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Coeur d'Alene River Ranger District

Iron Honey Resource Area
Final Environmental Impact Statement

IRON HONEY RESOURCE AREA
FINAL ENVIRONMENTAL IMPACT STATEMENT
November 2001

Coeur d'Alene River Ranger District
Idaho Panhandle National Forests
Kootenai and Shoshone Counties, Idaho

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ABSTRACT

The Forest Service is proposing aquatic, vegetative and wildlife habitat improvement activities in the 21,600-acre Iron Honey Resource Area, located at the upper end of the Little North Fork Coeur d'Alene River drainage. There are four primary objectives to the proposed activities in the Iron Honey Resource Area: 1) Improve water quality, fish habitat and riparian habitat by reducing sediment and increasing large woody debris in streams; 2) trend the vegetative species composition toward historical levels, which included species better adapted to local climatic stress and therefore more resistant to insects and disease; 3) increase age-class diversity and trend toward reduced fragmentation (especially in old growth); and 4) reduce fire hazard and potential fire severity.

The Final Environmental Impact Statement describes the actions proposed in the Iron Honey Resource Area, provides an assessment of the scope and analysis of alternatives, addresses public concerns and recommendations, describes key changes that have been made to the analysis and documentation between the Draft and Final EIS's, and discusses the environmental effects that could occur under each alternative.

Seven alternatives were initially developed in response to the major issues identified during scoping and environmental analysis. These include a No-Action Alternative (Alternative 1), a watershed restoration-only alternative (Alternative 6), and four alternatives that propose a range of timber harvest, fuels treatment, and watershed restoration activities (Alternatives 2, 3, 5 and 7). Alternative 4 proposed extensive use of prescribed fire (without timber harvest or other activities) on a large scale to mimic large stand-replacing fires. Alternative 4 was eliminated from further consideration because it would not meet the purpose and need identified for the area, would result in unacceptable environmental impacts to area resources, and is not economically feasible at this time. Based on public comments on the Draft EIS, another alternative was developed (Alternative 8) combining features of Alternatives 2 and 6. The objective of Alternative 8 is to restore vegetation composition and structure to more closely resemble historical patterns within the Iron Creek and Solitaire Creek watersheds, and the face drainages of the Upper Little North Fork Coeur d'Alene River. **Alternative 8 is the Forest Service's preferred alternative at this time**.

Copies of this EIS are available on compact disk (CD) or in paper format from the Coeur d'Alene River Ranger District Office at the address above, and on the Idaho Panhandle National Forests' internet website (www.fs.fed.us/ipnf/eco/manage/nepa).

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IRON HONEY RESOURCE AREA
FINAL ENVIRONMENTAL IMPACT STATEMENT

TABLE OF CONTENTS

CHAPTER I - PROPOSED ACTION

1.1 Purpose and Need ..... Page I-1
1.1.1 Introduction ..... Page I-1
1.1.2 Interior Columbia Basin Ecosystem Management Project ..... Page I-1
1.1.3 Geographic Assessment for the Coeur d'Alene River Basin ..... Page I-1
1.1.4 Objectives of the Iron Honey Resource Area Proposal ..... Page I-2
1.2 Proposed Action ..... Page I-4
1.3 Scope of the Proposal ..... Page I-5
1.4 Organization of the Document ..... Page I-5
1.5 Changes Made Between the Draft and Final EIS ..... Page I-6
1.6 Decisions to be Made ..... Page I-7

CHAPTER II - ALTERNATIVES

2.1 Introduction ..... Page II-1
2.2 Policy Direction and Legal Guidance ..... Page II-1
2.2.1 Organic Act of 1897 ..... Page II-1
2.2.2 Multiple-Use Sustained-Yield Act of 1960 ..... Page II-1
2.2.3 Wild and Scenic Rivers Act of 1968 ..... Page II-1
2.2.4 National Environmental Policy Act of 1969 ..... Page II-2
2.2.5 National Forest Management Act of 1976 ..... Page II-2
2.2.6 Natural Resources Agenda ..... Page II-2
2.2.7 National Fire Plan ..... Page II-2
2.2.8 FS Road Management and Transportation System Rule ..... Page II-2
2.2.9 Roadless Area Conservation Rule ..... Page II-3
2.2.10 Interior Columbia Basin Ecosystem Management Project ..... Page II-3
2.2.11 Northern Region Review ..... Page II-4
2.2.12 Forest Plan for the IPNF ..... Page II-5
2.2.13 Coeur d'Alene River Basin Geographic Assessment ..... Page II-6
2.2.14 Migratory Bird Executive Order ..... Page II-7
2.2.15 Other Legal Mandates ..... Page II-7
2.3 Scoping and Alternative Development ..... Page II-7
2.3.1 Scoping ..... Page II-7
2.3.2 Issues ..... Page II-8
2.3.3 Alternative Development and Modification ..... Page II-9
2.3.4 Alternatives Considered But Eliminated From Further Study ..... Page II-10
2.4 Ongoing and Reasonably Foreseeable Activities ..... Page II-10
2.5 Opportunities ..... Page II-12
2.5.1 Opportunities to improve aquatic resources ..... Page II-12
2.5.2 Opportunities to improve forest vegetation ..... Page II-12
2.5.3 Opportunities to reduce the spread of noxious weeds ..... Page II-12
2.6 Alternative Descriptions ..... Page II-13
2.6.1 Introduction ..... Page II-13
2.6.2 Alternative 1 ..... Page II-14
2.6.3 Alternative 2 ..... Page II-14
2.6.4 Alternative 3 ..... Page II-15
2.6.5 Alternative 5 ..... Page II-15
2.6.6 Alternative 6 ..... Page II-16
2.6.7 Alternative 7 ..... Page II-17
2.6.8 Alternative 8 ..... Page II-18

2.6.9 Features Common to All Action Alternatives ..... Page II-20
A. Features Designed to Protect Aquatic Resources ..... Page II-20
B. Features Designed to Improve Vegetation Management ..... Page II-21
C. Features Designed to Protect Soils ..... Page II-22
D. Features Designed to Protect Rare Plants ..... Page II-22
E. Features Designed to Protect Air Quality ..... Page II-23
F. Features Designed to Protect Wildlife Habitat ..... Page II-23
G. Features Designed to Protect Heritage Resources ..... Page II-24
H. Features Designed to Reduce the Spread of Noxious Weeds ..... Page II-24
I. Long-term Transportation Plan Common to All Alternatives ..... Page II-24
J. Land Exchange – Adjustment of Right-of-Way Easements ..... Page II-25
K. Anticipated Timing of Activities Under the Action Alternatives ..... Page II-25
2.6.10 Mitigation ..... Page II-26
A. Mitigation to Reduce Effects to Aquatic Resources ..... Page II-26
B. Mitigation to Reduce Effects to TES Plants ..... Page II-26
C. Mitigation to Reduce Effects to Soils ..... Page II-27
D. Mitigation to Reduce Effects to Wildlife ..... Page II-27
E. Mitigation to Reduce Effects Related to Recreation ..... Page II-28
F. Mitigation to Reduce Effects to Scenic Resources ..... Page II-28
2.6.11 Monitoring ..... Page II-28
A. Forest Plan Monitoring ..... Page II-28
B. Forest Corporate Monitoring ..... Page II-29
C. Monitoring Specific to This Project ..... Page II-29
2.7 Comparison of Alternatives ..... Page II-30
2.7.1 Aquatics ..... Page II-30
2.7.2 Forest Vegetation (including Old Growth) ..... Page II-36
2.7.3 Soil Productivity ..... Page II-39
2.7.4 Fire/Fuels ..... Page II-39
2.7.5 Wildlife Habitat ..... Page II-40
2.7.6 Recreation ..... Page II-50
2.7.7 Scenic Resources ..... Page II-51
2.7.8 Finances ..... Page II-51

CHAPTER III - EXISTING CONDITIONS, ENVIRONMENTAL CONSEQUENCES

3.1 Introduction ..... Page III-1
3.1.1 Overview of the Area ..... Page III-1
3.1.2 Past Activities ..... Page III-1
3.2 Aquatics ..... Page III-5
3.2.1 Regulatory Framework ..... Page III-5
3.2.2 Methodology ..... Page III-6
A. Methodology Used to Identify Existing Conditions ..... Page III-6
B. Methodology Used in the Assessment of Environmental Consequences ..... Page III-7
3.2.3 Existing Conditions ..... Page III-13
A. Introduction ..... Page III-13
B. Desired Conditions ..... Page III-14
C. Effects of Past Land Management Activities on Aquatic Resources ..... Page III-14
D. Fish Presence ..... Page III-15
E. Fish Abundance and Composition ..... Page III-18
F. Existing Conditions, by Watershed ..... Page III-19
1. Conditions in the Iron Creek Watershed ..... Page III-19
2. Conditions in the Hudlow Creek Watershed ..... Page III-21
3. Conditions in the Tom Lavin and Lewelling Creek Watersheds ..... Page III-23
4. Conditions in the Honey, Sob, Solitaire and Upper Little North Fork Coeur d'Alene River Watersheds ..... Page III-25

3.2.4 Environmental Consequences ....Page III-27
A. Effects Common to All Action Alternatives....Page III-27
B. Effects to Aquatic Resources at the Watershed Scale ....Page III-29
1. Effects to the Iron Creek Watershed....Page III-29
2. Effects to the Hudlow Creek Watershed....Page III-34
3. Effects to the Tom Lavin Creek Watershed....Page III-35
4. Effects to the Lewelling Creek Watershed ....Page III-37
5. Effects to the Upper Little North Fork Coeur d'Alene River Watershed....Page III-39
6. Effects to the Honey Creek Watershed....Page III-42
7. Effects to the Sob Creek Watershed....Page III-45
8. Effects to the Solitaire Creek Watershed....Page III-47
9. Effects to the Face Drainages of the Little North Fork Watershed ....Page III-50
C. Effects to Fisheries at the Watershed Scale ....Page III-52
1. Riparian harvest....Page III-52
2. Sediment delivery risk ....Page III-53
3. Estimated sediment yield ....Page III-54
4. Increased fish passage....Page III-58
5. Reduced length of encroachment by roads ....Page III-58
D. Effects to Fisheries at the Cumulative Effects Scale (Hudlow Creek and Above)....Page III-60
E. Cumulative Effects Beyond the Project Area (above Skookum Creek)....Page III-73
3.2.5 Consistency With Forest Policy and Legal Mandates ....Page III-75
A. Consistency With the Forest Plan as Amended by the INFS ....Page III-75
B. Consistency With Legal Mandates....Page III-79
3.3 Forest Vegetation....Page III-80
3.3.1 Regulatory Framework ....Page III-80
3.3.2 Methodology....Page III-82
A. Assessment of Existing Conditions....Page III-82
B. Assessment of Environmental Consequences....Page III-83
3.3.3 Overview ....Page III-84
A. Introduction....Page III-84
B. Habitat Types ....Page III-84
C. Disturbance and Successional Patterns....Page III-85
D. Coeur d'Alene Basin Current Situation ....Page III-86
E. Existing Conditions in the Iron Honey Resource Area....Page III-87
3.3.4 Existing Conditions and Environmental Consequences in the Iron Creek Watershed....Page III-91
3.3.5 Existing Conditions and Environmental Consequences in the Hudlow Creek Watershed....Page III-94
3.3.6 Existing Conditions and Environmental Consequences in the Tom Lavin Creek Watershed.Page III-97
3.3.7 Existing Conditions and Environmental Consequences in the Lewelling Creek Watershed...Page III-99
3.3.8 Existing Conditions and Environmental Consequences in the Honey Creek Watershed....Page III-101
3.3.9 Existing Conditions and Environmental Consequences in the Sob Creek Watershed ....Page III-103
3.3.10 Existing Conditions and Environmental Consequences in the Solitaire Creek Watershed .Page III-105
3.3.11 Existing Conditions and Environmental Consequences in the Upper Little North Fork Coeur d'Alene River Watershed ....Page III-107
3.3.12 Existing Conditions and Environmental Consequences in the Upper Little North Fork Coeur d'Alene River Face Watersheds....Page III-109
3.3.13 Direct and Indirect Effects at the Resource Area Scale ....Page III-111
3.3.14 Cumulative Effects at the Watershed Scale ....Page III-116
3.3.15 Consistency With Forest Policy and Legal Mandates ....Page III-121
3.4 Soil Productivity ....Page III-125
3.4.1 Regulatory Framework ....Page III-125
3.4.2 Methodology....Page III-126
3.4.3 Existing Conditions....Page III-128
3.4.4 Environmental Consequences ....Page III-129
3.4.5 Consistency With Forest Policy and Legal Mandates ....Page III-135

3.5 Fire/Fuels ..... Page III-136
3.5.1 Regulatory Framework ..... Page III-136
3.5.2 Methodology ..... Page III-137
3.5.3 Existing Conditions ..... Page III-138
3.5.4 Environmental Consequences ..... Page III-143
3.5.5 Consistency With Forest Policy and Legal Mandates ..... Page III-148
3.6 Wildlife ..... Page III-149
3.6.1 Regulatory Framework ..... Page III-149
3.6.2 Methodology ..... Page III-149
A. Introduction ..... Page III-149
B. Species Relevancy Screen ..... Page III-150
C. Threatened and Endangered Species ..... Page III-151
D. Sensitive Species ..... Page III-152
E. Big Game Management Indicator Species ..... Page III-152
F. Old Growth Management Indicator Species ..... Page III-153
G. Nongame ..... Page III-154
H. Neotropical (Migrant) Birds ..... Page III-154
3.6.3 Threatened and Endangered Wildlife Species ..... Page III-154
A. Gray Wolf ..... Page III-154
B. Bald Eagle ..... Page III-157
C. Lynx ..... Page III-158
D. Grizzly Bear ..... Page III-160
3.6.4 Sensitive Wildlife Species ..... Page III-160
A. Goshawk ..... Page III-160
B. Wolverine ..... Page III-163
C. Fisher ..... Page III-166
D. Black-backed woodpecker ..... Page III-169
E. Flammulated owl and white-headed woodpecker ..... Page III-171
F. Coeur d'Alene Salamander ..... Page III-172
3.6.5 Big Game Management Indicator Species ..... Page III-173
3.6.6 Old Growth Management Indicator Species ..... Page III-179
3.6.7 Non-game Habitat ..... Page III-185
3.6.8 Neotropical (Migratory) Land Birds ..... Page III-188
3.6.9 Cumulative Effects to Wildlife ..... Page III-189
3.6.10 Consistency With Forest Policy and Legal Mandates ..... Page III-191
3.7 Recreation Access ..... Page III-194
3.7.1 Regulatory Framework ..... Page III-194
3.7.2 Existing Conditions ..... Page III-194
3.7.3 Environmental Consequences ..... Page III-195
3.7.4 Consistency With Forest Policy and Legal Mandates ..... Page III-197
3.8 Scenic Resources ..... Page III-199
3.8.1 Regulatory Framework and Methodology ..... Page III-199
3.8.2 Existing Conditions ..... Page III-199
3.8.3 Environmental Consequences ..... Page III-199
3.8.4 Consistency With the Forest Plan and Other Legal Mandates ..... Page III-201
3.9 Finances ..... Page III-202
3.9.1 Regulatory Framework ..... Page III-202
3.9.2 Methodology ..... Page III-202
3.9.3 Existing Conditions ..... Page III-205
3.9.4 Financial Consequences ..... Page III-205
3.9.5 Consistency With Forest Policy and Legal Mandates ..... Page III-210
3.10 Other Required Disclosures ..... Page III-210
3.10.1 Potential Conflicts With Plans and Policies of Other Jurisdictions ..... Page III-210
3.10.2 Probable Adverse Environmental Effects Which Cannot Be Avoided ..... Page III-211
3.10.3 Short-term Uses and Long-term Productivity ..... Page III-212
3.10.4 Irreversible and Irretrievable Commitment of Resources ..... Page III-213
3.10.5 Specifically-required Disclosures ..... Page III-213

LIST TO WHOM COPIES OF THE DOCUMENT HAVE BEEN SENT
LIST OF PREPARERS
LIST OF REFERENCES
ACRONYMS/GLOSSARY

APPENDICES

Appendix A – Public Involvement in Issue Identification and Alternative Development and Modification
Introduction ..... Page A-1
Scoping and Issue Identification ..... Page A-1
Public Notices and Outreach ..... Page A-1
Issues Addressed in Detail in This EIS ..... Page A-1
Issues Not Discussed in Detail in This EIS ..... Page A-1
Alternative Development and Modification ..... Page A-5
Alternatives Considered But Eliminated ..... Page A-5
Public Comments During Review of the Draft EIS ..... Page A-6

Appendix B – Threatened, Endangered and Sensitive Plants
Regulatory Framework ..... Page B-1
Methodology ..... Page B-1
Existing Conditions ..... Page B-2
Environmental Consequences ..... Page B-5
Consistency With Forest Policy and Legal Mandates ..... Page B-14

Appendix C – Aquatic Resources Monitoring and Evaluation Plan
Introduction ..... Page C-1
Monitoring Plan Design ..... Page C-1

Appendix D – Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances
Physical Characteristics ..... Page D-1
Qualifications ..... Page D-1
Hydrologic Regime ..... Page D-2
Watershed Hydrologic Response Estimates and WATSED ..... Page D-2

Appendix E – Specific Unit Information

Appendix F – Transportation
Introduction ..... Page F-1
Transportation System ..... Page F-2
Road Management ..... Page F-3
Access Management ..... Page F-4
Long-range Transportation System ..... Page F-4

Appendix G – Proposed Harvest Openings Greater Than 40 Acres

Appendix H – Pruning and Thinning Opportunities

LIST OF FIGURES

II-1. Management Area Allocations in the Iron Honey Resource Area ..... Page II-5
II-2. Comparison of maximum percent sediment yield ..... Page II-31
II-3. Comparison of net reduction in stream crossings ..... Page II-31
II-4. Comparison of reduction in sediment delivery for the Iron Creek drainage ..... Page II-32
II-5. Comparison of reduction in sediment delivery, North Fork CDA River (above Iron Creek) ..... Page II-32
II-6. Comparison of reduction in sediment delivery, North Fork CDA River (Hudlow Creek) ..... Page II-32
II-7. Comparison of maximum percent peak flow ..... Page II-33
II-8. Comparison of net decrease in road miles ..... Page II-33
II-9. Comparison of open and total road density after completion of project activities ..... Page II-34
II-10. Comparison of net reduction in encroaching road miles ..... page II-34
II-11. Comparison of vegetation removed within RHCA's ..... Page II-35
II-12. Comparison of increased fish passage ..... page II-35
II-13. Comparison of changes to forest vegetation structural stages ..... Page II-37
II-14. Comparison of allocated recruitment old growth ..... Page II-38
II-15. Comparison of changes in forest vegetation cover types ..... Page II-38
II-16. Comparison of soil compaction and displacement in harvest units ..... Page II-39
II-17. Comparison of goshawk nesting habitat ..... Page II-41
II-18. Comparison of wolverine habitat ..... Page II-42
II-19. Comparison of late successional (fisher) habitat ..... Page II-42
II-20. Comparison of total allocated old growth and recruitment old growth ..... Page II-42
II-21. Comparison of total miles of riparian habitat restored ..... Page II-43
II-22. Comparison of black-backed woodpecker habitat ..... page II-43
II-23. Comparison of flammulated owl and white-headed woodpecker (capable) habitat ..... Page II-44
II-24. Comparison of elk habitat potential in each EHU following completion of project activities ..... Page II-44
II-25. Comparison of elk habitat potential in Compartments 302 and 303 ..... Page II-45
II-26. Comparison of elk habitat potential in Compartments 304 and 305 ..... Page II-45
II-27. Comparison of changes in elk security in Compartment 302 ..... Page II-45
II-28. Comparison of changes in elk security in Compartment 303 ..... Page II-46
II-29. Comparison of changes in elk security in Compartment 305 ..... Page II-46
II-30. Comparison of changes in elk security in the Iron Honey Resource Area ..... Page II-46
II-31. Comparison of habitat suitability values for marten cover and forage habitat ..... Page II-47
II-32. Comparison of habitat suitability values for pileated woodpecker habitat ..... Page II-48
II-33. Comparison of amount of openings created under each alternative ..... Page II-50
II-34. Comparison of funding for watershed restoration activities ..... Page II-52
III-1. Historic logging systems in the Iron Honey Resource Area ..... Page III-3
III-2. Existing road system in the Iron Honey Resource Area ..... Page III-4
III-3. Geographic scales of the aquatics analysis for the Iron Honey Resource Area proposal ..... Page III-9
III-4. Photo taken in 1959 showing the riparian harvests within the main stem of Tom Lavin Creek ..... Page III-24
III-5. Examples of stream conditions (Upper Little North Fork Coeur d'Alene River above Solitaire) ..... Page III-26
III-6. WATSED results for Alternatives 1 and 3 (change in average annual sediment yield) ..... Page III-54
III-7. WATSED results for Alternatives 2 and 7 (change in average annual sediment yield) ..... Page III-55
III-8. WATSED results for Alternative 5 (change in average annual sediment yield) ..... Page III-55
III-9. WATSED results for Alternative 6 (change in average annual sediment yield) ..... Page III-55
III-10. WATSED results for Alternative 8 (change in average annual sediment yield) ..... Page III-56
III-11. WATSED results of implementing restoration opportunities (change in average annual sediment yield) Page III-56
III-12. Downcut reach, Little North Fork ..... Page III-60
III-13. Aggraded reach, Little North Fork ..... Page III-61
III-14. Historic and current cover types, Coeur d'Alene River Basin ..... Page III-88
III-15. Historic and current size classes, Coeur d'Alene River Basin ..... Page III-89
III-16. Estimated trees per acre and predicted flame length under a 50 to 60-year fire return interval ..... Page III-141
III-17. Flame length potential over time in a typical stand unaltered by management or wildfire ..... Page III-144
III-18. Elk Habitat Units ..... Page III-175

E-1. Harvest method depictions ..... Page E-5

LIST OF TABLES

II-1. Ongoing or reasonably foreseeable projects within the Iron Honey cumulative effects analysis area ..... Page II-11
II-2. Comparison of activities proposed under the Iron Honey Resource Area project..... Page II-19
II-3. Acres of land and miles of road to be surveyed for TES plants ..... Page II-27
II-4. Long-term monitoring of ecosystem core data ..... Page II-29
II-5. Changes to groomed snowmobile routes..... Page II-51
II-6. Comparison of discounted net value and contributions to counties..... Page II-52

III-1. Sixth-scale and seventh-scale code watersheds and the HUC associated with the watershed..... Page III-8
III-2. Summary of selected fish species distribution within selected streams in the project area..... Page III-16
III-3. Projected watershed response in the Iron Creek Watershed (Total Iron Creek) ..... Page III-34
III-4. Projected watershed response in the Hudlow Creek Watershed (Total Hudlow Creek) ..... Page III-35
III-5. Projected watershed response in the Tom Lavin Creek Watershed ..... Page III-37
III-6. Projected watershed response in the Lewelling Creek Watershed ..... Page III-38
III-7. Projected watershed response in the Upper Little North Fork Watershed..... Page III-41
III-8. Projected watershed response in the Honey Creek Watershed ..... Page III-44
III-9. Projected watershed response in the Sob Creek Watershed..... Page III-47
III-10. Projected watershed response in the Solitaire Creek Watershed..... Page III-50
III-11. Projected watershed response, Upper Little North Fork Coeur d'Alene River Face (above Iron Creek) Page III-52
III-12. Approximate amount of vegetation removed wihtin Riparian Habitat Conservation Areas ..... Page III-53
III-13. Approximate amount of sediment delivery risk associated with stream crossing-restoration activities .. Page III-57
III-14. Increased fish passage ..... Page III-58
III-15. Reduction of encroaching roads ..... Page III-59
III-16. Effects to aquatic management indicator species, Alternative 1 ..... Page III-63
III-17. Effects to aquatic management indicator species, Alternatives 2 and 7 ..... Page III-64
III-18. Effects to aquatic management indicator species, Alternative 3 ..... Page III-65
III-19. Effects to aquatic management indicator species, Alternative 5 ..... Page III-68
III-20. Effects to aquatic management indicator species, Alternative 6 ..... Page III-70
III-21. Effects to aquatic management indicator species, Alternative 8 ..... Page III-72
III-22. Projected watershed response in the cumulative effects analysis area, Hudlow Creek and Above ..... Page III-73
III-23. Projected watershed response in the extended cumulative effects analysis area, above Skookum Creek Page III-73
III-24. Vegetative conditions in Iron Creek watershed..... Page III-92
III-25. Vegetative conditions in Hudlow Creek watershed..... Page III-95
III-26. Vegetative conditions in Tom Lavin Creek watershed..... Page III-98
III-27. Vegetative conditions in Lewelling Creek watershed ..... Page III-100
III-28. Vegetative conditions in Honey Creek watershed..... Page III-102
III-29. Vegetative conditions in Sob Creek watershed ..... Page III-104
III-30. Vegetative conditions in Solitaire Creek watershed..... Page III-106
III-31. Vegetative conditions in Upper North Fork Coeur d'Alene watershed..... Page III-108
III-32. Vegetative conditions in Coeur d'Alene River Face watersheds ..... Page III-110
III-33. Approximate acres of structural stages, Iron Honey analysis area ..... Page III-120
III-34. Approximate acres of cover types, Iron Honey analysis area ..... Page III-121
III-35. Estimated rate of fire spread and flame length during normal and drought conditions..... Page III-144
III-36. Approximate proposed acres of stand treatments and miles of road access ..... Page III-146
III-37. Goshawk territories in the Iron Honey Resource Area ..... Page III-162
III-38. Acres of nesting habitat within goshawk territories ..... Page III-162
III-39. Acres of lat successional stage forest ..... Page III-168
III-40. Acres to be managed as old growth or recruitment old growth ..... Page III-168
III-41. Miles of riparian habitat restored..... Page III-168
III-42. Acres of harvest in black-backed woodpecker nesting habitat ..... Page III-170
III-43. Acres of harvest in black-backed woodpecker forage habitat..... Page III-170
III-44. Percent elk habitat potential during and after project activities ..... Page III-177
III-45. Acres of elk security during and after project activities ..... Page III-177
III-46. Habitat suitability index values for pine marten cover ..... Page III-181
III-47. Habitat suitability values for forage for marten ..... Page III-181

LIST OF TABLES, continued

III-48. Habitat suitability values for pileated woodpecker (post sale)..... Page III-184
III-49. Site-specific factors affecting expected stumpage values..... Page III-203
III-50. Cost estimates for proposed activities..... Page III-204
III-51. Summary of purchaser contractual costs and sensitivity of featured KV project funding ..... Page III-207
III-52. Financial efficiency analysis ..... Page III-207
III-53. Accomplishment of watershed restoration work by sale purchaser ..... Page III-208
III-54. Accomplishment of watershed restoration work through KV (Other) contracts ..... Page III-208
III-55. Accomplishment of watershed restoration work through special funding an/or grants ..... Page III-209

A-1. Noxious weed treatment sites in the Iron Honey Resource Area ..... Page A-2

B-1. Coeur d'Alene TES Plants by rare plant habitat guild ..... Page B-3
B-2. Sensitive plant occurrences in the Iron Honey Resource Area..... Page B-4
B-3. Rare plant guilds with potential for effects in the Iron Honey Resource Area..... Page B-4
B-4. Sensitive plant surveys completed in the Iron Honey Resource Area ..... Page B-5
B-5. Summary acres of suitable Sensitive plant habitat potentially affected by harvest treatments..... Page B-8
B-6. Summary of determination of effects on Sensitive plant species, by guild..... Page B-14

C-1. Aquatics restoration implementation monitoring plan of operation ..... Page C-2
C-2. Aquatics restoration effectiveness monitoring plan of operation ..... Page C-3
C-3. Aquatics restoration corporate monitoring core data ..... Page C-3

D-1. Watershed characteristics, condition indicators, dominant watershed disturbances (Total Iron Creek) ..... Page D-3
D-2. Watershed characteristics, condition indicators, dominant watershed disturbances (Upper/Lower Iron)..... Page D-4
D-3. Watershed characteristics, condition indicators, dominant watershed disturbances in Rablens Creek..... Page D-4
D-4. Watershed characteristics, condition indicators, dominant watershed disturbances in Cataract Creek ..... Page D-5
D-5. Watershed characteristics, condition indicators, dominant watershed disturbances in Hudlow Creek..... Page D-5
D-6. Watershed characteristics, condition indicators, dominant watershed disturbances, West Fork Hudlow..... Page D-6
D-7. Watershed characteristics, condition indicators, dominant watershed disturbances, Middle Fork Hudlow... Page D-6
D-8. Watershed characteristics, condition indicators, dominant watershed disturbances, East Fork Hudlow ..... Page D-7
D-9. Watershed characteristics, condition indicators, dominant watershed disturbances, Tom Lavin Creek ..... Page D-7
D-10. Watershed characteristics, condition indicators, dominant watershed disturbances, Lewelling Creek..... Page D-8
D-11. Watershed characteristics, condition indicators, dominant watershed disturbances in Honey Creek ..... Page D-8
D-12. Watershed characteristics, condition indicators, dominant watershed disturbances in Sob Creek ..... Page D-9
D-13. Watershed characteristics, condition indicators, dominant watershed disturbances in Solitaire Creek ..... Page D-9
D-14. Watershed characteristics, condition indicators, dominant watershed disturbances, Upper Little NF..... Page D-10
D-15. Watersheds not burned by large fires, in which timber harvest activities have occurred..... Page D-16
D-16. Watersheds burned by large fires, in which timber harvest activities have occurred..... Page D-17

E-1. Specific unit information, Alternative 2 .....Page E-1
E-2. Specific unit information, Alternative 3 .....Page E-2
E-3. Specific unit information, Alternative 5 .....Page E-3
E-4. Specific unit information, Alternative 7 .....Page E-3
E-5. Specific commercial harvest unit information, Alternative 8 .....Page E-4
E-6. Specific instream wood source unit information, Alternative 8 .....Page E-4

F-1. Proposed changes to system roads.....Page F-7
F-2. Proposed changes to amount of total roads open .....Page F-7
F-3. Proposed changes to road densities .....Page F-7
F-4. Proposed changes to roads designated for ATV/motorcycle use .....Page F-7
F-5. Proposed watershed restoration work.....Page F-8

G-1. Proposed harvest openings greater than 40 acres ..... Page G-1

H-1. Pruning and thinning opportunities in the Iron Honey Resource Area..... Page H-1

CHAPTER I
PURPOSE AND NEED FOR ACTION

1.1 PURPOSE AND NEED

1.1.1 Introduction

The Forest Service is proposing aquatic, vegetative and wildlife habitat improvement activities in the 21,600-acre Iron Honey Resource Area, located at the upper end of the Little North Fork Coeur d'Alene River drainage (please refer to the enclosed maps). The purpose and need for this project were derived from the analysis and conclusions in the Interior Columbia Basin Ecosystem Management Project and the Coeur d'Alene River Basin Geographic Assessment.

1.1.2 Interior Columbia Basin Ecosystem Management Project

The Interior Columbia Basin Ecosystem Management Project was guided by integrated ecological assessments and strategies that began in 1993 by direction from President Clinton to "develop a scientifically sound and ecosystem-based strategy for management of eastside forests." This direction resulted in the combined Bureau of Land Management and Forest Service project known as the Interior Columbia Basin Ecosystem Management Project (ICBEMP). The assessment covers the "interior" portion of the Columbia River Basin and those portions of the Klamath and Great Basins within Oregon. This includes the states of Oregon and Washington east of the crest of the Cascade Mountains, most of Idaho, and small portions of northern Nevada, western Montana and western Wyoming, for a total of 145 million acres. The scientific findings for the ICBEMP were released during the fall of 1996. At the Interior Columbia Basin scale, the findings show that the river basins on the Idaho Panhandle National Forests have a low composite ecological integrity primarily due to past alterations. Further findings show low forest integrity throughout the Idaho Panhandle National Forests, mixed low to moderate aquatic integrity, and mixed low, moderate and high integrity hydrologic conditions.

The Iron Honey Resource Area is in ICBEMP Forest Cluster #4, which emphasizes reducing risk to ecological integrity and species viability (USDA Forest Service, 1996, Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin). The primary risks to ecological integrity within Forest Cluster #4 are risks to hydrologic and aquatic systems from fire potential, risks to late and old forest structures in managed areas, and risks in forest compositions that are susceptible to insect, disease, and fire (Integrated Scientific Assessment, page 113). Additional information is provided in 2.2.8 Interior Columbia Basin Ecosystem Management Project, in this chapter.

1.1.3 Geographic Assessment for the Coeur d'Alene River Basin

An assessment for the Coeur d'Alene River basin was conducted to gain a better understanding of the "big picture" of conditions at this level in relation to those at the Upper Columbia River Basin scale (USDA Forest Service, 1998. Toward an Ecosystem Approach: An Assessment of the Coeur d'Alene River Basin. Idaho Panhandle National Forests, Ecosystem Paper #4). For clarity, that document is referred to simply as the "Geographic Assessment." The findings of the assessment proved to be consistent with the findings of the Upper Columbia River Basin at the next scale down. To identify the overall strategy for the Coeur d'Alene River Basin, the terrestrial, watershed, wildlife and recreation (sense of place) maps were overlaid. According to the Geographic Assessment, the type of intensive vegetative and watershed restoration proposed in Iron-Honey is appropriate in non-functioning watersheds with serious terrestrial problems (Geographic Assessment, p. 65).

The Geographic Assessment for the Coeur d'Alene River Basin identified all of the tributaries within the Iron Honey analysis area as "functioning at risk" or "properly functioning" except for Iron Creek, which is listed as "nonfunctioning." (A definition of these terms is provided in the Chapter III, Aquatics, 3.2.2 Methodology). The Geographic Assessment also found that all of the watersheds within the project area are high priority for vegetative restoration due to the effects of white pine blister rust, past harvest activities, and fire exclusion (USDA Forest Service, IPNF, 1998). The Geographic Assessment identified the Upper Little North Fork as having priority for both vegetative and watershed restoration, with the watershed (aquatic) restoration need focused in Honey and Hudlow Creeks.

For additional discussion, please refer to 2.2.11 Coeur d'Alene River Basin Geographic Assessment in this chapter.

1.1.4 Objectives of the Iron Honey Resource Area Proposal

Based on these findings, there are four primary objectives to the proposed activities in the Iron Honey Resource Area:

1. *Improve water quality, fish habitat and riparian habitat by reducing sediment and increasing large woody debris in streams;*
2. *Trend the vegetative species composition toward historical levels, which included species more resistant to insects and disease;*
3. *Increase age-class diversity and reduce old-growth fragmentation;*
4. *Reduce fire hazard and potential fire severity.*

Proposed activities in the Iron Honey Resource Area would address these three primary risks in a manner consistent with Chapter 8 of the Integrated Scientific Assessment and with the recommendations of the Geographic Assessment. The effectiveness of each alternative in addressing those risks is discussed for each appropriate resource (in the Aquatic Resources, Forest Vegetation, and Fire/Fuels sections).

Additional discussion for each of these objectives is provided below.

A. Improve water quality and riparian habitat.

Both the Forest Service and public have identified the need to maintain or improve water quality and riparian habitat in the Upper Little North Fork Coeur d'Alene River. Water yields have significantly changed over historic levels within the Upper Little North Fork Coeur d'Alene River, primarily due to extensive vegetative changes from logging and through the extension of channel networks associated with roading. The most serious process influencing the tributaries in the Upper Little North Fork is the failure of roads, road fills, and road channel crossings in close proximity to streams. Many roads in the analysis area have experienced failures, whether due to inadequate design or construction methods, a lack of maintenance, or the inevitable degradation over time. Typically, where instream failures or evidence of channel instability are found, upstream road-related failures that directly compromised the stream can also be found.

Water quality, fish habitat, and riparian habitat can be improved by removing channel crossings and recontouring and/or scarifying, seeding, and waterbarring roadbeds of closed roads.

B. Trend the vegetative species composition toward historical levels, which included species more resistant to insects and disease.

Studies such as the Interior Columbia Basin Ecosystem Management Project and Coeur d'Alene River Basin Geographic Assessment have documented the desirability of trending area forests toward a species composition more resistant to insects and disease. (Please refer to "2.2 Policy Direction and Legal Guidance" in this chapter, and "3.3 Forest Vegetation" in Chapter III). Western white pine and western larch, which are better adapted to local climatic stress and therefore more resistant to insects and disease than other species, have significantly declined within the Coeur d'Alene River Basin as a result of white pine blister rust and timber harvesting. Stands with a major component of these early seral species would also be more resistant to root diseases and stem decay and better able to achieve the long-term objectives of stand structures, size class and patterns that more closely match historical conditions. Timber harvests in the past tended to remove these species while leaving species such as grand fir, hemlock, and Douglas-fir, which compete against white pine and western larch for light and nutrients. Aggressive fire suppression on drier sites has allowed the encroachment of Douglas-fir and grand fir into the understories, creating much denser stands over larger areas, and increasing the potential for stand-replacing fires.

The health and vigor of the more desirable species in young stands can be improved through activities such as precommercial thinning and pruning of white pine. Recent studies indicate that pruning and thinning of white pine, even of non-resistant stock, can dramatically improve survival and growth (Schwandt, 1994). Harvest of disease-prone species (to reduce competition for light and moisture) followed by regeneration of white pine and western larch within created openings would help restore these species to their historical levels within the analysis area.

There are relatively few stands in the analysis area in which larch is a major component, and only a portion of these contain larch capable of responding to release by commercial thinning. However, these stands may provide an opportunity to improve growth and allow the white pine and western larch to provide a future large tree component quicker than would be attained without silvicultural treatment.

C. Increase age-class diversity and reduce old-growth fragmentation.

Forest Service specialists and members of the public have identified concerns related to age-class diversity in the Coeur d'Alene River Basin and the Iron Honey Resource Area, especially old growth. Old growth has declined from a historic average of about 21 percent of the area to less than 4 percent (Geographic Assessment, page 39). This was generally the result of aggressive harvesting of white pine and larch, and the loss of white pine to blister rust over the last 80 years. The large fires in the first few decades of the 1900's also played an important part in reducing the old forest component. Today, old growth on National Forest System lands in the Coeur d'Alene Basin tends to be in areas not burned in the 1910 fires, and tends to be fragmented by past timber harvest and road construction.

> Old-growth is distinguished by old trees and related structural attributes. Theyencompa ss the later stages of stand development that typically differ from earlier stages in characteristics such as tree age, tree size, number of large trees per acre, and basal area. Attributes such as decadence, dead trees, the number of canopy layers and canopy gaps are also important, but are more difficult to described because of high variability. For more information, please refer to "3.3 Forest Vegetation" in Chapter III.

Patch size and shape have been altered in all age classes over the last 80 years, decreasing the amount of interior forest habitat now and in the near future. Large residual trees are in short supply because of past selective logging practices and firewood gathering. This has resulted in low numbers of large-diameter snags. A lack of large wood as well as a lack of large boulders (removed during turn of the century log drives) in the Little North Fork has reduced habitat for the harlequin duck, which is now considered a rare species in Idaho.

Some wildlife in the Little North Fork drainage would benefit from increasing the size and connectivity of old growth and young forest blocks by allocating additional recruitment old growth, linking currently fragmented blocks of young forest, promoting western larch and white pine old growth, and promoting large residual trees (Geographic Assessment, pp. 63, 66).

D. Reduce fire hazard and potential fire severity.

Forest Service silviculturists, fuels specialists and fire managers are concerned about the associated risks associated with current fuel levels in the analysis area. Historically, in normal years, fires may have burned up to several hundred acres in small patches of overstory mortality, mixed with larger areas of underburn, before being stopped by summer rains. In particularly dry years when fire starts were followed by high winds, high intensity fires could cover tens of thousands to hundreds of thousands of acres. The fire of 1910 is an example of a stand-replacing fire. These fires often killed most trees within the fire perimeter, leaving islands of trees in riparian areas or where recent low intensity fires had removed ladder fuels from the understory.

There has not been a major large stand-replacing fire in the Coeur d'Alene Basin since 1931. Land management agencies have been particularly adept at putting out low and mixed severity fires, which have ceased to be a significant disturbance agent. This successful fire suppression has temporarily increased the security of human life and property, and made it easier to practice traditional forestry. However, as a result of the suppression of fire in a very productive ecosystem, woody dead fuels and multi-story stands are accumulating. The Coeur d'Alene River Basin shows the largest increase in forest fuels of any sampled watershed in the Interior Columbia Basin Assessment Area. This fuel accumulation increases the risk of wildfire and increases the potential severity of the fire.

1.2 PROPOSED ACTION

In addition to allocation of additional recruitment old growth, proposed alternatives include the following watershed restoration, vegetative restoration, and fuels treatment activities. For more specific information (acres by prescription, yarding method, fuels treatment, etc.), please refer to the Alternative Descriptions in Chapter II, Appendix E (Specific Unit Information), Appendix F (Transportation), and the enclosed maps.

For the purpose of this assessment, allocated "recruitment" old growth stands are those that meet most old growth criteria but are lacking some characteristics. These areas would be managed to develop those characteristics over time. Please note that these "recruitment" stands are described as "potential" old growth in the 2000 Forest Monitoring Plan (page 59).

Watershed restoration activities

- *Removal of stream channel crossings and problem roads that are no longer required. This would improve water quality and fish habitat by reducing sediment production that is detrimental to stream channel integrity. Removal of roads would also reduce fragmentation of old growth by increasing block size, improving habitat for old growth and snag-dependent wildlife species.*
- *Removal of fill material from stream channels*
- *Placement of large woody debris in stream reaches that are currently out of equilibrium*

Vegetative restoration activities

- *Regeneration harvests within those stands dominated by grand fir, Douglas-fir, and western hemlock, followed by the planting of long-lived seral species (blister rust-resistant white pine and western larch). In order to better mimic the large stand-replacing fires that occurred historically, these regeneration harvests would encompass hundreds or thousands of acres within individual drainages (varying by alternative). First priority for treatment would be those drainages that have been highly fragmented by past harvesting and those drainages dominated by grand fir and Douglas-fir showing signs of root disease and stem decays.*
- *Commercial thinning in those stands that have a significant component of western larch. This would provide for increased growth and vitality of the larch component in these stands and thereby increase the large, seral component within the analysis area.*
- *Precommercial thinning of previously-regenerated stands in which there is a significant western larch component competing with less desirable species.*

Fuels treatment

- *Prescribed burning (underburning and piling burning) to reduce woody debris*
- *Non-fire fuel treatment consisting of "lop and scatter" (branches are cut from felled trees to a predetermined height then scattered to reduce fuel concentrations)*

1.3 SCOPE OF THE PROPOSAL

The scope of this environmental impact statement was determined through public scoping and agency analysis, in accordance with the requirements of 40 CFR 1508.25. The scope of the actions to be addressed includes the proposed watershed restoration, vegetative restoration, allocation of recruitment old growth, and fuels treatment activities which could occur in the Iron, Hudlow, Tom Lavin, Lewelling, Honey, Sob and Solitaire Creek drainages, the Upper North Fork Coeur d'Alene River drainage, and the Coeur d'Alene River Face drainages. Also included in the scope of this analysis are road construction, reconstruction, and reconditioning; slash treatment; and site preparation in support of the proposed timber harvest and reforestation.

This environmental impact statement documents analysis of site-specific, on-the-ground activities. It is not a general management plan for the Upper Little North Fork Coeur d'Alene River Basin.

1.4 ORGANIZATION OF THE DOCUMENT

This document is tiered to and references the Forest Plan for the Idaho Panhandle National Forests, which sets forth the direction for managing the resources of the Forest. For clarity, that document is referred to simply as the "Forest Plan."

Chapter II presents the key resource issues within the area and describes the alternatives considered. Chapter III describes the existing conditions of specific resources and the changes that would occur to each resource under implementation of each alternative. Direct, indirect and cumulative impacts are discussed. A List of Preparers identifies the individuals who conducted the analyses and prepared the environmental impact statement. A List of References provides the full citation for those references noted in the environmental impact statement. A list of Acronyms used in the text is provided, and the Glossary defines terms used in the text that may be unfamiliar to the reader. A list of those who will receive copies of this environmental impact statement is provided (it is likely that others will request and receive copies of the document).

The Appendices contain analytical reports and specific or supplemental information that further explains discussions in the main chapters. Many more reports and analyses documentation have been referenced or developed during the course of this project, but were not included in this document either because they were technical in nature or were of excessive length. Those items are referred to as being part of the "project files." All project files for the Iron Honey Resource Area Environmental Impact Statement are available for review by the public. ***To review the files, please contact the Project Team Leader or the NEPA Coordinator at the Fernan Office of the Coeur d'Alene River Ranger District, (208) 664-2318.***

1.5 CHANGES MADE BETWEEN THE DRAFT AND FINAL EIS

Changes have been made to this EIS based on field verification activities and review of the Draft EIS by both the public and within the agency. Corrections of typographical or factual errors have been made as necessary. Editorial changes have been made for clarification and readability of the document. In addition, the following substantive changes have been made.

Development And Analysis Of A New Alternative: Alternative 8 was developed based on public comments during review of the Draft EIS. Alternative 8 responds to those who recommended an alternative that incorporated more of the watershed restoration features of Alternatives 6 with some of the vegetation management features of Alternative 2 or 7. For additional discussion, please refer to "2.5.7 Alternative 8" in this chapter, and Appendix A ("Alternative Development and Modification").

Identification of a Preferred Alternative: At the time the Draft EIS was published, the Forest Service did not have a preferred alternative. Based on public comment and subsequent alternative development, the Forest Service has identified Alternative 8 as the preferred alternative at this time.

Supplementation, Improvement Or Modification Of The Analyses and Documentation: The discussion of Ongoing and Reasonably Foreseeable Projects in Chapter II has been updated to reflect those activities that have been completed, ensure that all anticipated projects and activities have been appropriately addressed, and identify which resources are potentially affected by each of the reasonably foreseeable projects.

In the comparison of alternatives in Chapter II, a number of graphs have been used instead of tables to more clearly depict the differences in effects to resources under each alternative.

Additional information regarding effects to soils has been included in the Final EIS. Features designed to protect soils are described in Chapter II, as well as a comparison of effects to soils under each alternative. A section describing in detail the existing conditions and anticipated effects to Soil Productivity has been added to Chapter III. Previously, this information was part of the Project Files, but has been added to the EIS in response to concerns identified by the public regarding effects to soils.

Appendix H has been added to identify opportunities for white pine pruning and precommercial thinning in the Iron Honey Resource Area. These activities could occur under any action alternative.

Response To Public Comments: In the Draft EIS, Appendix A disclosed response to comments made by the public and other agencies during scoping and alternative development, prior to release of the Draft EIS. In this Final EIS, Appendix A documents responses to comments made by the public and other agencies after their review of the Draft EIS. Additional documentation has been provided in Appendix A to better portray the use of public comments in issue identification and alternative development (also discussed briefly in Chapter II).

1.6 DECISIONS TO BE MADE

This environmental impact statement is not a decision document. This document discloses the environmental consequences of implementing the proposed action or alternatives to that action. The Forest Supervisor for the Idaho Panhandle National Forests is the Deciding Official. The decision and the rationale for that decision will be stated in the Record of Decision. An alternative will be selected for implementation based on how well the alternative addresses:

- *the extent to which each alternative addresses the purpose and need for action*
- *consistency with the goals and findings of Forest policy (including standards, goals and objectives of the Forest Plan) and legal mandates*
- *how well each alternative responds to the environmental issues and concerns identified by the public, other agencies, and Forest Service resource specialists*
- *effects of the selected alternative in comparison to other alternatives considered*

Although no public review of a Final Environmental Impact Statement (EIS) is required before issuing a Record of Decision, we have elected to provide the public a 30-day review of the Iron Honey Final EIS due to the copious amount of information being presented. The decision will be prepared based on comments received throughout the process from the public and other agencies, identification of necessary corrections or additional analysis, and any new information.

To ensure consideration in making a decision, comments must be postmarked or received 30 days from the date of publication of the legal notice in the Spokesman-Review newspaper. Commenters should include their name, address, telephone number, and the organization they represent (if any); the title of the document on which the comment is being submitted; and facts and reasons specific to this proposal for the Deciding Official to consider. All comments received to date have been considered and addressed as appropriate (please refer to Appendix A). Those who have already commented need not re-submit their comments unless they have new issues of concern.

Comments received on the proposed project (including names and addresses of those who comment) will be considered part of the public record and will be available for public inspection. We can accept and consider comments submitted anonymously; however, people who submit anonymous comments will not have standing to appeal the subsequent decision (36 CFR 215). Any person may request that we withhold submitted comments from the public record (pursuant to 7 CFR 1.27(d)) by showing how the Freedom of Information Act (FOIA) permits such confidentiality. However, confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. We will inform the requestor of the agency's decision regarding the request for confidentiality. If the request is denied, we will return the submitted comments and notify the requester that the comments may be resubmitted, with or without name and address, within a specified time.

Forest Supervisor Ranotta McNair is the responsible official for this proposal. For further information, please contact Ecosystems Staff Officer Steve Bateman or Project Team Leader Glenn Truscott at the Fernan Office of the Coeur d'Alene River Ranger District, (208) 664-2318.

CHAPTER II
ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the alternatives considered to achieve the purpose and need discussed in Chapter I. The National Environmental Policy Act (NEPA) regulations require federal agencies to “identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment” (40 CFR 1500.2(e)). This chapter discloses the sources of analysis direction and guidance, alternative development (including public involvement), features common to all alternatives (including monitoring and mitigation), and a comparison of alternatives and their effects.

2.2 POLICY DIRECTION AND LEGAL GUIDANCE

2.2.1 Organic Act of 1897

The Organic Act of 1897 (16 USC 473-478, 478-482 and 551, June 4, 1897) provided that no national forest may be established except to improve and protect the forest, or to secure favorable conditions of water flows, and to furnish a continuous supply of timber. Section 551 of the Act was repealed by the Federal Land Policy and Management Act of 1976 to the extent the action applied to the issuance of rights-of-way over, upon, under and through public lands and lands in the National Forest System.

2.2.2 Multiple-Use Sustained-Yield Act of 1960

In 1960 the Forest Service was charged with management of National Forest System lands according to a philosphy of sustained yield and multiple use: production of timber, preservation of fish and wildlife habitat, watershed maintenance, mining, grazing and recreation (16 USC 528-531, 16 USC 1604(e), 1607 and 1609). The courts have distinguished the multiple-use and sustained-yield mandate of national forests from other Congressional management mandates, such as national parks. "The national forests, unlike national parks, are not wholly dedicated to recreational and environmental values," *Cronin v. United States Department of Agriculture*, 919 F.2d 439, 444 (7th Cir. 1990).

2.2.3 Wild and Scenic Rivers Act of 1968

The Wild and Scenic Rivers Act (Pub. L 90-542 as amended; 16 USC 1271-1287) established a method for providing Federal protection for certain free-flowing rivers, preserving them and their immediate environments for the use and enjoyment of present and future generations. Rivers which are found eligible and included in the National Wild and Scenic Rivers System are classified as 1)wild river areas, 2) scenic river areas, or 3) recreational river areas. Segments of the Coeur d'Alene River and North Fork Coeur d'Alene River were identified as potential recreational river segments in 1982. The Wildl and Scenic Rivers Interagency Guidelines (Federal Register, Vol. 47, No. 173, September 7, 1982) define “recreational river areas” as those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Ten management principles have been identified for recreational rivers, addressing carrying capacity, public use and access, basic facilities, major facilities, motorized travel, agricultural and forestry practices, other resource management practices, water quality, land use controls, and rights-of-way.

2.2.4 National Environmental Policy Act of 1969

The regulations implementing the National Environmental Policy Act (Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended) require analysis of projects to ensure the anticipated effects upon all resources within the project area are considered prior to project implementation (40 CFR 1502.16). The analysis for the Iron Honey project followed the guidelines of NEPA as provided by the Council on Environmental Quality (CEQ).

2.2.5 National Forest Management Act of 1976

The National Forest Management Act reorganized, expanded and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on national forest lands. The National Forest Management Act requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. It is the primary statue governing the administration of national forests.

2.2.6 Natural Resources Agenda

On March 2, 1998, former Forest Service Chief Mike Dombeck announced the Forest Service Natural Resource Agenda. The Agenda provides the Chief's focus for the Forest Service, and identifies specific areas where there will be added emphasis, including:

- *watershed health and restoration*
- *forest road policy*
- *sustainable forest management*
- *recreation*

The alternatives have been designed to be consistent with these goals.

2.2.7 National Fire Plan

In 2000, over 92,000 wildland fires burned more than 7.5 million acres of grass, brush and forested lands across the United States. In response, the Secretaries of Agriculture and the Interior developed an interagency approach to respond to severe wildland fires, reduce their impacts on rural communities, and assure sufficient firefighting capacity in the future. The “National Fire Plan” identifies five key program areas designed to respond to the severe wildfires of 2000, to reduce their impacts on rural communities, and to enhance firefighting capabilities in the future. In Idaho, a total of over $91.3 million has been allocated to these programs. Specific proposals were submitted by field units (such as Ranger Districts) for consideration. The Iron Honey Resource Area project is not a National Fire Plan proposal. Therefore, there is no further discussion of the National Fire Plan in this document.

2.2.8 Forest Service Road Management and Transportation System Rule

On January 28, 1998, in an Advance Notice of Proposed Rulemaking (63 CFR 4350), the Forest Service announced its intent to revise regulations concerning management of the national forest transportation system. In January 2001, the Forest Service issued a Final Rule regarding specific revisions to the road system rules at 36 CFR part 212 and to Forest Service administrative directives governing transportation analysis and management. The roads policy provides basic procedural protection for inventoried roadless areas and

contiguous unroaded areas from road building until the Roadless Area Conservation Rule (discussed below) becomes effective, and the Forest completes a forest-scale roads analysis and incorporates it into the Forest Plan.

One of the tools developed to meet objectives of the revised policy is an integrated, science-based roads analysis process that allows objective evaluation of the environmental, social and economic impacts of proposed road construction, reconstruction, maintenance, and decommissioning (USDA Forest Service, 1999, Misc. Rep. FS-643). The six-step process does not make decisions nor allocate lands for specific purposes. Rather, the analysis identifies and addresses a set of possible issues and applicable analysis questions that, when answered, produce information for forest line officers to consider about possible road construction, reconstruction, and decommissioning needs and opportunities. Line officers must also choose the appropriate geographic scale or scales and how detailed the analysis will be. Selecting the appropriate scale for assessing roads opportunities depends on the issues being analyzed and how their effects are manifested; the extent and nature of linkages with other ecological, social, and economic systems; the nature of variables under the control of the decision process; the information availability and value in relation to the range of potential consequences; and budget and personnel constraints (Roads Analysis: Informing Decisions about the National Forest Transportation System, USDA Forest Service, 1999, pg. 4).

Since the Iron Honey proposal was initiated in 1996, this analysis tool was not available to us at the time the Iron Honey proposal was being developed and analyzed. Consequently, the transportation analysis was conducted based on existing information and guidelines provided in the Forest Plan. The management of each road was determined based on the logging systems plan under each alternative. A summary of the information that was considered in the roads analysis for the Iron Honey Resource Area is provided in the Project Files (Transportation, “Roads Analysis”). For additional information, please refer to the transportation planning discussions in Appendix F.

2.2.9 Roadless Area Conservation Rule

On October 13, 1999, President Clinton directed the Forest Service to develop a proposal for managing approximately 50 million acres of roadless areas in the National Forests. The Roadless Area Conservation Rule was published in the Federal Register on January 5, 2001, and was to be effective May 12, 2001. Essentially, the Final Rule prohibits new road construction and reconstruction and prohibits the cutting, sale and removal of timber in inventoried roadless areas on National Forest System lands (with specific exceptions). On May 10, 2001, the Idaho U.S. District Court preliminarily enjoined the Forest Service from implementing the Roadless Area Conservation Rule. There are no lands in or adjacent to the Iron Honey Resource Area identified as roadless (Management Area 10) under the Forest Plan. Therefore, there would be no change to road access in relation to inventoried roadless areas under any alternative.

2.2.10 Interior Columbia Basin Ecosystem Management Project

The Interior Columbia Basin Ecosystem Management Project analysis was guided by integrated ecological assessments and strategies that began in 1993 by direction from President Clinton to “develop a scientifically sound and ecosystem-based strategy for management of eastside forests.” This direction resulted in the combined Bureau of Land Management and Forest Service project known as the Interior Columbia Basin Ecosystem Management Project (ICBEMP). The assessment covers the “interior” portion of the Columbia River Basin and those portions of the Klamath and Great Basins within Oregon. This includes the states of Oregon and Washington east of the crest of the Cascade Mountains, most of Idaho, and small portions of northern Nevada, western Montana and western Wyoming, for a total of 145 million acres. The scientific findings for the ICBEMP were released during the fall of 1996 (USDA Forest Service, 1996. Status of the interior Columbia basin: summary of scientific findings). At the Interior Columbia Basin scale, the findings for the river basins on the Idaho Panhandle National Forests show that the river basins have a low composite

ecological integrity primarily due to past alterations (such as timber harvest, road construction, mining, fire suppression, grazing, etc.). Further findings show low forest integrity throughout, mixed low to moderate aquatic integrity, and mixed low, moderate and high integrity hydrologic conditions.

The Iron Honey Resource Area is in ICBEMP Forest Cluster #4, which emphasizes reducing risk to ecological integrity and species viability (USDA Forest Service, 1996, Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin). The primary risks to ecological integrity within Forest Cluster #4 are risks to hydrologic and aquatic systems from fire potential, risks to late and old forest structures in managed areas, and risks in forest compositions that are susceptible to insect, disease, and fire (Integrated Scientific Assessment, page 113). Proposed activities in the Iron Honey Resource Area would address these three primary risks in a manner consistent with Chapter 8 of the Integrated Scientific Assessment. The effectiveness of each alternative in addressing those risks is discussed for each appropriate resource (in the Aquatic Resources, Forest Vegetation, and Fire/Fuels sections).

A Final EIS for the Interior Columbia Basin project was released in December 2000, with a “proposed” decision. Once a Record of Decision is signed, National Forests and BLM Districts will begin implementing the new strategy. Although the scientific findings of the ICBEMP are not part of the Forest Plan for the Idaho Panhandle National Forests, they are expected to provide guidance for the revision of the Forest Plan. No decisions or guidelines for analysis were made exclusively on this information; however, the science behind the ICBEMP is used in the analyses for the Iron Honey project. When available, information and direction provided in the ICBEMP Record of Decision will be reviewed to determine whether a correction, supplement, or revision to the Iron Honey EIS is necessary, in compliance with Forest Service Handbook 1909.15 (Chapter 18).

2.2.11 Northern Region Overview

The Northern Region Overview, which covers northern Idaho and Montana, focused on priorities within northern Idaho and Montana for restoring ecosystem health and availability of recreation opportunities.

> *"In northern Idaho and moist portions of western Montana, Douglas-fir was largely an early succession species that regenerated well after wildfire in various mixes with white pine and larch, but then was largely eliminated by root disease and beetles after 100-140 years, giving way to pine and larch. In the absence of white pine and larch, we have experienced an increase in Douglas-fir during early succession, and an apparent increase in root disease inoculum levels as succession proceeds. When Douglas-fir dies in stands now, the result is an effective 50-150 year acceleration of succession to grand fir and hemlock. This condition with heavy root disease and ladder fuels promotes and increases risk of stand-replacement fire.” (Northern Region Overview Detailed Report; USDA October, 1998, page 22)*
>
> *"The most significant risk is associated with fire; particularly where ladder fuels exist or are developing near or adjacent to urban interface locations." (Northern Region Overview; USDA October, 1998. page 23)*

The Northern Region Overview Summary explores this Region's situation with regard to ecosystem health and recreation. Ecosystem health was once referred to by ecologist Aldo Leopold as the capacity of the land for self-renewal. Ecological integrity, as discussed in the Columbia Basin and step-down assessments, is the wholeness or completeness of an ecosystem, the degree to which it has all the parts and processes it needs to function properly (Northern Region Overview Summary, USDA, October 1998, page 6).

Characteristics of ecosystems with high integrity are:

- *Resiliency (the ability to withstand fires and other disturbances)*
- *Supportive of native and desired non-native species diversity*
- *Consist of a mosaic of well-connected habitats.*
- *Have functions (such as seed dispersal and decay) and processes (such as nutrient and water cycles) that operate effectively*

The Northern Region Overview findings conclude that there are multiple areas of concern in the Northwest Zone of the Region, but that "this subregion holds the greatest opportunity for vegetation treatments and restoration with timber sales. From a social and economic standpoint, using timber harvest for ecological restoration would be a benefit to the many communities which still have a strong economic dependency, more so than in other zones in the Region. Aquatic restoration should be focused on specific needs based on the zone aquatic restoration strategy." The timber management (timber harvest) tool best fits with the forest types in northern Idaho and is essential, for example, to achieve the openings needed to restore white pine and larch, and maintain upland grass/shrub communities (Northern Region Overview Summary, USDA April 1999, page 9).

2.2.12 Forest Plan for the Idaho Panhandle National Forests

General management direction for the Idaho Panhandle National Forests is found in the Forest Plan, which provides Forest-wide goals and objectives (Forest Plan, Chapter II). The standards and guidelines for the Forest Plan (Forest Plan, Chapter II) apply throughout the Resource Area.

The Forest Service administers all but 193 acres of land within the Resource Area; there is an 82-acre parcel of private land at the mouth of Iron Creek, with 111 acres of patented mining claims in the Prospector Creek drainage east of Honey Mountain. The Forest Plan designated National Forest System lands within the Iron Honey Resource Area to five management areas.

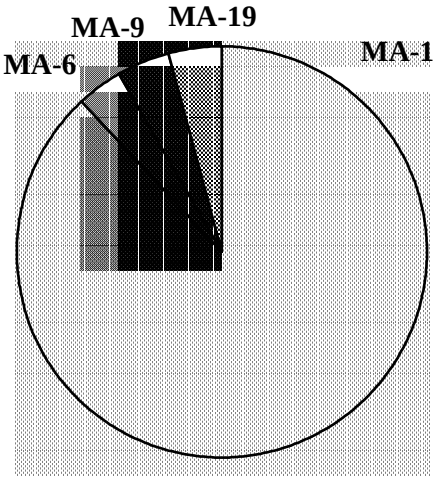
Figure II-1. Forest Plan Management Area Allocations in the Iron Honey Resource Area.

*Approximately 19,000 acres (88%) are in **Management Area (MA) 1**, with emphasis on timber production*

*Approximately 800 acres (4%) are in **Management Area 6**, with the objectives of providing both high quality elk summer habitat and wood products through road management and scheduling of harvest activities*

*Approximately 900 acres (4%) are in **Management Area 9**, managed to maintain and protect existing improvements and resource productive potential with minimum investments*

*Approximately 900 acres (4%) are in **Management Area 19**, managed for a semi-primitive recreation setting while providing low levels of timber harvest with minimum standard roads.*



It should be noted that Management Area 9 consists of a combination of areas of non-forest lands, lands not capable of producing industrial products, lands physically unsuited for timber production, and lands capable of timber production but isolated by the other types listed or by private ownership (Forest Plan, page III-39). All harvest proposed under the alternatives would occur on lands capable of timber production. For more information, please refer to the "Forest Vegetation" discussion in Chapter III.

In addition to those management areas identified in Figure II-1, streamside (riparian areas) were designated as **Management Area 16**, with primary goals of managing those areas to feature riparian-dependent resources (fish, water quality, certain vegetation and wildlife communities) while producing other resource outputs at levels compatible with the objectives for dependent resources.

In development of the alternatives considered for the Iron Honey proposal, standards and guidelines of the Inland Native Fish Strategy were used specifically to protect water and aquatic biota within the Resource Area. The Inland Native Fish Strategy was prepared in July 1995, to provide interim direction to protect habitat and populations of resident native fish outside of anadromous fish habitat in eastern Oregon, eastern Washington, Idaho, western Montana, and portions of Nevada (USDA Forest Service, 1995). Under the authority of 36 CFR 219.10(f), the decision amended Regional Guides for the Forest Service's Intermountain, Northern, and Pacific Northwest Regions and Forest Plans in the 22 affected Forests, including the Idaho Panhandle National Forest. Please refer to the discussion under "Features Common to All Action Alternatives – Features Designed to Protect Aquatic Resources" in this chapter and the Project Files ("Aquatics") for more specific information.

The Forest Plan directs that creation of openings larger than 40 acres must conform with current Regional guidelines regarding public notification, environmental analysis and approval. The public was notified in March 1998 that regeneration openings in excess of 40 acres were proposed under some of the alternatives (Project Files, Public Involvement, Scoping). Appendix G displays the units (by alternative) that would create openings larger than 40 acres. Please refer also to the Forest Vegetation discussion in Chapter III.

2.2.13 Coeur d'Alene River Basin Geographic Assessment

An assessment for the Coeur d'Alene River basin was conducted to gain a holistic understanding of the conditions at the Coeur d'Alene River Basin scale in relation to those at the Upper Columbia River Basin scale (USDA Forest Service, 1998. Toward an Ecosystem Approach: An Assessment of the Coeur d'Alene River Basin. Idaho Panhandle National Forests, Ecosystem Paper #4). For clarity, that document is referred to simply as the "Geographic Assessment." The Geographic Assessment supplements the Forest Plan, but is not a Forest Plan amendment. In addition, the Geographic Assessment will facilitate revision of the Forest Plan, which is scheduled to be accomplished in 2002.

The recommendations and strategies presented in the Geographic Assessment were based on three major groups of findings: 1) social and economic, 2) landscape and terrestrial, and 3) aquatic. The findings of the assessment are consistent with the findings of the Upper Columbia River Basin findings at the next scale down. To identify the overall strategy for the Coeur d'Alene River Basin, the terrestrial, watershed, wildlife and recreation maps were overlaid. The intensive restoration for vegetation and watershed is appropriate for non-functioning watersheds with serious terrestrial problems such as the Iron Honey project area (Geographic Assessment, p. 65). The Geographic Assessment identified the Upper Little North Fork as having priority for both vegetative and watershed restoration, with the aquatic restoration needs focused in Honey and Hudlow Creeks.

2.2.14 Migratory Bird Executive Order

On January 10, 2001, President Clinton signed an Executive Order describing the Responsibilities of Federal Agencies to Protect Migratory Birds, directing executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act. Section 3 of the Order states, "Each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the Fish and Wildlife Service (Service) that shall promote the conservation of migratory bird populations." Item e-6 directs that each agency shall "ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern."

The analysis of effects to wildlife in the Iron Honey Resource Area evaluated effects of the proposed activities on neotropical (migratory) birds, as disclosed in Chapter III (Wildlife) and summarized in this Chapter (Comparison of Alternatives – Wildlife Habitat). As more information and direction related to this Executive Order becomes available, the analysis and documentation related to the Iron Honey project will be reviewed to determine whether a correction, supplement, or revision to the EIS is necessary, in compliance with Forest Service Handbook 1909.15 (Chapter 18).

2.2.15 Other Legal Mandates

In addition to compliance with Forest policy and the legal mandates discussed above, each resource discussion in Chapter III identifies the laws and regulations ("Regulatory Framework") that applies to that particular resource, and addresses how well each alternative would meet applicable legal mandates ("Consistency With Forest Policy and Legal Mandates"). Additional information (such as compliancy with the Environmental Justice Act, is provided under "Other Required Disclosures" at the end of Chapter III).

2.3 SCOPING AND ALTERNATIVE DEVELOPMENT

2.3.1 Scoping

The first step in environmental analysis is to determine what needs to be analyzed. To do this the NEPA outlines a process termed "scoping" (refer to 40 CFR 1501.7). This is an open process designed to determine the potential issues associated with a proposed action and then, from this list, to further identify those issues that are significant to the decision and those which are not significant or which have been covered by prior environmental review and therefore should be eliminated from detailed analysis. The public was first notified of this project through the "Quarterly Schedule of Proposed Actions" for the Idaho Panhandle National Forests, beginning in the October 1996 issue and continuing through the current issue. Scoping activities also included a public field trip to the area, legal ads, a notice of intent to prepare an environmental impact statement (published in the Federal Register), and newspaper articles. During scoping, comment letters were received from Richard Parkin (Environmental Protection Agency), Jeff Juel (Ecology Center) and Mike Mihelich (Kootenai Environmental Alliance). Their concerns were identified and addressed in Appendix A of the Iron Honey Draft EIS (refer also to the Project Files, Public Involvement – Scoping). The team considered concerns identified by the public and incorporated their ideas into alternative design whenever possible. A more complete description of the scoping process and how comments were used in alternative development for the Iron Honey project is provided in Appendix A of this document.

2.3.2 Issues

There are several issues considered in the decision to be made. Some issues are of sufficient concern to drive development of alternatives within the physical, biological, and legal limits of forest management. Other issues are important for their value in assessing specific protective measures. These protective measures become either features of the alternatives or specific mitigation measures. A list of the issues addressed in detail in this document and a brief statement of concern for each is provided below. For more information regarding concerns identified by other agencies and members of the public, please refer to Appendix A.

Issue 1 - ***Aquatic resources and fisheries****: Concerns related to aquatics and fisheries habitat have been identified by the Forest Service and other agencies (including the Environmental Protection Agency and Idaho Department of Environmental Quality) as well as environmental organizations (Ecology Center, Kootenai Environmental Alliance, and Idaho Rivers United /Idaho Conservation League). Many streams in the Coeur d'Alene River Basin continue to recover from the residual effects of historic disturbances (such as fires and volcanoes), as well as from ongoing human disturbances (such as timber harvest and road building). The Geographic Assessment identified all tributaries in the Iron Honey Resource Area as "functioning at risk" (defined in the Aquatics methodology discussion in Chapter III), with the exception of Iron Creek, which is identified as "non-functioning." Watersheds that are considered "functioning at risk" are the highest priority for aquatic restoration and protection*

Issue 2 - ***303(d) Water Quality Limited****: The Little North Fork of the Coeur d'Alene River from the headwaters to Laverne Creek is a 303d listed stream segment for flow alteration, habitat alteration and sediment. No TMDL has been established. Under authority of the Clean Water Act, the EPA and States must develop plans and objectives (TMDLs) that will eventually restore listed stream segments. In lieu of those plans, the Forest Service will demonstrate that their actions will result in a net decrease in the pollutant of concern and will not prohibit or delay potential recovery (IDHW, 1997; USDA Forest Service, 1995).*

Issue 3 - ***Vegetative resources (including old growth)****: The Geographic Assessment identified all of the watersheds in the Iron Honey Resource Area as a high priority for vegetation restoration due to the effects of white pine blister rust, past harvest activities, and fire exclusion. Comments from the public (Environmental Protection Agency and Kootenai Environmental Alliance) specifically identified concerns related to protection of old-growth stands within the project area.*

Issue 4 - ***Soils****: The Forest Service is required to ensure that management of the National Forests is accomplished without impairing the land's productivity. To achieve this, soil quality standards and guidelines are used to measure effects and design activities to avoid compromising soil productivity. The Environmental Protection Agency identified specific concerns related to protection of soil resources.*

Issue 5 - ***Fire/Fuels****: The fire suppression policy from the early 1900's to the 1970's was one of total suppression. Only recently has fire policy been modified to recognize the importance of fire in balance forest vegetation cycles. Of primary concern to the Forest Service are the long-term increase in fuel loading (the amount of combustible materials which contribute to the intensity of a fire) and the subsequent changes in fire intensity and severity that may occur. The Forest Service goals are to reduce fire hazard in the Iron Honey Resource Area to a level where cost effective resource protection is possible should a wildfire ignition occur, by reducing the potential fire severity. Comments from the public (Environmental Protection Agency and Ecology Center) identified concerns with how those fuels reduction activities are carried out.*

Issue 6 - ***Wildlife****: Section 7 of the Endangered Species Act directs federal agencies to ensure that their activities are not likely to jeopardize the continued existence of any Threatened or Endangered species or result in the destruction or adverse modification to their critical habitat. A number of species have been identified as Sensitive within the geographic area of the Idaho Panhandle National Forests. Other species of wildlife are used as indicators of how well their needs for certain types of habitat are being met. Public comments were received from the Environmental Protection Agency, Idaho Fish and Game, and Ecology Center identifying concerns related to protection of wildlife and associated habitat. The Forest Service has analyzed the effects to black-backed woodpecker, flammulated owl, white-headed woodpecker, fisher, northern goshawk, and elk. (A brief discussion of why other species were not addressed in detail in this document is provided in Appendix A.)*

Issue 7 - ***Recreation opportunities****: The Iron Honey Resource Area encompasses a wide variety of recreation opportunities. Management activities have the potential to disrupt activities or change access into a particular area. Existing uses and proposed activities were considered to ensure that the proposed activities would not result in a loss of opportunities over the long term.*

Issue 8 - ***Scenic values****: Management activities have the potential to change the scenic character surrounding the project area. Visual quality objectives are used to identify and manage effects to scenic values in the National Forest.*

Issue 9 - ***Financial considerations****: The proposed activities have associated costs as well as the potential to generate revenues. Public comments (from the Idaho Fish and Game and the Ecology Center) indicated concerns with the financial aspects of the proposal, specifically the concept of generating funds for restoration through timber harvest.*

In addition, the Ecology Center and Kootenai Environmental Alliance emphasized the importance of the cumulative effects analysis, which is addressed through the documentation in Chapter III, rather than as a separate issue.

Based on the assessment of effects and public comment, the agency determined that most other issues could be adequately mitigated or addressed by design features or other aspects of the proposed activities. A list of these issues and brief discussion of each of those issues is provided in Appendix A ("Issues Not Addressed in Detail in this Environmental Assessment").

2.3.3 Alternative Development and Modification

Development of alternatives was based on existing condition of resources, issues and concerns identified by the project team and the public, and the purpose and need identified for the project. The project team used the 6-step process outlined in the "Federal Guide to Watershed Analysis - Environmental Analysis at the Watershed Scale" (USDA Forest Service, August 1995) to focus on proposed activity areas, describe current conditions, and identify possible treatment alternatives. Documentation related to the process is provided in the project files ("Alternative Development"). In addition to the No-Action Alternative, five action alternatives were initially developed and are analyzed in detail in this document (Alternatives 2, 3, 5, 6 and 7). Another alternative (Alternative 8) was ultimately developed based on public comments. For more information related to public comments and development of alternatives, please refer to Appendix A.

2.3.4 Alternatives Considered But Eliminated From Further Study

During project development, three other alternative concepts were considered but dismissed from further study. These alternatives and the reasons they were dismissed are discussed briefly here, with additional discussion in Appendix A ("Alternatives Considered But Eliminated From Further Study").

The project team proposed an option that would include **extensive use of only prescribed fire (Alternative 4**). This alternative was eliminated from further consideration because it would not meet the purpose and need identified for the area, would result in unacceptable environmental impacts to area resources, and is not economically feasible at this time. The large-scale application of fire would likely result in a substantial increase in water yields and would consume commercially valuable timber. In addition, disease-resistant white pine would only be restored if planted in the area. These activities would require a considerable amount of funding, while the financial value of commercial timber in the burned areas would be lost.

Another option proposed and considered by the team would include **extensive use of even-aged harvest units but none exceeding 40 acres.** Although extensive use of units 40 acres and less in size would help meet the objective of restoring white pine to the area, it would also lead to more stand fragmentation and would require an extensive road system to allow stand tending in the years to come. Further development of this alternative was halted because additional fragmentation is counter to the purpose and need for the Iron Honey Resource Area.

The team also proposed and considered an option that would include **extensive use of uneven-age management tools.** This alternative would not help trend the watershed toward improvement over the long term because an extensive road system would be required for stand tending, as entries would occur every 20 years or so; nor would the alternative meet the objective of restoring white pine to the area. This alternative was not developed further because it would not meet the purpose and need for the Iron Honey Resource Area.

The public did not identify any alternatives that were eliminated from further study. Additional discussion of these alternatives considered but eliminated from further study is provided in Appendix A.

2.4 ONGOING AND REASONABLY FORESEEABLE ACTIVITIES

Activities within the cumulative effects analysis area that have a reasonable chance of occurring have been identified. This helps to establish the appropriate geographic and temporal (time) boundaries for the cumulative effects analysis. Some of the activities identified as "active" or "reasonably foreseeable" in the Iron Honey Draft EIS have since been completed. These include the relocation of a cattle guard on Road 209, restoration of Hudlow Meadow, and the upgrade of Road 385 from its junction with Road 209 on the Little North Fork Coeur d'Alene River, to where it again meets Road 209.

Table II-1 displays information about the remaining projects that are either ongoing or reasonably foreseeable at this time. The analysis of effects to resources incorporated the effects of these activities as appropriate (please refer to the cumulative effects discussions for each resource in Chapter III). In addition to the activities identified in the table, two long-term management programs are ongoing. The first is the recently issued **District Travel Plan**. An environmental assessment (EA) was used to document proposed changes to access management and the analyses of effects for the public to review. The assessment has been completed, and a new Travel Plan developed that identifies suitable routes for public access using an existing system of roads and trails.

Changes in access will be implemented over a period of several years, through both administrative changes to transportation management (documented in an updated closure order signed by the Forest Supervisor) and through specific documentation in a written decision under the National Environmental Policy Act (Project

Files, "Transportation"). Proposed changes to access management under the Iron Honey project are consistent with access management under the District's new Travel Plan.

The second long-term management program is the District's **Noxious Weed Treatment Program**. A Noxious Weeds Environmental Impact Statement was prepared and a Record of Decision issued that provides guidance for the integrated treatment of noxious weeds (USDA Forest Service, 2000). Additional information regarding noxious weed treatment is provided in Appendix A ("Issues Not Discussed in Detail in this EIS") and the Project Files (Noxious Weeds).

There are no commercial or preferred fuelwood areas or active minerals projects within the Iron Honey Resource Area. Other than the grazing allotment permit (identified in Table II-1), there are no special use permits issued for activities within the project area.

Within the analysis area, there is an 82-acre parcel of private land at the mouth of Iron Creek, and 111 acres of patented mining claims in the Prospector Creek drainage east of Honey Mountain. The land along Iron Creek is an old airstrip that is generally maintained free of trees, and timber harvest has already occurred on the privately-owned mining claim. There are no ongoing or reasonably foreseeable mining or land management activities that would contribute to the cumulative effects of this proposal. Please refer to Chapter III for additional discussion related to the effect of private lands on resources within the project area.

Table II-1. Ongoing or reasonably foreseeable projects within the cumulative effects analysis area.

Project Name	Miles of Road Construction	Miles of Road Reconstruction	Miles of Road Obliteration or Decommissioning	# of Channel Crossings to be Removed	Estimated Harvest Acres	Activities to be completed (and estimated completion year)	Resources Potentially Affected by Project
Proposed West Gold Creek (Sandpoint Ranger District)	0.3	15	1.3	NA	1,338	Road construction (2003-04) Timber harvest (2003-04)	Wildlife
West Hudlow Ice Timber Sale	None	None	None	None	88 (Done)	Burning at landings (2001) Stocking/stand exams (2001) Noxious weed treatment (2003)	Aquatics Vegetation Wildlife
Barney Rubbles Cabin Salvage Timber Sale	None	16.8 (Done)	38.6 (Done)	82 (Done)	216 (Done)	Burning at landings (2001) Stocking/stand exams (2001) Instream work (2003) Noxious weed treatment (2003)	Aquatics Vegetation Wildlife
Skookum Salvage Timber Sale	1.85 (Done)	18.1 (Done)	9 (Done)	12 (Done)	81 (Done)	Burning at landings (2001) Stocking/stand exams (2001) Noxious weed treatment (2003) Instream work (2004)	Aquatics Vegetation Wildlife
Huckleberry Mountain trail extension to Spades Mountain	0	0	0	0	0	8 miles of trail extension (2001)	Wildlife Recreation
Irons-Mokins-North Fork Grazing allotment re-issuance	0	0	0	0	0	Grazing (ongoing)	Aquatics

MBF = thousand board feet
CCF = 1 cunit (one hundred cubic feet).

2.5 OPPORTUNITIES

The following are projects that could complement and improve resource conditions within the project area. These projects are not considered mandatory for project implementation nor are they guaranteed to be implemented; they may be accomplished if funding becomes available. The anticipated effects of implementing these activities are discussed below and by resource in Chapter III.

2.5.1 Opportunities to Improve Aquatic Resources

Idaho Department of Fish and Game, Idaho Rivers United/Idaho Conservation League, Kootenai Environmental Alliance, and Trout Unlimited all commented on the need to accomplish watershed restoration and fish habitat improvement in the Iron Honey Resource Area. Improvements to channel stabilization and fish habitat could be achieved by placing wood in streams. There are also many opportunities to further reduce road related sediment loads in the drainage. All roads not identified as part of the long-term transportation plan would be available for road removal activities. The work consists of the removal of headwater roads and their associated road channel crossings, and the removal of additional low standard riparian roads. The analysis of effects to aquatic resources considered and disclosed the effects of these opportunities.

These activities would be implemented as additional monies become available through appropriated funding or grant monies. The order in which the work would be accomplished depends upon the condition and location of these residual roads. Damaging flood events, such as those experienced in 1996, may dictate future priorities. There is also the potential for a portion of funds generated by the timber harvest to be utilized in improving riparian vegetation along Iron Creek.

Additional information regarding the implementation and effects of this type of rehabilitation work is provided in Chapter III for each appropriate resource, and in the Project Files (Aquatics).

2.5.2 Opportunities to Improve Forest Vegetation

Opportunities for vegetation restoration include 956 acres of precommercial thinning and 587 acres of white pine pruning. The effect of these treatments would be to improve the growth and vigor of planted or naturally regenerated trees in stands that were harvested in the past. Precommercial thinning stands are prioritized to treat those stands with a large component of early seral species (white pine, western larch and ponderosa pine) first. This would allow these species to better compete with the more shade-tolerant species so they can better provide the desired forest structure and composition. Pruning of white pine reduces the potential of infection by white pine blister rust and also improves the tree's ability to survive infection by removing infected branches. Pruned trees have a better chance of reaching maturity and contributing to the desired forest structure and composition.

Opportunities to precommercial thin stands and prune white pine (which does not include merchantable timber harvest) depend on which alternative is selected for implementation and/or availability of appropriated funding or grants. Please refer to Appendix H for a list of stands proposed for thinning and/or pruning.

2.5.3 Opportunities to Reduce the Spread of Noxious Weeds

Many areas affected by the proposed activities (especially road segments and landings) would likely be surveyed and monitored to assess the establishment and spread of noxious weeds, new invader species in particular. The full extent of surveying, monitoring and treatment and the availability of funding (KV or appropriated) is not known at this time; therefore, these activities are identified as opportunities that could be accomplished if funding became available. Treatment would be conducted under the guidelines of the Coeur

d'Alene River Ranger District Noxious Weed Final Environmental Impact Statement and Record of Decision (USDA Forest Service, 2000).

2.6 ALTERNATIVE DESCRIPTIONS

2.6.1 Introduction

The No-Action Alternative and six action alternatives are described in detail in this section, including features common to all alternatives, mitigation measures, and monitoring, as provided under 40 CFR 1502.14. In addition to water restoration activities, recruitment old-growth allocation, and fuels treatment, the action alternatives include timber harvest practices designed to meet particular silvicultural goals, and road access necessary to accomplish project activities. A depiction of silvicultural methods is provided in Appendix E. A detailed description of the features of various silvicultural systems and their effects are included in the Forest Plan (Forest Plan, Appendix A). Specific unit information is provided in Appendix E.

Road access needs are described briefly for each alternative, with additional information provided under "Long-term Transportation Plan Common to All Alternatives" (in this chapter), and Appendix F ("Transportation"). Please refer also to the enclosed alternative maps for location of the proposed activities.

Alternative 4 is not described below because it was eliminated from further study as briefly described under "Alternatives Considered But Eliminated From Further Study" earlier in this chapter and in Appendix A.

Comparing a range of alternatives (from no change in management to intensive management) will help determine which activities, if any, should occur in watersheds of the Iron Honey Resource Area. The range of alternatives is reasonable given the characteristics of the area, current conditions, the purpose and need for action, and the desired conditions.

The long-term transportation plan for the Iron Honey Resource Area is described under 2.6.9 Features Common to All Alternatives (Long-term Transportation Plan Common to All Alternatives), in this chapter. To achieve the goals of the long-term transportation plan, the following changes in the transportation network would occur under any alternative:

1. *Roads 1560 and 1550 would be opened to create a route between Horse Heaven and Crooked Ridge Road 258 that would replace the Rablens Fork route (the upper end of Road 794) to Crooked Ridge. Road 794 would then be obliterated as part of the watershed restoration effort.*

2. *Road 2346 (Colt Mountain Road) would be upgraded and linked through to Argument Saddle and Road 1532. This new route would allow the removal of the Moose Creek section of Road 1532 while still maintaining direct access to Argument Saddle from Horse Heaven.*

It is the professional opinion of both the District's Fisheries Scientist and Hydrologist that the long-term health of the Iron Creek drainage can be greatly improved through the removal of riparian roads and stream crossings. The lower section of Roads 794 and 1532 are located in and across the Iron Creek riparian area, with several stream crossings (culverts). These roads are used year-round by the public, and are part of the District's groomed snowmobile trail system. Due to the established level of public use, nearby replacement routes were identified as described above. These were considered to be the best replacement routes because of their close proximity, lack of culverts, and position on the hillslope. The replacement routes would need to be widened (from the current 14-foot width to a 16-foot width) to allow safe passage of the snow groomer.

Alternatives 2, 5 and 8 all incorporate a "pulse" approach to forest management. Yount and Niemi (1990) describe "press" and "pulse" forest disturbances. A **press** situation involves a series of disturbances (such as intensive timber harvest, road construction, or prescribed burning) at short intervals over time, which does not allow the cosystem to return to its original or historic condition. A **pulse** situation is when disturbances occur over a relatively short period of time and at lengthy intervals, allowing an ecosytem to return to its original (historic) processes or hydraulic condition between each disturbance.

For purposes of analysing alternatives that would cause a pulse disturbance under the Iron Honey Resource Area proposal, a "short" period of disturbance is defined as approximately 5 years, with a 30 to 40-year interval before the next disturbance by forest management activities (timber harvest, road construction, or prescribed burning). Members of the public have expressed doubt that the Forest Service could or would avoid entering the area for an extended period of time. There is no administrative or managerial tool available to guarantee that drainages where a "pulse" harvest would occur would not be entered for commercial timber harvest in the future. However, it is the intention of the current District Ranger and Ecosystems staff that no commercial entry be made into these drainages for a period of 30 to 40 years. Conditions of the ecosystem would be monitored as provided by the Forest Plan and for this project (please refer to the monitoring discussions in this chapter and in Appendix C). Should conditions change extensively (for example, if a large-scale wildlfire or other natural disturbance occured in the area), management would be re-evaluated under 40 CFR 1909.15 (Chapter 18).

2.6.2 Alternative 1 (No Action)

The No-Action Alternative is required by NEPA. Under this alternative, none of the proposed activities would occur at this time. There would be no change from current management direction or from the level of management intensity in the area. Implementation of the foreseeable activities identified in Table II-1 would still occur. Because there would be no active improvement in the vegetation, aquatic, or wildlife habitat conditions and no reduction in the risk of wildfire, natural processes would eventually begin to meet the objectives identified under the purpose and need, and over the very long term (100 or more years) meet objectives identified by the Forest Plan and Geographic Assessment. The No-Action Alternative was analyzed in detail to compare the effects of not actively meeting these objectives, and to compare against the action alternatives.

2.6.3 Alternative 2

The objective of this alternative is to restore vegetation composition and structure to more closely resemble historical patterns within the Iron Creek drainage. Alternative 2 would combine watershed restoration activities with a limited "pulse" of regeneration harvest in the Iron Creek drainage.

Watershed Restoration: A total of approximately 49 miles of road would be obliterated and recontoured under Alternative 2, removing 117 channel crossings and upgrading 7 culverts. No stream stabilization work would occur.

Timber Harvest: Approximately 1,100 acres would be harvested using the "shelterwood with reserves" method. Units would range from approximately 50 to 270 acres in size. This type of harvest is intended to simulate the extent of natural disturbances that occurred historically in this area. The wet habitat types within the analysis area were likely to experience a stand-replacing fire event every 200-250 years (Smith, Jane K., Fischer, William C., 1997). These fires may have covered from thousands to hundreds of thousands of acres. However, as large as these fires may have been, there were always many subwatersheds that were minimally impacted or not impacted at all. Although intensive management activities would occur in the Iron Creek drainage, the rest of the analysis area would be minimally impacted by harvest activities for a period of 30 to 40 years.

Recruitment Old Growth Allocation: There would be 1,380 acres of additional recruitment old growth identified within the analysis area. Approximately 58 percent of this (800 acres) is within the Iron Creek drainage.

Roads: In addition to the changes in transportation described in 2.6.1 Introduction, approximately 0.5 miles of temporary (low standard) road construction would occur in order to yard harvested trees with skyline machines. These roads would be obliterated by the sale purchaser upon completion of the contractual duties in each harvest unit.

2.6.4 Alternative 3

The objective of this alternative is to create small openings for the regeneration of early seral tree species and to thin stands of western larch while minimizing increases in water yield, which can affect the structure and function of a stream. This type of regeneration treatment would occur on a relatively small portion of a watershed but would be repeated at regular, short intervals.

Watershed Restoration: A total of approximately 8 miles of road would be obliterated and recontoured under Alternative 3, removing 10 channel crossings and upgrading 45 culverts. No stream stabilization work would occur.

Timber Harvest: Approximately 190 acres would be regeneration harvested in 32 units of 5 to 10 acres in size scattered throughout the analysis area. Some of these regeneration harvests would be considered clearcuts and some clearcuts with reserves. Because such a small portion of the analysis area would be regenerated each entry, similar stand-level harvests could be anticipated every 10 to 15 years. Commercial thinning would occur on approximately 141 acres, with the goal of simulating, in those stands, the effects of low-intensity fires that occurred between stand-replacing fires.

Recruitment Old Growth Allocation: In order to display a range of effects for comparison, no additional recruitment old growth was proposed in the Iron Honey analysis area under this alternative.

Roads: In addition to the changes in transportation described in 2.6.1 Introduction, approximately 0.5 miles of temporary (low standard) road construction would occur in order to yard harvested trees with skyline machines. These roads would be obliterated by the sale purchaser upon completion of the contractual duties in each harvest unit. No other permanent road construction is proposed under Alternative 3.

Alternative 4 was eliminated from further study as described under "Alternatives Considered But Eliminated From Further Study" in this chapter and in Appendix A.

2.6.5 Alternative 5

Alternative 5 was based on the Geographic Assessment, which is consistent with the Columbia River Basin Assessment (Chapter III, page III-81 and III-82). The objective of this alternative is to restore vegetation composition and structure to more closely resemble historical patterns within the entire analysis area, using the "pulse" approach described earlier (disturbances such as road construction/reconstruction, intensive harvest treatments and prescribed burning would occur over a large area within a period of about 5 years, but would not be repeated in the watershed for a period of 30 to 40 years).

Watershed Restoration: A total of approximately 309 miles of road would be obliterated and recontoured under Alternative 5, removing 76 road channel crossings and upgrading 51 culverts. Approximately 3 miles of stream stabilization work would occur.

Timber Harvest: Major regeneration harvests would occur in all subwatersheds except the Lewelling and Tom Lavin Creek drainages. Aquatic systems in these drainages are considered to be properly functioning and are identified as priority for maintaining their integrity under the Geographic Assessment, so harvest would be limited to commercial thinning in stands where larch is a major component. Approximately 3,520 acres would be harvested using the "shelterwood with reserves" method and 675 acres harvested with the "clearcut with reserves" method. An additional 141 acres would be commercially thinned. These types of harvest are intended to simulate the effects of the same kind of stand-replacing fires discussed for Alternative 2, but on a much broader scale. Approximately 70% of the basal area in each shelterwood harvest unit would be removed while the rest would be retained as individual trees or small 3 to 5-acre groups.

To meet visual quality objectives along the major side roads, tree removal would be in gradation, with more trees left per acre near the bottom of units than at the top. Harvest units would range from 48 to 383 acres in size. Clearcut with reserves is a more applicable term than shelterwood with reserves for Units 20, 21, and 22. These units are in stands dominated by lodgepole pine where individual leave trees would likely fall over shortly after harvest or be killed during slash reduction and site preparation burning. Most leave trees in these units would be in 3 to 5-acre groups, although individual trees would be retained to provide down woody debris for long-term soil productivity and also to provide some biological diversity.

Wherever possible, trees other than lodgepole pine would be retained. Lodgepole pines have very poorly developed root systems, particularly in dense stands, so most would be expected to fall over. Those leave trees that do fall over would provide important woody debris on the site, and eventually provide organic matter to the soil. Regeneration harvest areas, which may include more than one unit, would range from 40 to 476 acres in size. In the Hudlow Creek watershed, proposed harvest areas are adjacent to recently regenerated stands. Therefore, total opening size could be as large as 960 acres. The public was informed in March 1998, that regeneration openings in excess of 40 acres were proposed under some alternatives. Appendix G displays the units (by alternative) that would create openings greater than 40 acres, as well as adjacent existing openings.

Recruitment Old Growth Allocation: Another aspect of Alternative 5 is the designation of approximately 800 acres of additional recruitment old growth within the Iron Creek drainage.

Roads: In addition to the changes in transportation described in 2.6.1 Introduction, approximately 14 miles of temporary (low standard) road construction would occur in order to yard harvested trees with skyline machines. These roads would be obliterated by the sale purchaser upon completion of the contractual duties in each harvest unit.

2.6.6 Alternative 6

This alternative was developed in response to public comments received during scoping, which recommended analysis of an alternative that would facilitate rehabilitation and restoration of area watersheds, with no commercial timber harvest or associated road building. The objective of this alternative is to improve watershed function; concentrating most efforts in watersheds that are functioning at risk or are not properly functioning, as recommended by the Geographic Assessment. This would be accomplished through projects that reduce the sediment and water yield associated with roads and restoring natural watershed processes through instream improvement projects, and removal of roads from riparian areas. **Since there is no commercial timber sale proposed under Alternative 6, the activities accomplished would be dependent upon appropriated funds and/or funds obtained through grants rather than receipts from the sale of timber.**

Watershed Restoration: Watershed restoration would take place throughout the analysis area. A total of approximately 147 miles of road would be obliterated and recontoured, removing 335 road channel crossings and upgrading 38 culverts. Approximately 5 miles of stream stabilization work would occur. The Lewelling

and Tom Lavin Creek drainages would require the least effort since they are currently considered to be properly functioning. Iron Creek drainage would require the most effort since it is considered to be not properly functioning.

Timber Harvest: Alternative 6 does not propose any commercial timber harvest. Trees harvested under this alternative would go directly to watershed improvement projects located within the analysis area (described under "Watershed Restoration," above). Partial or selective harvest would occur on approximately 380 acres to provide large wood for instream use as part of the watershed restoration activities.

Recruitment Old Growth Allocation: There would be 1,380 acres of additional recruitment old growth identified within the analysis area. Approximately 58 percent of this (800 acres) is within the Iron Creek drainage.

Roads: Besides the road system necessary to provide general access to the area, about 4.4 miles of existing roads would be needed in the Hudlow Creek drainage to access previously-harvested stands. No new roads would be created for the purpose of stand tending. However, approximately 0.5 miles of temporary (low standard) road construction would occur in order to harvest trees (using skyline yarding) for instream use as part of the watershed restoration activities. These roads would be obliterated upon completion of the unit activities.

2.6.7 Alternative 7

The objective of this alternative is to restore vegetation composition and structure to more closely resemble historical patterns within the Iron Creek drainage, improve growth and structure in stands where larch is a major component, and provide for regeneration of early seral, disease-resistant species in small openings.

Watershed Restoration: A total of approximately 49 miles of road obliteration and recontouring would occur, removing 113 road channel crossings and upgrading 30 culverts. No stream stabilization work would occur under Alternative 7.

Timber Harvest: Under this alternative, approximately 1,100 acres would be harvested using the "shelterwood with reserves" method in units ranging from 48 to 266 acres in size; 45 acres using the clearcut or "clearcut with reserves" method in units ranging from 5 to 10 acres in size; and 141 acres of commercial thinning. The harvest within the Iron Creek drainage is exactly the same under this alternative as under Alternative 2 and is intended to simulate the extent and effects of natural, stand-replacing disturbances that occurred historically in this area. The commercial thinning is intended to simulate low-severity fires that would tend to kill small-diameter, non fire-resistant species in the understory and thin small diameter fire resistant co-dominants. The clearcuts and "clearcuts with reserves" are intended to simulate mixed severity fires that would create small openings suitable for regeneration of early seral species. These small openings would be placed in stands where root disease is a major problem or in lodgepole pine stands where growth has stagnated.

Recruitment Old Growth Allocation: Approximately 800 acres of recruitment old growth would be allocated in the Iron Creek drainage.

Roads: In addition to the changes in transportation described in 2.6.1 Introduction, approximately 0.7 miles of temporary (low standard) road construction would occur in order to yard harvested trees with skyline machines. These roads would be obliterated by the sale purchaser upon completion of the contractual duties in each harvest unit.

2.6.8 Alternative 8

Alternative 8 was developed based on public comments after review of the Draft EIS, and is the alternative preferred by the Forest Service at this time. Alternative 8 is similar to Alternative 2 in that it would combine watershed restoration activities with a limited "pulse" of regeneration harvest in the Iron Creek and Solitaire drainages, as described earlier (where disturbances occur over a large area within approximately 5 years, but are not repeated in the watersheds for 30 to 40 years). In addition to watershed restoration and timber harvest activities, Alternative 8 would include additional recruitment old growth allocation, and road construction. However, where Alternative 2 would focus on the Iron Creek drainage, the objective of Alternative 8 is to trend toward restoration of vegetation composition and structure to more closely resemble historical patterns within the Iron Creek and Solitaire drainages, and trend the landscape pattern of the upper-most reaches of the Little North Fork toward historical patterns.

Watershed Restoration: A total of approximately 76 miles of road would be obliterated and recontoured under Alternative 8, removing 176 road channel crossings and upgrading 21 culverts. Approximately 5 miles of stream stabilization work would occur.

Timber Harvest: Approximately 1,900 acres would be harvested using the "shelterwood with reserves" method in units ranging from 50 to 330 acres in size. The shelterwood type of harvest is intended to simulate the extent of natural disturbances that occurred historically in this area. The wet habitat types within the analysis area were likely to experience a stand-replacing fire event every 200-250 years (Smith, Jane K., Fischer, William C., 1997) with the last major fire in this area likely during the late 1700's. These fires may have covered from thousands to hundreds of thousands of acres. However, as large as these fires may have been; at the landscape level, there were always many subwatersheds that were minimally impacted or not impacted at all. Although intensive management activities would occur in the Iron Creek and Solitaire drainages, it is our intention that the remainder of the analysis area would be minimally impacted by harvest activities for a period of 30 to 40 years.

Recruitment Old Growth Allocation: Approximately 1,380 acres of recruitment old growth would be allocated within the analysis area. Approximately 58 percent of this (800 acres) is within the Iron Creek drainage.

Roads: In addition to the changes in transportation described in 2.6.1 Introduction, approximately 4 miles of temporary (low standard) road construction would occur in order to yard harvested trees with skyline machines. These roads would be obliterated by the sale purchaser upon completion of the contractual duties in each harvest unit.

The following table displays a comparison of the activities that would occur under each of the alternatives. Specific unit information and a depiction of harvest methods are provided in Appendix E. Please refer to the enclosed alternative maps and the Project Files for additional information.

Table II-2. Comparison of activities proposed under the Iron Honey project, by Alternative.

Feature	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Watershed recovery treatments							
Miles of Level 1 road obliteration	0	37	7	27	118	36	54
Miles of Level 2 road obliteration	0	10	1	11	26	11	19
Miles of Level 2 riparian road obliteration	0	2	0	1	3	2	3
Total miles of roadbed obliterated/recontoured	0	49	8	39	147	49	76
# of channel crossings removed	0	117	10	76	335	113	176
# of culverts upgraded	0	7	45	51	38	30	21
Miles of stream stabilization work	0	0	0	3	5	0	5
Proposed harvest (acres)							
Clearcut w/ Reserve Trees	0	0	190	680	0	40	0
Commercial Thinning	0	0	140	140	0	140	0
Shelterwood Harvest	0	1,100	0	3,520	0	1,100	1,900
Selective (for instream use)	0	0	0	0	380	0	230
Total acres of harvest proposed	0	1,100	330	4,340	380	1,280	2,130
Yarding systems (acres)							
Skyline	0	900	130	3,800	0	920	1,690
Tractor	0	200	70	400	380	220	440
Helicopter	0	0	140	140	0	140	0
Estimated timber harvest volume*							
Cunits (CCF) *1*	0	29,600	8,100	98,700	0	33,600	57,400
Million board feet (MMBF)	0	14.8	3.4	45.7	0	16.2	27.0
Proposed Road Work (Miles)							
Permanent road construction**	0	0.2	0	0.2	0.2	0.2	0.2
Temporary road construction	0	0.7	0.5	14	0.5	0.7	4.0
Road reconstruction	0	23	28	58	0	37	30
Additional acres of allocated recruitment old growth	0	1,380	0	800	1,380	800	1,380
Fuel treatments							
Underburning	0	1,100	192	4,200	0	1,140	1,340

** CCF = 1 cunit (one hundred cubic feet)*

*** To allow removal of the Moose Creek Road 1532 as part of the watershed restoration activities.*

Fuel Treatments

Underburning is a prescribed fire method designed to meet various resource objectives where a tree canopy is present and is to be preserved. The treatment reduces woody debris, provides site-preparation for natural or artificial regeneration and eliminates unwanted vegetation. Underburning can also improve wildlife habitat.

Watershed Recovery Treatments

Mileages are estimates based on Geographic Information Systems (GIS) mapping; these estimates may be overestimated because GIS considers road segments as a whole, and does not allow for "spot work" distances of the actual road treatment.

Level 1 Obliteration includes removal and recontour of all stream crossings and, as needed, recontour of unstable fill slopes, cutslope stabilization, ripping the road tread, installation of no-maintenance cross ditches, and revegetation. Obliteration also includes some closure method, such as a guard-rail barrier, gate, earthen berm, or short section of full recontour, referred to as "front-end" obliteration. Front-end obliteration includes recontouring of about the first 250 feet of the road, to stop motorized traffic from entering onto the road.

Level 2 Obliteration includes removal of all stream crossings and full recontour of the entire road prism, introduction of woody debris, and revegetation as needed.

Roads identified for obliteration under the Iron Honey project are roads that were already closed to motorized vehicles under earlier decisions or closure orders.

Stream stabilization work consists of reconstructing degraded stream reaches, adding large wood to the channel, and planting native vegetation along streambanks and in the flood-prone area.

2.6.9 Features Common to All Action Alternatives

Alternatives were designed to protect natural resources in the Iron Honey Resource Area while implementing project activities.

A. Features Designed to Protect Aquatic Resources

In development of the action alternatives, standards and guidelines of the Inland Native Fish Strategy (USDA Forest Service, 1995, pages A-6 through A-15) were used specifically to protect water and aquatic biota within the Resource Area. Riparian Habitat Conservation Areas (RHCAs), known locations of sensitive plants and special wildlife habitat areas were excluded from proposed timber harvest or fuel treatment activities. Standard widths for defining interim Riparian Habitat Conservation Areas (RHCA's) were utilized with no modifications. Under the Inland Native Fish Strategy the stream channel buffer widths are as follows (USDA Forest Service, 1995, Inland Native Fish Strategy, pages A-5 and A-6):

- **Category 1 - Fish-bearing Streams**: Interim RHCA's consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.

- **Category 2 - Permanently flowing non-fish bearing streams:** Interim RHCA's consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.

- **Category 3 – Ponds, lakes, reservoirs, and wetlands greater than 1 acre:** Interim RHCA's consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, or to the extent of moderately and highly unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond or lake, whichever is greatest.

- **Category 4 - Seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas:** This category includes features with high variability in size and site-specific characteristics. At a minimum, the interim RHCA's must include:

  - *The extent of landslides and landslide-prone areas*
  - *The intermittent stream channel and the area to the top of the inner gorge*
  - *The intermittent stream channel or wetland and the area to the outer edges of the riparian vegetation*
  - *For Priority Watersheds, the area from the edges of the stream channel, wetland, landslide or landslide-prone area to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest.*
  - *For watersheds not identified as Priority Watersheds, the area from the edges of the stream channel, wetland, landslide or landslide-prone area to a distance equal to the height of one-half site potential tree, or 50 feet slope distance, whichever is greatest.*

Riparian Management Objectives and road management standards and guidelines were applied within the Resource Area boundary on those roads used for harvesting or hauling of timber. Roads that are proposed for closure to maintain big-game security goals would comply with the Inland Native Fish Strategy prior to closure. Streamside buffers would be applied along all harvest units in all action alternatives. The intent of the buffers are to meet the riparian management objectives of maintaining slope stability in potentially sensitive areas, maintain stream temperatures and provide a long-term supply of large woody debris.

Instream work would be avoided prior to July 15 each year. Instream work can cause increased sedimentation (fines) while the work is being conducted. Timing guidelines are used to reduce impacts to eggs and fry.

To minimize erosion and ensure compliance with State water quality standards, all road construction and timber harvest associated with the Iron Honey project would be completed using Best Management Practices. In their scoping comments (Iron Honey Draft EIS, page A-5; Project Files, Scoping), the Environmental Protection Agency expressed concern with the adequacy of Best Management Practices. Monitoring of Best Management Practices has determined that recent projects on the Idaho Panhandle National Forests have been implemented as designed and have achieved the desired objectives (USDA Forest Service, 2000, Idaho Panhandle National Forests Monitoring - 1999, p. 34-41). The Forest Service Handbook 2509.22 (Soil and Water Conservation Handbook) outlines Best Management Practices that meet the intent of the water quality protection elements of the Idaho Forest Practices Act. Many are standard provisions to timber sale contracts (USFS Timber Sale Contract - Division B, 2400-6). Activities would meet or exceed rules and regulations of the Idaho Forest Practices Act, Best Management Practices, and the Idaho Forestry Act and Fire Hazard Reduction Laws (1988).

B. Features Designed to Improve Vegetation Management

Although some shelterwood unit boundaries are within the Management Area 9 allotment, all proposed harvest units are on sites identified by the Forest Plan as suitable for timber production. Management Area 9 consists of a combination of areas of non-forest lands, lands not capable of producing industrial products, lands physically unsuited for timber production, and lands capable of timber production but isolated by the other types listed or by private ownership (Forest Plan, page III-39). During layout of the shelterwood units, all harvest would be located on sites verified to be capable of timber production. Prescriptions would be completed and approved by a certified silviculturist prior to implementation (Forest Plan, Appendix A, p. A-2), providing detailed guidance for vegetative management specific to each unit. For more information, please refer to the “Forest Vegetation” discussion in Chapter III.

Under Alternatives 2, 3, 5, 7 and 8, vegetative treatments would occur within a portion of the Iron Honey Resource Area. All vegetative treatments would have silvicultural prescriptions approved by a certified silviculturist before treatment. Prescriptions will consider site-specific factors such as physical, site, soils, climate, habitat type, current and future vegetative composition and conditions as well as interdisciplinary objectives, NEPA decisions and Forest Plan goals, objectives and standards. All regeneration areas would be regenerated with site-adapted species/seed source and resulting stands will be dominated by appropriate long-lived seral species. In treated areas, site preparation for regeneration, fuel treatment and planting would occur within 5 years of regeneration treatment. Site preparation and/or fuel treatment may include a combination of prescribed burning, underburning, grapple piling and hand piling, depending on post-harvest conditions which meet both site preparation and hazard reduction objectives.

In approximately 10-30 years, the stands proposed for regeneration may be entered for pre-commercial thinning, pruning, cleaning and possibly fertilization to meet target stand and management area guidelines. Regeneration harvests would occur under all action alternatives except Alternative 6. Access for stand-tending purposes would be maintained to all regeneration units, including past regeneration harvest areas in the Hudlow Creek drainage in which early seral species, particularly white pine, have been planted. Precommercial thinning and pruning (not involving commercial timber harvest) has been shown to decrease

mortality due to white pine blister rust in non-resistant stock (Schwandt, Marsden, McDonald, 1994) and are important tools in managing for white pine as well as western larch.

None of the alternatives propose harvest, fuels treatment, or other activities in allocated old growth or recruitment old growth stands. Under some alternatives, harvest is proposed in some stands that contain trees over 150 years of age but which do not demonstrate the old-growth characteristics defined by the Forest Plan. For those units that are directly adjacent to old-growth stands, harvest design and subsequent treatments will be adjusted as necessary to protect the integrity of the old growth (for example, modification of harvest patterns to reduce the risk of timber blow down). These adjustments are described in the silvicultural prescriptions (Project Files, Vegetation).

C. Features Designed to Protect Soils

Fine organic matter and large woody debris would be retained on the ground in harvest units; which is necessary for sustained nutrient recycling (especially in areas of low potassium). On units designated for tractor harvest, planned skid trails would be established at 150-foot spacing to reduce overall soil compaction and displacement. In units where previous tractor work has exceeded Forest Plan guidelines for soil disturbance, existing skid trails that do not meet the 150-foot spacing guideline would be ripped to ameliorate compaction concerns. All tractor harvest and wood removal would be scheduled to occur when the soil profile is dray. In units where whole trees are to be removed for the purpose of instream enhancement work, soil attached to the root ball would be retained on site to promote revegetation. Prescribed broadcast burning and underburning would be of low intensity and would occur when the soil's surface horizon has a 25% moisture content in order to protect the site's surface organic component.

To minimize erosion and ensure compliance with State water quality standards, all road construction and timber harvest associated with the Iron Honey project would be completed using Best Management Practices, as described under "Features Designed to Protect Aquatic Resources." Monitoring of Best Management Practices has determined that recent projects on the Idaho Panhandle National Forests have been implemented as designed and have generally achieved the desired objectives (USDA Forest Service, 2000, Idaho Panhandle National Forests Monitoring - 1999, p. 34-41). The results of the 1999 monitoring indicates that a good job is being done in meeting compaction, displacement, and fine organic matter soil quality standards, but coarse woody debris did not meet recommended guidelines on the unit monitored on the Coeur d'Alene River Ranger District (USDA Forest Service, 2000, Idaho Panhandle National Forests Monitoring - 1999, p. 50-51). Although there were some concerns related to skid trail construction on specific projects (none on the Coeur d'Alene River Ranger District), reviews indicated that most projects met BMP compliance for soil protection. Maps related to soil conditions in the Iron Honey Resource Area (such as sensitive landtypes and potassium deficient areas) are provided in the Project Files (Soils).

D. Features Designed to Protect Rare Plants

No harvest activity would occur which would adversely affect any known rare plant population. All populations potentially adversely affected would be buffered from harvest activity by a minimum of 100 feet. No harvest activity would occur within riparian habitat. Site-specific surveys would be conducted as necessary for in-stream watershed work in highly suitable riparian habitat. All newly identified Threatened and Sensitive plant occurrences would be evaluated. Specific protection measures would be implemented to minimize impacts to that population occurrence and its habitat. Areas of high potential habitat would be surveyed prior to implementation. The timber sale contract would include provision C6.251, which allows for modification of the contract if protection measures prove inadequate, if new areas of plants are discovered, or if new species are added to the list.

The number of acres surveyed for rare plants is a measure of the Forest Plan commitment to determine the status and distribution of rare plants within the Idaho Panhandle National Forests. Qualified botanists and

other personnel that have had training in botany and sensitive plant identification conduct botanical surveys. In 1999, forest botany personnel performed on-the-ground clearance surveys on 16,602 acres of high potential habitats for TES and rare plants in support of various projects (including timber, watershed, fisheries, KV, trails, grazing, special use, and land exchange projects). For additional information on protection of rare plants, please refer to the "Mitigation" discussion in this chapter.

E. Features Designed to Protect Air Quality

The Idaho Panhandle National Forest is a party to the North Idaho Smoke Management Memorandum of Agreement, which established procedures regulating the amount of smoke produced from prescribed fire. The North Idaho group currently uses the services and procedures of the Montana State Airshed Group. The procedures used by the Montana Group are considered to be the "best available control technology" (BACT) by the Montana Air Quality Bureau for major open burning in Montana. A Missoula-based monitoring unit is responsible for coordinating prescribed burning in North Idaho during the months of April through November. This unit monitors meteorological data, air quality data, and planned prescribed burning and decides daily on whether or not restrictions on burning are necessary the following day.

Prescribed burning on the Coeur d'Alene River Ranger District occurs in the spring and fall seasons, with a total time span of 45 to 60 days during each season. All burning complies with federal, state and local regulations. Management practices include, but are not limited to, burning under spring-like conditions (high moisture content in fuels, soil and duff) to reduce emissions, provide for retention of large woody debris, and to protect the soil. Prescribed burning during spring or fall will generate less smoke than a much hotter stand replacing summertime wildfire.

Each year, a list of all prescribed burning planned for the burning season on the Coeur d'Alene River Ranger District is forwarded to the monitoring unit through the Idaho Panhandle National Forest fire desk before March 1. Daily, by 8:30 a.m., the Coeur d'Alene River Ranger District informs the fire desk of all burning planned for the next day and the fire desk forwards this information to the monitoring unit. By 3:00 p.m. the same day the monitoring unit informs the Forest if any restrictions are to be in effect the following day, and the fire desk informs the District. These procedures limit smoke accumulations to legal, acceptable limits. The District strictly complies with these procedures, and has had no air quality violations.

F. Features Designed to Protect Wildlife Habitat

Live leave trees in regeneration areas would be reserved from harvest to provide size class diversity and long-term snag recruitment. Forest Plan snag guidelines will be met. In proposed harvest units that currently provide quality snag densities, 6 wildlife trees per acre would be maintained, with three Type 1 or 2 snags and 3 live replacement trees where appropriate. In all other units, 4 to 6 wildlife trees per acre would be maintained, with Type 1 or 2 trees preferred where available.

Under any alternative, several roads in the Iron Honey Resource Area would be opened to accomplish project activities (please refer to Appendix F, "Transportation"). All roads that are currently closed with earth barriers, that are opened for periods greater than 2 weeks, will be required to be gated during use to meet wildlife security needs during activities. Gates will be closed at the end of daily activities. Following completion of the project, these roads would be closed using physical barriers (such as earth berms). Please refer to Appendix F (Transportation) for additional information.

Type 1 snags are live trees that are defective or deformed with sound tops, trunks and roots (generally not considered danger trees).

Type 2 snags are dead trees with sound tops, trunks, and roots (generally not considered danger trees; reasonably safe to work around).

Type 3 snags are live or dead trees with broken or unstable tops or upper portions (posing high hazard).

Type 4 snags are live or dead trees with unstable trunk or roots (the most dangerous type).

For additional wildlife habitat protection measures, please refer to section 2.6.10 Mitigation (D. Mitigation to Reduce Effects to Wildlife) in this chapter.

G. Features Designed to Protect Heritage Resources

All known heritage resource sites would be protected under any alternative, as directed by the Cultural Resources Management Practices (Forest Plan, Appendix FF). Any future discovery of heritage resource sites or caves would be inventoried and protected if found to be of cultural significance. A decision would be made to avoid, protect, or mitigate effects to these sites in accordance with the National Historic Preservation Act of 1966. In 1999, the Idaho Panhandle National Forests reported (and the state Historic Preservation Office reviewed) thirteen timber sale projects. It was determined that none of these projects would have an effect on heritage resources (USDA Forest Service, 2000. Idaho Panhandle National Forests – Forest Plan Monitoring and Evaluation Report – 1999; p. 17).

H. Features Designed to Reduce the Spread of Noxious Weeds

Noxious weed prevention strategies on the Coeur d'Alene River Ranger District are conducted based on the Noxious Weeds Final Environmental Impact Statement and Record of Decision (USDA Forest Service, 1998). Known infestation sites and priorities for treatment were established in that document. Measures to protect Threatened, Endangered and Sensitive plant population viability and habitat capability would be implemented following information provided in that document. To help reduce the spread of noxious weeds and prevent the introduction of new invader species, contract clause CT 6.361 Equipment Washing would be used in all construction and timber sale contracts. For further information regarding noxious weeds, please refer to Appendix A (Issues Not Addressed in Detail) and the Project Files (Noxious Weeds).

I. Long-term Transportation Plan Common to All Alternatives

The transportation planning for the Iron Honey proposal tiered to the Forest Plan, but has a higher degree of specificity. The goals for transportation facilities in Chapter II of the Forest Plan state in part:

> *Construct the minimum number of roads necessary to permit the efficient removal of timber and mineral resources. Construct and reconstruct roads only to minimum standards necessary to prevent soil loss, maintain water quality, minimize safety hazards for a reasonable and prudent Forest user, and provide access for fire protection where needed to meet management area goals.*

Many of the roads providing for the use and administration of National Forest System lands are relatively permanent or long-lived facilities. As a result, there is a wide range of effects associated with the road system. Analysis of road systems must occur at varying levels of detail, from the programmatic (national, regional, and forest-wide) to the site-specific (on an area-by-area basis through the NEPA planning process). The District completed an Access Management Environmental Assessment, using the NEPA planning process to ensure widespread public involvement in the review and modification of the District's Travel Plan (USDA Forest Service, 2000, Coeur d'Alene River Ranger District Access Management Environmental Assessment). The Travel Plan identifies those roads available to the public for motorized use across the Coeur d'Alene River Ranger District. The new Travel Plan is discussed under "Ongoing and Reasonably Foreseeable Activities" in this Chapter. Proposed changes to access management under the Iron Honey project are consistent with access management under the District's new Travel Plan (Project Files, "Transportation").

For each site-specific NEPA proposal, a long-term transportation plan is developed to identify the access needs for that area over the next several decades. The Long-term Transportation Plan for the Iron Honey Resource Area is described in detail in Appendix F (this information was presented to the public for review in

the Draft EIS). The long-term plan would apply to all action alternatives, although it would be implemented to varying degrees under each alternative.

Key objectives of the transportation plan are to:

- *Maintain routes and/or loops through the analysis area for established snowmobile, motorcycle, and other vehicular recreation traffic.*
- *Establish routes where ATV's would not share the roadway with larger vehicular traffic.*
- *Maintain access to private property (at Horse Heaven and along the Bunco Road).*
- *Maintain access to the heart of the analysis area (Horse Heaven) from the traditional access points: Hudlow Saddle, Argument Saddle, Crooked Ridge, and Bunco Saddle.*
- *Maintain vehicular access to the top and bottom of the major ridges for attack and control of wildfire.*
- *Reduce the amount of road fills in the flood plains, thus providing for more natural functioning flood plains, which in turn will reduce the cost of road repair due to flooding.*
- *Install fords in place of culverts, where possible, to both lessen environmental impact risks and reduce road maintenance costs.*

J. Land Exchange - Adjustment of Right-of-Way Easements Common to All Alternatives

Historic records show that a fee-strip of land was retained by the U.S. Government for a forest road through the private ownership at Horse Heaven. However, it appears that the location of the fee-strip does not match the location of the existing road (Road 794) through the area, and never did. Nor could a right-of-way easement be found for the Colt Mountain Road (Road 2346). Construction of the Colt Mountain Road was started in 1934; the road has been both used and maintained by the Forest Service since that time. As part of all of the action alternatives, an easement would be sought for the existing location of Road 794 in exchange for the present fee-strip. At the same time, an easement would be sought for the present location of Road 2346. This type of land inter-exchange is permitted under the Small Tracts Act.

K. Anticipated Timing of Activities Under the Action Alternatives

Should one of the action alternatives be selected for implementation, the following schedule of activities would likely occur. The actual seasons of work and acres treated would depend upon the alternative selected, availability of funding, and operating schedule. In addition, implementation would be delayed in the event of an administrative review (appeal) of the project decision or litigation. Please refer to Chapter III, Finances, for a discussion of the types of funding.

Any timber sales resulting from implementation of Alternatives 2, 3, 5, 7 or 8 would be sold in fiscal year 2002, with completion of harvest activities in 3 to 4 years under all but Alternative 3, which would be completed in about two years.

Road construction and reconstruction activities under these alternatives would also begin in 2002, with completion in about 3 years under all except Alternative 3 (with completion in about 2 years).

Prescribed burning would begin under Alternatives 2, 3, 5, 7 and 8 in 2003, lasting 3 to 4 years under all but Alternative 3 (which would last about 1 year).

Tree planting would begin under Alternatives 2, 3, 5, 7 and 8 in 2005, lasting 3 to 4 years under all but Alternative 3 (which would last about 1 year).

Depending on the source of funding, watershed restoration activities could begin in 2002 under any alternative (including Alternative 6), with any KV-funded watershed restoration beginning in about 2003. All watershed restoration activities would be complete under any alternative by 2012.

If new information or changed circumstances relating to the environmental impacts of this proposal come to the attention of the responsible official after the decision has been made and prior to completion of the project, the information will be carefully reviewed to determine its importance as directed in the Forest Service Environmental Policy and Procedures Handbook 1909.15 (Chapter 18).

2.6.10 Mitigation

After analyzing the potential effects of proposed activities, specific "mitigation" measures were identified to reduce impacts to natural resources (these are measures taken to reduce the anticipated effects of a specific action). The following mitigation measures are an integral facet of all action alternatives and have been identified as necessary to reduce environmental effects to natural resources. These measures will be incorporated into the project design, timber sale contract, and other contracts and project plans.

A. Mitigation to Reduce Effects to Aquatic Resources

Based on current information, no new stream crossings would be needed under any alternative. If it were discovered during implementation that crossings do need to be installed, they would be engineered to meet 100-year flood events, which would minimize the risk of failure.

B. Mitigation to Reduce Effects to TES Plants

All previously unsurveyed areas identified as potential or highly suitable habitat that, as a result of the proposed activity, would have a high risk of adverse effects to Threatened and Sensitive plants or habitat and a likely reduction in population viability, must be surveyed by a botanist prior to project implementation. Some areas previously surveyed may be resurveyed, based on the date and intensity of the most recent sensitive plant survey and the risk to sensitive habitat from proposed activities.

The table below displays the approximate number of acres by alternative within proposed activity areas, including harvest units, road construction, and road obliteration, which must be surveyed prior to project implementation. Survey acres were based on habitat queries (refer to the project file), aerial photograph and topographical map interpretation, previous Sensitive plant surveys, and risk of adverse impacts to Sensitive plants and suitable habitat from the proposed activity. Lists of specific units that must be surveyed are contained in the project file. It should be noted that, in some cases, potential habitat occurs only in portions of units, and the entire unit would not be surveyed. Other highly suitable habitat adjacent to proposed units might be surveyed based on the potential risk of adverse effects from proposed activities. Areas to be surveyed may be adjusted as project design and layout progresses, to assure all activity areas are covered by surveys, and for efficiency in completing the surveys.

Table II-3. Acres of land and miles of road to be surveyed for TES plants.*

Habitat Guild	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Wet forest guild	0 acres .68 miles	0 acres 0 miles	13 acres 1 mile	0 acres 0 miles	0 acres .68 miles	13 acres .78 miles
Moist forest guild	424 acres 2.13 miles	52 acres 0 miles	779 acres .69 miles	97 acres 0 miles	424 ac. 2.13 miles	653 acres 2.66 miles
Dry forest guild	141 acres .76 miles	0 acres 0 miles	237 ac. .34 miles	35 acres 0 miles	141 acres .76 miles	193 acres .68 miles
Grassland guild	8 acres 0 miles	0 acres 0 miles	0 acres 0 miles	0 acres 0 miles	8 acres 0 miles	10 acres 0 miles
Total	573 acres 3.57 miles	52 acres 0 miles	1,029 acres 2.03 miles	132 acres 0 miles	565 acres 3.57 miles	859 acres 4.24 miles

**Surveys would be conducted in highly suitable habitats where activities such as vegetative management, new road construction, road obliteration and watershed restoration projects are proposed. Miles of road to be surveyed represent entire road segments within suitable habitat. Actual road miles surveyed may be less than those displayed depending on location and risk from activities. There are no areas to be surveyed in the deciduous riparian, peatland, or subalpine guilds, therefore they are not included in the table.*

Should rare plants be located during surveys, one or more of the following protective measures would be implemented:

- *Drop proposed units from activity.*
- *Modify the proposed unit or activity.*
- *Implement a minimum of 100 feet slope distance buffers around sensitive plant occurrences as necessary to minimize effects and maintain population viability.*
- *Implement, if necessary, Timber Sale Contract provisions C(T)6.251#, Protection of Endangered Species, and C(T)9.52, Settlement for Environmental Cancellation.*

These measures are estimated by the District botanist to be highly effective. The requirement to survey, identify and protect populations from adverse effects and to buffer habitat for threatened species from all activities will be implemented prior to the award of the contract. The maintenance of any buffers protecting populations would be administered in the contract.

C. Mitigation to Reduce Effects to Soils

Out of the proposed harvest units, only Unit 22 (under Alternative 5) would occur on low potassium soils. If Alternative 5 were selected for implementation, the tops and limbs of harvested trees in Unit 22 would be left on site (not whole tree yarded). All organic matter left on site would be allowed to over-winter one season so that the fine materials begin to integrate with the existing organic layer.

D. Mitigation to Reduce Effects to Wildlife

Under Alternatives 2, 3, 5, 7, and 8, the project area would be divided into at least three subdivisions, with activities occurring in no more than two subdivisions at any time. This would allow the remaining subdivision(s) to provide security for big game and other wildlife species during project implementation.

Lynx sightings will continue to be recorded. If it is determined that there is a pattern of lynx use (based on lynx sightings in the area), current lynx analysis unit boundaries may require modification in cooperation with the U.S. Fish and Wildlife Service and Idaho Fish and Game.

Because of observed responses from goshawks to beg calls in the Colt Mountain area during the 1997 field season, some units would need to be surveyed for goshawks prior to unit layout: Under Alternatives 2, 5, 7

and 8, Unit 6 would be surveyed. Under Alternative 3, Units 28 and 29 would be surveyed. If active goshawk nest sites were found, the nest site would be protected with a 30-acre no-harvest buffer. If the nest were being actively used by a goshawk, no tree felling, yarding or other potentially disturbing activities would occur within approximately one-quarter mile of the nest site (as determined by the Forest Service) from March 15 to August 15. These features would be incorporated into timber sale packages using Timber Sale Contract clause C6.251. These mitigation measures are expected to result in no effect to northern goshawk populations.

If trees outside of units were scorched during site preparation operations (prescribed burning), at least 15% of those scorched trees would be retained (in dense clumps where feasible) to provide forage opportunities for black-backed woodpeckers.

E. Mitigation to Reduce Effects Related to Recreation

Under Alternatives 2, 5, 7 and 8, large areas would be opened (at least temporarily) that may attract unauthorized off-road vehicle use that could detrimentally affect vegetation, soils, and wildlife. These areas would be signed to discourage such use, and monitored to prevent undesireable effects of unauthorized off-road travel.

F. Mitigation to Reduce Effects to Scenic Resources

Implementation of Alternatives 5 and 8 would require mitigation to meet Forest Plan objectives for visual quality. New units should incorporate the tree lines of past clearcuts as much as possible to reduce the “edge” effects that tree-line unit boundaries have on the scenery. Foreground views from key visual points on Road 209 would need to be protected with tree screens or unit boundary set backs. The primary objective is that most of the units are not seen from the road or campsites along the Little North Fork Coeur d’Alene River. Reserve trees retained in the units should be western larch or western white pine to help diversify the color and texture of the forest in the future.

In 1999, 100% of the projects planned were designed to meet Visual Quality Objectives. Of those projects that were implemented in 1999, 95% were determined to be in compliance with Visual Quality Objectives (USDA Forest Service, 2000. Idaho Panhandle National Forests – Forest Plan Monitoring and Evaluation Report – 1999; p. 12).

2.6.11 Monitoring

A. Forest Plan Monitoring

The Forest Plan documents a system to monitor and evaluate Forest activities. Monitoring and evaluation each have distinctly different purposes and scope. In general, monitoring is designed to gather the data necessary for project evaluation. During evaluation of project effectiveness, data provided through the monitoring effort are analyzed and interpreted. This process will provide periodic data necessary to determine if implementation is within the bounds of the project design (Forest Plan, page IV-7). For activities in the Iron Honey Resource Area, all alternatives would comply with specific monitoring requirements identified by the Forest Plan (Forest Plan, Chapter IV; and Project Files, “Monitoring”). The length of time that monitoring is needed will be determined by the results and evaluation of what is being monitored. When it is certain that regulations and standards are being met, monitoring of a particular element will cease. If monitoring evaluations show that regulations or standards are not being achieved at the desired level, management intervention will occur.

B. Forest Corporate Monitoring

In December 1999, the Ecosystem Team for the Idaho Panhandle National Forests facilitated development of a Corporate Monitoring System. The emphasis is on monitoring our progress in restoring the ecosystems of the Idaho Panhandle and in being more consistent in the way we analyze effects to the ecosystems. The monitoring is tied closely to findings of the Interior Columbia Basin and Geographic Assessment. The data that will be tracked for long-term monitoring is provided in the table below.

Table II-4. Long-term monitoring of ecosystem core data.

Ecosystem condition core data monitoring element	Core data to be monitored
Hydrologic integrity	Road density
Wildlife security and public access	Open road density
Water yield	Hydrologic openings (equivalent clearcut acres)
Changes in forest structure outside the historic range of variability	Forest structure by size and age-class groups
Changes in species composition outside the historic range of variability	Forest composition by forest cover type group
Habitat loss and species decline	TES dry and moist/cold site habitat restoration
Changes in landscape pattern	Landscape pattern indicators (mean patch size and variability, edge density, etc.)

Further information regarding corporate monitoring is provided in the Project Files ("Monitoring").

C. Monitoring Specific to This Project

In addition to the above, the following monitoring activities would occur specific to this project:

Vegetation: All regeneration and rehabilitation units would be monitored for regeneration success and compliance with silvicultural prescriptions. All regeneration would be complete in 5 years to meet the NFMA requirements. All intermediate treatments would be monitored to assess achievement of prescription objectives.

Aquatic Resources: The objective of monitoring aquatic resources is to determine if land management activities are meeting the resource protection and improvement objectives. In addition to the core data monitoring identified above, monitoring would occur in relation to implementation and effectiveness of Best Management Practices and watershed restoration activities. Monitoring of Best Management Practices has determined that recent projects on the Idaho Panhandle National Forests have been implemented as designed and have achieved the desired objectives (USDA Forest Service, 2000, Idaho Panhandle National Forests Monitoring - 1999, p. 34-41). Additional information on monitoring for aquatic resources is provided in Appendix C.

Recreation: Under Alternatives 2, 5, 7 and 8, large areas would be opened (at least temporarily) that may attract unauthorized off-road vehicle use. The large openings created by timber harvest could be favored as snow play sites by snowmobile users. As described in Chapter II (Mitigation), harvested areas would be signed to discourage such use, and monitored to prevent undesirable effects of unauthorized off-road travel.

All timber sales are monitored by timber sale administrators and other contracting representatives to ensure activities are conducted in accordance with contract specifications. For example, that activities occur where and when they should to protect resource such as soils and wildlife, that yarding is accomplished as planned and specified in the contract to protect soils, that seedlings are planted at the appropriate spacing, etc.

2.7 COMPARISON OF ALTERNATIVES

The following briefly compares the effects of each alternative as they relate to the project objectives and issues. It is important that the data in the tables and graphs be used as a simple comparison, and not taken out of context. The decision to implement one alternative over another will mean weighing the trade-offs of benefits and effects. A detailed discussion of environmental consequences is provided in Chapter III, by resource.

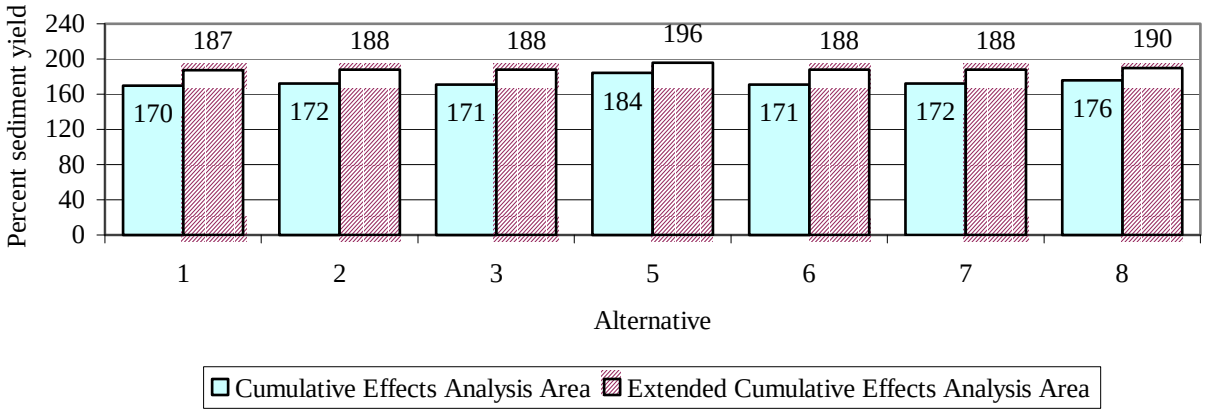
2.7.1 Aquatics

The most serious process influencing the tributaries in the Upper Little North Fork is the failure of roads, road fills, and road channel crossings in close proximity to streams. Under all action alternatives, aquatic restoration activities would help in the long-term recovery of Iron Creek and in both the short- and long-term recovery of the Little North Fork Coeur d'Alene River. The removal of hillslope roads would reduce the long-term risk of catastrophic introduction of sediment to the stream systems, and the removal of streamside roads and stabilization of stream channels would reduce the direct effects of roads that are currently confining the streams or contributing sediment to the stream systems. The effects to aquatics and fish habitat under each alternative can be compared using the following indicators: sediment yield, number of stream crossings, reduction in sediment delivery, peak flow, net road miles, open and total road density, net reduction of road miles encroaching on streams, vegetation removed along streams, and increase in fish passage.

Sediment yield: The estimated annual sediment loading is reported as the percent change above the estimated natural sediment yield for the same area. There is no threshold for sediment; instead, specific guidelines are applied (refer to the text box below). For more information regarding these guidelines, please refer to the "Aquatic Resources" discussion and materials in Chapter III, Appendix D, and the Project Files. The information in the following graph was extracted from Chapter III, Aquatics, Table III-22 (Projected watershed response in the Project Area, Hudlow Creek and above) and Table III-23 (Projected watershed response in the extended cumulative effects area (Coeur d'Alene River above Skookum Creek).

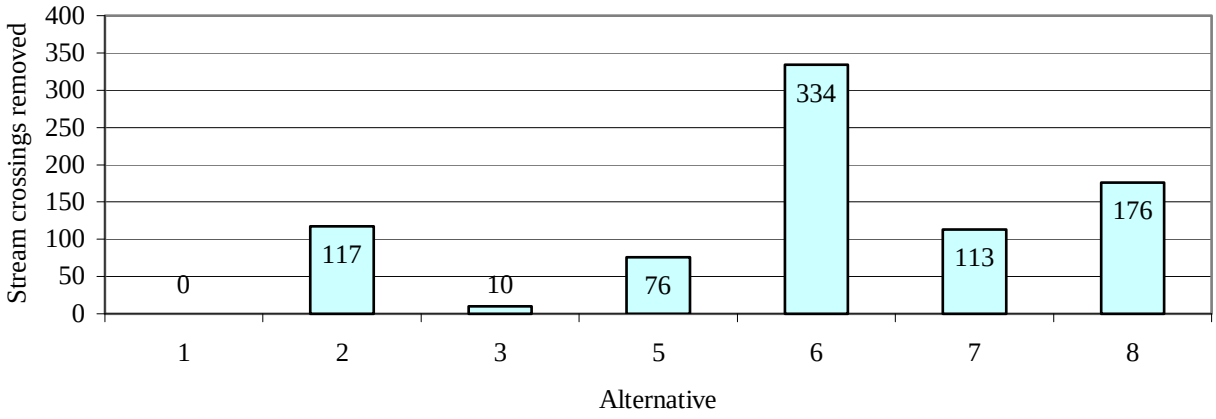
Zero	If the increase over the existing level (represented by Alternative 1) is zero, there is no potential for an increase in sediment or delay of watershed recovery.
0 to 10%	Potential exists for an increase in sediment or delay of watershed recovery, but the increase would not be measurable. For example, if you dumped a cup of dirt into a stream, you know the sediment has increased; yet it would not be measurable at a gauging station or by using a sampler.
10 to 20%	There is a slight potential that there would be a measurable increase in sediment or delay of watershed recovery.
20% or more	There would likely be a definite increase in sediment resulting in a visible change in stream morphology and delay of watershed recovery.

Figure II-2. Comparison of maximum percent sediment yield effects at the cumulative effects analysis area level (total Little North Fork above Hudlow Creek) and extended cumulative effects analysis area level (Coeur d'Alene River above Skookum Creek).



Reduction in stream crossings: Extensive road networks were constructed throughout much of the analysis area during the 1960's. Typically, these roads (and their crossing structures) were designed for a useful life of 20 years. The majority of these roads are currently stabilized with vegetation, and are not actively delivering sediment to stream channels. Although often brushed in, many of these roads still have culverts and fills at stream crossings that will fail over time, which could increase sediment delivery to streams. Removal of stream crossings (where appropriate) would reduce the risk of this increased sediment delivery. The information in the following graph was extracted from Chapter III, Aquatics, Table III-22 (Projected watershed response in the Project Area, Hudlow Creek and above).

Figure II-3. Comparison of net reduction in stream crossings (total Little North Fork above Hudlow Creek).



Reduction in sediment delivery risk: The risk of sediment delivery is associated with failure at stream crossings and road construction (both temporary and permanent). The information in the following three graphs was extracted from Chapter III, Aquatics, Table III-13 (Approximately amount of sediment delivery risk associated with roads and stream crossing restoration activities). Values represent the potential reduction or addition of yearly sediment (measured in tons per year) that could be delivered at the mouth of the stream or the bottom of a reach from the inventoried transportation system, including both system and non-system roads. Risk reduction would result from the upgrading and/or removal of stream crossings. Figure II-5 represents the local site, Figure II-6 represents the cumulative effects scale of the project area, and Figure II-7 represents an extended cumulative effects area. For additional discussion of these geographic scales, please refer to the Aquatics methodology discussion in Chapter III (page III-8).

Figure II-4. Comparison of sediment reduction in the Iron Creek drainage as a result of cumulative effects from ongoing, reasonably foreseeable, and proposed watershed restoration activities.

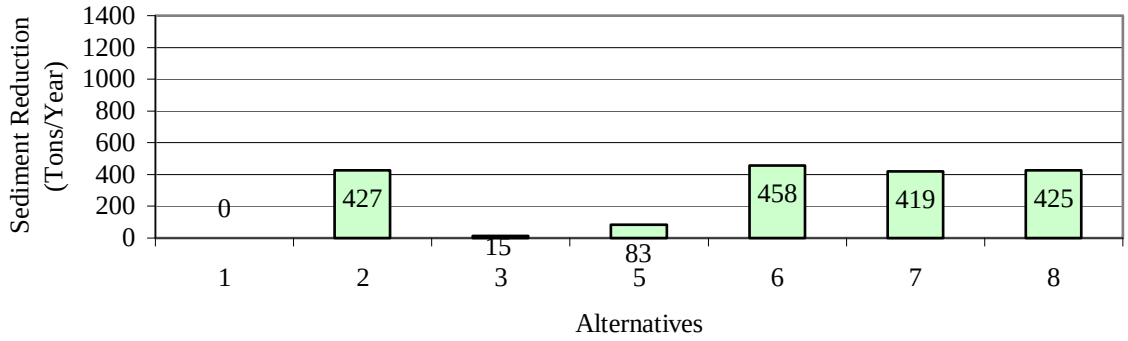


Figure II-5. Comparison of sediment reduction in the North Fork Coeur d'Alene River (above Iron Creek) as a result of cumulative effects from ongoing, reasonably foreseeable, and watershed restoration activities.

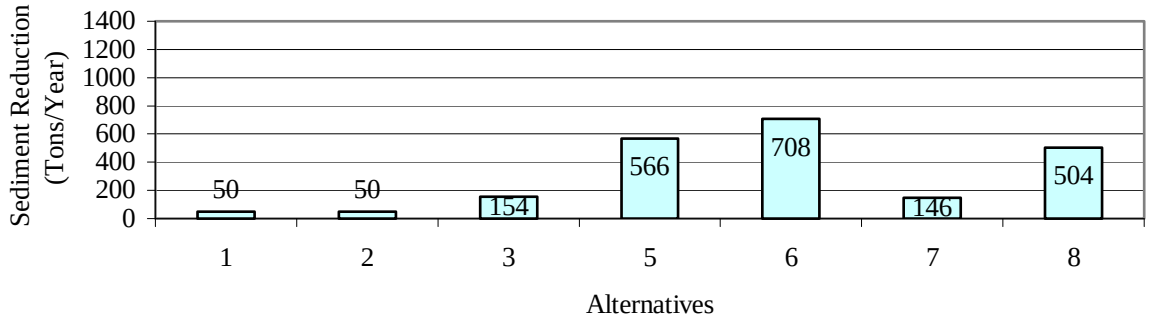
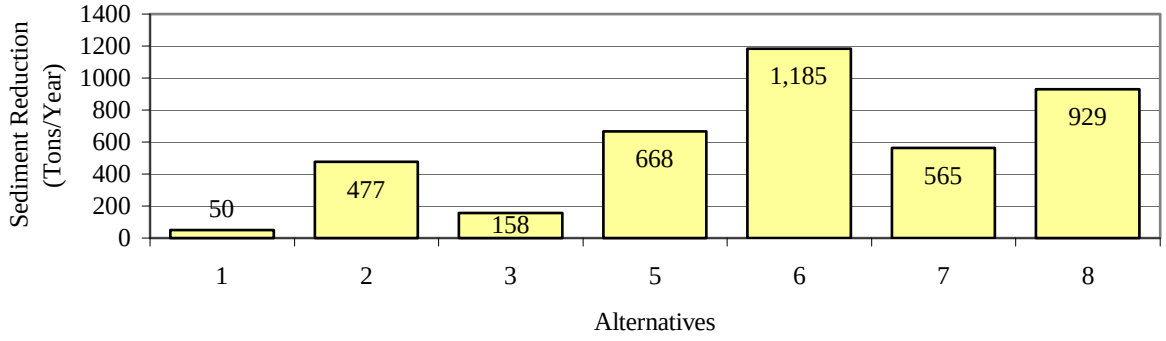


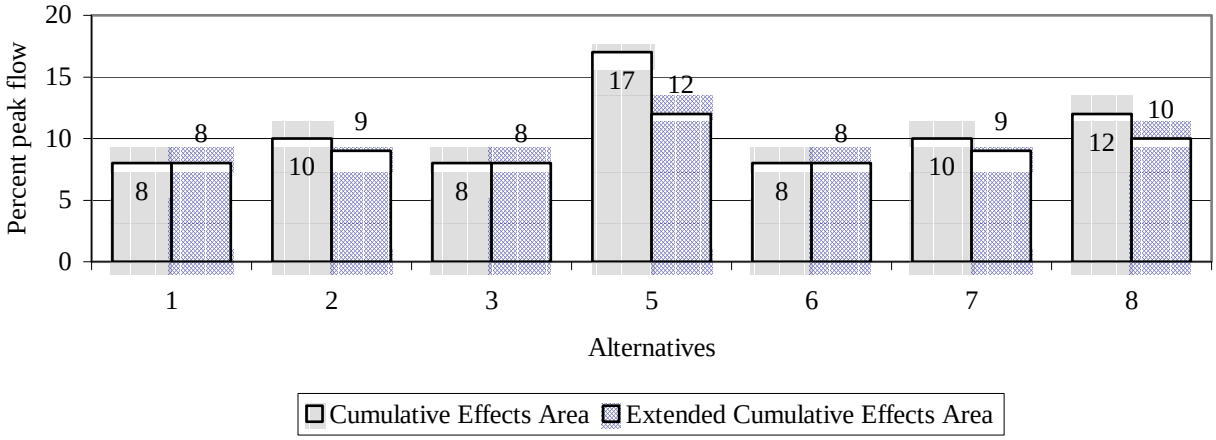
Figure II-6. Comparison of sediment reduction in the North Fork Coeur d'Alene River (above and including Hudlow Creek drainage) as a result of cumulative effects from ongoing, reasonably foreseeable, and watershed restoration activities.



<u>Peak flow</u>: Specific guidelines were applied when considering predicted changes to peak flow (please refer to the text box below). For more information regarding these guidelines, please refer to the "Aquatic Resources" discussion and materials in Chapter III, Appendix D, and the Project Files. The information in the following graph was extracted from Chapter III, Aquatics, Table III-22 (Projected watershed response in the Project Area, Hudlow Creek and above) and Table III-23 (Projected watershed response in the extended cumulative effects area (Coeur d'Alene River above Skookum Creek).

Zero	If the increase over the existing level (represented by Alternative 1) is zero, there is no potential for an increase in peak flow or delay of watershed recovery.
0 to 5%	Potential exists for an increase in peak flow or delay of watershed recovery, but the increase would not be measurable. For example, if you dumped a cup of water into a stream, you know the flow has increased, yet it would not be measurable at a gauging station.
5 to 10%	There is a slight potential that there would be a measurable increase in peak flow or delay of watershed recovery.
10% or more	There would likely be a definite increase in peak flow resulting in a visible change in stream morphology and delay of watershed recovery.

Figure II-7. Comparison of maximum percent peak flow effects at the cumulative effects analysis area level (total Little North Fork above Hudlow Creek) and extended cumulative effects analysis area (Coeur d'Alene River above Skookum Creek).



Net decrease in roads: The decrease in road miles (and road density) is an indicator of change to watershed risks associated with roads. The information in the following graph was extracted from Chapter III, Aquatics, Table III-22 (Projected watershed response in the Project Area, Hudlow Creek and above). Also shown is road density (open and total) following completion of project activities (refer to Appendix F, Transportation).

Figure II-8. Comparison of net decrease in road miles (total Little North Fork above Hudlow Creek).

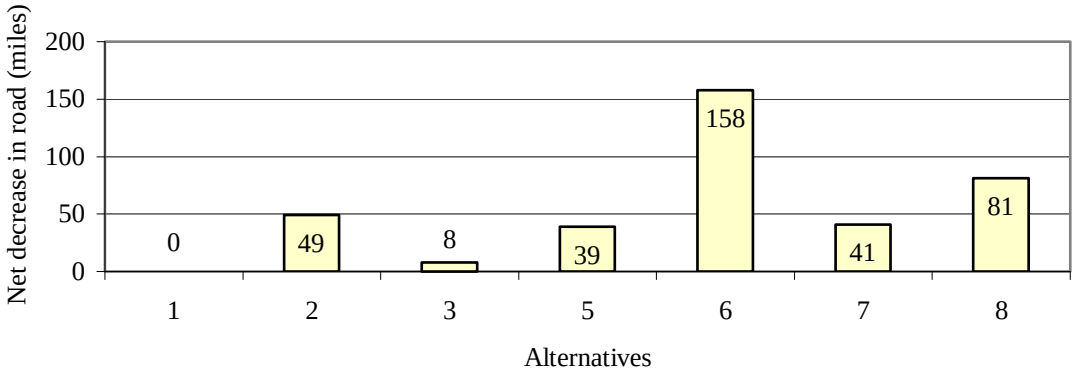
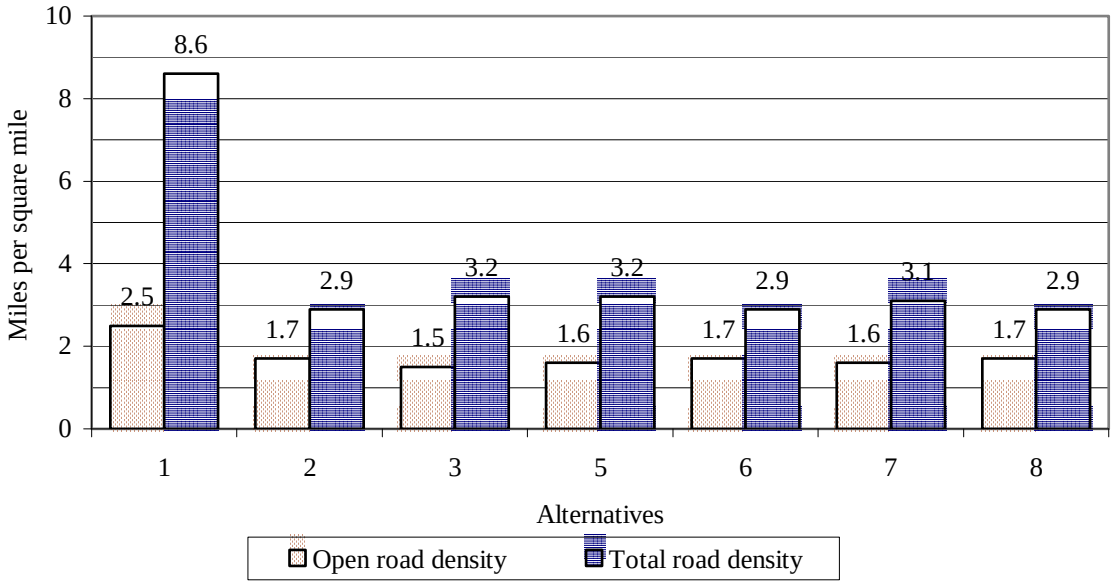


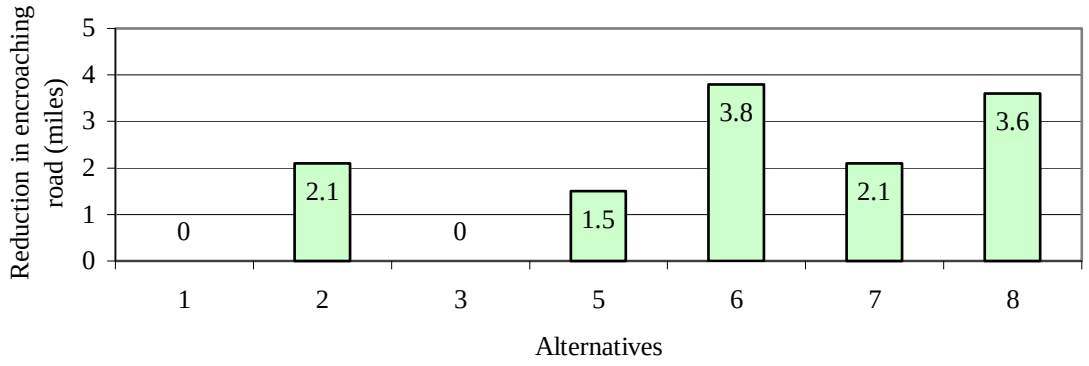
Figure II-9. Comparison of open and total road density after completion of project activities.



<u>Reduction in encroaching road miles</u>: Reducing the miles of road that is encroaching upon streams is extremely important for maintaining the long-term viability of fish species, as well as maintaining terrestrial species that rely on riparian habitat. The direct effect of reducing the amount of road that is encroaching upon streams is reduced flow velocity. Indirect effects include an increase in habitat complexity and fish carrying capacity. Cumulatively, there would be increased fish numbers.

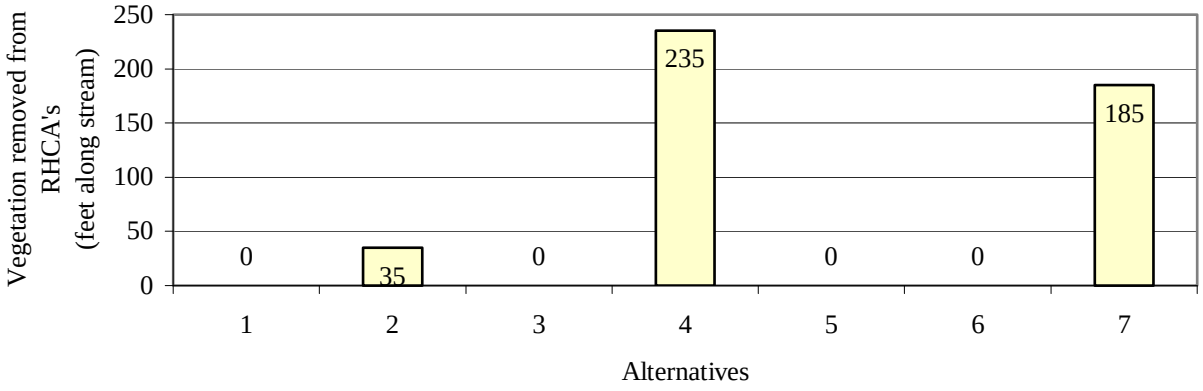
The information in the following graph was taken from Chapter III, Table III-22 (Projected watershed response in the cumulative effects analysis area, Hudlow Creek and above). For further discussion, please refer to the "Aquatics" discussions in Chapter III and Appendix D.

Figure II-10. Comparison of net reduction in encroaching road miles.



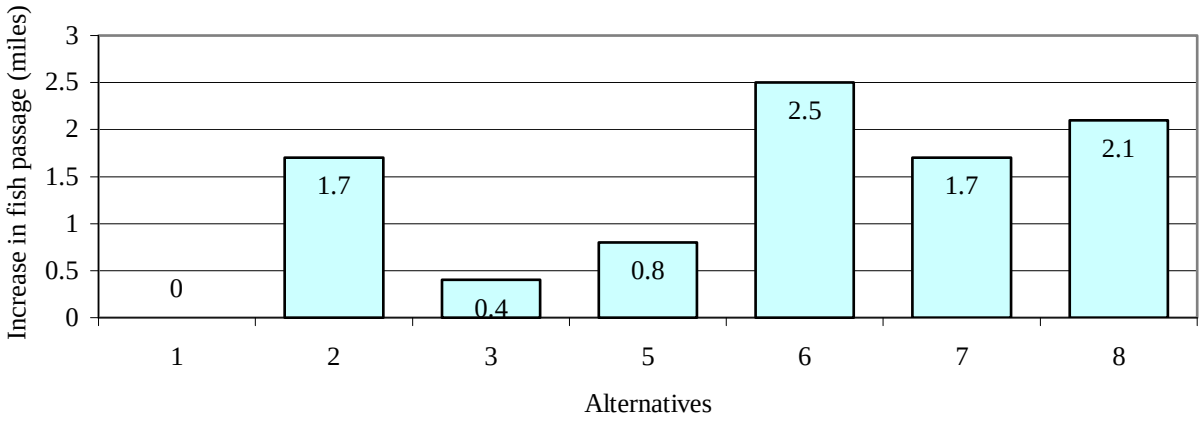
<u>Removal of vegetation along streams</u>: For this project, the amount of harvest that would occur in the riparian area is a surrogate measurement for changes in stream temperature, habitat diversity, cover complexity, and channel stability. For consistency, an average distance of 300 feet from fish-bearing streams and 75 feet from intermittent streams was considered riparian habitat. Maintaining riparian habitat will help trend conditions toward the large woody debris Riparian Management Objective identified by the Inland Native Fish Strategy. For more information, please refer to the Chapter III "Aquatics" discussion. The information used in the following graph was taken from Chapter III, Table III-12 (Approximate amount of vegetation removed within Riparian Habitat Conservation Areas).

Figure II-11. Comparison of vegetation removed along streams (within Riparian Habitat Conservation Areas).



Increased fish passage: The placement of culverts at road crossings alters the ability of fish to utilize stream habitat above the culvert. The direct effects of modifying these culverts are increased fish passage. The indirect effects are movement of fish to portions of streams not previously used; however, replacement activities may also increase short-term sediment production. Cumulatively, there would be an increased probability of persistence of Management Indicator Fish species (this analysis focused on spring migration of adult Westslope cutthroat trout and summer/fall migration of bull trout). The information in the following graph was taken from Chapter III, Table III-14 (Miles of increased fish passage). For additional information, refer to the "Aquatics" discussion in Chapter III and Appendix D.

Figure II-12. Comparison of increased fish passage.



2.7.2 Forest Vegetation (including Old Growth)

Effects to forest vegetation are compared by the changes in structural stages and cover types under each alternative.

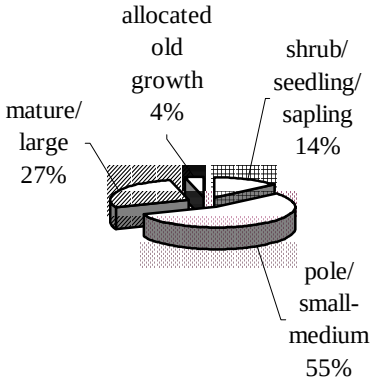
Forest structural stages: Structural stage categories are based on stand age and tree size class. Briefly, the shrub/seedling/sapling stage includes forest stands that are less than 35 years old; the pole/small to medium stage stands are 36 to 100 years old; the mature/large timber stage stands are over 100 years old, and allocated old growth as defined by the Forest Plan. In general terms, old growth has 10 trees per acre that are over 17 or 21 inches diameter at breast height (depending on habitat and cover types) and the large tree component is at least 150 years old. The desired condition would be to have a fairly even distribution between these stages.

Stands meeting old growth criteria have been allocated for management as old growth. No harvest would occur within allocated old growth stands under any alternative. Therefore, the only change to old growth would be in the amount of additional recruitment old growth allocated.

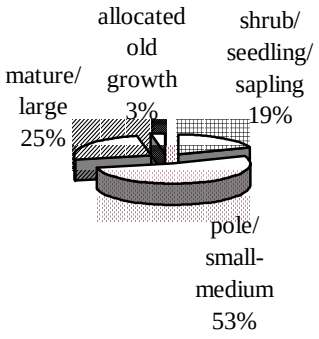
The information in the following graphs was taken from Chapter III, Table III-38 (Approximate acres of structural stages and cover types in the Iron Honey Resource Area). For more information, please refer to the "Forest Vegetation" discussion in Chapter III.

Figure II-13. Comparison of changes to structural stages in the Iron Honey Resource Area.

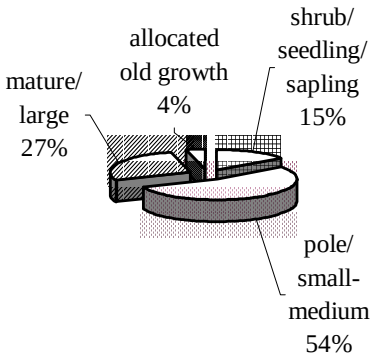
Alternatives 1 and 6



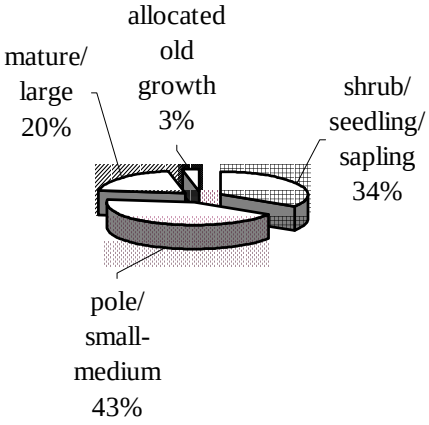
Alternatives 2 and 7



Alternative 3



Alternative 5



Alternative 8

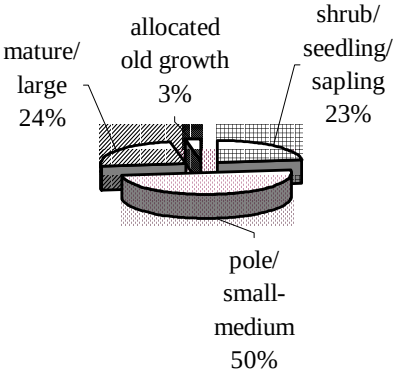
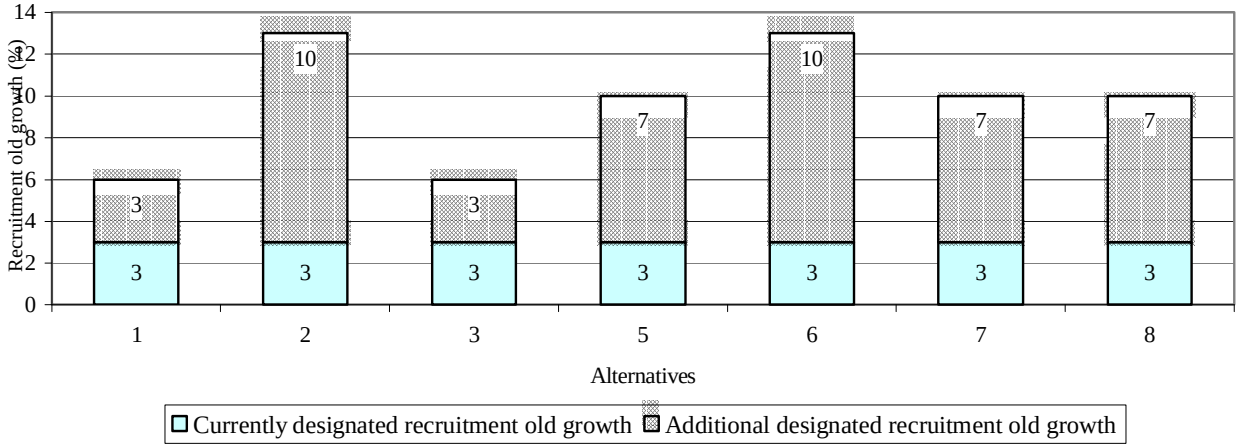


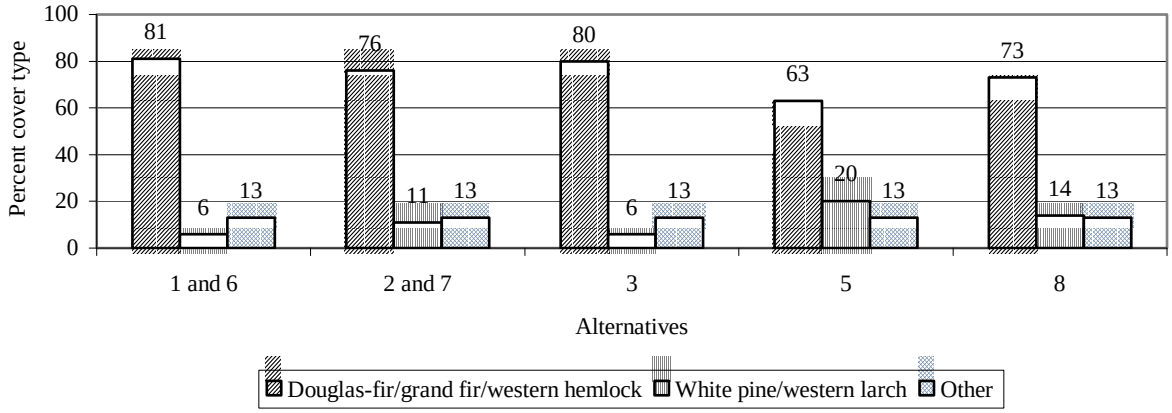
Figure II-14. Comparison of total allocated recruitment old growth in the Iron Honey Resource Area (includes currently allocated recruitment old growth).



Forest vegetation cover types: Findings of the Geographic Assessment indicate there has been a tremendous change in species composition within the Coeur d'Alene River Basin (for further discussion, please refer to "Forest Vegetation" in Chapter III). Long-lived seral species that are better adapted to local climatic stress and therefore more resistant to insects and diseases (western white pine and western larch) have declined as a result of white pine blister rust and timber harvest practices that tended to remove these species while leaving more susceptible species such as Douglas-fir, grand fir, and hemlock. White pine has declined by more than 94 percent over the past 100 years, with larch declining by 68 percent. Douglas-fir has increased by 40 percent, and grand-fir/hemlock has increased by 677 percent.

For the purpose of comparing changes in composition, the cover types are grouped by white pine/western larch, Douglas-fir/grand fir/western hemlock, and other species (which includes subalpine fir and lodgepole pine). Current composition is reflected and would not change under Alternatives 1 and 6. Changes in species composition from Douglas-fir and grand fir to white pine and larch would occur under Alternatives 2, 3, 5, 7 and 8 at the time of planting in harvested stands. The information in the following graphs was taken from Chapter III, Table III-38 (Approximate acres of structural stages and cover types in the Iron Honey Resource Area). For more information, please refer to the "Forest Vegetation" discussion in Chapter III.

Figure II-15. Comparison of changes in forest vegetation cover types.

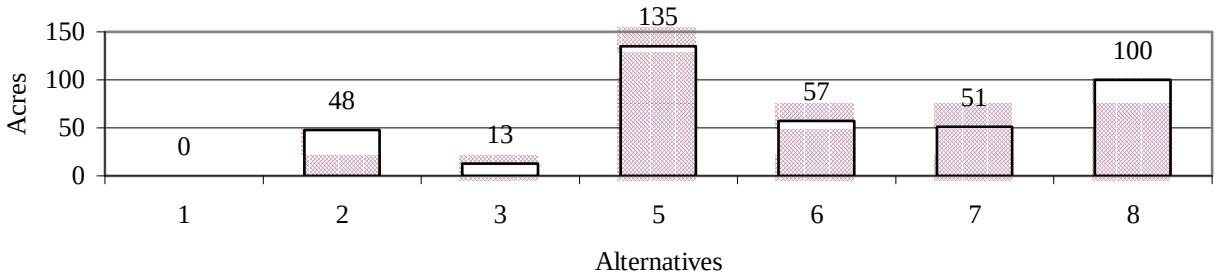


2.7.3 Soil Productivity

Alternatives were designed to protect soil productivity. Some activities will result in detrimental disturbance (soil compaction and displacement) to soils within harvest units; some will occur on a soil landtypes that have high potential for landslides or "mass wasting."

Compaction, displacement and severe burning affect soil's physical, chemical and biological properties, which indirectly can affect the growth and health of trees and other plants. The most soil disturbance would occur with road building and in tractor-yarded units with additional designated skid trails. Minor disturbances would occur in skyline and cable-yarded units, and where fire lines are mechanically constructed around units.

Figure II-16. Comparison of increased soil compaction and displacement (acres) in harvest units.



Landtype ratings identify the relative probability of downslope movement of masses of soil material (a map displaying landtypes in the Iron Honey Resource Area is provided in the Project Files ("Soils"). These ratings consider slope gradient, soil depth, surface drainage characteristics, soil texture, bedding structure, and orientation, slope dissection density, and water input. Landtypes with a "high" landslide potential rating have steep to very steep slopes, impervious materials over a large portion of the area, saturated soil conditions, non-cohesive soils, bedding planes parallel to the slope, high dissection density, and high intensity storms, with rain-on-snow events. There is only one landtype with a "high" rating within activity areas under the Iron Honey project (Landtype 479). Soil productivity would not be compromised beyond Forest Plan soil quality standards under any alternative due to specific alternative features designed to protect soils (described earlier in this chapter).

2.7.4 Fire/Fuels

The project interdisciplinary team identified concerns related to current fuel levels and potential wildland fires. Comments from the public (Environmental Protection Agency and Ecology Center) identified concerns with how those fuels reduction activities are carried out.

Due to changes in species composition and structure, low and mixed-severity fires similar to the historic regime are an improbable occurrence in much of the forest in the analysis area. Severe stand-replacing fires are more likely to occur. The combination of more fine fuels such as grasses and shrubs regenerating in openings, new understory trees serving as ladder fuels, and continuing accumulation of heavy fuels from down logs and snags all contribute to changes in fuels and toward more severe fire behavior. These in turn threaten future fire control, increase the danger to firefighters, and place neighboring forest ecosystems at risk. The fuel conditions that enable a fast moving wildfire of higher than normal intensity could persist for several decades. After that time, these fuels would likely be decomposed and become incorporated into the organic layer of the soil.

Alternatives 1 and 6 would not interrupt this trend, since there would be no fuels reduction or change in forest species composition under either alternative. The prolonged buildup of fuel may lead to fires more catastrophic and destructive to the site than typically occurred in the native forest.

As a result of proposed activities that reduce fuel accumulations and re-introduce seral species (such as ponderosa pine, white pine, and larch), Alternatives 2, 3, 5, 7 and 8 would trend toward reduced potential wildfire intensities and severities.

Road closures proposed under each of the action alternatives would most likely reduce firefighting efficiency and increase initial attack times, although the closures may also slightly reduce human-caused fires due to the reduced access.

2.7.5 Wildlife Habitat

Public comments identifying concerns related to protection of wildlife and associated habitat were received from the Environmental Protection Agency, Idaho Fish and Game, and Ecology Center. The comparison of effects to wildlife and their habitat addresses the following categories: Threatened and Endangered species (bald eagle, gray wolf, and lynx), Sensitive species (goshawk, wolverine, fisher, black-backed woodpecker, flammulated owl and white-headed woodpecker, and Coeur d'Alene salamander), Management Indicator Species for big game (elk) and old growth-dependent species (pine marten and pileated woodpecker), nongame, and neotropical (land) birds. Habitat needs vary by species. Please refer to the Wildlife discussions in Chapter III for detailed discussion of habitat requirements and effects to habitat by species.

Threatened, Endangered and Candidate species: The U.S. Fish and Wildlife Service issues a biannual list of Threatened and Endangered species that may occur on the Idaho Panhandle National Forests. A copy of the most recent list (reference No. 1-9-01-SP-613 (105.0100), dated July 23, 2001) is part of the Project Files (Wildlife). There are four Threatened and Endangered species that could exist on the Coeur d'Alene River Ranger District: grizzly bear, bald eagle, gray wolf, and lynx. Grizzly bears are not likely to occur on the district, and the district is not within a recovery area for the bear. There would be no effect to grizzlies, therefore they are not addressed in detail in this document. For further discussion, please refer to Appendix A (Issues Not Addressed in Detail in This EIS). The Iron Honey Resource Area is not a recovery area for any Threatened or Endangered species. For further discussion of effects to bald eagle, gray wolf, and lynx, please refer to Chapter III, "Wildlife."

Bald eagle: Bald eagles are a Threatened species. There would be no effect to bald eagles or their habitat in the Iron Honey Resource Area. Their habitat is directly tied to large bodies of water. There are no records of bald eagle sightings in the project area. There is some seasonal use of the North Fork Coeur d'Alene River during migration in last November through mid-January. The area does provide potential bald eagle habitat that could be used for feeding and resting, primarily during migration. Based on these conditions and because there would be a long-term improvement of watershed and fisheries habitat in the Little North Fork Coeur d'Alene River as a result of watershed restoration activities, there would be no effect to the survival of bald eagles under any alternative.

Gray wolf: Gray wolves are an Endangered species. In 1994, a distinction was made between wolves that occur north of Interstate 90 and those that occur south of Interstate 90 in Idaho. Gray wolves occurring north of Interstate 90 are listed as Endangered species and receive full protection in accordance with provisions of the Endangered Species Act. Gray wolves occurring south of Interstate 90 are listed as an experimental population, with special regulations defining their protection and management. The Iron Honey Resource Area lies north of Interstate 90. The Resource Area lacks important winter range for big game, which provide a prey base for wolves. Key elements in gray wolf habitat include a year-round prey base, secluded areas for raising pups, and isolation from frequent human disturbance.

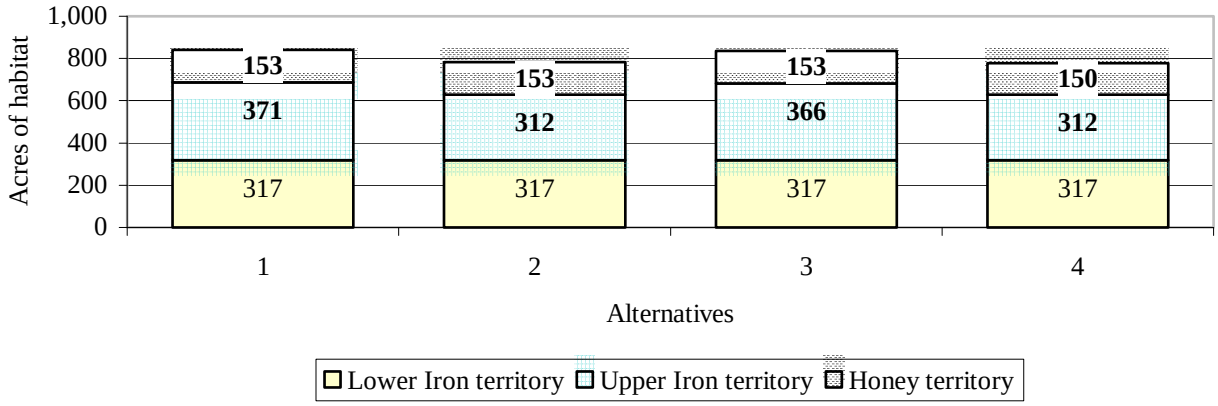
There would be no effect to gray wolves under Alternative 1, since no management activities would occur. Under all action alternatives, there would be a short-term (10 to 15-year) disturbance to big game, but these activities would also result in an increase in forage for big game, which would increase the wolf's prey base. Over the long term, the prey base would be maintained and there would be a reduction in open road densities with improved closure methods. Therefore, implementation of any alternative may affect (but would not likely adversely affect) gray wolves.

Lynx: Lynx habitat units (identified as lynx analysis units or LAU's) were defined for the Coeur d'Alene River Ranger District during the summer of 1999 under the direction of the U.S. Fish and Wildlife Service. The LAU boundaries were based on elevation and available lynx habitat. The Iron Honey Resource Area is not considered to provide lynx habitat (due to low elevation and lack of spruce and fir habitats) and is not within any LAU boundaries. Lynx are probably an infrequent visitor to the area. Because of occasional sightings in or near the area, travel corridors for lynx were considered in the effects analysis. Effects to travel corridors can be measured by the amount of roads and large openings.

Sensitive species: There are 13 Sensitive species that may occur on the Coeur d'Alene River Ranger District. Of these, there would be no effect to 5 species; please refer to Appendix A (Issues Not Addressed in Detail in This EIS) for further information on these five species. The remaining six species are addressed in Chapter III, and a comparison of alternatives is provided below.

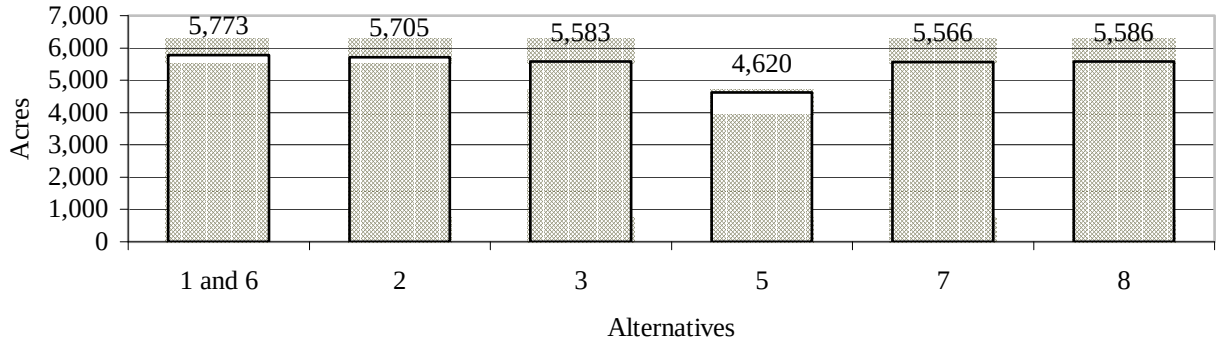
Goshawk: There is one known occupied goshawk territory in the Iron Honey Resource Area, and potentially two additional territories that could be occupied. Goshawk nesting habitat was identified in the three territories based on forest structure and continuity. A comparison of alternatives is made using the amount of nesting habitat that would remain in each territory after project activities are completed.

Figure II-17. Comparison of goshawk nesting habitat (acres) remaining after project completion.



Wolverine: Maintenance of large, remote areas of habitat is probably the most important factor affecting wolverine in the Iron Honey Resource Area. There are an estimated 5,773 acres of suitable wolverine habitat within the project area. However, due to the lack of wilderness and winter range as well as the high level of recreational use in the area, this is not considered optimal habitat. The effects to wolverines are compared by the amount of wolverine habitat that would remain after completion of the regeneration and thinning harvests under each alternative.

Figure II-18. Comparison of wolverine habitat remaining after completion of regeneration and thinning harvests.



Fisher: Effects to fisher under the alternatives can be compared by displaying the amount of late successional forest remaining after project completion, amount of allocated old growth and recruitment old growth, and miles of riparian habitat restored. Based on the level of reduction in late successional forests that would occur under Alternative 5, implementation of this alternative would impact fisher individuals or their habitat to such an extent that it could contribute to a trend toward federal listing or cause a loss of viability to the population or species. The remainder of the alternatives would impact individuals but would not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.

Figure II-19. Comparison of late successional forests (fisher habitat) remaining in the Iron Honey Resource Area following project completion.

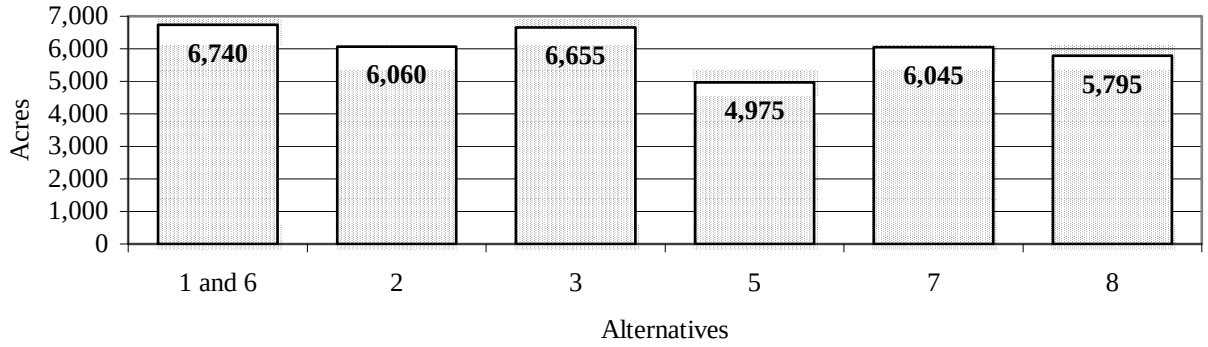


Figure II-20. Comparison of total acres of allocated old growth and recruitment old growth in the Iron Honey Resource Area following project completion.

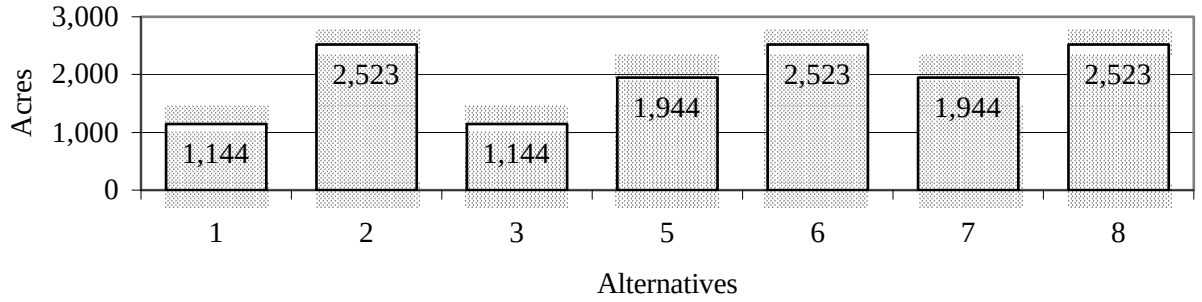
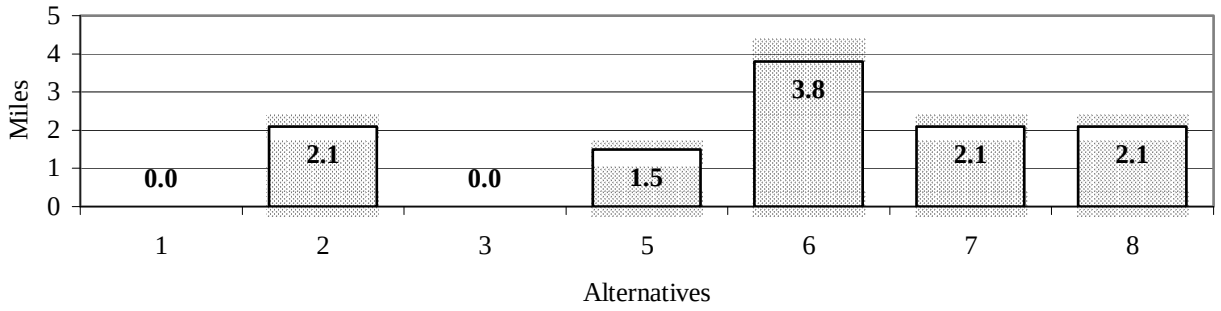
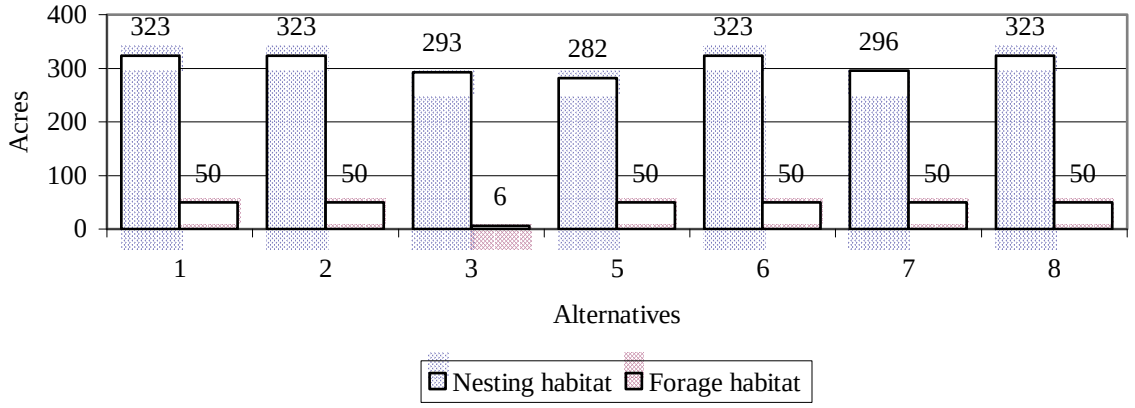


Figure II-21. Comparison of total miles of riparian habitat restored in the Iron Honey Resource Area following project completion.



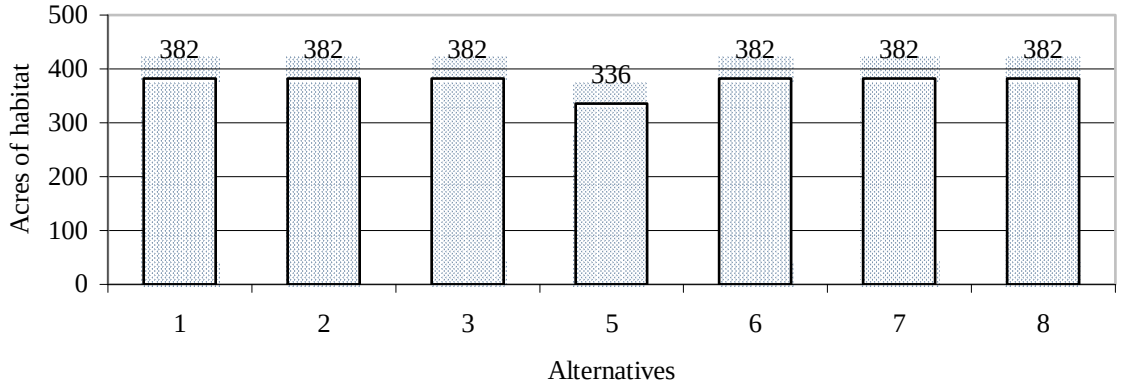
Black-backed woodpeckers: There are 50 acres of black-backed woodpecker forage habitat and 323 acres of nesting habitat within the Iron Honey Resource Area. The comparison of alternatives displays the amount of nesting and forest habitat that would remain following regeneration and thinning harvests in the project area. Based on anticipated activities and features of the alternatives designed to protect snag habitat (discussed under "Features Designed to Protect Wildlife Habitat" in this chapter), implementation of any of the alternatives may impact individual black-backed woodpeckers but would not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.

Figure II-22. Comparison of black-backed woodpecker habitat remaining in the project area following regeneration and thinning harvests.



Flammulated owl and white-headed woodpecker: Flammulated owls nest in the cavities of snags. Habitat in the Iron Honey Resource Area is limited for this species due to the lack of ponderosa pine communities and dry Douglas-fir sites preferred by the species. Because of habitat similarities with flammulated owls, white-headed woodpeckers are treated as a guild with flammulated owl in this document. Only Alternative 5 would change the amount of habitat for these species, with harvest occurring on 23 acres of capable habitat, which may impact individuals or habitat, but would not likely trend toward federal listing or cause a loss of viability to the population or species. The remaining alternatives would have no effect upon flammulated owls or white-headed woodpeckers.

Figure II-23. Comparison of changes to flammulated owl and white-headed woodpecker (capable) habitat.



Coeur d'Alene salamander: None of the alternatives would alter the known habitat in Lewelling Creek or the potential habitat in the Little North Fork Coeur d'Alene River, Tom Lavin Creek, or Rablens Creek. Proposed activities resulting in slight changes to stream flows under Alternatives 2, 5, 6, 7 and 8 could alter habitat in Iron Creek and therefore may impact individuals or habitat, but would not likely trend toward federal listing or cause a loss of viability to the population or species. Over the long term, implementation of any alternative should maintain or enhance viability of the Coeur d'Alene salamander, since known populations would not be affected and the restoration activities would trend their habitat toward an improved condition.

Management Indicator Species for big game: Elk habitat potential and security data displayed in the charts below represent the post-sale conditions, when all activities (including road closures) would be completed. Elk habitat potential is displayed by elk habitat unit (with Forest Plan goals) and by compartment (there are no goals set at the compartment level). Compartments 302 and 303 are part of Elk Habitat Unit 10; Compartments 304 and 305 are part of Elk Habitat Unit 2. The information provided in these graphs was taken from Chapter III, Tables III-45 and III-46 (see 3.6.5 Big-Game Management Indicator Species).

Figure II-24. Comparison of elk habitat potential in each elk habitat unit following completion of all project activities.

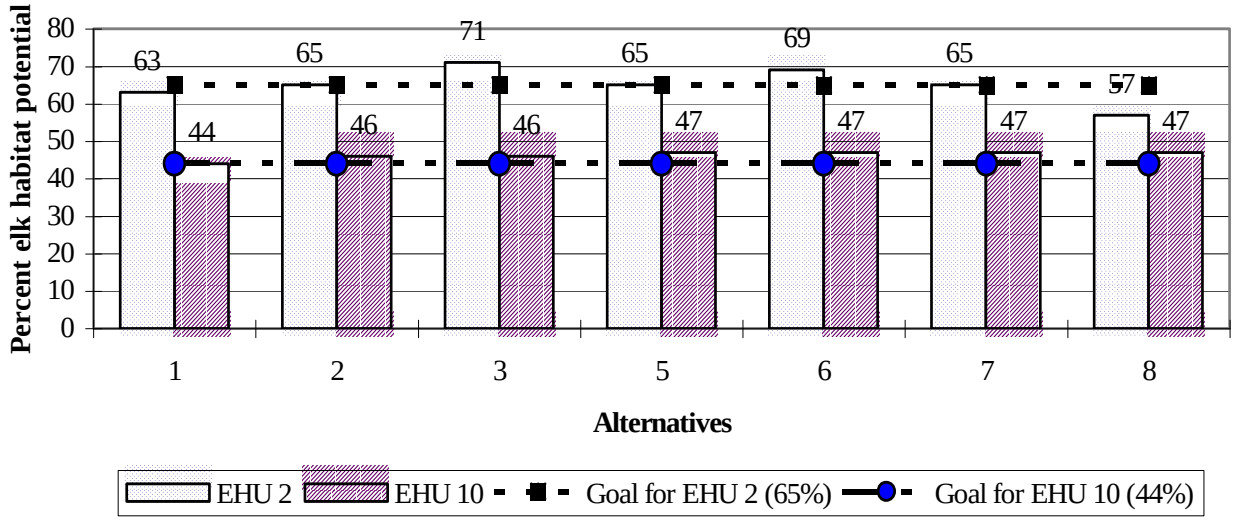
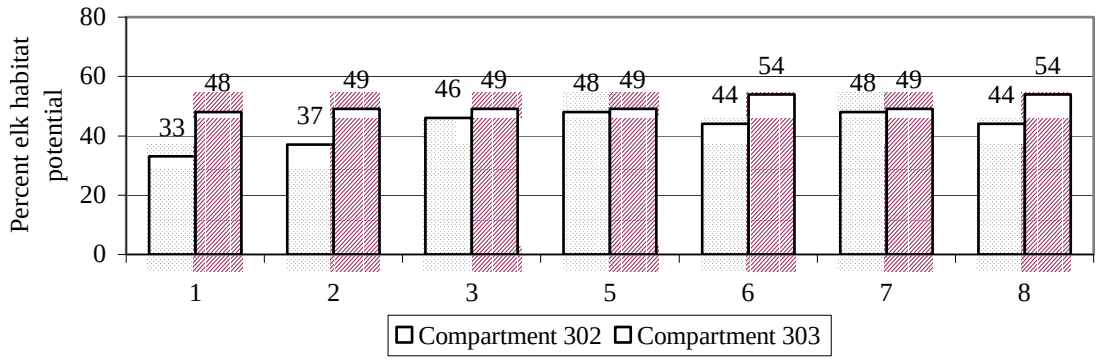


Figure II-25. Comparison of elk habitat potential in Compartments 302 and 303 (in EHU 10) following completion of all project activities.



There are no goals for elk habitat potential at the Compartment level.

Figure II-26. Comparison of elk habitat potential in Compartments 304 and 305 (in EHU 2) following completion of all project activities.

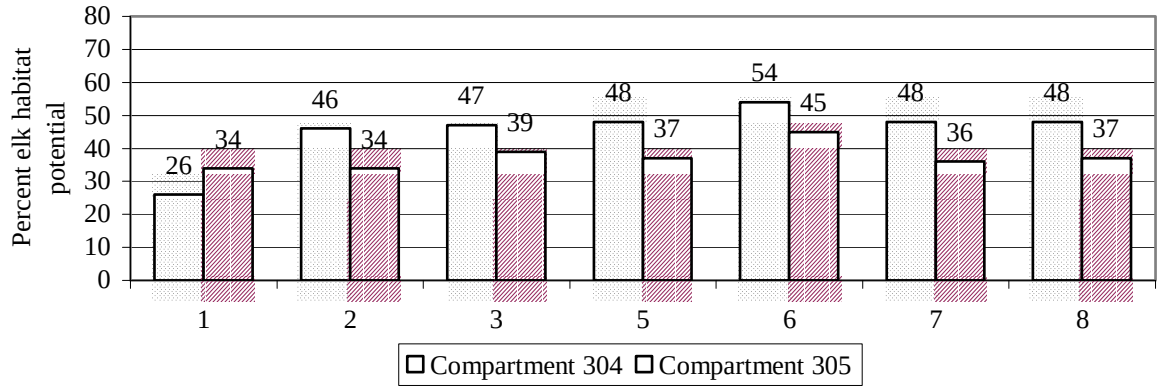


Figure II-27. Comparison of changes in elk security in Compartment 302.

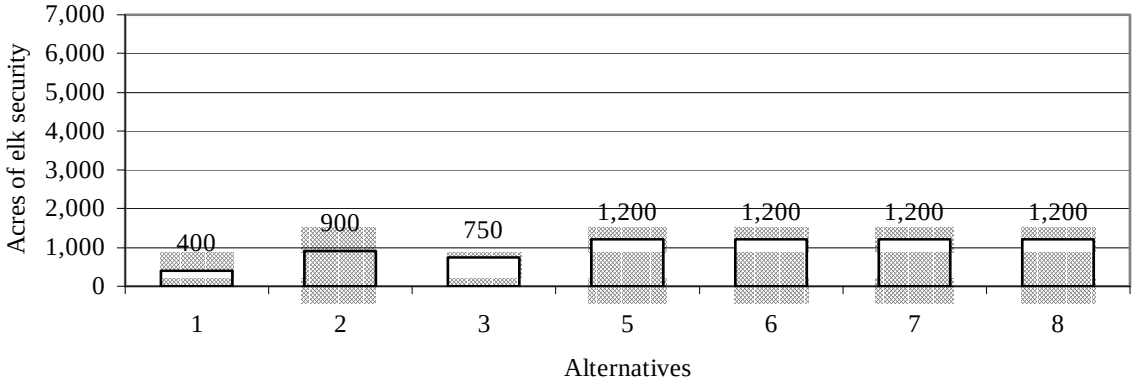
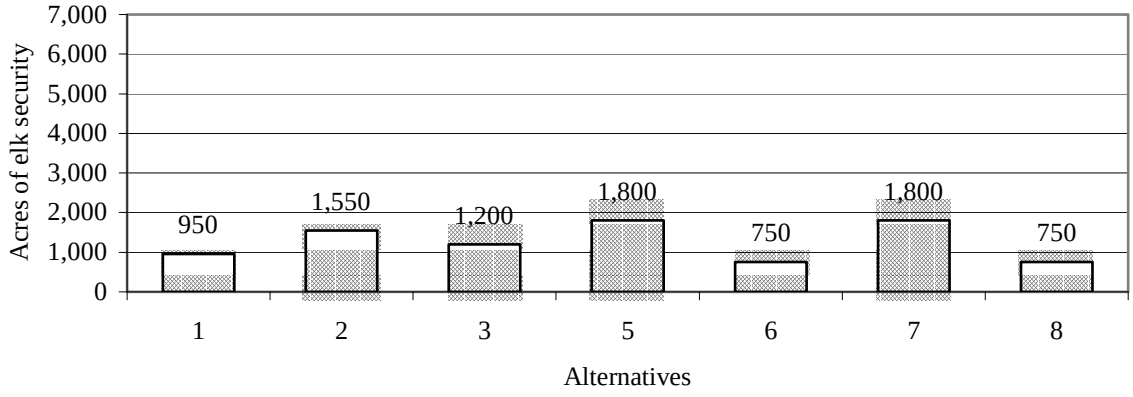


Figure II-28. Comparison of changes in elk security in Compartment 303.



There is no graph depicting changes to elk security in Compartment 304 because there would be no change under any alternative.

Figure II-29. Comparison of changes in elk security in Compartment 305.

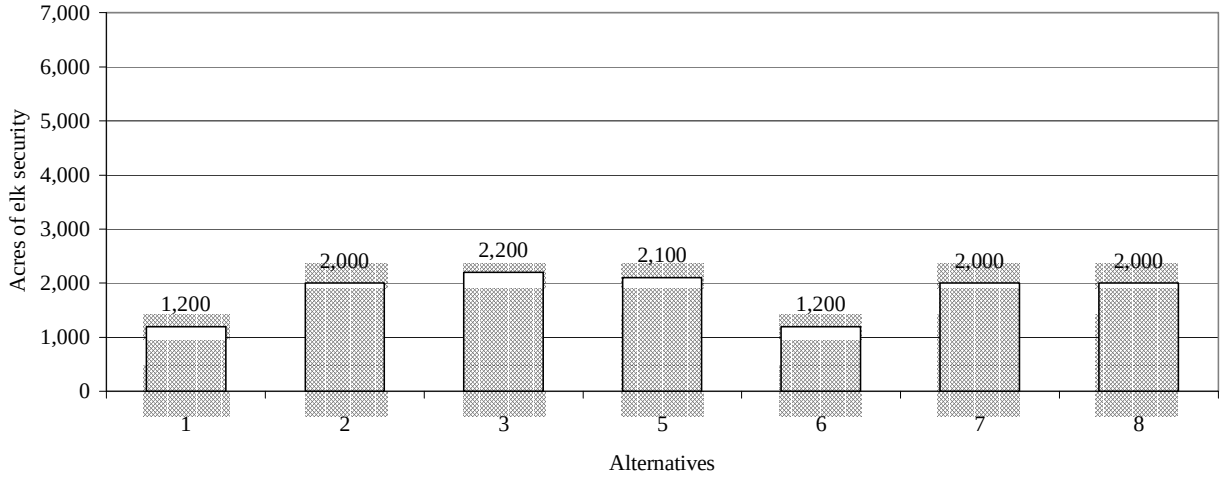
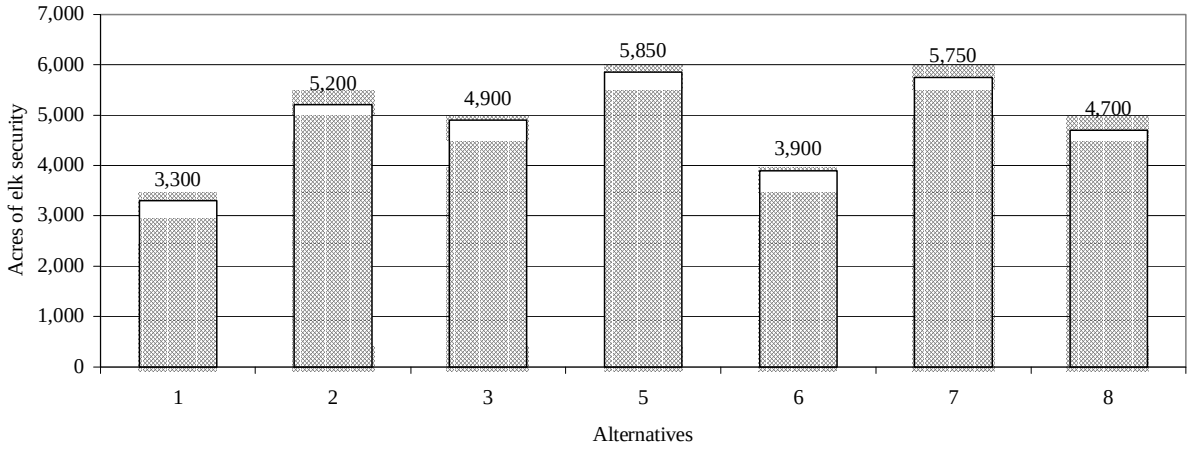


Figure II-30. Comparison of changes in elk security in the Iron Honey Resource Area.



Management indicator species for old growth: Comments from the public (Environmental Protection Agency and Kootenai Environmental Alliance) specifically identified concerns related to protection of old growth stands within the project area. The Forest Plan designated three management indicator species for the monitoring of old growth and late successional conditions: pine marten, pileated woodpecker, and goshawk. The status of these species indicates the ability of forest habitat to support wildlife and plant populations that inhabit older forests. Goshawks have been placed on the list of Sensitive species for the Forest Service's Region 1, and are addressed in the "Sensitive Species" discussion earlier in this section of Chapter II.

Harvest would not occur in any allocated old-growth stands under any alternative. The changes reflected to habitat are the result of harvest activities in stands 150 years or older that do not meet the criteria to be allocated for old growth management. Old growth is discussed further in the "Forest Vegetation" and "Wildlife" sections of Chapter III.

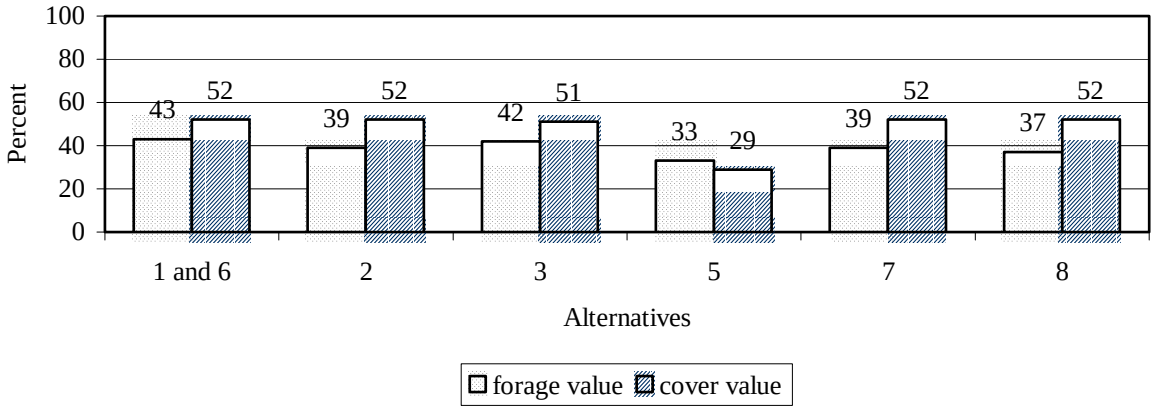
Data collected through timber stand examinations was analyzed using a habitat suitability model to rate existing habitat quality for marten and pileated woodpecker. Suitable stands were rated on a habitat suitability index (HSI) of zero (no value) to 100 percent (optimum value) for cover and forage habitat, based on vegetative characteristics.

The information provided in the graph below was taken from Chapter III, Table III-47 (Habitat suitability values for marten cover habitat) and Table III-48 (Habitat suitability values for marten forage habitat).

The suitability ratings for marten and pileated woodpecker habitat are categorized as follows:

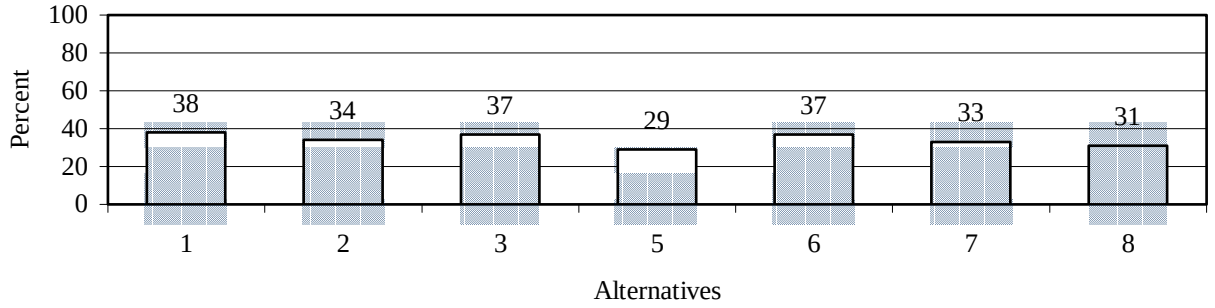
0% is nonhabitat
up to 25% is poor to fair habitat
25 to 50% is moderate habitat
50 to 80% is good habitat
80 to 100% is optimal habitat

Figure II-32. Comparison of habitat suitability values for marten cover and forage habitat.



The information taken from the following graphs was taken from Chapter III, Table III-49 (Habitat suitability values for pileated woodpecker habitat). The values reflect habitat conditions after project activities are completed (post sale). A rating of 50 percent or more is sufficient to provide a home range for pileated woodpeckers.

Figure II-32. Comparison of habitat suitability values for pileated woodpecker habitat.



<u>Non-game habitat</u>: Non-game species are those not managed as a hunted species, and are of primary importance as prey for other species of importance, such as furbearers and large predators like wolves, lynx and bears. They include (but are not limited to) species such as amphibians, rodents, songbirds, furbearers and raptors. In the Iron Honey Resource Area, the vegetation and the non-game habitat it provides have been changed over the last 100 years by man's activities in the area. Those changes are described briefly here for the purpose of comparing effects to non-game habitat under the alternatives. Further detail of the changes are provided in the Chapter III "Forest Vegetation" and "Wildlife" discussions.

Stand composition has shifted from the more enduring white pine and western larch to species more susceptible to insects and disease (hemlock, grand fir and Douglas-fir). These forests are of different character than the mature white pine forests that tended to consist of a heavy overstory canopy a hundred feet overhead and very little live growth in the understory. The white pine forests generally had very large rotting logs on the forest floor, providing an important component of non-game habitat. Road construction has reduced and isolated wetlands in the flood plains, and contributed to a reduction of beaver activity that normally bolsters wetland habitat.

Age composition has also shifted, from an older, mature forest to one that has only small isolated patches of old growth forest (generally along riparian corridors). The most recent regeneration harvests have reintroduced white pine and larch into the landscape, but it will take 50 to 80 years before they are considered mature forests, and over 100 years before they start exhibiting old growth characteristics. Root diseases that are common throughout the analysis area provide an abundance of snags, although they are primarily grand fir, hemlock and Douglas-fir, and the disease kills progressively smaller trees over time in these patches.

<u>Alternative 1</u>: Taking no action at this time would allow the naturally occurring vegetation changes to continue. White pine and western larch forests, and the wildlife species associated with them, would remain far below historic levels for the long term. Root diseases would continue to kill the susceptible firs and hemlock, over the long term continually adding to snags and downed log recruitment. Mature stands would move towards climax species (hemlock, cedar and grandfir) old growth. Stands that were previously planted to white pine, larch and ponderosa pine would continue to be cultured to provide mature stands of these species. As these stands mature and gain old growth characteristics, they could be added to the old growth allocation, or they could be harvested to again move the area toward stands of vigorously growing conifers. Harvesting these stands would not provide habitat for old growth dependent specie (please refer to Table II-2). If the stands are not harvested in the future, they would over time provide much needed habitat for white pine old-growth dependent species, including non-game species like rodents, amphibians, and songbirds, although on a very small proportion (600 acres, or less than 3%) of the analysis area.

<u>Alternative 2</u>: The openings created with the harvest proposed under this alternative would reduce non-game habitat (by approximately 3%) in the Iron Honey Resource Area for those species dependent upon older interior forests. This effect would last at least 30 years until these regeneration harvest again function as

young conifer forests instead of created openings. Reserve trees within the shelterwood harvest units would provide some stand structure diversity in the future and provide for future legacies (old, large trees) as long as these trees are not harvested at a future date. Non-game bird species that were adapted to the white pine forests are now at reduced numbers or extirpated (Upper Columbia River Basin Draft EIS, Chapter 2, page 66). Over the long term, non-game species could benefit from the regeneration of white pine forests in the drainage. A long-term increase in old, early seral forest could be assured if additional stands of this maturing white pine are managed as old growth (Project Files, Wildlife: Late Successional Forests). Over time, the area would trend towards improved non-game habitat and historical condition. It is likely that these species would increase in numbers and reinhabit the renewed white pine forests.

Alternative 3: This alternative includes 141 acres of commercial thinning in three units (please refer to the enclosed Alternative 3 map and Appendix E, "Specific Unit Information"). There would be no immediate reduction of mature or old forest in the Iron Honey Resource Area. However, this investment in thinning indicates these stands are being managed for maximum growth and yield, and would be regeneration harvested when they mature. In addition to these 141 acres of thinning, there would be 183 acres of small openings created throughout the resource area. These small openings would create edge and diversity in the short term. Because they are small and not large blocks and are therefore unlikely to be successfully regenerated to white pine or larch, they would not contribute to interior forest habitat for species such as the marten and goshawk (Witmer, G. et al., Forest Carnivore Conservation and Management in the Interior Columbia Basin 1998, and Idaho Department of Fish and Game, Habitat Conservation Assessment, 1995). The Iron Honey Analysis area would not trend toward historical conditions for non-game species under this alternative.

Alternative 5: Alternative 5 proposes over 4,000 acres of shelterwood and clearcut harvest with a result of loss of existing levels of snags and downed logs. The alternative would have significant short-term impacts on non-game species due to the loss of approximately 8% of the mature and old forests (but not allocated old growth) within the Resource Area, loss of interior habitat and loss of snags. Over the long-term, the regeneration of healthy long-lived seral species like white pine and larch could benefit non-game species if no further disturbances occurred for at least 50 years (to grow to at least pole-size). Additionally, riparian restoration work would improve non-game wetland habitat and proposed recruitment old growth as part of this alternative would provide large diameter trees, snags and downed logs over time. Creating large harvest units would provide interior forest habitat in 80 to 100 years.

Alternative 6: This alternative would have very slight short-term impacts on non-game species, primarily from harvesting for the wood necessary for the instream rehabilitation, and the short-term disturbance to riparian habitats affected by the rehabilitation. The project would benefit non-game species over the long-term by reducing roads that traverse through wetland systems and natural processes leading to increasing large diameter trees, snags and downed logs. As the watershed condition improves, disturbance from additional timber harvests would likely continue because vegetative rehabilitation would remain a high priority in this highly productive area.

Alternative 7: This alternative would have impacts to non-game species similar to those discussed under Alternatives 2 and 3, above. Mature and old forests (not allocated old growth) in the Iron Honey Resource Area would be reduced by approximately 3 percent. A total of 142 acres of commercial thinning would occur, with 40 acres harvested in small openings. The small openings would create more edge and diversity in the short term, but lead to a more fragmented forest than is desirable for species such as the marten (and their prey), which depend on interior habitat not influenced by wind and sunlight. The investment in thinning indicates these stands are being managed for maximum growth and yield, and would be regeneration harvested when they mature, and not retained as old growth habitat for non-game species.

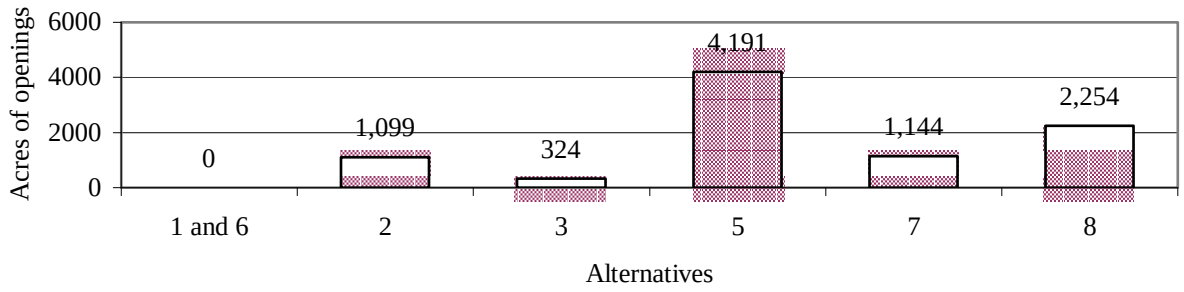
Alternative 8: Impacts would be similar to Alternatives 2 and 7; with a short term decline in non-game habitat. There would be more extensive shelterwood harvest in Solitaire Creek, Sob Creek, Honey Creek and near the

head of the Little North Fork than under the other alternatives. Mature and old forests (not allocated old growth) in the Iron Honey Resource Area would be reduced by approximately 4 percent. Over the long-term, this type of harvest (in large blocks) could benefit non-game species, similar to the effects described in Alternative 5. The included riparian restoration work would improve non-game wetland habitat, as discussed in Alternative 6, and proposed recruitment old growth would provide large diameter trees, snags and downed logs on larger areas over time.

Neotropical (migratory) land birds: Neotropical birds are those that breed and nest in one area and migrate a considerable distance to winter. Effects to these species are measured by the amount of newly created openings under each alternative, which impacts nesting and foraging habitat for land birds. Increased openings also create more favorable habitat for cowbirds, which are nest parasites for land birds.

The following graph compares the amount of openings created under each alternative. There would be no change to habitat for neotropical birds under Alternatives 1 or 6, because neither would create new openings in the forest canopy (harvest under Alternative 6 would use a selective harvest method that removes individual trees and does not result in canopy openings). Alternative 5 would create the most openings of any alternative, and would result in the greatest loss of nesting and foraging habitat for land birds, followed by Alternatives 8, 7, 2 and 3.

Figure II-33. Comparison of openings created under each alternative.



2.7.6 Recreation

Management activities have the potential to disrupt recreation activities or change access into a particular area. Relatively close proximity to urban areas in the Coeur d'Alene-Spokane metropolitan region makes the Iron Honey Resource Area important for recreation. The water corridor formed by the Little North Fork Coeur d'Alene River is a main attraction. Primary recreation activities include camping, seasonal operation of over snow vehicles and all-terrain vehicles (including motorcycles). The long-term recreation access goals for the area encompassing the Iron Honey project are to manage for a high degree of motorized vehicle use along designated routes.

None of the alternatives would have a substantial effect on recreation opportunities. The overall effects of timber harvest activities are primarily to the scenic environment. Harvest activities can temporarily disrupt recreation by precluding entry into a particular area or in producing dust, noise, and smoke. Proposed stream rehabilitation activities may change the nature of access to an area (for example, a conventional road may be eliminated from standard vehicle use, so that only people afoot or on certain types of ATV's may be able to follow the former route).

Under Alternative 1, the current level of recreation management would continue. As described earlier in this chapter ("Ongoing and Reasonably Foreseeable Activities"), the District's new Travel Plan would be implemented.

Under Alternatives 2, 5, 7 and 8, large areas would be opened (at least temporarily) that may attract unauthorized off-road vehicle use. The large openings created by timber harvest could be favored as snow play sites by snowmobile users. As described in Chapter II (Mitigation), harvested areas would be signed to discourage such use, and monitored to prevent undesirable effects of unauthorized off-road travel.

Under all action alternatives (including Alternative 6), some groomed snowmobile routes would be affected as described in the table below. There are numerous other snowmobile routes in the area that are not displayed in the table because there would be no changes to those routes.

None of the alternatives would modify potential Wild and Scenic (Recreational) River segments to the degree that eligibility or classification would be affected.

Table II-5. Changes to groomed snowmobile routes, under all action alternatives.

Current Route	Change	Effect of Change
Road 794 (from its junction with Road 1560 to its junction with Road 258)	Replaced by Roads 1550 and 1560	Both routes are comparable. The new route would be superior with fewer curves and easier grooming.
Roads 794 and 1532 (connecting Horse Haven to Cascade Creek)	Replaced by Roads 2346 and 2346C (upon completion) to connect the east end of Horse Heaven airstrip with the Walker Saddle and Cascade Creek trail system	No impacts to the quality of the snowmobile trail system. The new route would be superior with fewer curves and easier grooming.

2.7.7 Scenic Resources

Management activities have the potential to change the scenic character surrounding the Iron Honey Resource Area. Scenery management direction is provided by the Forest Plan and described in terms of Visual Quality Objectives based on the area seen from sensitive travel corridors and other features that result in a high visual sensitivity level. The two primary travelways (and locations of greatest scenic concern) are Road 209 along the Little North Fork Coeur d'Alene River and the Chilco Mountain National Recreation Trail.

Under Alternative 1, there would be no short-term effects to the scenic resources because no harvest activities would occur. Past harvest units would continue to recover tree growth, muting the visual effects of unnatural-shaped openings. Over the long term, the increasing vulnerability of the area to wildfire could bring change to the scenic condition.

Under Alternatives 2, 3, and 7, none of the harvest units would be visible from the two primary travelways, although some may be visible from less sensitive viewpoints.

Alternative 5 and (to a lesser extent) Alternative 8 would have substantial impact to the visual condition of the area, with large regeneration harvest units visible from both primary travelways, as well as several other less sensitive viewpoints. Implementation of either alternative would require mitigation (described earlier in this chapter) to be consistent with Forest Plan objectives for visual quality.

2.7.8 Finances

Proposed timber harvest would contribute to the continuing operation of local mills, directly and indirectly enhancing the local and state economy through employment and tax revenues. The economy would be further enhanced through employment created by restoration work outside of the timber sale contracts. Historically, 25 percent of the gross timber receipts generated by the Coeur d'Alene River Ranger District would go directly to Kootenai and Shoshone Counties (Idaho) for public schools and roads. Under Public Law 106-393

(Secure Rural Schools and Community Self-Determination Act of 2000), eligible counties have the option of continuing to receive their share of the State's payments under the 25 Percent Fund Act, or electing to receive their share of the average of the three highest 25 percent payments to the State during the period of fiscal year 1986 through 1999 (essentially the full payment amount). It is likely that timber sale receipts will continue to be used to satisfy payments to the counties. For further discussion, please refer to "Finances" in Chapter III.

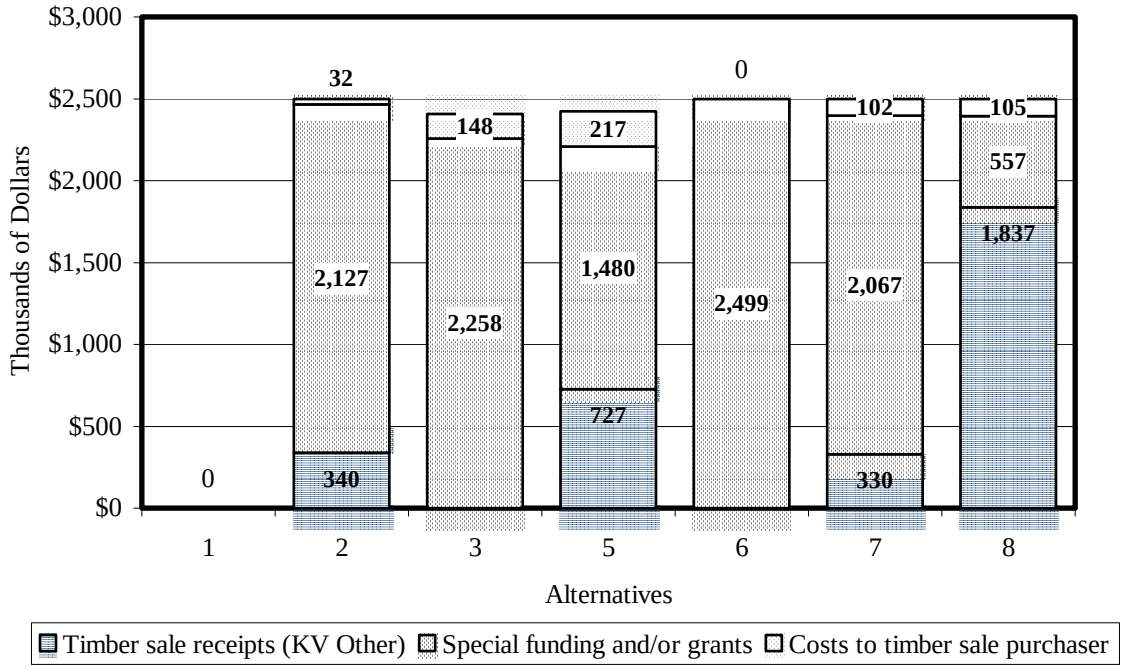
The following table provides a comparison of the financial consequences under each alternative. The discounted net value displayed in the table reflects the anticipated income from the sale of timber minus costs of activities, planning, sale preparation and sale administration. Alternatives 1 and 6 would incur $250,000 in planning and analyses costs, with no revenues generated from the sale of timber.

Table II-6. Comparison of discounted net value and contributions to counties.

Alternative	Discounted Net Value ($)	25% Fund to Counties ($)
1	-250,000	0
2	57,000	746,000
3	-647,000	19,000
5	-1,613,000	1,930,000
6	-3,230,000	0
7	492,000	889,000
8	1,813,000	2,324,000

The concept for Alternative 6 (restoration of area watersheds, with no timber harvest and no further road building) was developed in response to public comments received during scoping. In addition, it was recommended that the restoration activities not depend upon timber sale receipts. The following figure compares the amount and sources of funding for the watershed restoration activities under each alternative.

Figure II-34. Comparison of funding for watershed restoration activities.



CHAPTER III
EXISTING CONDITIONS, ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

The purpose of Chapter III is to describe the components of the environment in the Iron Honey Resource Area and the effects that could occur under each alternative analyzed, including the No-Action Alternative. For each resource, direct, indirect and cumulative effects are predicted, providing a comparison of alternatives. ***Direct effects*** are caused by the action and occur at the same time and place. ***Indirect effects*** are caused by the action and occur later than the action or are farther removed geographically (40 CFR 1508.8). ***Cumulative effects*** are those affecting the environment as a result of the incremental impact of the action, when considered with other past, present and reasonably foreseeable actions (40 CFR 1508.7). The estimated effects described in this chapter are based on current knowledge of the environmental conditions, the ongoing and reasonably foreseeable activities (described in Chapter II), and the effects of management activities.

3.1.1 Overview of the Area

The Iron Honey Analysis Area is comprised of approximately 21,600 acres of National Forest System lands. The Forest Service administers all but 193 acres of the land. There is an 82-acre parcel of private land at the mouth of Iron Creek, and 111 acres of patented mining claims in the Prospector Creek drainage east of Honey Mountain.

Landtypes, geology, soils, climate conditions, and vegetation within the analysis area are similar to what is found in the immediately surrounding areas and in the Coeur d'Alene River Basin as a whole.

3.1.2 Past Activities

Human-caused fires likely occurred from 1870-1930's as early miners (from Lakeview on Lake Pend Oreille) and Coeur d'Alene Basin settlers were active in and around the resource area, but these were not the major disturbance in the area. Overall, the major disturbances in this area would be timber harvest activity. The first timber harvest within the project area began in the early to mid 1890's and continues to the present. The first entry occurred with the development of splash dam and flumes, the peak of this logging occurred in the 1929, with the last log drive occurring in the 1940's.

From the early 1950's to the mid-1990's, extensive road construction and timber harvest occurred within the analysis area. Because most of this area did not burn in the large fires of the late 19th and early 20th centuries, there was an abundance of large white pine, which attracted the logging industry in the first half of the century (Figures III-1 and III-2). In the late 1930's and early 1940's, a logging railroad extended to Iron and Honey Creeks to facilitate removal of the logs. Flumes were used to transport logs from the forest to the

railhead. These early harvests were generally quite selective, removing only the large pine and larch and leaving stands of poor quality and/or damaged hemlock and grand fir. Where white pine did regenerate, it was susceptible to blister rust with few trees surviving to maturity.

More intensive management began in the late 1950's with the use of clearcutting harvests fragmenting the landscape into smaller patch sizes. Salvage of the remaining white pine often took place between harvest units. There are approximately 3,750 acres of clearcuts, 2,736 acres of overstory removal and liberation harvests, 1400 acres of commercial thinning, 1,221 acres of salvage logging, and 1066 acres of selective harvest within the analysis area. All areas harvested in the 1930's and 1940's may not be included in these figures and many stands have been harvested several times.

The most intensive harvests occurred in the 1960's with over 5,900 acres harvested, of which 2,400 acres were clearcuts. Unfortunately, most of the areas regenerated prior to the late 1970's were not planted with white pine. The reason was that blister rust was likely to kill white pine seedlings and resistant stock was not available. Douglas-fir was the preferred species since seed sources were readily available and the species grew well, although larch was also planted to some extent. The problems associated with root disease that develop in these stands as they mature were not recognized at the time. More recently regenerated stands have been planted with species mixes that included blister rust resistant white pine and western larch.

The most recent harvests occurred in the early 1990's with 475 acres being clearcut in the Hudlow Creek drainage. In 1997, ice and snowstorms caused severe damage to thousands of trees within the analysis area. Information regarding effects of past activities on environmental resources of the Iron Honey Resource Area is provided in the specific resource discussions in this chapter.

Figure III-1. Historic logging systems in the Iron Honey Analysis Area.

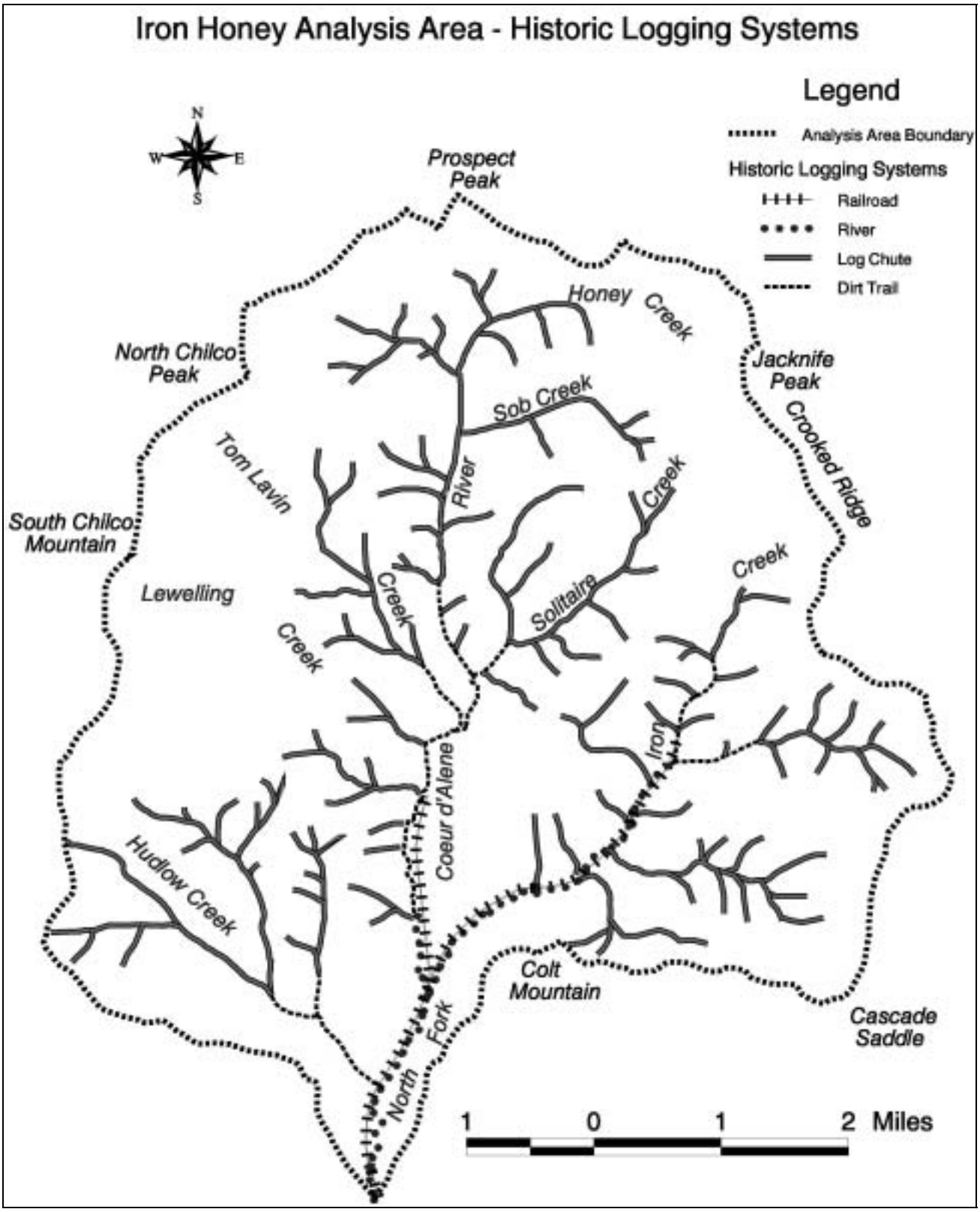
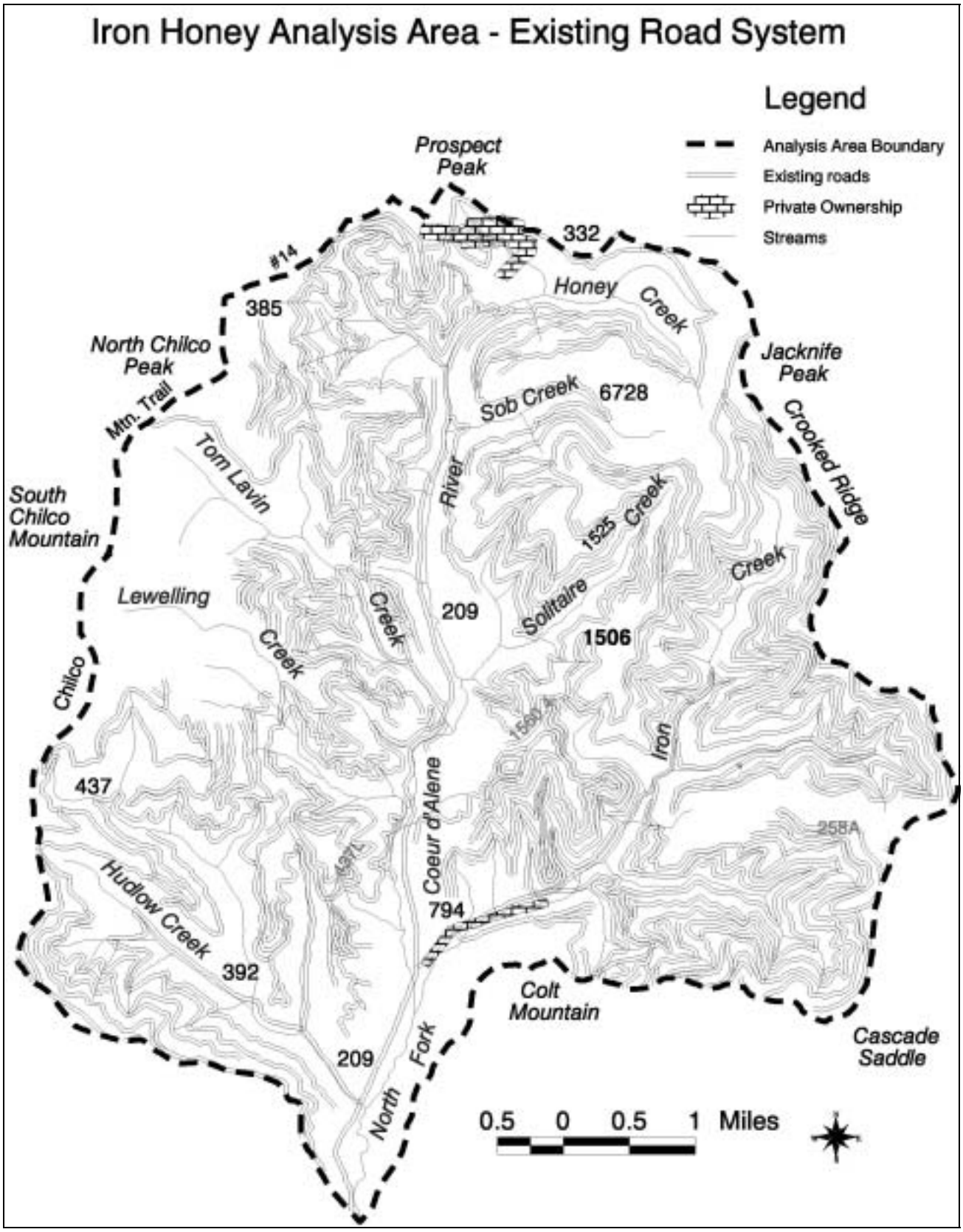


Figure III-2. Existing road system in the Iron Honey Analysis Area.



3.2 AQUATICS

3.2.1 Regulatory Framework

The regulatory framework for the aquatic resources aspect of the analysis is based on:

- *National Forest Management Act*
- *Executive Order 12962 (Recreational Fishing)*
- *Endangered Species Act*
- *Clean Water Act and its amendments*
- *Idaho State's implementation of the Clean Water Act*
- *Forest Plan and the Inland Native Fish Strategy amendment*

The National Forest Management Act (NFMA) (1976) requires that the Forest Service manage for a diversity of fish habitat to support viable fish populations (36CFR219.19). Regulations further state that the effects on these species and the reason for their choice as management indicator species be documented (36CFR219.19(a)(1).

Executive Order 12962 (June 7, 1995) states objectives "to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by: (h) evaluating the effects of Federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order."

Section 7 of the 1973 Endangered Species Act (ESA) includes direction that Federal agencies, in consultation with the U.S. Fish and Wildlife Service, will not authorize, fund, or conduct actions that are likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat.

Under authority of the Clean Water Act, the Environmental Protection Agency and the States must develop plans and objectives that will eventually restore identified stream segments of concern. The Little North Fork of the Coeur d'Alene River above Laverne Creek is listed under Section 303d as water quality impaired due to sediment. In lieu of an approved TMDL for sediment and an implementation plan, the Forest Service will demonstrate that its actions will result in a net decrease in the pollutant of concern (i.e., sediment) at the scale of the project. The Forest Service has agreements with the States to implement Best Management Practices or Soil and Water Conservation Practices for all management activities. Proposed activities will be in compliance with the guidelines in the Soil and Water Conservation Handbook (Forest Service Manual 2509.22), which outlines Best Management Practices that meet the intent of the water quality protection elements of the Idaho Forest Practices Act.

The Forest Plan provides management goals, standards and guidelines and objectives for the protection of aquatic resources. The Inland Native Fish Strategy amended the Forest Plan in August 1995 and contains additional standards and guidelines to protect the aquatic environment. Specific riparian management goals and objectives have been developed, and Riparian Habitat Conservation Areas are defined and delineated. Riparian management and riparian management objectives are addressed using site-specific and watershed analyses, and supportive data.

3.2.2 Methodology

A. Methodology Used to Identify Existing Conditions

The assessment of existing condition is critical to an environmental analysis because it both describes the current condition of the project area and provides a basis for comparing the effects of management alternatives. This existing condition discussion was developed from many information sources and using a variety of tools, including field surveys, aerial photographs, Geographic Information Systems (GIS), hydrologic response techniques and models (such as WATSED), and other watershed and aquatic data derived by the Forest Service and other sources. The assessments followed the principles and processes in the Ecosystem Analysis at the Watershed Scale: Federal Guide for Watershed Analysis (August 1995).

The project areas were first subdivided into manageable watershed units for analysis. Two types of units were identified: true watersheds and composite watersheds or "face drainages." True watersheds are areas of land in which all of the streams are interconnected and drain through a single point. In a true watershed, all of the surface water from the watershed and its tributaries eventually converge to a mainstem channel and leave the watershed through a distinct outlet or "pore point." For example, the Iron Creek watershed consists of Upper Iron, Lower Iron, Cataract Creek and Rablens Fork. Face drainages consist of smaller independent watersheds grouped together. Streams in face drainages are not as directly interconnected as those in true watersheds. The small drainages along the mainstem of the Little North Fork have been grouped together into a group of face drainages. Therefore, the discussions in this section group and address watersheds in the following order:

1. *Iron Honey*
2. *Hudlow*
3. *Tom Lavin and Lewelling*
4. *Honey, Sob, Solitaire and Upper Little North Fork*

The aquatic ecosystems of the Iron Honey Resource Area were identified as falling into one of three condition classes, as defined in the Geographic Assessment (USDA Forest Service, 1998, pages 59-61):

- *<u>Properly functioning</u>: Within the scope of this assessment, a properly functioning watershed system is one that is exhibiting dynamic equilibrium characteristics and whose streams are operating and responding appropriately under their current environment. These systems can absorb and respond to disturbances that they have evolved under within their historic range. Typically, parts of these systems, or the system as a whole, can move toward a more stable condition over time following a disturbance (or a series of disturbances) within a certain time period. As a system, these watersheds will not benefit from large-scale watershed restoration actions (although local, site-specific improvements may be productive.)*

- *<u>Functioning at risk</u>: A watershed system that is functioning-at-risk is one that is essentially still properly functioning. However, it may be exhibiting trends or it may contain known risks that are likely to compromise that status and the ability to fully support beneficial uses in the future. This status may be assigned where the apparent watershed status is uncertain because the complexity of the system and disturbances. These systems are the first priority for large-scale watershed system restoration and improvement programs. Such programs will often produce effective and timely responses in the near future.*

- *<u>Not properly functioning</u>: Watershed systems that are not properly functioning often exhibit rapid adverse trends and may not fully support beneficial uses. These systems may appear to be responding to their own last adjustment, rather than toward stabilizing the last disturbance. They are "out-of-balance" with their environment and may not be in dynamic equilibrium, in*

periods of at least several decades. These systems are in need of large-scale restoration. These watersheds are usually second priority due to limited availability of resources, uncertain technology, and the long time period expected for positive responses.

The Geographic Assessment lists all the tributaries within the analysis area as functioning-at-risk or properly functioning except for Iron Creek, which is listed as non-functioning. Those subwatersheds that are functioning-at-risk are the highest priority for aquatic restoration and protection.

The fisheries biologist established the current condition and distribution of the fisheries resources within the analysis area by utilizing the best available information, including interpretation of information from stream inventories, field reviews, historical records, aerial photographs, analysis of watershed conditions, and published scientific literature. Additional information has been gained through ongoing discussions with Fisheries Biologists from the Idaho Department of Fish and Game, the U.S. Fish and Wildlife Service, and the Idaho Division of Environmental Quality.

B. Methodology Used in the Assessment of Environmental Consequences

1. Geographic Scale of the Analyses

Based on recommendations and analyses provided in the Geographical Assessment, the cumulative effects area includes the entire Coeur d'Alene River Basin. The Geographic Assessment recommends one integrated strategy that will help respond to issues and process of the terrestrial, aquatic and recreation components of the ecosystem (Geographic Assessment, page 59). This strategy identified different implementation strategies for each area, so native aquatic resources can be conserved and protected. Within the Iron Honey analysis area, implementation strategy varies depending on watershed condition.

Within this fifth-code watershed, there are fifteen sixth- and seventh-code watersheds for which a fisheries analysis was conducted, as displayed in the table below. Hydrologic Unit Code (HUC) numbers may represent a single sixth plus-code, although multiple HUCs are within the watershed area.

The Hydrologic Unit Code (HUC) is a hierarchal watershed classification. For example, the "17" in HUC 17010301 represents the Columbia River Basin. Each successive pair of numbers in the HUC represents the next lower hierarchial watershed area (1701 represents the Upper Columbia River Basin, and 170103 represents the Coeur d'Alene River Basin).

The U.S. Geological Service defines watersheds up to the 8th digit (4 pairs), referred to as the "4th code" HUC, which is the subbasin level. HUC numbers with more than 8 digits indicate watersheds and subwatersheds delineated at the Forest or District level. The Iron Honey proposal aquatic analysis was conducted for 15 watersheds (to the 7th code HUC where appropriate).

Table III-1. Sixth-scale and seventh-scale watersheds and the Hydrological Unit Code (HUC) associated with the watershed.

Stream Name	HUC #	Acres	Feet of fish-bearing stream
Little North Fork Coeur d'Alene River (above and including Hudlow and Iron)	170103010327	21,674	151,110
Hudlow (Middle Fork and lower)	17010301033900	1,787	28,001
Hudlow (East Fork)	17010301033909	472	8,667
Hudlow (West Fork)	17010301033903	1,223	4,291
Iron Creek (total)	17010301035400	6,319	38,919
Rusty Creek		192	4,061
Cataract	17010301035409	1,297	3,766
Moose Creek		448	5,561
Rablens Fork	17010301035406	1,131	4,939
Silver Run		320	4,062
Little North Fork Coeur d'Alene River (above Iron Creek)	170103010327	11,848	86,252
Honey Creek	17010301034806	1,594	7,953
Lewelling Creek	170103010342	1,402	10,256
Sob Creek	17010301034809	792	842
Solitaire Creek	17010301035100	1,667	15,321
Tom Lavin Creek	170103010345	2,053	12,000

As displayed in Figure III-3, the Upper Little North Fork of the Coeur d'Alene River and it's tributaries were evaluated at three scales to evaluate the potential effects of the proposed actions and alternatives:

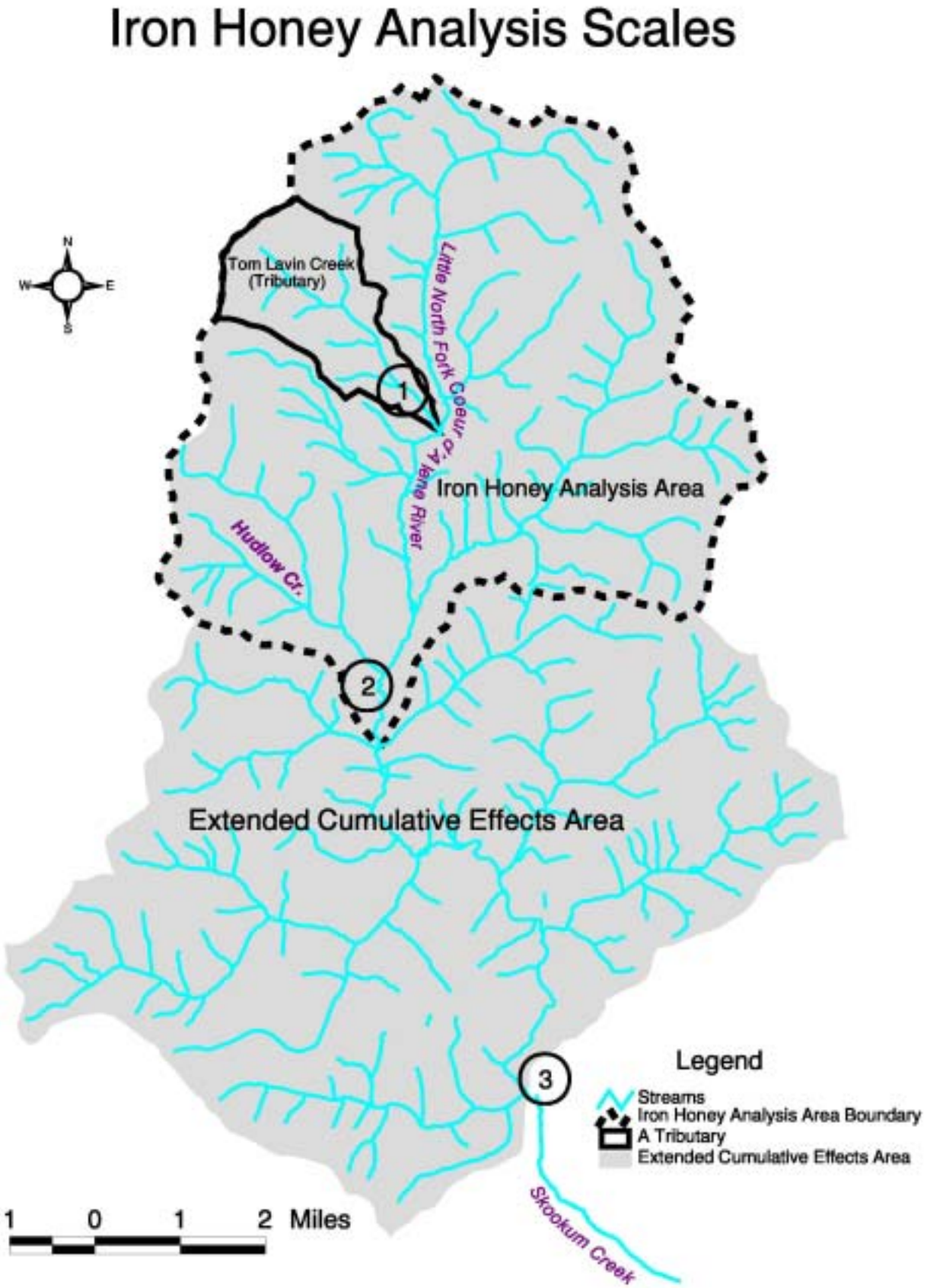
1) *the local site or tributary*
2) *the cumulative effect scale of the project area*
3) *an extended cumulative effects area*

The first scale of analysis evaluates effects to individual tributaries (referred to as the sixth plus-code scale) and localized areas within the project area. Tributaries analyzed include Hudlow, Tom Lavin, Lewelling, Upper Coeur d'Alene River, Coeur d'Alene River Face, Honey, Sob, Solitaire and Iron Creeks. Iron and Hudlow Creeks were further subdivided for the analysis.

The second includes the Iron Honey project area proper (referred to as the sixth-code scale) and extends from the headwaters of the Little North Fork to just below its confluence with Hudlow Creek (HUC #170103010327). It represents the culmination of water flow coming out of the Iron Honey Resource Area.

The third analysis was performed for a broader area (referred to as the fifth-code scale) extending from the Little North Fork headwaters to its confluence with Skookum Creek near Honeysuckle Campground. This extended area was analyzed for potential cumulative effects of the Iron Honey project, including ongoing activities in the Burnt Cabin and Barney Rubble project areas. This area was used to reflect cumulative effects because it represents the maximum extent for which cumulative effects might be measurable. No physical response would extend to or be measurable in the Coeur d'Alene River or Coeur d'Alene Lake below the project watersheds. Coeur d'Alene Lake flows into the Spokane River, which eventually combines with the Upper Columbia River far downstream. No effects would reach either of these points.

Figure III-3. Geographic scales of the aquatics analysis for the Iron Honey Resource Area proposal.



2. Environmental Factors Considered for Each Watershed

A narrative discussion of direct, indirect, and cumulative effects is provided for each watershed at the appropriate spatial and temporal scale. The following factors were considered along with the indicators discussed above:

- *levels of past harvest and road building in the project area*
- *existing condition of the main channels in the project area*
- *relationships between existing indicators and existing channel conditions*
- *relationships between projected indicators and harvest prescriptions*
- *relationships between projected streamflow and sediment supply and size*

The action alternatives would, to varying degrees, alter the stream flow regime and/or the supply and size of sediment. The number of road channel crossings (used to reflect reductions in sediment load) are those that would be available for removal.

For the purpose of comparing effects of alternatives, a table of indicator variables is also presented for each analysis watershed. These indicators are used to analyze the potential effects of both harvest-related and watershed restoration activities for each management alternative. The effects of ongoing and reasonably foreseeable activities (identified in Chapter II, section 2.4) have also been included in the analysis and are reflected by the values in each table. Effect estimates were presented as a percent (%) change over the predicted “natural” (unmanaged) conditions. In an unmanaged watershed, the percent change is zero. In most watersheds, existing condition estimates are greater than zero because the land has been managed in the past. For additional discussion, please refer to Appendix D (Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances). Briefly, indicators include:

Percent sediment yield: Percent sediment yield is calculated for each alternative using the WATSED model. The estimated annual sediment loading for the watershed is reported as the percent change above the estimated natural sediment yield for the watershed. The proposed timber harvest units, construction and reconstruction of both system and temporary roads, and site preparation treatments are included in the analysis.

Percent peak flow: The change in runoff expressed for each watershed as a percent change from the estimated "natural" peak month discharge. The WATSED model was used for this analysis to estimate the effects of the proposed timber harvest, road construction and reconstruction, and fuel treatment activities. WATSED estimates of changes in annual water yield were very similar to estimates for peak flow and not specifically addressed in the FEIS.

The WATSED model was originally run in early 1998 for the project area. It was re-run in 2000 with updated GIS coverages for stands and roads. For modeling purposes, all harvest was assumed completed in the year 2001. Therefore, the tables display maximum effects in that year. In reality, harvest activities take several years to complete, which means that the magnitude of the effect would lessen and recovery would take longer. For a more detailed discussion of the use and interpretation of WATSED, see Appendix D.

Net number of stream crossings: The change in the number of stream crossings can increase in an alternative due to new road construction or decrease in number due to watershed restoration actions. Net crossings include both inventoried and estimated uninventoried stream crossings.

Net associated sediment risk: The anticipated change in sediment risk is associated with stream crossings that were inventoried within the scope of this project. A comprehensive field inventory was cost-prohibitive, so all stream crossings within the analysis area could not be inventoried. Instead, roads with high-risk stream crossings were selected for inventory based on landtype, position in the watershed, proximity to stream channels, crossing density, and other existing road data. The associated risk for

inventoried crossings is presented as tons of sediment per year for the inventoried crossings only. This figure was calculated based on measurements of road fill at stream crossings. Crossings that would be eliminated or upgraded would reduce net associated risk. This issue indicator is important in assessing watershed improvement work associated with the alternatives. The associated risk of the uninventoried stream crossings is not included in the reported value. However, many uninventoried stream crossings would be removed in the restoration associated with the project, reducing the sediment risk below that predicted by the Net Associated Risk estimates.

Net miles of roads: The change in road mileage for a watershed. These values can increase in an alternative due to proposed or foreseeable permanent road construction or decrease due to watershed restoration actions. Proposed temporary roads are not included in this calculation because they would be removed following project activities. This value is an indicator of change to watershed risks associated with roads.

Net miles of encroaching roads: The net change was identified (in miles) for inventoried roads that hydraulically modify streamflows at bankfull stage.

A discussion of the general effects of management activities is provided in Appendix D.

3. Assessment of Environmental Consequences to Fisheries

Due to the large number of fish species within the cumulative effects areas, analysis of direct, indirect, and cumulative effects to fish uses the concept of Management Indicator Species (MIS). Under this concept, larger groups of organisms or communities are believed to be adequately represented by a subset of the group (Idaho Panhandle National Forest Plan 1987). The use of Management Indicator Species within the area affected by this EIS is simple since historically the area was dominated by cold-water biota and these species are sensitive to the types of land management action proposed under most alternatives (Meehan 1991). The Forest Plan identifies Westslope cutthroat trout and bull trout as potential Management Indicator fish species for the effects of management actions on fisheries and they are used for that purpose in this document. The life histories of one additional species listed on the Regional Foresters sensitive species list, the torrent sculpin, are included below. Inasmuch as the torrent sculpin is also a cold-water species, the effects of this action to these species would be similar, where these species occur in the project area, and is covered under the effects to the Management Indicator Species. Two other sensitive species, the burbot and redband cutthroat, are not addressed in the EIS because they are not known to occur in the Coeur d'Alene Watershed (Simpson and Wallace 1978; Dunnigan 1997).

<u>Assessment of Direct Effects to Fisheries</u>

Existing conditions were established for primary habitat components believed to be influencing the productive potential of the Management Indicator fish species within the planning areas. Habitat components of interest include stream temperature, aquatic habitat diversity, cover complexity, and channel stability.

Stream temperature and dissolved oxygen are indicators of aquatic habitat conditions for this project area (Hicks et al. 1991). Stream temperature information collected during stream surveys is evaluated in relation to Idaho State Water Quality Standards for designated beneficial uses. The direct removal of riparian vegetation through road construction and timber harvest can indirectly change stream temperature by increasing sunlight to the water. If this increases outside the range that cutthroat trout evolved (6 to 17 degrees Centigrade) detrimental effects may occur (Bjornn and Reiser 1991). Because of the low water temperature requirements of bull trout, any increase in stream temperature would likely have a negative effect on this species. Dissolved oxygen in high gradient streams in a mountain valley setting is usually at or exceeding saturation levels for dissolved oxygen. These saturation levels are dependent on water temperatures. By tracking the potential changes in stream temperature, changes to dissolved oxygen can be indirectly determined.

Habitat diversity (composition and quality) is another indicator of aquatic habitat conditions and is assessed as to the quantity and degree of development of various types of aquatic habitat (*e.g.* pools, riffles, etc.). Stream segments possessing numerous habitats with a wide variety of stream velocities, water depths, and physical habitat configurations are considered more diverse and have a greater potential for meeting the habitat requirements of naturally reproducing trout populations. Removal of riparian vegetation, which reduces instream wood, along with increases in bedload and sediment, and changes in stream morphology can affect the composition and quality of habitat.

Cover complexity is also an indicator of habitat conditions and is evaluated by the degree of habitat partitioning by various structural elements such as large woody debris, boulders, and undercut banks. This physical separation within habitat units can help maximize fish production by decreasing competition and aggression, reducing predation, increasing carrying capacity, and producing microhabitat conditions that minimize energy requirements and provide refugia for fish inhabitants. The same information used to reflect changes in habitat diversity is used to display changes to cover complexity, particularly instream wood and channel morphology.

Channel stability is another indicator for fish habitat conditions because it influences the quality of pool habitat as well as helps to establish the trend for aquatic habitat conditions. The relationship between upslope processes and stream channel condition was also evaluated by incorporating the analysis of the hydrologic condition within the project area. Selected features that are believed to influence the condition of riparian areas, and subsequently fish habitat are discussed.

Changes to these habitat components by the action alternatives are addressed by measuring changes in physical structures that affect the habitat components important to fish and are affected by management actions. To estimate the potential effects of the proposed action and alternatives, the Little North Fork and its tributaries were evaluated for direct, indirect, and cumulative effects to water yield, peak flow increase potential from rain-on-snow events, intensity of roading, and riparian disturbance. Cumulative effects include both spatial and temporal changes to stream flow, sediment yield, and channel stability from all sources within the analysis area. We also evaluated disturbance patterns and frequency within the basin. Recent research (Reeves et al, 1995) indicates that disturbance patterns produced by man are significantly different than natural patterns. These differences have caused substantial changes in aquatic ecosystems, mostly negative (Quigley et al 1996).

Assessment of Indirect Effects to Fisheries

The cumulative effects analysis was based on management actions that could alter stream conditions. The relationship between the habitat component and the measurement of change is discussed below.

Riparian Harvest: For this EIS, the amount of riparian harvest is a surrogate measurement for changes in stream temperature, habitat diversity, cover complexity, and channel stability. The direct effect of riparian harvest is the reduction of shade and large wood component near streams. The indirect effect of reducing the amount of streamside vegetation include altering timing and amount of sediment delivery, wood loading in stream, stream temperature, and the hydrologic regime (Meehan et al. 1991). The cumulative effects of riparian harvest can be reduced egg-to-fry survival (by increased fines in redds) and reduced adult survival (by increasing temperature outside of tolerated range and/or by altering carrying capacity by reducing highly utilized habitat) of Management Indicator Species. For purposes of consistency in this analysis, an average distance of 300 feet from fish-bearing streams will be considered as riparian habitat (USDA Forest Service, Inland Native Fish Strategy, 1995). Although not all the vegetation within this 300-foot buffer will consist of vegetation that is dependent on the water table, it does provide conditions necessary to maintain these types of vegetation (FEMAT, 1993). In addition, riparian harvest within 75 feet of intermittent streams will be considered riparian harvest. By maintaining riparian habitat, the Forest will trend toward

meeting the large woody debris Riparian Management Objective identified by the Inland Native Fish Strategy.

Sediment Delivery Risk: The risk of sediment delivery will be tracked by risk of failure at crossings and temporary/permanent road constructions. A majority of these risks are located where roads cross streams. The direct effect of sediment delivery at roads can be reduced passage of fish. The indirect effects of these failures include increased fine sediment in redds, and channel simplification due to torrents. The cumulative effects of additional sediment delivery can be reduced egg-to-fry survival (by increased fines in redds) and reduced adult survival (by altering carrying capacity by reducing highly utilized habitat such as pools) of Management Indicator Species. The cumulative effects related to road failures can ultimately lead to a decline in fish number (Furniss et al. 1991). Reducing the amount of sediment entering streams will result in a trend toward the Pool Frequency and the Width/Depth ratios in the Riparian Management Objectives.

Increased Fish Passage: The placement of culverts at road crossings alters the ability of fish to utilize stream habitat above the culvert. The direct effect of modifying these culverts (by replacing or removing) is increased fish passage. The indirect effect of fish passage is the movement of fish to portions of streams not previously used. However, culvert replacement activities may also increase short-term sediment production. The cumulative effect of increased passage is the increased probability of persistence of the Management Indicator Species. For this analysis, changes in passage will focus on spring migration of adult Westslope cutthroat and summer/fall migration of bull trout.

Reduced Length of Encroaching Roads: The fourth of these measures of change will be the amount of encroaching roads removed as a result of restoration activities. The direct effect of reducing the length of encroaching roads is reduced flow velocity. Indirect effects include an increase in habitat complexity and fish carrying capacity. Cumulative effects are increased numbers of fish. Because valley bottom roads pose a significant risk for fish (Dose and Roper 1994, Hick et al. 1991), reducing such roads aids in maintaining the long-term viability of fish species (including Management Indicator Species), as well as maintaining terrestrial species within the basin that rely on riparian habitat. By reducing the amounts of encroaching road, there will be a trend toward the Pool Frequency and the Width/Depth ratios in the Riparian Management Objectives.

Assessment of Cumulative Effects to Fisheries

In addition to the specific activities identified for each alternative, several other activities are ongoing or reasonably foreseeable to occur (Chapter II). Each of these activities has the potential to alter various aspects of watershed conditions. Protective measures were recommended and incorporated into the designs for these projects allowing watershed resources to be maintained. Effects to fisheries resources can be expected from these activities, and any action alternative under this analysis is considered to have additive effects when combined with the No-Action Alternative. All projects identified as reasonably foreseeable will need to complete consultation with the U.S. Fish and Wildlife Service prior to the decision, unless consultation has already occurred. There are currently no ongoing or foreseeable activities on private lands within the analysis area. Currently, the most impact from private land is through motorized recreation, affecting Iron Creek and lower Little North Fork Coeur d'Alene River below Iron Creek.

3.2.3 Existing Conditions

A. Introduction

The headwater landscape of the Upper Little North Fork of the Coeur d'Alene is comprised of mid- and high-elevation mountain slopes underlain by highly fractured, weakly weathered metamorphic rocks (quartzites and siltites). Soils generally form in a thick mantle of volcanic ash influenced loess, overlaying very gravelly or cobble material derived from underlying bedrock. Breakland areas adjacent to headwater

channels are very steep with narrow riparian areas. Landslide potential and sediment delivery in these areas is moderate to high. The landscape adjacent to major streams is characterized by weakly to highly dissected, very steep slopes. The drainage pattern is dominated by low order drainages, with relatively long reaches. Natural stream sediment is primarily from in channel erosion rather than from associated landforms.

Several primary physical processes affect the behavior of a watershed and its associated stream network. Those watershed processes that have affected the existing condition of the watersheds in the Iron Honey Resource Area are described in Appendix D.

B. Desired Conditions

The desired condition can be described as one which would best provide enough good habitat spatially and temporally to ensure viable populations of native fish. Since native populations evolved with the local landscape, it is easiest to discuss the desired future conditions by reviewing the condition of the area prior to human settlement. History indicates that this area was forested under a dense canopy of trees with a mosaic of openings caused by fire, insect and disease (Zack 1994; Leiberg 1897). Fire seems to have been the dominant creator of most of the openings. The Coeur d'Alene area has a general history of a major forest stand replacing event approximately every 203 years. The last major events of this nature occurred in 1814 to 1849.

The reference data used for a comparison of healthy stream habitat was taken from historical and current accounts of streams with limited or no management activities in the Coeur d'Alene and St. Joe drainages. The geology of the two areas is slightly different, but the habitat composition of the streams is expected to be compatible. An important factor that is limiting current fish habitat is the number, depth and complexity of the pools that are present in the stream system. Pools provide oversummer and overwinter habitat for trout (Reeves et al. 1993).

Large woody debris is a very important component of a natural stream system. Historically, the amount of large wood naturally found in the stream systems in the Coeur d'Alene exceeded the minimum values identified under the Inland Native Fish Strategy. In an oral history of the North Fork Coeur d'Alene River, it was noted that a logjam existed in the North Fork Coeur d'Alene River that was one and a half miles long, stretching from Grizzly Creek to Brown Creek (Russell 1984). An aerial photo of Miners Creek, a tributary stream to the Upper North Fork Coeur d'Alene River, shows an estimated large wood density of 283 pieces per 1,000 feet of stream (District Aquatic Data Files). Large woody debris loading for local habitat types (forest types) may average over 100 large stable stems per stream mile (District monitoring report, 1997). To achieve this amount of wood in any given stream at this time would require both instream management as well as riparian revegetation. It is necessary, however, to look at the elements under which the stream channels and their fisheries evolved, in order to move these resources towards a functional state.

C. Effects of Past Land Management Activities on Aquatic Resources

Newer roads and some historic roads within the planning area have been constructed in more stable locations higher on the hillslopes and are of less concern for fisheries. However, roads on hillslope locations can contribute to impaired fish habitat conditions. These roads can elevate stream sedimentation by increasing surface erosion potential and mass erosion potential. Fill failures from sections of riparian roads during the winter of 1995-1996 delivered approximately 11,500 cubic yards of material in eighteen streams within the analysis area and considerably altered the condition and trend for fish habitat (District ERFO reports, 1996).

Recent timber harvest, mining, and recreational facilities (within the past five years) have generally had a less dramatic effect on fisheries resources than historical fires, historical salvage operations, and the

existing transportation system (Furniss et al. 1991). However, recent timber harvests and associated roads have contributed to cumulative effects that are affecting recovery of fish habitat conditions in these streams.

The quality of fish habitat conditions in the cumulative effects area has generally been compromised but is adequate to support viable populations of some cold-water biota, especially resident fishes. Diverse conditions of the habitat components (stream temperatures, aquatic habitat diversity, cover complexity, and channel stability) primarily responsible for regulating populations of native salmonids in the cumulative effects area have enabled these populations to persist albeit at suppressed levels. Analysis of existing conditions indicates that many streams in the cumulative effects area continue to recover from the residual effects from historic pulse-type disturbances (fires, volcanoes) acting in isolation or in combination with effects from ongoing press-type disturbances (timber harvest, road building) (Chamberlin, et al 1991).

Additional information on the effects of past activities on fish (habitat connectivity) is provided in Appendix D (Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances).

Recently, watershed and fisheries improvement has been completed that is beneficial to aquatic resources. Fish passage has been improved in many tributary streams, allowing for more genetic interchange between populations and in an increase in production of fluvial fish. Removal of stream crossings and relocation of encroaching roads has improved channel function and reduced sediment risks. Maps are provided in the Project Files (Aquatics) depicting watershed restoration activities accomplished both in the Little North Fork Coeur d'Alene River watershed and district wide.

D. Fish Presence

1. Introduction

The project area contains approximately 40 miles of fish-bearing streams. Fish species that historically or currently inhabit streams in this area include native populations of westslope cutthroat (*Oncorhynchus clarki*), bull trout (*Salvelinus confluentus*), mountain whitefish (*Prosopium williamsoni*), northern pike minnow (*Ptychocheilus oregonensis*) (formerly squawfish), large-scale sucker (*Catostomus macrocheilus*), torrent sculpin (*Cottus rhotheus*), shorthead sculpin (*Cottus confusus*), and possibly longnose dace (*Rhinichthys cataractae*) and redside shiner (*Richardsonius balteatus*). Introduced fish species include populations of rainbow trout (*Oncorhynchus mykiss*) and brook trout (*Salvelinus fontinalis*) (data on file at the Coeur d'Alene River District; Simpson and Wallace, 1978). Fish that are the product of hybridization between native cutthroat trout and exotic rainbow trout and between native bull trout and exotic brook trout may be present. The distribution of some of these fish within streams in the cumulative effects areas can be found in the table below.

Codes for access:

Y	*access present, no known migration barriers*
N	*human-caused migration barrier within the stream*
*N**	*natural migration barrier within stream*

Codes for species present:

Y	*Surveyed and present*
LY	*Unsurveyed but likely present*
N	*Surveyed but not found*
*N**	*Natural barrier*
LN	*Unsurveyed but unlikely present*
H	*Documented historic, now unlikely*
LH	*Likely historic, now unlikely*
LH1	*Professional judgement of fish biologist: Likely historic, now unlikely*

Table III-2. Summary of selected fish species distribution within selected streams in the project area.

Stream Name	HUC #	Access	Westslope cutthroat trout	Bull trout	Rainbow Trout	Brook Trout	Mountain whitefish	Sculpin
Little North Fork Coeur d'Alene River (above and including Hudlow)	170103010327	Y	Y	LH1	N	N	N	Y
Hudlow (MF and lower)	17010301033900	Y	Y	LH1	N	N	N	LY
Hudlow (EF)	17010301033909	Y	Y	LH1	LN	LN	LN	LY
Hudlow (WF)	17010301033903	Y	Y	LH1	N	N	N	Y
Iron Creek	17010301035400	Y	Y	LH1	N	N	N	Y
Rusty Creek		N	LY	LH1	LN	LN	LN	LY
Cataract	17010301035409	Y	LY	LH1	LN	LN	LN	LY
Moose Creek		Y	LY	LH1	LN	LN	LN	LN
Rablens Fork	17010301035406	2,436*	LY	LH1	LN	LN	LN	LY
Silver Run		N	Y	LH1	LN	LN	LN	LN
Little North Fork Coeur d'Alene River (above Iron)	170103010327	Y	Y	LH1	N	N	LN	LY
Honey	17010301034806	Y	Y	LH1	N	N	N	Y
Lewelling Creek	170103010342	2,112*	Y	LH1	LN	LN	LN	LY
Sob Creek	17010301034809	Y	Y	LH1	N	N	N	Y
Solitaire Creek	17010301035100	2,031*	Y	LH1	N	N	N	Y
Tom Lavin	170103010345	Y	Y	LH1	N	N	N	Y

** The number of feet of fish-bearing stream blocked due to a migration barrier. Fish have access to the lower reaches of these streams.*

Westslope cutthroat trout and bull trout are native to streams in the project area (Maclay 1940, Dunnigan 1997, Horton 1985, Lider and Techau 1994). Westslope cutthroat trout are known to be utilizing streams within the project area for migration, spawning, rearing, and over-wintering. Although bull trout were historically documented in the project area reproducing populations have not been recently documented. Individual fish, however, have been reported within the mainstem Coeur d' Alene River and the Little North Fork of the Coeur d' Alene. All reports have been outside the project area. Nonetheless, Westslope cutthroat trout and bull trout have been selected as appropriate Management Indicator Species for the fisheries analysis of the vegetative and watershed restoration opportunities related the Iron Honey project. Although both fish do not exist in all streams one of the two is found in most large streams. These species are indicators for all the cold-water biota within the stream segment (Meehan 1991).

2. Westslope Cutthroat Trout

Westslope cutthroat trout are listed as "Sensitive" by Region 1 of the Forest Service and listed as a "Species of Special Concern" by the State of Idaho. In addition, the U.S. Fish and Wildlife Service lists Westslope cutthroat trout as a "Species of Concern" with respect to section 7(c) of the 1973 Endangered Species Act (USDI Fish and Wildlife Service, March 2, 1998 letter, FWS 1-9-99-SP-158). This species is currently being reviewed for listing under the Endangered Species Act.

Westslope cutthroat trout are native to many of the watersheds in the project area. Their preferred habitat is cold, clear streams that possess rocky, silt-free riffles for spawning and slow, deep pools for feeding, resting, and over-wintering (Reel 1989). Pools are a particularly important habitat component as cutthroat trout occupy pool habitat more than 70% of the time (Mesa 1991). Other key features of cutthroat habitat are large woody debris for persistent cover and habitat diversity as well as small headwater streams for spawning and early rearing.

Resident, fluvial, and adfluvial life history strategies of Westslope cutthroat trout are likely present within watersheds in the project area (Maclay 1940, Dunnigan 1997, Horton 1985, Lider and Techau 1994). The Coeur d'Alene system supports resident, fluvial, and adfluvial Westslope cutthroat trout (Averett and MacPhee, 1971; Bjornn, 1986). Resident populations remain in river tributaries throughout their life. Migratory populations (fluvial and adfluvial fish) use river tributaries for early rearing and spring spawning as adults, but typically migrate to river (fluvial) or lake (adfluvial) habitat as they mature. In the fall, fish that have not previously returned to river and lake areas migrate to deeper water where they congregate and over-winter (Bjornn 1975). Streams within the project area are utilized by Westslope cutthroat trout representing all life history strategies during various phases of their life cycle.

A 1989 population status review of Westslope cutthroat trout in Idaho has determined that populations in northern Idaho are declining, with viable populations existing in only 36% of the original Idaho range. The primary cause of the decline was found to be degradation of habitat (Rieman and Apperson 1989). A post-flood survey of resident Westslope cutthroat population levels in the Coeur d'Alene drainage in 1996 showed that the relative trout density had decreased even further, though not to the point of local extinction in any of the subdrainages. Rieman (1996) tentatively concluded that catastrophic events, such as major floods, have less impact on trout populations than continued habitat degradation.

Of the streams listed in Table III-2, the Coeur d'Alene River (above Iron Creek), Tom Lavin Creek, and Lewelling Creek are likely the most important to species persistence of Westslope cutthroat trout within the analysis area. The Little North Fork Coeur d'Alene River provides some of the larger pools within the project area that have high woody debris loading and complexity. Based on recent snorkel surveys, these areas are heavily utilized as rearing areas (Project Files, Aquatics). Tom Lavin and Lewelling Creeks appear to have stable channels and have some of the highest cutthroat trout number in the upper basin (Dunnigan 1997).

In the Geographical Assessment, it was noted that the North Fork of the Coeur d'Alene River and many of its major tributaries are no longer within the range of "dynamic equilibrium" typical of their aquatic systems. The Little North Fork of the Coeur d'Alene system appears to be one of the few larger watersheds in the Coeur d'Alene basin that is not capable of fully supporting native fish or other biotic beneficial uses of the water.

The Little North Fork Coeur d'Alene River system (specifically the lower reaches) provides critical winter habitat for Westslope cutthroat trout. The remaining larger, deep pools are critical winter refugia areas for adult fish. Lewynsky (1986) found that fluvial fish concentrated in a few large runs and pools during winter. These areas seem to be critical for the maintenance of stocks of fluvial fish. Resident and fluvial fish utilize this watershed for spawning and rearing. It has a variety of stream types (size, flows and complexity) that appear to provide fish with diverse habitats allowing for long-term persistence within the watershed. Factors that are limiting fish production relate to amount of roads within the watershed. Hillslope roads have been contributing excessive levels of sediment, which are affecting channel conditions and pool habitat. Valley bottom roads also affect channel condition by increasing sediment loading (from road failures). Both factors could negatively affect channel/floodplain connectivity and the distribution and stability of large wood, which influences instream cover and stream complexity. Both of these parameters can have a significant effect on fish production.

3. Bull Trout

The U.S. Fish and Wildlife Service lists bull trout as a "Threatened Species" with respect to section 7(c) of the 1973 Endangered Species Act (USDI Fish and Wildlife Service, July 23, 2001 letter, FWS 1-9-01-SP-613). Bull trout are native to watersheds draining into Lake Coeur d'Alene and the North Fork of the Coeur d' Alene River within the project area. Currently, only occasional migrants are found within the Coeur d'Alene River watershed. They have been noted in the main Coeur d'Alene River and the little North Fork of the Coeur d'Alene River (Horton, 1984), and are known to occur within Lake Coeur d'Alene (J. Davis,

Idaho Department of Fish and Game, personal communication). No fish have been documented in the project area during recent surveys. Bull trout appear to have more specific habitat requirements than other salmonids (Rieman and McIntyre, 1993). Habitat characteristics (including water temperature, stream size, substrate composition, cover and hydraulic complexity) have been associated with distribution and abundance (Jakober 1995; Dambacher and others, 1994; Rieman and McIntyre 1993).

Stream temperature and substrate composition are important characteristics of suitable bull trout habitat. Bull trout have repeatedly been associated with the coldest stream reaches within basins. The lower limits of many strong bull trout distributions mapped by Lee et al. (1997) correspond to a mean annual air temperature of about 4 degrees Centigrade (ranging from 3 to 6 degrees Centigrade) and should equate to ground water temperatures of about 5 to 10 degrees Centigrade (Meisner 1990). Stream temperature can be strongly influenced by land management activities that remove stream canopy (Henjum et al. 1994).

In a status review of bull trout on the Idaho Panhandle National Forests, stocks from the Coeur d'Alene watershed were considered to be at high risk of extinction (Cross, 1992). Genetic analysis has shown bull trout within many sub-basins of Northern Idaho may be unique stocks (B. Rieman, Rocky Mountain Research Station, personal communication), but are closely linked to the upper Columbia River group, one of three major groupings of bull trout throughout the Columbia and Klamath River drainages (Williams, unpublished). Within the last 15 months, bull trout have been documented or observed in the Little North Fork Coeur d'Alene River near Bumblebee, which is outside the cumulative effects area for this project. However, seasonal bull trout migration up and down the mainstem from the mouth up to Brett Creek makes it likely that individuals periodically inhabit portions of the Coeur d'Alene River drainage. No individuals are known to spawn within the basin.

Of the streams listed within Table III-2, the Coeur d’Alene River (above Iron Creek), Tom Lavin Creek, and Lewelling Creek are likely the most important to species persistence for bull trout within the analysis areas. The importance of these three streams is presented in the discussion on cutthroat trout. The Little North Fork provides some of the larger pools within the project area that have high woody debris loading and complexity. Based on recent snorkel surveys, these areas are heavily utilized as rearing areas. Tom Lavin and Lewelling Creeks appear to have stable channels and have some of the highest cutthroat trout number in the upper basin.

4. Torrent Sculpin

Torrent sculpin were added to the Idaho Panhandle's Sensitive Species list (dated March 12, 1999). This species has been found within the mainstem Coeur d'Alene River and larger tributary streams. Their preferred habitat is riffle habitat in medium to wide streams and rivers (Markle et al. 1996). Large adults (>150 mm) are found in pools. Spawning usually occurs in May and June and occurs in riffles with moderate to swift flows. The range of torrent sculpin, a cold water species, overlaps with both Westslope cutthroat and historic bull trout. Because this species primarily inhabits large streams, it would only be affected by proposed activities if the magnitude of the effects altered habitat conditions in the larger streams. The possible effects on this species are covered by analyzing effects on the cold-water Management Indicator Species. This species will be assumed present in all larger streams.

E. Fish Abundance and Composition

Electrofishing within the project area was conducted in the tributary streams in 1993, 1994, 1996 and 1997. Honey, Sob, Solitaire, Tom Lavin, Lewelling, Iron, and Hudlow Creeks were monitored in 1993. Lewelling Creek was monitored in 1994, 1996 and 1997. Tom Lavin and Iron Creeks and the Upper Little North Fork of the Coeur d’Alene River (Reach 3) were monitored in 1997. No bull trout were found during any survey work. Westslope cutthroat trout and cutthroat rainbow hybrids were the only salmonids noted.

Fish densities were variable with abundances ranging from a high of 0.089 fish per square meter in Tom Lavin Creek to a low of 0.013 fish per square meter in Sob Creek. The densities observed in these tributaries were within the range observed by other investigators for Westslope cutthroat trout (Irving 1987, Pratt 1984, Thurow 1976, Rieman unpublished). A general trend of higher fish abundance with less roading was noted (Dunnigan 1997).

Snorkeling was conducted in the project area in 1997 within Reach 1 of the Little North Fork. From these surveys it was noted that this area was being utilized for rearing, as most size classes of fish represented ages 0+ to 2 year-old fish. Few large adult fish were observed in 1997.

Abundance was quite variable, with densities being lowest in transects below Iron Creek (up to 0.008 fish per square meter). Snorkel information from the Idaho Department of fish and Game for stream reaches below the project area indicate that densities are depressed when compared to similar systems, such as the St. Joe River and Kelly Creek (Nelson et al, 1996; Bowler 1974; Lewynsky 1986; Hunt and Bjornn, 1992). Transects above Iron Creek exhibited a marked increase in density (0.023 to 0.204 fish per square meter). This increase may be associated with the high loadings of woody debris and complex habitat features within the reach.

F. Existing Conditions, by Watershed

The following discussions detail the current condition of the watersheds involved in the analysis. As discussed under "Methodology" for Aquatics, the discussions in this section group and address watersheds in the following order:

1. *Iron Honey*
2. *Hudlow*
3. *Tom Lavin and Lewelling*
4. *Honey, Sob, Solitaire and Upper Little North Fork*

The discussion is structured by watershed as described below:

- *Watershed Name*
- *Overview (size, topography, past activities)*
- *Streamflow Regime (peak flow increases, rain-on-snow sensitivity, Equivalent Clearcut Area)*
- *Stream Channel Stability (miles of streamside road, percent of riparian area affected by timber harvest, relationship between water quality and water quantity*
- *Water Quality (road channel crossings)*

1. Conditions in the Iron Creek Watershed

Overview: Iron Creek is a 6,319-acre tributary to the Little North Fork Coeur d'Alene River. Valley side slopes are steep (40 to 70 percent) and vegetated predominately with conifers. Iron Creek and several of its tributaries (including Rablens and Moose Creeks) are severely constricted by a road. The lower two miles are characterized by a broad flood-prone area that ranges from 75 to 300 feet in width. The lower mile of riparian area is private land, which receives high recreation use with both ATV's and snowmobiles, and is known as Horse Heaven Landing. Two miles above its outlet, the streamside road parallels Iron Creek for another 2 miles. This same streamside road also parallels Rablens Creek for approximately 1.4 miles, with a total mileage of streamside roads within the Iron Creek drainage of 6.3 miles. Previous activities in the drainage include extensive timber harvest and associated road building. Field observations suggest that the main channel, and a majority of the flood plain have been altered by the streamside road and harvest of riparian influenced areas. As a result of these impacts, Iron Creek is listed as Non-Functioning in the Geographic Assessment.

The concerns in Iron Creek are:

1. *The delivery of sediment to the main channel from repeated failures of the streamside roads, and confinement of the lower channel by infringement of the road in the riparian area.*
2. *Delivery of sediment associated with the high densities of road channel crossings.*
3. *Disturbance of runoff patterns in the headwater areas, from timber harvest and road building, resulting in increased water yields and peak flows.*

Stream Flow Regime: Past management activities have altered the flow regime in Iron Creek and its tributaries, as described in the Geographic Assessment. Extensive harvest and road-building have altered the timing, duration and magnitude of flows. Hydrologic changes are caused by many factors including canopy removal, increased drainage efficiency due to the road network, and the increased gradient from stream straightening (Thomas and Megahan 1998, Jones and Grant 1996, Brooks 1991, Harr 1986, Troendle and King 1983). WATSED model results estimate that average monthly peak flows were about 15% above baseline conditions in the early 1980's, but have been reduced to approximately 10% in the year 2000 due to vegetative and hydrologic recovery (Project Files, Aquatics: Iron Creek WATSED Report, p. 19). For a more detailed discussion of processes and the interpretation of WATSED, see Appendix D and the Interpretation section of the WATSED project reports.

Stream Channel Stability: A streamside road is the dominant feature of the riparian areas in Iron Creek, Rablens Creek and the lower portion of Moose Creek. Streams that have been constricted by roads are less able to handle the increased energy associated with large flow or sediment inputs. Channel pattern changes resulting from streamside road placement may result in drastic and long-term changes to the streamflow and sediment routing regime. Additionally, streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Frequent road failures have caused excess sediment introduction through the years, including the February 1996 flood event. During the 1996 flood event a section of the nonsystem streamside road at the lower end of Cataract Creek failed due to an altered stream gradient and bed aggrading, introducing a substantial volume of roadfill into Iron Creek. Many such failures have occurred in the past.

Increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Toews and Moore (1982) report streambank erosion was more than 250 percent greater after logging than before in clearcut areas where no buffers strips were left. Within the Iron Creek drainage, 57 percent of the linear riparian influenced area has been directly affected by past harvest. This represents a relatively high amount of riparian harvest presently within the Iron Creek drainage.

Water Quality: Approximately 122 miles of road and 159 road channel crossings exist in the Iron Creek drainage. Each of the road channel crossings have the potential to plug and subsequently fail, particularly on roads which are no longer maintained. Fills at channel crossings without plugged culverts may also fail because of exceptionally steep slopes and/or unstable soils. Approximately 11 percent of the miles of road are on sensitive land types that are prone to high landslide potential, surface erosion, and/or sediment delivery. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris. Frequent bank erosion was evident along the main Iron Creek channel and its tributaries, particularly in the lower drainage where the channel parallels the road. Of the 108 road channel crossings inventoried, 32 (30 percent) have failed or are in the process of failing. The majority of these sites were located on unmaintained or irregularly maintained roads. These failures and the continual bank erosion and road fill failures of the streamside road are the primary sediment contributors and component of disturbance to the lower to mid elevation areas of the watershed. Some restoration work has occurred in the past with the removal of culverts in Iron and Cataract Creeks in the mid-1980's.

Fisheries: The main stem of Iron Creek currently supports fluvial and resident Westslope cutthroat trout. Historically Iron Creek and its tributaries most likely supported fluvial and resident bull trout and Westslope cutthroat trout. Major tributary streams such as Rablens Fork, Cataract, Moose, Silver Run and Rusty Creek also contain native cutthroat populations. The larger stream systems, such as lower Iron Creek, are believed to hold torrent sculpin.

Recent and past timber harvest and road building in the entire basin has modified the headwater stream channels, the main stem fish rearing streams and main Iron Creek. Fish Habitat inventories were conducted in the 1970's, 1980's and in 1990 in Iron Creek, Rablens Fork and Cataract Creek. Rusty and Silver Run have no documented surveys.

In the late 1970's, channel inventory work indicated that all reaches showed signs of instability due to excessive sediment loads, road constrictions and failures and streambank failures. These surveys indicated that in-channel sediment was very unstable with 80-100% of the material being moving. Photo points show large gravel bars with channel filling occurring. This was also evident in the 1993 survey, with over 90% of the channel material moving.

Habitat in Iron Creek is dominated by fast water. Riffles accounted for over 66% and run habitat an additional 13%. Pools (13%) and other slow-water resting areas are limited within Iron Creek. The lowest reach of Iron Creek contains the greater percentage of pools and is the only area not impacted by parallel riparian roads. This reach contained 18% pool habitat, where as all other reaches contained less than 9%. Large wood and rootwads were the dominant features in the creation of pools.

Excessive roading and sediment in the Iron Creek watershed and its tributaries have caused channel migration and pool filling in the lower gradient reaches and downcutting in the steeper confined reaches. Streamside roads have promoted the removal of large woody debris in the past. These roads affect the stability of woody debris and the stream channel. Road segments adjacent to the stream are very susceptible to failures due to frequent high water. The width-depth ratios are most likely outside what may be expected for many of the reaches. Tributary streams flowing into Iron Creek have high riffle percentages ranging from 80 to over 90% and relatively low pool percentages. All of these tributary streams have been altered due to increase disturbance from timber harvest and road building. Fish migration barriers (culverts) currently exist on Rablens Fork, Silver Run, and Rusty Creek. In the mid-1980's, fish migration barriers were removed in the upper and middle sections of Iron Creek.

2. Conditions in the Hudlow Creek Watershed

Overview: Hudlow Creek is a 3,441-acre tributary to the Little North Fork of the Coeur d'Alene River. Valley side slopes are steep (40 to 60 percent) and vegetated predominately with conifers. Lower Hudlow Creek and the West Fork of Hudlow have short sections of road that encroach directly on the stream. The East Fork of Hudlow also had an encroaching road that was removed in 1998 along with the introduction of large woody debris in the lower mile. A total of almost 4 miles of riparian-influenced area is subject to the effects of a streamside road influencing stream channel morphology. The lower 2.0 miles of the West Fork and 1.5 miles of the East and Middle Forks of Hudlow Creek are characterized by a broad flood-prone area ranging from 50 to 250 feet in width. Previous activities in the drainage include timber harvest and associated road building. Hudlow Creek is listed as Functioning-at-Risk in the Geographic Assessment.

The concerns in Hudlow Creek are:

1. *Delivery of sediment associated with the high densities of road channel crossings.*
2. *Disturbance of runoff patterns in the headwater areas, from timber harvest and road building, resulting in increased water yields and peak flows.*
3. *The catastrophic delivery of sediment to the main channel from potential failures of the streamside*

road, and channelization of the lower channel by infringement of the road in the riparian area.

Stream Flow Regime: The hydrologic regime in Hudlow Creek and its tributaries has been altered as result of timber harvest and road building in the same four respects as Iron Creek, but to a lesser degree. Peak flows are higher and flow durations are longer than historical levels. WATSED model results estimate that average monthly peak flows were about 12% above baseline or natural conditions in the early 1990's, but have been reduced to approximately 8% in 2000 due to vegetative and hydrologic recovery (Project Files, Aquatics: Hudlow Creek WATSED Report, p. 19). For a more detailed discussion of processes and the interpretation of WATSED, see Appendix D.

Stream Channel Stability: A streamside road is a feature of the riparian areas in Lower and the West Fork Hudlow Creek drainages, rendering the stream less able to handle the increased energy associated with large flow or sediment inputs. Watershed work completed in the summer of 1998 removed the East Fork of Hudlow riparian road, one of the major potential sediment sources and stream channel restrictions within this drainage. Placement of large woody debris within the riparian area and channel was also accomplished in wood-depleted sections of stream channel. Along with removal of the lower section of road, all the stream crossings in the headwaters of the East Fork were also removed. As a result, only short sections of road remain within the West Fork Hudlow Creek watershed that constrict streamflow.

As previously discussed, increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Within the Hudlow Creek drainage, 14 percent of the linear riparian influenced area has been directly affected by harvest. These figures indicated relatively moderate amounts of riparian harvest presently with the drainage.

Water Quality: Approximately 45 miles of road and 54 road channel crossings existed in the Hudlow Creek drainage prior to the summer of 1998. Each of the road channel crossings has the potential to plug and subsequently fail, particularly on roads that are no longer maintained. Fills at channel crossings without plugged culverts may also fail because of exceptionally steep slopes and/or unstable soils. Approximately 15 percent of the miles of road are on sensitive land types that are prone to high landslide potential, surface erosion, or sediment delivery. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris. Of the 29 road channel crossings inventoried, 6 (21 percent) have failed or are in the process of failing. The majority of these sites were located on unmaintained or irregularly maintained roads. These failures are the primary sediment contributors and component of disturbance to the lower to mid elevation areas of the watershed. Watershed improvement work during the summer of 1998 and 1999 reduced the number of road miles to 41 and the number of road channel crossings to 40 within the drainage. This improvement work addressed some of the known and potential sediment problems, reducing the risk overall for the drainage. Work completed in 1999 upgraded 10 culverts on Forest Service Road 392.

Fisheries: Hudlow Creek was surveyed in 1993. Fast water (riffles and runs) dominated all stream units ranging from 70 to 83% of the streams lengths. Pool habitat ranged from 4% in the East Fork to 11% in the main stem. Large woody debris was the dominant pool creator. During the ice storm in 1997, significant amounts of large wood were recruited to the main stem of Hudlow Creek (the middle fork and east fork were not surveyed). Quantitative surveys were not conducted after the ice storm, but visual observations indicated that artificial introduction of wood is not necessary in the main stem. Large wood was introduced into the east fork (approximately 60 pieces) during the summer low flow season of 1998 when Road 3013 was removed. Currently, no known fish migration barriers exist within the Hudlow Creek watershed, and approximately four of the old migration barriers were corrected with restoration work in the mid-1990's.

3. Conditions in the Tom Lavin and Lewelling Creek Watersheds

Overview: Tom Lavin Creek is a 2,053-acre tributary and Lewelling Creek is a 1,402-acre tributary. Streamflow in both of these tributaries to the Little North Fork is to the southeast. Valley side slopes are steep (40 to 60 percent) and vegetated predominately with conifers. There are approximately 2 miles of streamside road within these two tributaries. The lower mile in each of these tributaries is characterized by a broad flood-prone area ranging from 50 to 300 feet in width. Previous activities in the drainage include timber harvest and associated road building. Previous watershed restoration includes upgrading and removal of stream crossings and roads in both watersheds. Both Lewelling Creek and Tom Lavin Creek are listed as properly functioning in the Geographic Assessment. The concerns for Tom Lavin and Lewelling Creeks are:

1. *Delivery of sediment associated with the high densities of road channel crossings.*
2. *Disturbance of runoff patterns in the headwater areas, from timber harvest and road building, resulting in increased water yields and peak flows.*

Stream Flow Regime: The hydrologic regime in both Tom Lavin and Lewelling Creeks has been altered as result of timber harvest and road building in the same four respects as Iron and Hudlow Creeks, but to a lesser degree with less timber harvest activity. In Lewelling Creek, WATSED model results estimate that average monthly peak flows were about 5% above baseline conditions in the early 1980's, but have been reduced to approximately 3% in 2000 due to vegetative and hydrologic recovery (Project Files, Aquatics: Lewelling Creek WATSED Report, p. 19). In Tom Lavin Creek, WATSED estimate that average monthly peak flows were about 9% above baseline conditions in the early 1980's, but have been reduced to approximately 5% in 2000 (Project Files, Aquatics: Tom Lavin Creek WATSED Report, p. 19). For a more detailed discussion of processes and the interpretation of WATSED, see Appendix D.

Of all the subwatersheds in the Upper Little North Fork, these two drainages have the lowest monthly peak flows. Though still recovering from past harvest and road building activities, they have maintained a high degree of resiliency and channel integrity. Please refer to Appendix D for supporting information.

Stream Channel Stability: A streamside road is a feature of the riparian areas in both Tom Lavin Creek and Lewelling Creek but does not encroach significantly except at the road channel crossings. As discussed previously, streams that have been constricted by roads are less able to handle the increased energy associated with large flow or sediment inputs. Channel pattern changes resulting from streamside road placement may result in drastic and long-term changes to the streamflow and sediment routing regime. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. Both of these roads infringe only for short sections of the channel lengths and at the road channel crossings. Even through they do constrict the channel in a few sections of stream, no large failures have occurred.

As previously discussed, increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Within Lewelling Creek and Tom Lavin Creek drainages, 33 percent and 36 percent, respectively, of the linear riparian influenced area has been directly affected by harvest, which indicates relatively high amounts of past riparian harvest within the drainage. Even though recovery of these riparian areas is still far from complete and will not provide adequate amounts of large woody debris until sometime in the future, both Tom Lavin and Lewelling Creeks have remained stable in the relationship between runoff and sediment transport.

Water Quality: Approximately 36 miles of road and 58 road channel crossings exist in both the Tom Lavin and Lewelling Creek tributaries. Each of the road channel crossings, particularly on roads, which are no longer maintained, have the potential to plug and subsequently fail. Fills at channel crossings without plugged culverts, may also fail because of exceptionally steep slopes and/or unstable soils. Approximately

16 percent of the miles of existing road are on sensitive land types that are prone to high landslide potential, surface erosion, and/or sediment delivery. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris. Of the 12 road channel crossings inventoried, two have failed or are in the process of failing. These failures are the primary sediment contributors and component of disturbance to the lower to mid-elevation areas of the watershed.

The main road up Tom Lavin Creek (Road 385) has been upgraded to become the main route up to the divide road (Road 332). Pipes were upgraded to pass 100-year flow events, along with additional surface erosion control and road widening. A large culvert at the mouth of Tom Lavin Creek on Road 209 was also upgraded to a bottomless arch to improve fish passage. The upgrading of this road replaced the Road 209 route, which was closed due to a road failure.

Watershed improvement work in the Lewelling Creek drainage was accomplished in the summer of 1998, including removal of one road channel crossing in the lowest stream reach (just before Lewelling Creek enters the Little North Fork). This road channel crossing was on an unmaintained road and was a barrier for fish passage. Though only a minor step to reconnecting the fragmentation culverts cause, it was a key step in connecting fish migration to the lower reaches of Lewelling Creek.

Fisheries: Watershed surveys were conducted in Tom Lavin and Lewelling Creeks in 1976 and 1983. Surveys conducted in 1976 indicated that the upper reaches of Tom Lavin Creek have been heavily logged. Based on review of aerial photographs, it appears that most of this logging occurred in the 1940's. The logging left large amounts of debris in and adjacent to the channel. These logs as well as naturally occurring debris have stabilized and provided channel stability. It appears that this large wood has help to reduce potential long-term negative affects in the stream channel.

Figure III- 4. Photo taken in 1959 showing the area where riparian harvesting occurred within the main stem of Tom Lavin Creek (located on the far right of the photo).

Fish habitat-typing was conducted in 1992 and 1997 within both of these watersheds. Changes were noted in both streams in the five-year period. Within Tom Lavin Creek, the flood of 1996 may have eliminated all the beaver dam pools. Beaver were active prior to the 1996 flood, but no activity was noted in the 1997 survey, this could have been due to the flood or trapping. This reduced pool occurrence and increased the frequency of braids. From 1992 to 1997, riffle habitat decreased by 50%, but braids increased by 40%. Lewelling Creek also showed a decrease in fast water habitat, but an increase in pool habitat (a doubling) and an increase in braids similar to that seen in Tom Lavin. It appears that the floods of 1996 had similar results as other monitored streams (Forest monitoring 1996), where pool volumes increased but total numbers declined. It appears that both Tom Lavin and Lewelling Creek adjusted to the floods and are now recovering. Currently, fish migration barriers exist in the upper reaches of both streams, due to constrictions caused by Roads 437 and 1507.

4. Conditions in the Honey, Sob, Solitaire and Upper Little North Fork Coeur d'Alene River Watersheds

Overview: Honey Creek, Sob Creek and Solitaire Creek have drainage areas of 1,594, 792, and 1,667 acres, respectively. all flow west or southwest. The Upper Little North Fork is a 1,157-acre tributary located northwest of Honey Creek. Honey, Sob and Solitaire Creeks are all tributaries to the Little North Fork of the Coeur d'Alene River. Valley side slopes are steep (40 to 70 percent) and vegetated predominately with conifers. There are approximately 2.3 miles of streamside road within the Honey Creek and Upper Little North Fork drainages. The lower reaches in each of these tributaries are characterized by a broad flood-prone area ranging from 50 to 300 feet in width. Previous activities in the drainage include timber harvest and associated road building. All these tributaries are listed as Functioning-at-Risk in the Geographic Assessment.

The concerns for Honey, Sob, Solitaire Creeks and the Upper Little North Fork Coeur d'Alene River are:

1. *The catastrophic delivery of sediment to the main channel from repeated failures of the streamside road, and canalization of the lower channel by infringement of the road in the riparian area.*
2. *Delivery of sediment associated with the high densities of road channel crossings.*
3. *Disturbance of runoff patterns in the headwater areas, from timber harvest and road building, resulting in increased water yields and peak flows.*

Stream Flow Regime: The hydrologic regime in all these tributaries have potentially been altered as result of timber harvest and road building in the same four respects as Iron and Hudlow Creeks. Peak flows are higher and longer in duration than they would be under natural conditions. The following are WATSED estimates for peak flows under existing condition:

- *In the Upper Little North Fork, WATSED model results estimate that average monthly peak flows were about 20% above baseline conditions in the early 1980's, but have been reduced to approximately 12% above baseline conditions in 2000 due to vegetative and hydrologic recovery (Project Files, Aquatics: ULNF WATSED Report, p. 19).*
- *In Honey Creek, estimated peak flows were about 10% above baseline conditions in the early 1980's, but have been reduced to about 6% in 2000 (Project Files, Aquatics: Honey Creek WATSED Report, p. 19).*
- *In Sob Creek, estimated peak flows were about 9% above baseline conditions in the early 1980's, but have been reduced to about 6% in 2000 due to vegetative and hydrologic recovery (Project files, Aquatics: Sob Creek WATSED Report, p. 19).*
- *In Solitaire Creek, estimated peak flows were about 22% above baseline conditions in the early 1980's, but have been reduced to about 12% in 2000 due to vegetative and hydrologic recovery (Project Files, Aquatics: Solitaire Creek WATSED Report, p. 19).*

Though slowly recovering, these streams will be influenced for a long period of time by the hydrologic alterations described above. For a more detailed discussion of processes and the interpretation of WATSED, see Appendix D and the Interpretation section of the WATSED project file reports.

Stream Channel Stability: Streamside roads are the dominant feature of the riparian areas in the Upper Little North Fork and the lower reach of Honey Creek. As discussed previously, streams that have been constricted by roads are less able to handle the increased energy associated with large flow or sediment inputs. Channel pattern changes resulting from streamside road placement may result in drastic and long-term changes to the streamflow and sediment routing regime. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream. The upper section of Road 209 off the

Bunco Road 332 failed in 1997 causing large amount of road material to be deposited in the upper reaches of the Little North Fork drainage. This material, now part of the floodplain, is slowly being routed downstream, further degrading the stability of the Little North Fork with the increased sediment. With Road 209 closed, Road 385 up the Tom Lavin Creek drainage now has become the main transportation route. To reduce the potential of further sediment introduction due to road failure, three of the main culverts along Road 209 have been removed, with plans to remove the remaining culverts as money becomes available.

Increased bedload supply and bed mobility can result from riparian harvest and may result in increases in streambank erosion. Riparian harvest is generally high (33 to 40 percent) in the Honey, Solitaire and Upper Little North Fork drainages, and moderate in the Sob Creek drainage (11 percent).

Water Quality: Approximately 72 miles of road and 109 road channel crossings exist in these tributaries. Each of the road channel crossings has the potential to plug and subsequently fail, particularly on roads that are no longer maintained. Fills at channel crossings without plugged culverts may also fail because of exceptionally steep slopes and/or unstable soils. Approximately 8 percent of the road miles are on sensitive land types that are prone to high landslide potential, surface erosion, or sediment delivery. In addition, sediment has been released from headwater areas through harvest of riparian influenced areas and the "cleaning" of channel debris. Of the 65 road channel crossings inventoried, 37 (57 percent) have failed or are in the process of failing. The majority of these sites were located on unmaintained or irregular maintained roads. These failures are the primary sediment contributors and component of disturbance to the lower to mid-elevation areas of the watershed.

Figure III-5. Examples of stream conditions within the Upper Little North Fork Coeur d'Alene River above Solitaire Creek.

Fisheries: The most recent aquatic inventories evaluating stream conditions in Honey and Solitaire Creeks were conducted in 1993. The lower 400 feet of Sob Creek were surveyed in 1997. Honey Creek was dominated by fast water habitat (88%); slow water areas (pools) only accounted for approximately 10% of the length. Large woody debris was the dominant pool creator.

Solitaire Creek and its tributaries were dominated by fast water habitat accounting for approximately 80% of the stream length within the tributaries streams. Beaver pools dominated the main stem and west fork of Solitaire Creek in 1993 (36% and 22% respectively). Substrate surveys conducted in 1997 indicated that the 1996 floods affected the majority of these beaver pools. Substrate data showed a shift in substrate composition to larger particle sizes with the loss of pools and increased gradient in the main stem (Forest monitoring report 1997). Those stream reaches that were not dominated by beaver pools in 1993, the dominant pool creator was large woody debris. Fish migration is blocked in the upper reach of the main stem of Solitaire Creek.

No qualitative data was collected for Sob Creek. A review of the lower section indicated it had extensive flumes built in the stream. The section of stream walked in 1997 indicated that sections of these flumes were still present and helping provide some stream stability.

Within the project area the Little North Fork has two basic channel types: C-type channels that are low gradient meandering with distinct point bars, riffle/pool, with broad, well defined flood plains; and B-type channels that are moderately entrenched, moderate gradient, riffle dominated, with infrequently spaced pools. These B channels generally should have a very stable plan and profile with stable banks. Some of these stream reaches have been converted into braided channels with longitudinal and transverse gravel bars with very wide channels and eroding banks and entrenched "gully" step/pool channels (Figure III-5). These stream reaches are contributing significant sediment to lower stream reaches. The photos show areas of excessive bank erosion and stream aggradation. Some of the areas with high bank erosion were treated after the flood of 1995-96.

Three very distinct sections of stream were noted within the project area. The lowest section, from Hudlow to Lewelling Creek, is buffered from the riparian road with a relatively large flat flood plain. This section of stream is a "C" type stream channel with sections becoming braided. The stream had over 23% of its length in a braided condition, but also contained over 31% slow water habitat. This section was also characterized by excellent large woody debris loadings, stable large wood ranged from 150-200 pieces per mile with 50% of these having root mass attached. Total wood loading for this section of stream was over 14,000 total pieces per mile. Aggregates (debris jams) were common with approximately 9 per mile and averaging over 575 pieces of wood in each aggregate. The majority of these aggregates were associated with wood formed pools. This section of stream is currently functioning, but is at risk due to high sediment loads in the section of stream above and the sediment loading from the tributary streams, including Iron Creek.

Within the project area, the middle section of the Little North Fork exhibits signs of braiding and gullying. Road 209 has a greater influence on channel function within this section, and woody debris loading appears much lower. Sections of the stream have been diked to protect Road 209 and are considered non-functional. Habitat features are dominated by fast water, accounting for over 77% of the length, slow water habitat (pools) accounted for approximately 13%. The 1996 flood resulted in the failure of several beaver dams in lower Solitaire Creek. This failure resulted in the flushing of fine sediment in to the mainstem of the Little North Fork, as evidenced by a shift in Wolman pebble counts toward finer particle sizes in the river below Solitaire Creek. In 1997, a section of the Little North Fork was found dried up due to aggradation of sediment in the channel. This section was directly downstream of gullied areas with high bank erosion (Figure III-5). Short sections of road and bank within this section were rehabilitated in 1997.

The upper section of the Little North Fork has characteristics of "B" type channel. This section of stream has an old road that runs adjacent to it for most of its length. In 1997, a large mass failure on Road 209 contributed approximately 1,000 tons of sediment directly to the riparian area. Some of this sediment entered the channel but a large percentage is still perched adjacent to the channel. In this upper section of the stream, fast water (riffles) account for over 90% of its length, with only about 5% pools.

3.2.4 Environmental Consequences

A. Effects Common to All Action Alternatives

Aquatic restoration is proposed to varying degrees under all action alternatives. Watershed restoration work would help in the long-term recovery of Iron Creek and in both the short- and long-term recovery in the Little North Fork Coeur d'Alene River. The removal of hill-slope roads within the project area would reduce the long-term risk of catastrophic introduction of sediment to the systems. The removal of streamside roads and the stabilization of stream channels through in-channel modification, re-introduction

of large woody debris and revegetation would reduce the direct effects of roads that are currently confining the streams or contributing sediment to the systems.

There may be a difference in risk based on the timing of restoration within the Iron Creek and Upper Little North Fork watersheds. Jones and Grant (1996) indicated that increases in flows are attributable to changes both in flow routing due to roads and in water balance due to effects of harvest and vegetation succession. With the roads in place during and after harvest, there is a greater risk to watershed integrity and the fisheries. Therefore, applying watershed restoration actions prior to vegetative restoration can reduce the risks of increased flows and subsequent channel degradation within Iron Creek and the Upper Little North Fork. By applying the watershed work first there could not only be a reduced risk of increasing water yields, but also sediment levels and the transport of sediment into lower reaches of the little North Fork (please refer to the cumulative effects discussion for fisheries).

Watershed recovery trends would likely be positive within the currently functioning-at-risk watersheds with the removal of roads that are confining the streams or contributing sediment to the systems. These alternatives would reconnect stream segments that have been fragmented due to culvert barriers. Of the projects to be implemented in these alternatives none are expected to have detrimental affects on stream temperatures, buffers for harvest units would meet Inland Native Fish Strategy standards and guidelines; fisheries and watershed work within the buffers would not remove trees from the Riparian Habitat Conservation Area (RHCA). Fisheries and watershed restoration work requires the excavation of trees and other vegetation. All vegetation is retained for in-channel work or erosion control. The riparian planting and channel reconstruction would have beneficial effects by increasing plant density within riparian areas and narrowing and deepening stream channels.

Sedimentation has degraded rearing habitat in many locations, particularly in low-gradient stream reaches. There is the potential to increase fine sediment production during implementation of some project activities, but many of the project activities may reduce long-term sediment to the river system. All fisheries projects involve instream work. This can cause increased sedimentation (fines) during the project period. As described in Chapter II (2.6.9 Features Common to All Action Alternatives, (A) Features Designed to Protect Aquatic Resources), timing guidelines are used to reduce impacts to eggs and fry (by avoiding instream work prior to July 15). Existing populations of fish migrate during the spring. No instream work would occur during this migration period (February through July 15).

Watershed projects also have the potential to increase fine sediment after project implementation. This increase is due to headwater channel adjustment, but does not affect overall channel integrity or stability. Long-term benefits of the watershed work would reduce the total potential volume of sediment entering the stream channels and provide for better channel morphology and floodplain connectivity. Recent monitoring and project implementation has indicated that little channel adjustment occurs with the increase efforts of good grade control. The watershed and fisheries projects would have a direct effect on rearing habitat. Fisheries work adds large woody debris to stream channels, creates pools and in some cases redefines stream morphology, routing both water and sediment more efficiently, which provides for a more functional and complex stream channel (Rosgen, 1996). These activities occur within the interim RHCA's, but analysis indicates that these activities should not jeopardize riparian management objectives (RMO's), but benefit them.

Variable stream channel conditions exist throughout the project area. Watershed restoration projects can alter water yields by reducing road miles and stream crossings, effectively reducing delivery efficiency and stream power. Proposed watershed work includes removal of riparian roads that directly affect channel patterns. It requires the removal of streamside vegetation associated with the road fill and associated short-term effects. In the long term, road removal would promote a more natural channel condition and better fish habitat elements. The effects of watershed restoration on recreational fishing would be to improve habitat conditions, which could increase populations and the total number of fish available for recreational fishing. On the other hand, it could change access to some sections of streams. The proposed activities

would not change access to stream sections that currently provide fluvial fishing opportunities (larger fish), but would change access to spawning and rearing sections from roaded access to foot travel (nonroaded) on approximately 50% of the spawning and rearing streams.

The effects of grazing in the Iron Honey Project Area have been documented in the (Draft) Environmental Assessment for Coeur d'Alene River Grazing Allotments (2001). The Forest Service has not yet selected a management alternative, so the No-Action Alternative (which would have the most environmental impact) was assumed. Direct effects to stream conditions in the project area would consist of localized areas of bank trampling and erosion, primarily in the lower reaches of Iron and Hudlow Creeks (USDA Forest Service, 2001, Draft Grazing EA, pp. 66-67). Cumulative effects could include delayed vegetative recovery in portions of the riparian area, but would not affect overall stream conditions. In terms of water quality, nutrient loading and pathogens would not decrease and could inhibit support of beneficial uses including cold-water biota and salmonid spawning (USDA Forest Service, 2001, Draft Grazing EA, p. 70).

B. Effects to Aquatic Resources at the Watershed Scale

As described under the "Methodology" section for Aquatics (in this Chapter), the potential effects were evaluated at three scales: the local site or tributary, the cumulative effects scale of the project area, and an extended cumulative effects area. The following addresses effects at the local or tributary scale. For each watershed (or group of watersheds), effects are described by alternative, starting with a brief summary statement of effects to aquatic resources, followed by a more detailed discussion of effects. At the end of the section for each watershed, a table displays the changes that would occur under each alternative, by analysis indicator (described earlier, 3.2.2 Methodology).

The effects of implementing restoration opportunities (described in Chapter II, 2.5.1 Opportunities to Improve Aquatic Resources) were analyzed for each watershed, and the results are disclosed as "Alternative 8+" in each table. As seen in each table, there is no value entered to reflect effects to sediment yield and peak flow as a result of aquatic restoration opportunities. These effects were modeled and are displayed only for the entire project area (Figure III-11), not by individual watershed. Implementation of the restoration opportunities would occur only if funding becomes available. For further discussion, please refer to Chapter II, 2.5 Opportunities.

1. Effects to the Iron Creek Watershed

Alternative 1 (No Action): The watershed would continue to recover at a rate that is retarded by untreated sediment sources including stream crossings and encroaching roads.

Stream conditions in Iron Creek are not likely to improve significantly in the near future under Alternative 1. Conditions favoring improvement are seen in decreasing sediment yield and peak flow associated with vegetative recovery from previous harvest (Table III-3; Project Files, Aquatics: Iron Creek WATSED Report, pp. 19, 23). The risk of rain on snow-generated peak flows would also be reduced as vegetation recovers and the canopy closes. However, the condition of lower reaches in Iron Creek are not likely to improve until existing sediment sources on the hillsides are reduced. Iron Creek is aggraded and over-widened between Rablens Fork and Cataract Creek due to excess sediment from bank erosion and upstream crossing failures. These conditions would continue because peak flows (which would tend to flush excess sediment) are decreasing while sediment input from encroaching roads and failing stream crossings would continue at elevated levels. Bank erosion and in-channel sediment would be likely to remain constant or increase downstream of Rablens Fork until sediment sources are removed from the hillsides. The lower reaches of Iron Creek are also heavily impacted by instream recreational vehicle use, most of which occurs on private land.

Alternative 3: The watershed would continue to recover at a rate that is retarded by untreated sediment sources including stream crossings and encroaching roads.

Harvest would occur in approximately 1% of the Iron Creek watershed, consisting of small (5-acre), scattered harvest units. No measurable increase in sediment or peak flows over Alternative 1 would be expected for either Iron Creek or its tributaries (Table III-3). No watershed restoration would occur in Iron Creek under Alternative 3. The timber sale purchaser would remove one stream crossing. Sediment risk would be decreased by an estimated 15 tons/year from road upgrades in Lower Iron Creek associated with the timber sale. However, this would result in no measurable effects to Iron Creek. The cumulative effects of Alternative 3 would be similar to those expected under Alternative 1.

Alternative 5: It is very likely that there would be negative impacts from management activities under Alternative 5.

Harvest would occur in approximately 18% of the Iron Creek watershed (the same level as Alternatives 2 and 7), with limited watershed improvement activities. Eleven road channel crossings on 8 miles of road would be removed, reducing sediment risk by approximately 83 tons/year. No encroaching road would be removed. Immediately following management activities, increased peak flows and sediment yields could channel-widening and bank erosion in unstable reaches below Rablens Fork. The effect of removing 11 crossings would be negligible at the scale of the Iron Creek Watershed. Hydrologic recovery would occur, but extensive sediment sources still would exist within the watershed. As a result, current stream conditions in Lower Iron Creek characterized by unstable, aggraded channels and eroding banks would continue with little improvement in the near future. Iron Creek would be negatively impacted by activities under Alternative 5.

Under Alternative 5, sediment yields in Iron Creek are predicted to increase 6% over Alternative 1 and peak flows are estimated to increase by 8%. Observable changes over the No-Action Alternative from timber harvest and related activities would be expected within Iron Creek. The effects of increased sediment inputs on low-gradient reaches below Rablens Fork could include channel widening and accelerated bank erosion.

If aquatic resource work is not completed, or if the timing of this work is not implemented in the sequence described earlier, the potential for channel conditions to deteriorate further before recovery starts will be increased. If the aquatic resource improvement work were implemented prior to harvest activities, it would be expected that the erosional processes in both headwaters and lower reaches would be reduced and that a trend towards recovery would be initiated more rapidly than leaving conditions as described under Alternative 1.

Alternative 6: Alternative 6 would provide the greatest watershed benefits from restoration activities such as road obliteration and instream improvements.

Watershed improvement in Iron Creek would be significant under Alternative 6. No commercial harvest activities would occur. Harvest would occur in approximately 2% of the Iron Creek watershed to provide wood for watershed improvement projects within the analysis area. Watershed restoration in Iron Creek would include removal of approximately 153 road channel crossings and 78 miles of road with an associated sediment risk reduction of 458 tons per year (Table III-3). The negative direct effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which is not expected to adversely affect overall channel conditions. Positive direct effects include removing the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities and bank erosion at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses.

Watershed restoration would include the obliteration of 2.1 miles of encroaching road segments along Iron Creek. The direct effects of this obliteration would include elimination of sediment sources and flow constrictions, reduction in local stream velocities, and allowing the stream to access its flood-prone area; all of which reduce bank erosion and sediment inputs. Indirect effects include reduction of sediment sources to downstream reaches, restoration of natural stream hydraulic function, and improved fish habitat.

The placement of large wood would occur in the constricted reach above Rablens Fork to enhance stream conditions. Channel and floodplain work would occur in conjunction with the removal of Roads 1532 and 796. Instream restoration would replenish woody debris and modify the channel where appropriate to restore hydrologic condition and function. A narrower, deeper channel with a greater percentage of pools would likely result as sediment supplies decrease and bank stability increases. Wood placement would occur in approximately 11,000 feet of channel in Iron Creek. Added bank stability and complexity would be achieved with the addition of large woody debris and the planting of native vegetation along streambanks and in the flood prone area. Alternative 6 would provide the greatest benefits for restoring natural watershed function and condition in Iron Creek.

Alternatives 2, 7 and 8: The watershed benefits from restoration activities such as road obliteration and instream improvement are greater than the potential impacts from management activities.

For Iron Creek and all of its tributaries, the proposed actions and potential impacts would be similar under Alternatives 2, 7 and 8 (Table III-3). Harvest would occur in approximately 18% of the Iron Creek watershed. The major difference is that under Alternatives 2 and 7, large wood would be added only at localized encroaching road restoration sites (a total of approximately 2,000 feet). Under Alternative 8, large wood would be added to an additional 9,000 feet (a total of approximately 11,000 feet) of channel. Proposed management would result in long-term benefits to the watershed. Direct effects could occur at localized sites in individual streams. Indirect downstream effects of management activity at the tributary and watershed scale would not be measurable. Watershed benefits (direct, indirect and cumulative) associated with restoration activities would outweigh cumulative effects of timber management, as discussed below.

Potential exists under Alternatives 2, 7 and 8 for impacts to streams as a result of timber harvest activities in localized areas and low-gradient reaches in Iron Creek. Proposed timber harvest within the Iron Creek watershed would result in approximately 723 acres of equivalent clearcut area (ECA), which amount to an additional 11% over the existing condition (Project Files, Aquatics: Iron Creek WATSED Report, pp. 27-30). Harvest would be distributed throughout the drainage. The proposed shelterwood harvest is designed to leave about 35% of the canopy distributed over the harvest unit, but open areas would occur because of the uneven distribution of the desirable leave trees. The direct and indirect effects of large open areas are altered snow accumulation patterns and melt rates. Direct effects at individual channel sites would include changes in timing of flow along with increases in peak discharge and flow volume due to the increased rate of water delivery to soil, roads and ditches. In the event of a large precipitation event within 7 to 10 years of the harvest, stream adjustments involving both deposition and scour could occur in low-gradient reaches in Iron Creek. These would be indirect effects from higher flows, higher stream velocities and channel erosion in headwater channels. Sediment input from harvest would be minimal because all streams will be buffered according to INFS guidelines, which reduce the pathways for sediment to enter the stream system.

Potential increases in sediment from logging roads under Alternative 2, 7 and 8 could adversely affect local channel conditions in the short term. Input would be associated with harvest activities and existing roads off of the 1560 and 794 road system. Implementation of Best Management Practices would reduce potential sediment loading at these localized areas. Crossing failures could occur, which would degrade stream integrity at the site and could impact downstream reaches. The direct effect would be channel aggradation. Indirect effects could include channel widening and increased bank erosion. Short-term effects that occur would be reduced over the long-term by implementation of road restoration activities (discussed further below).

A temporary extension (approximately 0.5 mile) of Roads 1590-URT and 1594-AT would be constructed to access harvest units, and would be removed following the timber sale. A permanent extension of Road 2346C (0.2 mile) would also be built. These roads are high on the hillslope, well away from stream channels and are not expected to impact streams. Based on current information, no new stream crossings need to be constructed on any of the new roads. As described under "Mitigation" in Chapter II, if it were discovered during implementation that crossings need to be installed, they would be engineered to meet 100-year flood events to minimize the risk of failure.

The cumulative effects of harvest and roads in Iron Creek watershed are difficult to predict with high precision. WATSED outputs, which are relative indicators of cumulative effects, suggest that the watershed is currently in a period of recovery from previous management activities. Annual sediment yield and peak flow are currently estimated at 247% and 10% over natural conditions, respectively (Table III-3). Monthly peak flows are currently decreasing and projected to continue to decrease. Sediment yields have stabilized. WATSED results estimate an additional 6% increase in sediment yield and 10% increase in peak flow over existing conditions as a result of proposed harvest activities (Project Files, Aquatics: Iron Creek WATSED Report, p. 19-26). These estimated increases, which would peak immediately following harvest and progressively decline to pre-treatment levels, represent an interruption in the current recovery of the watershed of approximately five to nine years. It is unlikely, however, that the increases predicted by WATSED would produce measurable changes in Iron Creek. For example, assuming the 6% increase predicted by WATSED in average annual sediment yield is accurate, it would not be measurable on the ground because a 6% change in annual sediment yield is well within the normal range of variability for a natural stream (for further discussion, see Appendix D, "Watershed Hydrologic Response Estimates And WATSED" and the Interpretation section of the WATSED project file reports).

Watershed restoration associated with Alternatives 2, 7 and 8 would include removal of approximately 116 road channel crossings and 52 miles of road with an associated sediment risk reduction of 425 tons per year (Table III-3). Restoration would occur primarily on spurs of the 1560, 1590, 1532 and 794 road systems. The negative direct effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which is not expected to adversely affect overall channel conditions. Positive direct effects include removing the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities, bank erosion, peak flows and volume at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses. The benefits of restoration considerably outweigh the risks associated with management activities and would compensate for any delay in recovery under Alternatives 2, 7 and 8.

Watershed restoration is included in Alternatives 2, 7 and 8. All three include the obliteration of 2.1 miles of encroaching road segments along Iron Creek. Alternatives 2 and 7 would include approximately 2,000 feet of large woody debris placement associated with road removal. Alternative 8 would include the 2,000 feet plus an additional 9,000 feet of in-stream wood placement. Alternative 8 also includes in-channel reconstruction and riparian restoration of approximately 2.2 miles of degraded reaches. The work would initiate a more natural channel morphology, re-establish the flood-prone area, and promote higher sinuosity. A narrower and deeper channel with a greater percentage of pools and fewer riffles would result. Additional bank stability and complexity would be achieved with the addition of the large woody debris and the planting of native vegetation along streambanks and in the flood prone area.

The management proposed for Iron Creek under Alternatives 2, 7 and 8 is an approach designed to mimic natural, infrequent disturbances such as catastrophic fire (Yount and Niemi 1990, Reeves et. al. 1995). In this type of disturbance regime, only a portion of the watershed is affected, and there are long periods of rest and recovery in between.

One of the most significant differences between fire-related disturbance and that proposed in Alternatives 2 and 7 is the input of wood (Reeves et. al., 1995). A catastrophic fire introduces large amounts of both wood and sediment into affected streams along with the large increases in peak flow. The stream channel can be drastically altered from a large fire, but the wood provides structure, stability, hydraulic resistance and fisheries habitat the stream recovers. Alternatives 2 and 7 would not provide a large influx of wood analogous to a stand-replacing fire. Much of the riparian area in Iron Creek has been harvested to the streambank. The only placement of in-stream wood in Alternatives 2 and 7 would be associated with restoration of encroaching road sections. The amount of wood available to the stream in the next 100 years is limited, and subsequent channel deterioration could occur because lack of wood tends to result in straighter channels with higher velocities, fewer pools and less hydraulic complexity than streams with a larger wood component. Hydrologic recovery in Iron Creek would be accelerated by restoration activities in Alternatives 2 and 7, but stream stability associated with woody debris would not be restored. Alternative 8 would provide a large amount of wood to the channel, similar to a natural pulse event. This wood would be used for grade control, instream cover and bank stabilization. The amount of wood would meet or exceed levels described in Desired Conditions. Stream function and complexity would be improved. Reduced channel aggradation, reduced bank erosion, and faster recovery would be expected because of wood introduction.

Alternatives 2 and 7 would have greater beneficial effects to aquatic resources in the Iron Creek watershed than would Alternatives 1, 3 and 5. However, Alternatives 2 and 7 would not provide the same watershed benefits of wood introduction that would occur under Alternatives 6 and 8. If Alternative 2 or 7 is implemented, increased peak flows could increase bank erosion and instability in low-gradient reaches below Rablens Fork. Increased bank erosion would be reduced with the instream work proposed in Alternative 8.

If aquatic resource work is not completed, or if the timing of this work is not implemented in the sequence described earlier, the potential for channel conditions to deteriorate further before recovery starts would be increased. If the aquatic resource improvement work can be implemented prior to harvest activities, it can be expected that the erosional processes in both headwaters and lower reaches will be reduced and that a trend towards recovery would be initiated more rapidly than leaving conditions as described under Alternative 1.

<u>Effects of Implementing Opportunities</u>: The effects of implementing aquatic restoration in the Iron Creek watershed (including the removal of an additional 37 stream crossings, reducing sediment by 33 tons per year) were analyzed and are represented in Table III-3 as “Alternative 8+.” This additional restoration would occur only if funding becomes available. Additional environmental benefits similar to those discussed under the action alternatives would be realized by removing crossings that will eventually fail and input additional sediment to the stream system.

Table III-3 summarizes the effects analysis for the Iron Creek. An explanation of each measure of change displayed in the table is provided under "3.2.2 Methodology” earlier in this “Aquatics” section of Chapter III.

Table III-3. Projected watershed response in the Iron Creek Watershed (Total Iron Creek), by alternative.

WATERSHED NAME: Iron Creek Watershed	HUC: 17010301035403
TRIBUTARY: Total Iron Creek	HUC: 17010301035403

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt 8+
Sediment yield (%) [1]	247	253	247	253	248	253	253	N/A
Peak flow (%)[2]	10	18	11	18	10	18	18	N/A
Net stream crossings (#)[3]	0	-117	-1	-11	-153	-113	-116	-37
Net associated risk (t/yr) [4]	0	-427	-15	-83	-458	-419	-425	-33
Net roads (miles) [5]	0	-49	-.3	--8	-78	-48	-52	-26
Net reduction of encroaching road (miles) [6]	0	-2.1	0	0	-2.1	-2.1	-2.1	0

[1] *Iron Creek WATSED Report, pp. 7-14, 23-26.*
[2] *Iron Creek WATSED Report, pp. 7-14, 19-22.*
[3] *GIS coverage of Project Area: stream crossings.*
[4] *GIS coverages of Project Area: road restoration by Alternative.*
[5] *Sediment Risk Analysis, pp. 5-8 (see Project Files).*
[6] *Encroaching road inventories (see Project Files).*

2. Effects to the Hudlow Creek Watershed

Alternatives 1, 2, 3, and 7: The Hudlow Creek watershed would continue to recover at a rate that is retarded by untreated sediment sources, including stream crossings.

There would be no harvest in the Hudlow Creek watershed under Alternatives 1 and 2. Harvest would occur in approximately 2% of the watershed under Alternative 3, and in less than 1% of the watershed under Alternative 7. Sediment yield and peak flow, currently estimated to be 186% and 8% above natural levels, respectively, would continue to decrease with vegetative recovery over time (Table III-4; Project Files, Aquatics: Hudlow WATSED Report, pp. 19-26). The risk of rain-on-snow generated peak flows would also be reduced as vegetation recovers. Ten stream crossings along the mainstem of Hudlow were upgraded in 1998-1999 to accommodate a 100-year flood in compliance with Inland Native Fish Strategy standards and guidelines. An additional estimated 22 uninventoried channel crossings are suspected to be present on the hillslopes, but their size, condition and fill volumes are not known. Conditions favoring sediment input to the main stream channel would continue because both water yield and peak flows are decreasing with vegetative recovery while sediment inputs from failed and failing stream crossings continue at elevated levels. However, the lower reaches of Hudlow are resilient B-channel types (Rosgen Classification) that are well vegetated, stable and stocked with large woody debris. These reaches are resilient enough to accommodate periodic inputs of sediment without serious channel adjustment. Alternative 3 includes the removal of an estimated 5 stream crossings on 4 miles of road (Table III-4), which would produce localized benefits near individual sites, but no effects at the scale of the Hudlow Creek tributary. Although localized sediment inputs would occur with crossing failures, the effects of Alternatives 1, 2, 3, and 7 should be continued watershed recovery without significant stream channel destabilization.

Alternative 5: It is very likely that there would be negative impacts to the Hudlow Creek watershed from management activities under Alternative 5.

Harvest would occur in approximately 34% of the Hudlow Creek watershed under Alternative 5. Sediment yields for Hudlow Creek are predicted to increase 13% over Alternative 1 and peak flows are predicted to increase by 18%. Alternative 5 would have limited watershed improvement. Eight road channel crossings on 6 miles of road would be removed, reducing sediment risk by approximately 19 tons per year. Localized improvement would be observed at individual sites, but the effect of removing 8 crossings would be

negligible at the scale of the Hudlow Creek Watershed. Immediately following management activities, increased peak flows and sediment yields could result in channel adjustment along the mainstem. Because of the complexity of the channel, the nature of the changes is unpredictable. Although Hudlow Creek is a resilient stream, it could easily be negatively impacted by activities under Alternative 5.

Alternatives 6 and 8: The watershed benefits from improvement activities (such as road obliteration) would be greater than the potential impacts from management activities.

No commercial harvest activities would occur in the Hudlow Creek watershed under Alternatives 6 and 8; therefore, watershed improvement would be maximized (Table III-4). Harvest would occur in approximately 4% of the Hudlow Creek watershed under Alternative 6 to provide wood for use in watershed restoration projects within the analysis area. Under Alternative 5, approximately 12 road channel crossings on 8 miles of road would be removed, decreasing sediment risk by an estimated 19 tons per year. This would not be observable in the stream channels. Alternatives 6 and 8 would provide the greatest benefits for restoring natural watershed processes and function.

Effects of Implementing Opportunities: The effects of implementing aquatic restoration opportunities in the Hudlow Creek watershed (including removal of an additional 12 stream crossings, reducing sediment by 19 tons per year) on 8 miles of road were analyzed and the results displayed as "Alternative 8+" in Table III-4. This additional restoration would occur only if funding becomes available. Additional environmental benefits similar to those discussed under the action alternatives would be realized by removing crossings that will eventually fail and input additional sediment to the stream system.

Table III-4. Projected watershed response in the Hudlow Creek Watershed (Total Hudlow Creek), by alternative.

WATERSHED NAME: Hudlow Creek Watershed	HUC: 17010301033900
TRIBUTARY: Total Hudlow Creek	HUC: 17010301033900

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt 8+
Sediment yield (%) (1)	186	186	186	199	190	186	186	N/A
Peak flow (%) (2)	8	8	9	26	9	8	8	N/A
Net stream crossings (#) (3)	0	0	-5	-8	-12	-1	0	-12
Net associated risk (t/yr) (4)	0	0	0	-19	-19	0	0	-19
Net roads (miles) (5)	0	0	-4	-6	-8	-2	0	-8
Net reduction of encroaching road (miles) (6)	0	0	0	0	0	0	0	0

1 Hudlow Creek WATSED Report, pp. 7-14, 23-26
2 Hudlow Creek WATSED Report, pp. 7-14, 19-22
3 GIS coverage of Project Area: stream crossings.
4 GIS coverages of Project Area: road restoration by Alternative.
5 Sediment Risk Analysis, pp. 5-8 (see Project Files).
6 Encroaching road inventories (see Project Files).

3. Effects to the Tom Lavin Creek Watershed

Alternatives 1 and 2: The Tom Lavin Creek watershed would continue to recover at a rate that is retarded by untreated sediment sources such as stream crossings.

There would be no harvest activities in the Tom Lavin Creek watershed under either Alternatives 1 or 2. Sediment yield and peak flow, currently estimated to be 103% and 5% above natural levels, respectively, would continue to decrease with vegetative recovery over time (Table III-5). The risk of rain on snow-generated peak flows would also be reduced. At the same time, sediment input from failing stream crossings on the hillsides would continue at elevated levels, which promotes channel aggradation and bank

erosion. However, the lower reaches of Tom Lavin are resilient B-channel types (Rosgen Classification) that are well vegetated and stable. These reaches are resilient enough to accommodate periodic inputs of sediment without serious channel adjustment, but the failure of channel crossings could result in localized channel adjustment. The risk of impacts was further reduced and fish migration improved by road improvement and culvert upgrades in the lower portions of the stream. Hydrologic recovery in Tom Lavin Creek would continue under Alternatives 1 and 2, but at a slower rate than under Alternative 6 or 8.

Alternatives 3, 5 and 7: Minor watershed benefits would occur in the Tom Lavin Creek watershed as a result of culvert upgrades.

Harvest would occur in approximately 6% of the Tom Lavin Creek watershed under any of these three alternatives. The cumulative effects to peak flows and sediment as a result of management activities under Alternatives 3, 5 and 7 would not be measurable over the No-Action Alternative at the tributary scale (Project Files, Aquatics: Lavin Creek WATSED Report, pp. 20-22, 24-26). Sediment reductions are attributed to the upgrading of culverts to meet 100-year flow events. The direct effect of this work would be a short-term introduction of fine sediment at localized sites, which is not expected to adversely affect channel conditions. Other direct effects include reducing the risk of channel crossing failure and the contributing area.

The direct and indirect effects of canopy removal at localized sites under Alternatives 3, 5, and 7 would be altered snow accumulation patterns and melt rates. Some short-term change in timing, and increases in the magnitude and quantity of flow would occur under these alternatives at individual sites. No measurable effects would be expected to occur in stream channel conditions. No temporary road would be constructed in the Tom Lavin Creek drainage under Alternatives 3, 5 or 7. No measurable direct or indirect effects to beneficial uses in Tom Lavin Creek are anticipated from harvest activities and road reconstruction under any of the alternatives, including the No-Action Alternative. The short-term increase in sediment estimated by WATSED under Alternatives 3, 5, and 7 would not be measurable at the tributary scale. The implementation of Best Management Practices and compliance with the Inland Native Fish Strategy would provide protection for riparian habitat and control the majority of the sediment associated with these activities (please refer to Chapter II, 2.6.9 Features Common to All Action Alternatives, (A) Features Designed to Protect Aquatic Resources).

Alternatives 6 and 8: The watershed benefits from improvement activities (such as road obliteration) would be greater than the potential impacts from management activities.

No harvest would occur in the Tom Lavin watershed under either Alternatives 6 or 8. Cumulative benefits at the tributary scale due to watershed improvement resulting in the reduction of sediment would enhance stream conditions and water quality in some of the localized reaches in Alternatives 6 and 8. Under Alternative 6, there would be reduced sediment as a result of removing stream channel crossings and road miles in the Tom Lavin Creek drainage. Removing culverts eliminates flow constriction, which in turn reduces flow velocities at local sites. By reducing the contributing area, this might trend the localized tributaries towards reduced peak flows. Indirect effects of the watershed improvement work includes decreasing fine sediment and bedload sources, increasing flood-prone area, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. At this scale in the watershed, this would provide a gradual decline in sediment routing downstream, which in turn would provide improved conditions for beneficial uses.

Effects of Implementing Opportunities: The effects of implementing aquatic restoration opportunities in Tom Lavin Creek watershed (including removal of an additional 21 stream crossings on 9 miles of road, reducing sediment by 27 tons per year) were analyzed and are displayed as “Alternative 8+” in Table III-6. This additional restoration would occur only if funding becomes available. Additional environmental benefits similar to those discussed under the action alternatives would be realized by removing crossings that will eventually fail and input additional sediment to the stream system.

Table III-5. Projected watershed response in the Tom Lavin Creek Watershed, by alternative.

WATERSHED NAME: Tom Lavin Creek Watershed	HUC: 170103010345
TRIBUTARY: Tom Lavin Creek	HUC: 170103010345

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8	ALT 8+
Sediment yield (%) (1)	103	103	104	105	103	105	103	N/A
Peak flow (%) (2)	5	5	6	6	5	6	5	N/A
Net stream crossings (#) (3)	0	0	0	0	-21	0	0	-21
Net associated risk (t/yr) (4)	-4	-4	-16	-16	-31	-16	-4	-27
Net roads (miles) (5)	0	0	0	0	-9	0	0	-9
Net reduction of encroaching road (miles) (6)	0	0	0	0	0	0	0	0

1 Tom Lavin Creek WATSED Report, pp. 7-14, 23-26.
2 Tom Lavin Creek WATSED Report, pp. 7-14, 19-22.
3 GIS coverage of Project Area: stream crossings.
4 GIS coverages of Project Area: road restoration by Alternative.
5 Sediment Risk Analysis, pp. 5-8 (see Project Files).
6 Encroaching road inventories (see Project Files).

4. Effects to the Lewelling Creek Watershed

Alternatives 1 and 2: The watershed would continue to recover at a rate that is retarded by untreated sediment sources including stream crossings and encroaching roads.

No timber harvest would occur in the Lewelling Creek watershed under Alternatives 1 or 2. Sediment yield and peak flow, currently estimated to be 80% and 3% above natural levels, respectively, would continue to decrease with vegetative recovery (Table III-6; Project Files, Aquatics: Lewelling Creek WATSED Report, pp. 19, 23). The risk of rain on snow-generated peak flows would also be reduced. At the same time, sediment input from failing stream crossings on the hillsides would continue at elevated levels, promoting channel aggradation and bank erosion. The lower reaches of Lewelling are resilient B-channel types (Rosgen Classification) that are well vegetated and stable. These reaches are resilient enough to accommodate periodic inputs of sediment without serious channel adjustment, but the failure of several of the crossings could result in localized channel adjustment. Hydrologic recovery in Lewelling Creek would continue under Alternatives 1 and 2, but at a slower rate than under Alternative 6 or 8.

Alternatives 3, 5 and 7: Minor benefits would occur in the Lewelling Creek watershed as a result of culvert upgrades.

Harvest would occur in approximately 2% of the Lewelling Creek watershed under any of these three alternatives. No cumulative effects to sediment or peak flows would be measurable at the tributary scale as a result of proposed management activities (Table III-6; Project Files, Aquatics: Lewelling Creek WATSED Report, pp., 20-22 and 24-26). Sediment reductions under Alternatives 3, 5 and 7 would result from upgrading culverts to meet 100-year flow events. The direct effect of this work would be a short-term introduction of fine sediment at localized sites, which is not expected to adversely affect channel conditions. Other direct effects include reducing the risk of channel crossing failure and the contributing area. Indirect effects would be negligible.

The direct and indirect effects of canopy removal at localized sites under Alternatives 3, 5, and 7 would include altered snow accumulation patterns and melt rates. Some short-term change in timing, and increases in the magnitude and quantity of flow would occur under these alternatives at individual sites. No measurable effects would occur in stream channel conditions. There is no proposed road construction in Alternatives 3, 5 or 7.

Alternatives 6 and 8: The watershed benefits from improvement activities (such as road obliteration) would be greater than the potential impacts from management activities.

No commercial timber harvest would occur in the Lewelling Creek watershed under either of these alternatives. Harvest would occur in approximately 2% of the Lewelling Creek watershed under Alternative 6 to provide wood for use in watershed restoration projects within the analysis area. Cumulative benefits at the tributary scale would enhance stream conditions and water quality in some of the localized reaches under Alternative 6 and 8 (due to watershed improvement resulting in the reduction of sediment). Sediment reduction would be associated with reducing stream channel crossings, road miles, and encroaching roads in Lewelling Creek. Removing culverts eliminates flow constriction, which in turn reduces flow velocities at local sites. By reducing the contributing area, this might trend the localized tributaries towards reduced peak flows. Sediment reduction is most noticeable at localized sites where encroaching roads are removed. Only under Alternative 6 would the short section of encroaching road be removed. Substantial improvement in stream conditions would be observed at this localized site. The direct effects of encroaching road removal include removing immediate sediment sources and constrictions to flow, reducing local velocities, and allowing the streams to access their flood-prone area. Indirect effects include eliminating channel erosion sources, increasing flood-prone area, restoring hydraulic functions, and improving fish habitat.

Effects of Implementing Opportunities: The effects of implementing aquatic restoration opportunities in the Lewelling Creek watershed (including removal of an additional 20 stream crossings, reducing sediment by 79 tons per year) on 5 miles of road were analyzed and the results displayed as "Alternative 8+" in Table III-6. This additional restoration would occur only if funding becomes available. Approximately 0.1 miles of encroaching road would also be removed. Additional environmental benefits similar to those discussed under the action alternatives would be realized by removing roads and crossings that will eventually fail and add additional sediment to the stream system.

Table III-6. Projected watershed response in the Lewelling Creek Watershed, by alternative.

WATERSHED NAME: Lewelling Creek Watershed	HUC: 170103010342
TRIBUTARY: Lewelling Creek	HUC: 170103010342

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8	ALT 8+
Sediment yield (%) (1)	80	80	80	80	81	80	80	N/A
Peak flow (%) (2)	3	3	3	3	3	3	3	N/A
Net stream crossings (#) (3)	0	0	0	0	-20	0	0	-20
Net associated risk (t/yr) (4)	0	0	-70	-70	-79	-70	0	-79
Net roads (miles) (5)	0	0	0	0	-5	0	0	-5
Net reduction of encroaching road (miles) (6)	0	0	0	0	-.1	0	0	-.1

1 LewellingCreek WATSED Report, pp. 7-14, 23-26.
2 Lewelling Creek WATSED Report, pp. 7-14, 19-22.
3 GIS coverage of Project Area: stream crossings.
4 GIS coverages of Project Area: road restoration by Alternative.
5 Sediment Risk Analysis, pp. 5-8 (see Project Files).
6 Encroaching road inventories (see Project Files).

At the tributary scale, no direct or indirect effects to beneficial uses in Lewelling Creek are anticipated from harvest activities and road construction under any of the alternatives, including the No-Action Alternative. The implementation of Best Management Practices and compliance with the Inland Native Fish Strategy would provide protection for riparian habitat and control the majority of the sediment associated with these activities. The estimates assume implementation of standard Best Management Practices and Soil and Water Conservation Practices (please refer to Chapter II, 2.6.9 Features Common to All Alternatives, (A) Features Designed to Protect Aquatic Resources).

5. Effects to the Upper Little North Fork Watershed

Alternatives 1, 2, 3 and 7: The Upper Little North Fork watershed would continue to recover at a rate that is retarded by untreated sediment sources, including stream crossings and encroaching roads.

No timber harvest would occur in the Upper Little North Fork watershed under Alternatives 1 and 2. Harvest would occur in approximately 1% of the watershed under Alternative 3, and in less than 1% of the watershed under Alternative 7. Sediment yield and peak flow, currently estimated to be 108% and 12% above natural levels, would continue to decrease with vegetative recovery over time (Table III-7). The risk of rain on snow-generated peak flows would also be reduced. There are sediment sources on the hillsides and encroaching sections of Road 209. The reaches of the Upper Little North Fork are resilient A and B-channel types (Rosgen Classification) that are well vegetated and stable. These reaches are resilient enough to accommodate periodic inputs of sediment without serious channel adjustment. Hydrologic recovery would continue under Alternatives 1, 2, 3 and 7, but at a slower rate than under Alternative 6.

Alternative 6: Alternative 6 would provide the greatest watershed benefits in the Upper Little North Fork watershed, as a result of restoration activities such as road obliteration and instream improvements.

Of all alternatives, Alternative 6 would provide the greatest benefits to this watershed. Harvest would occur in approximately 1% of the Upper Little North Fork watershed to provide wood for watershed restoration projects within the analysis area. This harvest would result in an additional 13.5 acres of thinning (three ECAs) (Project Files, Aquatics: ULNF WATSED Report, pp. 13). The harvest would be selective, so would not result in significant canopy openings. No measurable cumulative effects would be expected (Project files, Aquatics: ULNF WATSED Report, pp. 22,26). Cumulative benefits to the Upper Little North Fork would result from the activities described below.

Watershed restoration under Alternative 6 would include the removal of 22 stream crossings and an associated 243 t/yr of sediment risk along 11 miles of the 209 road and old spurs to Road 385 (Table III-7). The negative direct effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which is not expected to adversely affect overall channel conditions. Positive direct effects include removing the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities and bank erosion at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses.

Watershed restoration under Alternative 6 includes the obliteration of 0.3 miles of encroaching road segments along a 1.5-mile section of the Road 209-UE. The direct effects include eliminating sediment sources and flow constrictions, reducing local velocities, and allowing the stream to access its flood-prone area; all of which reduce bank erosion and sediment inputs. Indirect effects include reducing sediment sources to downstream reaches, restoring natural stream hydraulic function, and improving fish habitat.

Alternative 6 would include channel restoration in conjunction with encroaching road removal. Degraded reaches would recover following encroaching road removal, but channel improvement measures would expedite recovery. The work would initiate a more natural morphology, re-establish the flood-prone area, and promote higher sinuosity. A narrower and deeper channel with a greater percentage of pools and fewer riffles would result. Additional bank stability and complexity would be achieved with the addition of large woody debris and the planting of native vegetation along streambanks and in the flood prone area.

Alternatives 5 and 8: The watershed benefits from improvement activities (such as road obliteration and instream improvements) would be greater than the potential impacts from management activities.

Harvest would occur in approximately 11% of the Upper Little North Fork watershed under either alternative. Proposed management in the Upper Little North Fork under Alternatives 5 and 8 would result in long-term benefits to the watershed. Direct management effects could occur at localized sites in individual streams. Indirect downstream effects of management activity at the tributary and watershed scale would not be measurable. Watershed benefits (direct, indirect and cumulative) associated with restoration activities would outweigh cumulative effects of timber management as discussed below.

The potential for stream impacts under Alternatives 5 and 8 would be minimal. Proposed timber harvest within the Upper Little North Fork would result in 87 acres of equivalent clearcut area (ECA), which amounts to an additional 7.6% of the watershed over existing condition (Project Files, Aquatics: ULNF WATSED Report, pp. 28-30). Harvest would be distributed throughout the drainage. The direct and indirect effects of large open areas would be altered snow accumulation patterns and melt rates. Direct effects at individual channel sites would include changes in timing of flow along with increases in peak discharge and flow volume due to the increased rate of water delivery to soil, roads and ditches. In the event of a large precipitation event within 7 to 10 years of the harvest, stream adjustments involving both deposition and scour could occur in low-gradient reaches. These would be indirect effects from higher flows, higher stream velocities and channel erosion in headwater channels. Sediment inputs from harvest would be minimal because all streams would be buffered according to Inland Native Fish Strategy guidelines, reducing the pathways for sediment to enter the stream system.

Potential increases in sediment associated with logging and roads under Alternative 5 and 8 would not be expected to adversely affect channel conditions. Limited, short-term sediment input could occur at localized areas within individual tributaries in the northeast portion of the Upper Little North Fork. Input would be associated with existing Roads 209 and 332, which intercept stream channels. Implementation of Best Management Practices would reduce potential sediment loading at these localized areas. There is only one inventoried crossing associated with harvest Unit 16, which does not represent a serious risk to aquatic resources. However, crossing failures could occur along haul routes, which would degrade stream integrity at the site and could impact downstream reaches. Direct effects would include channel aggradation. Indirect effects could include channel widening and increased bank erosion. Short-term effects that occur will be mitigated in the long-term from road restoration activities discussed below. Approximately 0.3 miles of new temporary roads would be constructed to access harvest units. These roads are high on the hillslope, well away from stream channels, and will be removed following the timber sale. Based on current information, no new stream crossings need to be constructed. If crossings do need to be installed, they would be engineered to meet 100-year flood events, which would minimize the risk of failure. These crossings would be removed immediately following harvest operations. Neither the use of the existing roads nor the construction of new temporary roads is expected to negatively affect aquatic resources.

The cumulative effects from harvest and roads in the Upper Little North Fork watershed are difficult to predict with high precision. WATSED outputs, which are relative indicators of cumulative effects, suggest that the watershed is currently in a period of recovery from previous management activities in the late 1970's (Project Files, Aquatics: ULNF WATSED Report, pp. 19, 23). Annual sediment yield and peak flow are currently estimated at 108% and 12% over natural conditions, respectively (Table III-7). Monthly peak flows are currently decreasing and projected to continue to decrease. Sediment yields have stabilized. WATSED results estimate an additional 7% increase in sediment yield and 5% increase in peak flow over existing conditions as a result of proposed harvest activities. These modeled increases, which would peak immediately following harvest and progressively decline to pre-treatment levels, represent an interruption in the current recovery of the watershed of approximately five to nine years (Project Files, Aquatics: ULNF WATSED Report, p. 21, 25). It is unlikely, however, that the increases predicted by WATSED would produce measurable changes in the stream itself. For example, assuming the 7% increase predicted by WATSED in average annual sediment yield is accurate, it would not be measurable on the ground because a 7% change in annual sediment yield is well within the normal range of variability for a natural stream (for further discussion, see Appendix D, "Watershed Hydrologic Response Estimates And WATSED").

Watershed restoration under Alternatives 5 and 8 would include the removal of eight stream crossings and an associated 189 tons per year of sediment risk. Restoration would occur on the east side of Road 209 in the lower parts of the drainage. The negative direct effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which is not expected to adversely affect overall channel conditions. Positive direct effects include removing the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities, bank erosion, peak flows and volume at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses. The benefits of restoration considerably outweigh the risks associated with management activities and would compensate for any delay in recovery under Alternatives 5 and 8.

Watershed restoration under Alternatives 5 and 8 would also include the obliteration of 0.3 miles of encroaching road segments along a 1.5-mile section of the Road 209-UE (Table III-7). The direct effects include eliminating sediment sources and flow constrictions, reducing local velocities and bank erosion, and allowing the stream to access its flood-prone area; all of which reduce bank erosion and sediment inputs. Indirect effects include reducing sediment sources to downstream reaches, restoring natural stream hydraulic function, and improving fish habitat. Degraded reaches would recover following encroaching road removal, but channel improvement measures would expedite recovery. In Alternatives 5 and 8, in-channel restoration would be conducted in conjunction with encroaching road removal. The work would initiate a more natural channel morphology, re-establish the flood-prone area, and promote higher sinuosity. A narrower and deeper channel with a greater percentage of pools and fewer riffles would result. Additional bank stability and complexity would be achieved with the addition of large woody debris and the planting of native vegetation along streambanks and in the flood-prone area.

Effects of Implementing Opportunities: The effects of implementing aquatic restoration activities in the Upper Little North Fork watershed (including removal of an additional 11 stream crossings from old spurs of Road 385, reducing sediment by 54 tons per year) were analyzed and are displayed as “Alternative 8+” in the table below. This additional restoration would occur only if funding becomes available. Additional environmental benefits similar to those discussed under the action alternatives above would be realized by removing crossings that will eventually fail and add additional sediment to the stream system.

Table III-7. Projected watershed response in the Upper Little North Fork, by alternative.

WATERSHED NAME: Upper Little North Fork of the Coeur d'Alene Watershed	HUC:170301034800
TRIBUTARY: Upper Little North Fork	HUC:170301034800

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 8+
Sediment yield (%) (1)	108	108	109	115	110	109	115	N/A
Peak flow (%) (2)	12	12	12	17	12	12	17	N/A
Net # of stream crossings (3)	0	0	0	-8	-22	0	-8	-14
Net associated risk (t/yr) (4)	-40	-40	-40	-189	-243	-40	-189	-54
Net roads (miles) (5)	0	0	0	-5	-11	0	-5	-6
Net reduction of encroaching road (miles) (6)	0	0	0	-.3	-.3	0	-.3	0

1 ULNF WATSED Report, pp. 7-14, 23-26.
2 ULNF WATSED Report, pp. 7-14, 19-22.
3 GIS coverage of Project Area: stream crossings.
4 GIS coverages of Project Area: road restoration by Alternative.
5 Sediment Risk Analysis, pp. 5-8 (see Project Files).
6 Encroaching road inventories (see Project Files).

6. Effects to the Honey Creek Watershed

Alternatives 1 and 2: The Honey Creek watershed would continue to recover at a rate that is retarded by untreated sediment sources including stream crossings and encroaching roads.

No harvest would occur in the Honey Creek watershed under either alternative. Sediment yield and peak flow, currently estimated to be 239% and 6% above natural levels, respectively, would continue to decrease with vegetative recovery (Table III-8; Project Files, Aquatics: Honey Creek WATSED Report, pp. 19-20, 23-24). The risk of rain-on-snow generated peak flows would also be reduced as vegetation recovers over time. At the same time, however, peak flows (which would tend to flush excess sediment) are decreasing while sediment inputs from encroaching roads and failing stream crossings would continue at elevated levels. Most of Honey Creek consists of resilient B-channel types (Rosgen Classification), well vegetated and stable. These reaches are resilient enough to accommodate periodic inputs of sediment without serious channel adjustment. However, the lower 0.5 miles of the stream is lower gradient with sections of encroaching road that would be removed under Alternatives 5 and 6. Hydrologic recovery would continue under Alternatives 1 and 2, but at a slower rate than under Alternative 6. Channel conditions would improve over the long term. Alternatives 1 and 2 would not increase projected sediment yields in Honey Creek, but neither do they promote recovery.

Alternatives 3 and 7: The Honey Creek watershed would continue to recover at a rate that is retarded by untreated sediment sources including stream crossings and encroaching roads.

Harvest would occur in less than 1% of the Honey Creek watershed under either alternative. The cumulative effects to peak flows and sediment from management activities under Alternatives 3 and 7 would not measurable (at the tributary scale) over those under the No-Action Alternative. The direct and indirect effects of canopy removal at localized sites would include altered snow accumulation patterns and melt rates. Some change in timing, and increases in the magnitude and quantity of flow would occur under these alternatives at individual sites. No measurable effects would be expected to occur in stream channel conditions. Alternatives 3 and 7 would not increase projected sediment yields in Honey Creek, but neither would they promote recovery.

Alternative 5: It is very likely that there would be negative impacts to the Honey Creek watershed as a result of management activities under Alternative 5.

Harvest would occur in approximately 33% of the Honey Creek watershed under Alternative 5, resulting in negative effects to the watershed as discussed below. Direct management effects could occur at localized sites in individual streams and at the tributary scale. Indirect downstream effects of management activity at the tributary and watershed scale could be measurable. Watershed benefits (direct, indirect and cumulative) associated with restoration activities would not outweigh cumulative effects of timber management in the Honey Creek watershed, as discussed below.

Proposed timber harvest within the Honey Creek drainage would result in approximately 327 acres of equivalent clearcut area (ECA), which amounts to an additional 21% of the watershed above baseline conditions (Project Files, Aquatics: Honey Creek WATSED Report, p. 29). The direct and indirect effects of large open areas would alter snow accumulation patterns and melt rates. Direct effects at individual channel sites would include changes in timing of flow along with increases in peak discharge and flow volume due to the increased rate of water delivery to soil, roads and ditches. In the event of a large precipitation event within 7 to 10 years of the harvest, stream adjustments involving both deposition and scour could occur in low-gradient reaches. These would be indirect effects from higher flows, higher stream velocities and channel erosion in headwater channels. Sediment inputs from harvest would be minimal because all streams will be buffered according to Inland Native Fish Strategy guidelines, reducing the pathways for sediment to enter the stream system.

Potential increases in sediment associated with logging roads under Alternative 5 could adversely affect local channel conditions in the short term. Inputs would be associated with harvest and existing spurs that intercept stream channels. Implementation of Best Management Practices would reduce potential sediment loading at these localized areas. Crossing failures could occur within units and along haul routes, which would degrade stream integrity at the site and could impact downstream reaches. Direct effects would include channel aggradation. Indirect effects could include channel widening and increased bank erosion. Short-term effects that occur will be mitigated in the long-term from road restoration activities discussed below. Approximately 2 miles of temporary road would be constructed to access harvest units. Most of this temporary road is high on the hillslope away from stream channels, but 0.5 miles of this new road could contribute fine sediment to streams due to proximity. All would be removed following the timber sale. Based on current information, no new stream crossings need to be constructed. As described in Chapter II (2.6.9 Features Common to All Action Alternatives, (A) Features Designed to Protect Aquatic Resources), if it is discovered during implementation that stream crossings need to be installed, they would be engineered to pass 100-year flood events to minimize the risk of failure.

The cumulative effects from harvest and roads in the Honey Creek watershed are difficult to predict with high precision. WATSED outputs, which are relative indicators of cumulative effects, suggest that the watershed is currently in a period of recovery from previous management activities in the late 1970's (Project Files, Aquatics: Honey Creek WATSED Report, pp. 19, 23). Annual sediment yield and peak flow are currently estimated at 239% and 6% over natural conditions, respectively (Table III-8). Monthly peak flows are currently decreasing and projected to continue to decrease. Sediment yields have stabilized. WATSED results estimate an additional 11% increase in sediment yield and 15% increase in peak flow over existing conditions as a result of proposed harvest activities (Project Files, Aquatics: Honey Creek WATSED Report, p. 21, 25). These modeled increases, which would peak immediately following harvest and progressively decline to pre-treatment levels, represent an interruption in the current recovery of the watershed of approximately five to nine years. A change of 11% is in the lower end of the range in which measurable changes in the stream itself would start to be a concern (for further discussion, please refer to Appendix D, "Watershed Hydrologic Response Estimates And WATSED").

Watershed restoration under Alternative 5 would include the removal of 10 stream crossings on 2 miles of road (reducing sediment risk by approximately 73 tons per year). The negative direct effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which is not expected to adversely affect overall channel conditions. Positive direct effects include removing the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities, bank erosion, peak flows and volume at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses. The benefits of restoration outweigh the risks of restoration activities, but would not outweigh the risks associated with harvest activities in Alternative 5.

Watershed restoration under Alternative 5 includes the obliteration of 0.1 miles of encroaching road segments. The direct effects include eliminating sediment sources and flow constrictions, reducing local velocities and bank erosion, and allowing the stream to access its flood-prone area; all of which reduce bank erosion and sediment inputs. Indirect effects include reducing sediment sources to downstream reaches, restoring natural stream hydraulic function, and improving fish habitat. Degraded reaches would recover following encroaching road removal, but channel improvement measures would expedite recovery. In-channel restoration would be conducted in conjunction with encroaching road removal. The work would initiate a more natural channel morphology, re-establish the flood-prone area, and promote higher sinuosity. A narrower and deeper channel with a greater percentage of pools and fewer riffles would result. Additional bank stability and complexity would be achieved with the addition of large woody debris and the planting of native vegetation along streambanks and in the flood prone area.

Alternative 6 and 8: The watershed benefits from restoration activities such as road obliteration and instream improvements would be greater than the potential impacts from management activities under these alternatives.

No commercial timber harvest would occur in the Honey Creek watershed under either Alternative 6 or 8. Harvest would occur in approximately 1% of the Honey Creek watershed under Alternative 6 to provide wood for watershed restoration projects within the analysis area. Watershed improvements from restoration under Alternative 6 and 8 would help promote channel condition improvement over the long term. Under Alternative 6, 24 stream crossings and 9 miles of hillslope road would be removed. Under Alternative 8, 10 stream crossings and 2 miles of road would be removed. The negative direct effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which is not expected to adversely affect overall channel conditions. Positive direct effects include removing the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities, bank erosion, peak flows and volume at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses. The benefits of restoration would considerably outweigh the risks associated with management activities and would compensate for any delay in recovery under Alternatives 6 and 8.

Effects of Implementing Opportunities: The effects of implementing aquatic restoration opportunities in the Honey Creek watershed (including removal of an additional 11 stream crossings and 5 miles of road) were analyzed and are displayed as "Alternative 8+" in the table below. This additional restoration would occur only if funding becomes available. The risk reduction estimate displayed in the table below is understated because several of the crossings have not been inventoried. Additional environmental benefits would be realized by removing crossings that will eventually fail and add sediment to the stream system.

Table III-8. Projected watershed response in the Honey Creek Watershed, by alternative.

WATERSHED NAME: Honey Creek Watershed	HUC: 17010301034806
TRIBUTARY: Honey Creek	HUC: 17010301034806

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt 8	Alt. 8+
Sediment yield (%) (1)	239	239	240	250	240	239	239	N/A
Peak flow (%) (2)	6	6	7	21	7	7	6	N/A
Net stream crossings (#) (3)	0	0	0	-10	-24	0	-10	-11
Net associated risk (t/yr) (4)	0	0	0	-73	-75	0	-73	-2
Net roads (miles) (5)	0	0	0	-3	-9	0	-2	-5
Net reduction of encroaching road (miles) (6)	0	0	0	-.1	-.1	0	-.1	0

1 Honey Creek WATSED Report, pp. 7-14, 23-26.
2 Honey Creek WATSED Report, pp. 7-14, 19-22.
3 GIS coverage of Project Area: stream crossings.
4 GIS coverages of Project Area: road restoration by Alternative.
5 Sediment Risk Analysis, pp. 5-8 (see Project Files).
6 Encroaching road inventories (see Project Files).

7. Effects in the Sob Creek Watershed

Alternatives 1 and 2: The watershed would continue to recover at a rate that is retarded by untreated sediment sources including stream crossings and encroaching roads.

No harvest would occur in the Sob Creek watershed under either alternative. Alternatives 1 and 2 would not increase projected sediment yields in Sob Creek, but neither would they promote recovery. Sediment yield and peak flow, currently estimated to be 156% and 6% above natural levels, would continue to decrease with vegetative recovery (Table III-9). The risk of rain on snow-generated peak flows would also be reduced. At the same time, peak flows (which would tend to flush excess sediment) would decrease while sediment input from encroaching roads and failing stream crossings would continue at elevated levels. The lower reaches of Sob Creek are very resilient A-channel types (Rosgen Classification), well vegetated and stable. These reaches are resilient enough to accommodate periodic inputs of sediment without serious channel adjustment. Hydrologic recovery would continue.

Alternatives 3 and 7: The watershed would continue to recover at a rate that is retarded by untreated sediment sources including stream crossings and encroaching roads.

Harvest would occur in approximately 2% of the Sob Creek watershed under Alternative 3, and in less than 1% of the watershed under Alternative 7. The cumulative effects from management activities over the No-Action Alternative would not be measurable at the tributary scale for increases in peak flows or sediment under Alternatives 3 or 7. The direct and indirect effects of canopy removal at localized sites under Alternatives 3 and 7 would include altered snow accumulation patterns and melt rates. Some change in timing and increases in the magnitude and quantity of flow would occur under these alternatives at individual sites. No measurable effects would be expected to occur in stream channel conditions under Alternative 3 or 7. Neither alternative would increase projected sediment yields in Sob Creek, nor would they promote recovery.

Alternative 5: It is very likely that there would be negative impacts to the Sob Creek watershed as a result of management activities under Alternative 5.

Harvest would occur in approximately 35% of the Sob Creek watershed under Alternative 5, which would likely result in negative effects to the watershed. Direct management effects would likely occur at localized sites in individual streams and at the tributary scale. Indirect downstream effects of management activity at the tributary and watershed scale would probably be measurable. There are no watershed restoration activities planned in the Sob Creek watershed under Alternative 5.

Proposed timber harvest within Sob Creek would result in approximately 192 acres of equivalent clearcut area (ECAs), which amounts to an additional 24% of the watershed over existing condition (Project Files, Aquatics: Sob Creek WATSED Report, pp. 12, 29). The direct and indirect effects of large open areas would alter snow accumulation patterns and melt rates. Direct effects at individual channel sites would include changes in timing of flow along with increases in peak discharge and flow volume due to the increased rate of water delivery to soil, roads and ditches. In the event of a large precipitation event within 7 to 10 years of the harvest, stream adjustments involving both deposition and scour could occur in low-gradient reaches. These would be indirect effects from higher flows, higher stream velocities and channel erosion in headwater channels. Sediment inputs from harvest would be minimal because all streams will be buffered according to Inland Native Fish Strategy guidelines, reducing the pathways for sediment to enter the stream system.

Potential increases in sediment associated with logging roads under Alternative 5 could adversely affect local channel conditions in the short term. Sediment input would be associated with harvest and existing spurs that intercept stream channels. Implementation of Best Management Practices would reduce potential sediment loading at these localized areas (Chapter II, 2.6.9 Features Common to All Action Alternatives,

A. Features Designed to Protect Aquatic Resources). Crossing failures could occur within units and along haul routes, which would degrade stream integrity at the site and could impact downstream reaches, directly resulting in channel aggradation. Indirect effects could include channel widening and increased bank erosion. Approximately 2.3 miles of temporary road would be constructed to access harvest units. This temporary road would be high on the hillslope away from stream channels and would be removed following the timber sale. Based on current information, no new stream crossings need to be constructed. As described in Chapter II (2.6.10 Mitigation), if it is discovered during implementation that crossings need to be installed, they would be engineered to pass 100-year flood events, which would minimize the risk of failure.

The cumulative effects from harvest and roads in the Sob Creek watershed are difficult to predict with high precision. WATSED outputs, which are relative indicators of cumulative effects, suggest that the watershed is currently in a period of recovery from previous management activities in the late 1970's (Project Files, Aquatics: Sob Creek WATSED Report, pp. 19, 23). Annual sediment yield and peak flow are currently estimated at 156% and 6% over natural conditions, respectively (Table III-9). Monthly peak flows are currently decreasing and projected to continue to decrease. Sediment yields have stabilized according to the model, but potential stream crossing failures are not modeled in WATSED and could increase sediment yields. WATSED results estimate an additional 20% increase in sediment yield and 17% increase in peak flow over existing conditions as a result of proposed harvest activities (Project Files, Aquatics: Sob Creek WATSED Report, p. 21, 25). These modeled increases, which would peak immediately following harvest and progressively decline to pre-treatment levels, represent an interruption in the current recovery of the watershed of approximately five to nine years. These increases predicted by WATSED could be measurable in the stream channel itself (please refer to the discussion in Appendix D, "Watershed Hydrologic Response Estimates And WATSED").

Alternatives 6 and 8: The watershed benefits from improvement activities such as road obliteration and would be greater than the potential impacts from management activities.

There would be no timber harvest in the Sob Creek watershed under either alternative. Watershed improvements from restoration under Alternative 6 and 8 would help promote channel condition improvement over the long term. Under Alternative 6, nine stream crossings (reducing sediment by 32 tons per year) and three miles of road would be removed. In Alternative 8, one stream crossing (reducing sediment by 18 tons per year) and 0.3 miles of road would be removed. The negative direct effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which is not expected to adversely affect overall channel conditions. Positive direct effects include removing the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities, bank erosion, peak flows and volume at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses. The benefits of restoration considerably outweigh the risks associated with management activities and would compensate for any delay in recovery under Alternatives 6 and 8.

Effects of Implementing Opportunities: The effects of implementing aquatic restoration opportunities in the Sob Creek watershed (including removal of an additional 8 stream crossings and 2.7 miles of road, reducing sediment by 14 tons per year) were analyzed and are represented in Table III-15 as "Alternative 8+." This additional restoration would occur only if funding becomes available. Additional environmental benefits similar to those discussed under the action alternatives would be realized by removing crossings that will eventually fail and add sediment to the stream system.

Table III-9. Projected watershed response in the Sob Creek Watershed, by alternative.

WATERSHED NAME: Sob Creek Watershed	HUC: 17010301034809
TRIBUTARY: Sob Creek	HUC: 17010301034809

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt 8	Alt. 8+
Sediment yield (%) (1)	156	156	156	176	156	156	156	N/A
Peak flow (%) (2)	6	6	8	23	6	7	6	N/A
Net stream crossings (#) (3)	0	0	0	0	-9	0	-1	-8
Net associated risk (t/yr) (4)	0	0	0	0	-32	0	-18	-14
Net roads (miles) (5)	0	0	+.1	+.3	-3	0	-.3	-2.7
Net reduction of encroaching road (miles) (6)	0	0	0	0	0	0	0	0

1 Sob Creek WATSED Report, pp. 7-14, 23-26.
2 Sob Creek WATSED Report, pp.7-14, 19-22.
3 GIS coverage of Project Area: stream crossings.
4 GIS coverages of Project Area: road restoration by Alternative.
5 Sediment Risk Analysis, pp. 5-8 (see Project Files).
6 Encroaching road inventories (see Project Files).

8. Effects to the Solitaire Creek Watershed

Alternatives 1 and 2: The watershed would continue to recover at a rate that is retarded by untreated sediment sources including stream crossings and encroaching roads.

There would be no harvest in the Solitaire Creek watershed under either Alternative 1 or 2. Sediment yield and peak flow, currently estimated to be 152% and 12% above natural levels, would continue to decrease with vegetative recovery (Table III-10). The risk of rain on snow-generated peak flows would also be reduced. However, the condition of the lower reaches in Solitaire Creek are not likely to improve until existing sediment sources on the hillsides are reduced. Peak flows (which would tend to flush excess sediment) are decreasing while sediment inputs from encroaching roads and failing stream crossings would continue at elevated levels, which promotes channel aggradation and bank erosion. Prior to the 1996 flood, beaver populated the lower portions of Solitaire Creek and parts of the west fork. The 1996 flood destroyed several dam complexes and the beaver have not repopulated. The lower reaches of Solitaire Creek underwent channel adjustment that is still continuing and the lower reaches have not re-stabilized. Bank erosion and in-channel sediment are likely to remain constant or increase in the lower reaches, and the risk of channel deterioration would remain high well into the future. Channel conditions would improve in Solitaire Creek over the long term, but at a slower rate than under Alternative 6.

Alternatives 3 and 7: Minor watershed benefits would occur from culvert removal.

Harvest would occur in approximately 1% of the Solitaire Creek watershed under Alternative 3, and in less than 1% of the watershed under Alternative 7. The cumulative effects from management activities over the No-Action Alternative would not be measurable at the tributary scale for increases in peak flows or sediment under Alternatives 3 and 7. The direct and indirect effects of canopy removal at localized sites would be altered snow accumulation patterns and melt rates. Some change in timing, and increases in the magnitude and quantity of flow would occur under these Alternatives at individual sites. No measurable effects would be expected to occur in stream channel conditions. Alternatives 3 and 7 would not increase projected peak flows or sediment yields in Solitaire Creek. Limited watershed recovery would be promoted by the removal of stream crossings (4 crossings (reducing sediment by 21 tons per year) on 2 miles of road under Alternative 3, and removal of 4 crossing upgrades (reducing sediment by 13 tons per year) under Alternative 7.

<u>Alternatives 5 and 8</u>: The watershed benefits from improvement activities (such as road obliteration) would be greater than the potential impacts from management activities.

Harvest would occur in approximately 20% of the Solitaire Creek watershed under either alternative. Alternatives 5 and 8 are very similar in terms of management and potential effects to the Solitaire Creek watershed. Proposed management activities would result in long-term benefits to the watershed. Direct management effects could occur at localized sites in individual streams. Indirect downstream effects of management activity at the tributary and watershed scale would not be measurable. Watershed benefits (direct, indirect and cumulative) associated with restoration activities would outweigh cumulative effects of timber management as discussed below.

Potential exists for stream impacts from timber harvest in Alternatives 5 and 8. Proposed timber harvest within Solitaire Creek would result in approximately 214 acres of equivalent clearcut area, which amounts to an additional 13% of the watershed over existing conditions (Project Files, Aquatics: Solitaire Creek WATSED Report, pp. 11, 12, 29). Harvest would be concentrated in the western and central portion of the drainage near stream channels. The direct and indirect effects of large open areas would include altered snow accumulation patterns and melt rates. Direct effects at individual channel sites would include changes in timing of flow along with increases in peak discharge and flow volume due to the increased rate of water delivery to soil, roads and ditches. In the event of a large precipitation event within 7 to 10 years of the harvest, stream adjustments involving both deposition and scour could occur in low-gradient reaches. These would be indirect effects from higher flows, higher stream velocities and channel erosion in headwater channels. Sediment input from harvest would be minimal because all streams would be buffered according to Inland Native Fish Strategy guidelines, reducing the pathways for sediment to enter the stream system.

Potential increases in sediment associated with logging roads under Alternative 5 and 8 could adversely affect local channel conditions in the short term. Inputs would be associated with harvest activities and crossings on Road 1525 and its associated spurs. Implementation of Best Management Practices would reduce potential sediment loading at these localized areas. Crossing failures could occur within units and along haul routes, which would degrade stream integrity at the site and could impact downstream reaches. Direct effects would include channel aggradation. Indirect effects could include channel widening and increased bank erosion. Short-term effects that occur would be mitigated over the long-term with road restoration activities (discussed below). A temporary one-quarter mile extension of Road 1525-UJT would be constructed to access harvest units. This temporary road would be high on the hillslope, well away from stream channels, and would be removed following the timber sale. Based on current information, no new stream crossings need to be constructed. As described in Chapter II (2.6.10 Mitigation), if it is discovered during implementation that crossings need to be installed, they would be engineered to pass 100-year flood events, which would minimize the risk of failure, and would be removed immediately after harvest is completed.

The cumulative effects from harvest and roads in the Solitaire Creek watershed are difficult to predict with high precision. WATSED outputs, which are relative indicators of cumulative effects, suggest that the watershed is currently in a period of recovery from previous management activities in the late 1970's (Project Files, Aquatics: Solitaire Creek WATSED Report, pp. 19, 23). Annual sediment yield and peak flow are currently estimated at 152% and 12% over natural conditions, respectively (Table III-10). Monthly peak flows are currently decreasing and projected to continue to decrease. Sediment yields have stabilized. WATSED results estimate an additional 7% increase in sediment yield and 8% to 9% increase in peak flow over existing conditions as a result of proposed harvest activities (Project Files, Aquatics: Solitaire Creek WATSED Report, p. 21, 25). These modeled increases, which would peak immediately following harvest and progressively decline to pre-treatment levels, represent an interruption in the current recovery of the watershed of approximately five to nine years. It is unlikely, however, that the increases predicted by WATSED would produce measurable changes in the stream itself. For example, assuming the 7% increase predicted by WATSED in average annual sediment yield is accurate, it would not be measurable on the ground because a 7% change in annual sediment yield is well within the normal range of variability for a

natural stream (for further discussion, see Appendix D, "Watershed Hydrologic Response Estimates And WATSED").

Watershed restoration under Alternatives 5 and 8 would include the removal of 32 and 36 stream crossings, respectively, on spurs of Roads 1525 and 1560 (reducing sediment by approximately 140 tons per year of sediment risk). The negative direct effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which is not expected to adversely affect overall channel conditions. Positive direct effects include removing the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities, bank erosion, peak flows and volume at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses. The benefits of restoration considerably outweigh the risks associated with management activities and would compensate for any delay in recovery under Alternatives 5 and 8.

Watershed restoration under Alternatives 5 and 8 includes the obliteration of one-tenth of a mile of encroaching road. The direct effects include eliminating sediment sources and flow constrictions, reducing local velocities and bank erosion, and allowing the stream to access its flood-prone area; all of which reduce bank erosion and sediment inputs. Indirect effects include reducing sediment sources to downstream reaches, restoring natural stream hydraulic function, and improving fish habitat. Degraded reaches would recover following encroaching road removal, but channel improvement measures would expedite recovery. In-channel restoration would be conducted in conjunction with encroaching road removal. The work would initiate a more natural channel morphology, re-establish the flood-prone area, and promote higher sinuosity. A narrower and deeper channel with a greater percentage of pools and fewer riffles would result. Additional bank stability and complexity would be achieved with the addition of large woody debris and the planting of native vegetation along streambanks and in the flood-prone area.

<u>Alternative 6</u>: Of all alternatives, Alternative 6 would provide the greatest watershed benefits to the Solitaire Creek drainage as a result of restoration activities (such as road obliteration and instream improvements).

Harvest would occur in approximately 2% of the Solitaire Creek watershed under Alternative 6. Watershed restoration would include the removal of 46 stream crossings on Roads 1525 and 1560 (reducing sediment risk by approximately 153 tons per year). The direct negative effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which is not expected to adversely affect overall channel conditions. Positive direct effects include removing the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities and bank erosion at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses.

Watershed restoration under Alternative 6 would include the obliteration of one-tenth of a mile of encroaching road. The direct effects of this obliteration would include eliminating sediment sources and flow constrictions, reducing local velocities, and allowing the stream to access its flood-prone area; all of which reduce bank erosion and sediment inputs. Indirect effects would include reducing sediment sources to downstream reaches, restoring natural stream hydraulic function, and improving fish habitat.

Table III-10. Projected watershed response in the Solitaire Creek Watershed, by alternative.

WATERSHED NAME: Solitaire Creek Watershed	HUC: 17010301035100
TRIBUTARY: Solitaire Creek	HUC: 17010301035100

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 8+
Sediment yield (%) (1)	152	152	152	158	15	152	158	N/A
Peak flow (%) (2)	12	12	12	21	12	12	20	N/A
Net stream crossings (#) (3)	0	0	-4	-32	-46	0	-36	0
Net associated risk (t/yr) (4)	0	0	-21	-140	-153	-13	-140	0
Net roads (miles) (5)	0	0	-2	-15	-19	0	-17	0
Net encroaching road (miles) (6)	0	0	0	-.1	-.1	0	-.1	0

1 Solitaire Creek WATSED Report, pp. 7-14, 23-26.
2 Solitaire Creek WATSED Report, pp. 7-14, 19-22.
3 GIS coverage of Project Area: stream crossings.
4 GIS coverages of Project Area: road restoration by Alternative.
5 Sediment Risk Analysis, pp. 5-8 (see Project Files).
6 Encroaching road inventories (see Project Files).

9. Effects to Face Drainages of the Little North Fork

Alternatives 1, 2, 3 and 7: The watershed would continue to recover at a rate that is retarded by untreated sediment sources including stream crossings and encroaching roads.

No management activity is proposed in the face drainages under Alternatives 1, 2, 3 or 7. Sediment risk reductions shown in Table III-11 are due to stream crossing upgrades recently completed on Road 385.

Alternative 6: Of all alternatives, Alternative 6 would provide the greatest watershed benefits in the face drainages of the Little North Fork, as a result of restoration activities such as road obliteration and instream improvements.

No commercial timber harvest would occur under Alternative 6; however, harvest would occur in less than 1% of the Little North Fork face drainages to provide wood for watershed restoration projects within the analysis area. Watershed restoration under Alternative 6 would include the removal of 27 stream crossings (reducing sediment risk by approximately 94 tons per year). The negative direct effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which would not be expected to adversely affect overall channel conditions. Positive direct effects include eliminating the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities and bank erosion at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses.

Watershed restoration under Alternative 6 would include the obliteration of one mile of encroaching road segments. The direct effects of this obliteration would include eliminating sediment sources and flow constrictions, reducing local velocities, and allowing the stream to access its flood-prone area; all of which reduce bank erosion and sediment inputs. Indirect effects would include reducing sediment sources to downstream reaches, restoring natural stream hydraulic function, and improving fish habitat.

Alternatives 5 and 8: The watershed benefits from improvement activities (such as road obliteration and instream improvements) would be greater than the potential impacts from management activities.

Harvest would occur in approximately 20% of the Little North Fork face drainages under Alternative 5, and in approximately 11% of the drainages under Alternative 8. Proposed management in the face drainages under Alternatives 5 and 8 would result in long-term benefits to the watershed. Direct and indirect management effects could occur at localized sites in individual streams and in reaches of the Little North Fork. Watershed benefits (direct, indirect and cumulative) associated with restoration activities would outweigh cumulative effects of timber management as discussed below.

There is potential for localized stream impacts from timber harvest under Alternatives 5 and 8. Proposed timber harvest within the face drainages would result in 321 acres of equivalent clearcut area (10% of the face drainage area). Harvest would extend along the east side of the Little North Fork between Tom Lavin and Honey Creeks. The direct and indirect effects of large open areas would alter snow accumulation patterns and melt rates. Direct effects at individual channel sites would include changes in timing of flow along with increases in peak discharge and flow volume due to the increased rate of water delivery to soil, roads and ditches. In the event of a large precipitation event within 7 to 10 years of the harvest, stream adjustments involving both deposition and scour could occur in low-gradient reaches. These would be indirect effects from higher flows, higher stream velocities and channel erosion in headwater channels. The most vulnerable area is a 1.5-mile reach just upstream of Solitaire Creek, where Unit 10 would be located from 300 to 500 feet from the Little North Fork Coeur d'Alene River. In the case of a large flood, stream adjustments involving both deposition and scour could occur in low-gradient reaches between Solitaire and Hudlow Creek, degrading the integrity of functioning-at-risk reaches. Sediment input from harvest would be minimal because all streams would be buffered according to Inland Native Fish Strategy guidelines, reducing the pathways for sediment to enter the stream system.

Potential increases in sediment associated with logging and roads under Alternative 5 and 8 would not be expected to adversely affect channel conditions. Limited, short-term sediment input could occur at localized areas within individual tributaries just north of Solitaire Creek. Input would be associated with existing Roads 1525 and 6728, both of which intercept stream channels. Implementation of Best Management Practices would reduce potential sediment loading at these localized areas. There are only 2 inventoried crossings and one uninventoried crossing associated with the harvest units, which do not represent a serious risk to aquatic resources. However, crossing failures could occur along haul routes, which would degrade stream integrity at the site and could impact downstream reaches. Direct effects would include channel aggradation. Indirect effects could include channel widening and increased bank erosion. Short-term effects that occur would be reduced over the long-term as a result of road restoration activities discussed below. Approximately 1.5 miles of new temporary roads would be constructed to access harvest units. Most of these roads would be high on the hill slope well away from stream channels, and would be removed following the timber sale. There are two locations where new stream crossings might need to be constructed. If so, they would be engineered to pass 100-year flood events, which would minimize the risk of failure. These crossings would be removed immediately following harvest operations. Neither the use of the existing roads nor the construction of new temporary roads is expected to negatively affect aquatic resources.

Cumulative effects to face drainages of the Little North Fork Coeur d'Alene River (associated with timber harvest and roads) were not analyzed in the same way as other watersheds in the project area. The face drainages are not true watersheds; they are parts of a larger watershed that extends from the headwaters of the Little North Fork to just below the outlet of Hudlow Creek. WATSED is only appropriate for analyzing true watersheds and was not run explicitly for the face drainages. Cumulative effects in the faces drainages would occur at the scale of the project area and are discussed under "Cumulative Effects Beyond the Project Area (to the Coeur d'Alene River Above Skookum)."

Watershed restoration under Alternatives 5 and 8 would include the removal of 6 stream crossings and an associated risk of approximately 80 tons per year (Table III-11). Restoration would occur on Road 209 west of the Little North Fork and on Road 1525. The negative direct effect of crossing removal would include a short-term introduction of fine sediment at individual sites, which is not expected to adversely affect overall

channel conditions. Positive direct effects include removing the risk of crossing failure that could introduce tons of excess bedload into the stream system. Removing culverts eliminates flow constriction, which reduces flow velocities, bank erosion, peak flows and volume at local sites. Indirect effects of the crossing removal includes reducing bedload sources to downstream reaches, reducing risks of catastrophic channel failures, and allowing the streams to dynamically adjust to flows and sediment. Sediment routing to downstream reaches would decrease providing improved conditions for beneficial uses. The benefits of restoration considerably outweigh the risks associated with management activities and would compensate for any delay in recovery under Alternatives 5 and 8.

Watershed restoration under Alternatives 5 and 8 would include the obliteration of one mile of encroaching road segments on Road 209 (Table III-11). The direct effects of this obliteration would include eliminating sediment sources and flow constrictions, reducing local velocities and bank erosion, and allowing the stream to access its flood-prone area; all of which reduce bank erosion and sediment inputs. Indirect effects would include reducing sediment sources to downstream reaches, restoring natural stream hydraulic function, and improving fish habitat. Degraded reaches would recover following encroaching road removal, but channel improvement measures would expedite recovery. In Alternatives 5 and 8, approximately 2 miles of in-channel restoration would include channel reconstruction and riparian restoration. Alternative 8 includes an additional 0.5 miles of in-channel restoration extending into Honey Creek. The work would initiate a more natural channel morphology, re-establish the flood-prone area, and promote higher sinuosity. A narrower and deeper channel with a greater percentage of pools and fewer riffles would result. Additional bank stability and complexity would be achieved with the addition of large woody debris and the planting of native vegetation along streambanks and in the flood prone area.

Effects of Implementing Opportunities: The effects of implementing aquatic restoration opportunities in the face drainages of the Little North Fork Coeur d'Alene River (including removal of an additional 21 stream crossings on spurs of Roads 1506 and 385, reducing sediment by 14 tons per year) were analyzed and the results displayed as "Alternative 8+" in Table III-11. This additional restoration would occur only if funding becomes available. Additional environmental benefits similar to those discussed above would be realized by removing crossings that will eventually fail and add additional sediment to the stream system.

Table III-11. Projected watershed response in the Upper Little North Fork of the Coeur d'Alene River Face above Iron Creek, by alternative.

WATERSHED NAME: Upper Little North of the Coeur d'Alene River Face	HUC:170103010327
TRIBUTARY: Little North Fork Face above Hudlow Creek	HUC:170103010327

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt.8	Alt. 8+
Net stream crossings (#) (1)	0	0	0	-6	-27	0	-6	-21
Net associated risk (t/yr) (2)	-6	-6	-6	-80	-94	-6	-80	-14
Net roads (miles) (3)	0	0	0	-6	-16	0	-4	-12
Net reduction of encroaching road (miles) (4)	0	0	0	-1	-1	0	-1	0

1 GIS coverage of Project Area: stream crossings.
2 GIS coverages of Project Area: road restoration by Alternative.
3 Sediment Risk Analysis, pp. 5-8 (see Project Files).
4 Encroaching road inventories (see Project Files).

C. Effects to Fisheries at the Watershed Scale

1. Riparian Harvest

Under Alternatives 2, 5 and 8, temporary road would be constructed across Riparian Habitat Conservation Areas (RHCA's) to access timber harvest units within some of the watersheds (as displayed in the table below). Loss of riparian habitat does not benefit the Management Indicator Species for fish. Alternatives 1

and 6 propose no new road construction, so there would be no change in riparian vegetation. Alternative 5 would remove the greatest amount of riparian vegetation. Alternative 8 has the next highest level of incursion into RHCA's with roads. Although roads would be constructed under Alternatives 3 and 7, they would not enter RHCA's. The majority of these channel crossings are in intermittent drainages and all are in stream reaches where fish are not present. Some of the crossings may be within swales, which have no defined channel and limited ability to move sediment or transport wood. These areas would only be active during snowmelt or summer storm events. The value of zero in the table means no loss of riparian vegetation would occur. No timber harvest units would occur within RHCA's.

There would likely be no measurable change in stream temperature within the fisheries reaches (increases in temperatures should be localized within the intermittent reaches). In addition to removing shade, the removal of riparian habitat under Alternatives 2, 5 and 8 would reduce the amount of large woody debris that is eventually incorporated into the stream. The direct effect of this would be less wood in the channel. The indirect effect would be a slight reduction in pool habitat, increased channel gradient and stream velocity. The cumulative effect would be limited to reduced fish numbers in small downstream reaches contiguous to the removal of riparian habitat. The small amount of riparian harvest, in combination with its localized effect, would not result in a significant cumulative effect to Management Indicator Species within the fifteen cumulative watershed effect areas.

Table III-12. Approximate amount (feet) of vegetation removed within Riparian Habitat Conservation Areas.

Watershed	Alternatives 1, 3, 6 and 7	Alternative 2	Alternative 5	Alternative 8
North Fork Coeur d' Alene River (total, above and including Hudlow)	0	35	235	185
Hudlow Creek (Middle Fork and lower)	0	0	0	0
Hudlow Creek (East Fork)	0	0	0	0
Hudlow Creek (West Fork)	0	0	0	0
Iron Creek (total)	0	35	35	35
Rusty Creek	0	0	0	0
Cataract Creek	0	35	35	35
Moose Creek	0	0	0	0
Silver Run Creek	0	0	0	0
Rablens Fork Creek	0	0	0	0
Little North Fork Coeur d'Alene River (above Iron Creek)	0	0	200	150
Honey Creek	0	0	0	0
Lewelling Creek	0	0	0	0
Sob Creek	0	0	0	0
Solitaire Creek	0	0	50	0
Tom Lavin Creek	0	0	0	0

2. Sediment Delivery Risk

All action alternatives would reduce long-term sediment risk associated with culvert failure.

There would be short-term effects related to new culverts crossing streams and new roads (as displayed in Table III-13). Any value greater than zero is a short-term increase in risk. In contrast, values in the long-term effects are the amount of annual risk of sediment delivery. Any value in these columns less than under Alternative 1 (a greater negative value) is a reduction in risk, while any values greater than Alternative 1 is an increased risk (smaller negative value).

In all watersheds, Alternative 6 would have the highest amount of sediment risk reduction as a direct result of road channel crossing upgrades (increased culvert size to meet 100-year-flow) and the removal of road channel crossings and encroaching roads. Alternatives 8, 5, 2, and 7 respectively, would have the next highest risk reduction in sediment delivery as a direct result of road channel crossing upgrades on roads to access timber harvest units and the removal of unmaintained crossings and roads. The No-Action Alternative (Alternative 1) would have the lowest risk reduction in sediment delivery. Reductions in the risk of sediment delivery should be paralleled by decreases in bedload and sediment, thus changes in stream morphology could be positively affected, having net benefits to the composition and quality of fish habitat. The small amount of road building in riparian areas, in combination with upgrading culverts (thereby reducing risk) would not result in a significant cumulative effect to the Management Indicator Species within the watershed.

3. Estimated Sediment Yield

Alternatives 2, 5, 6, 7, and 8 would reduce long-term sediment yield. Alternatives 1 and 3 would not reduce long-term sediment yield.

Given the amount of roads within the cumulative effects areas, the benefits of restoration activities would vary by alternative, as displayed in the figures below. With no foreseeable removal of stream channel crossings under Alternative 1, there would be no short-term decrease in sediment in any of the watersheds. Alternative 6 would have the greatest positive effect with negligible management impacts and an estimated sediment yield reduction of 94%, followed by Alternative 8 (with an estimated 50% reduction in sediment yield), Alternative 2 (with an estimated 35% reduction in sediment yield), and Alternative 5 (with an estimated 27% reduction in sediment yield).

WATSED modeling indicates that Alternative 3 would provide no reduction in estimated sediment yield, which is not consistent with the risk assessment (Figures III-5). This was because the WATSED model was not sensitive enough to detect the limited culvert removals associated with Alternative 3.

It is anticipated that the watershed restoration under Alternatives 5 and 8 would have a greater positive effect because fish populations within the Little North Fork are greater than in Iron Creek. There would be a short-term increase in sediment under all alternatives with the placement of stream crossings on newly constructed roads. Under Alternative 5, there would be a short-term increase in sediment with a slight long-term reduction in Honey Creek.

Figure III-6. WATSED results for Alternatives 1 and 3 (change in average annual sediment yield).

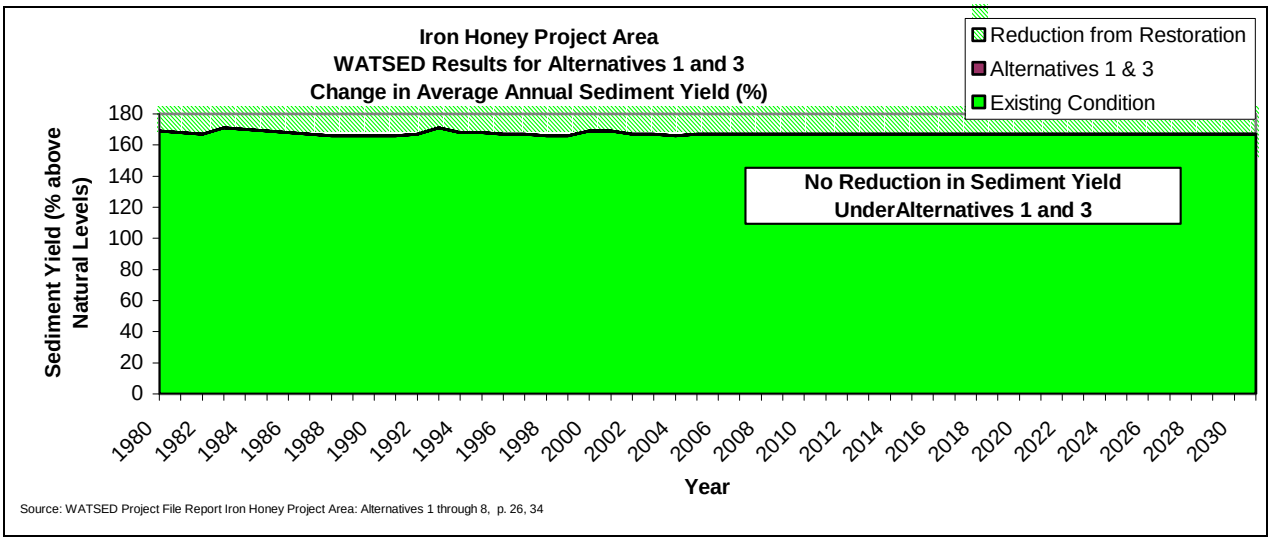


Figure III-7. WATSED results for Alternatives 2 and 7 (change in average annual sediment yield).

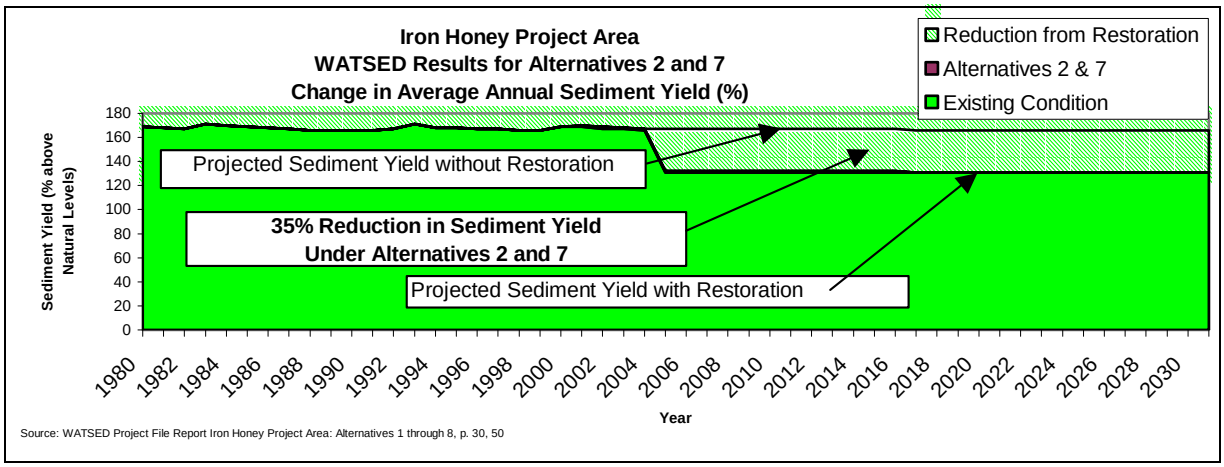


Figure III-8. WATSED results for Alternative 5 (change in average annual sediment yield).

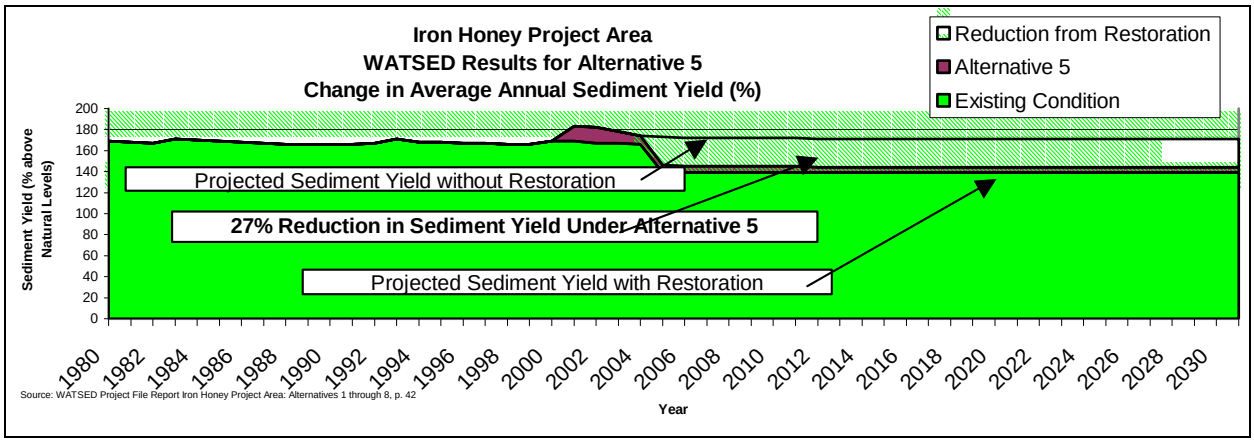


Figure III-9. WATSED results for Alternative 6 (change in average annual sediment yield).

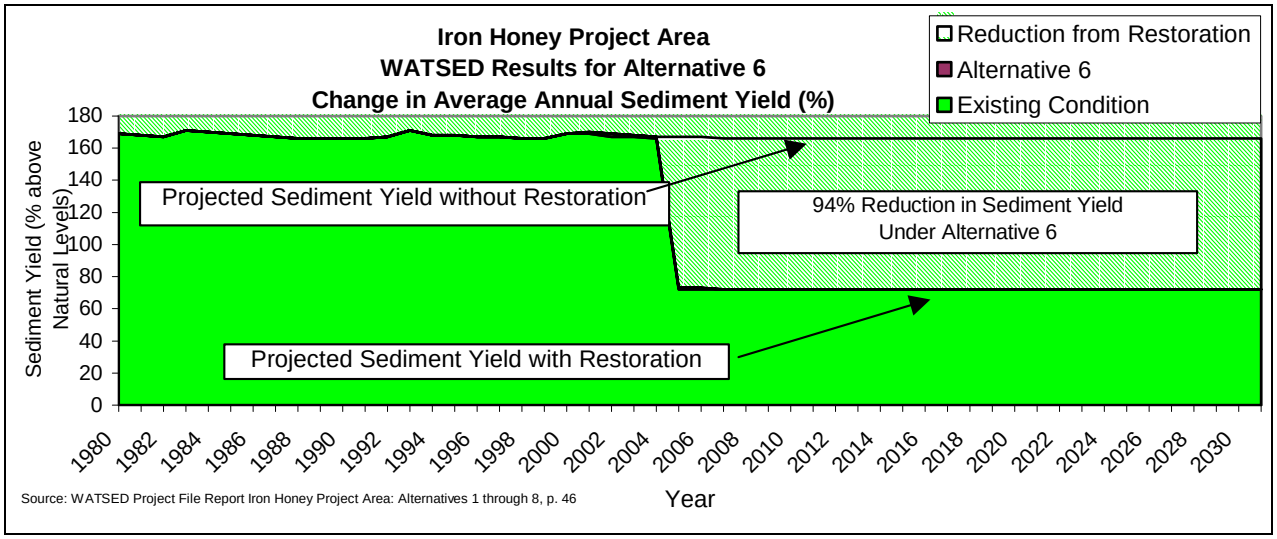
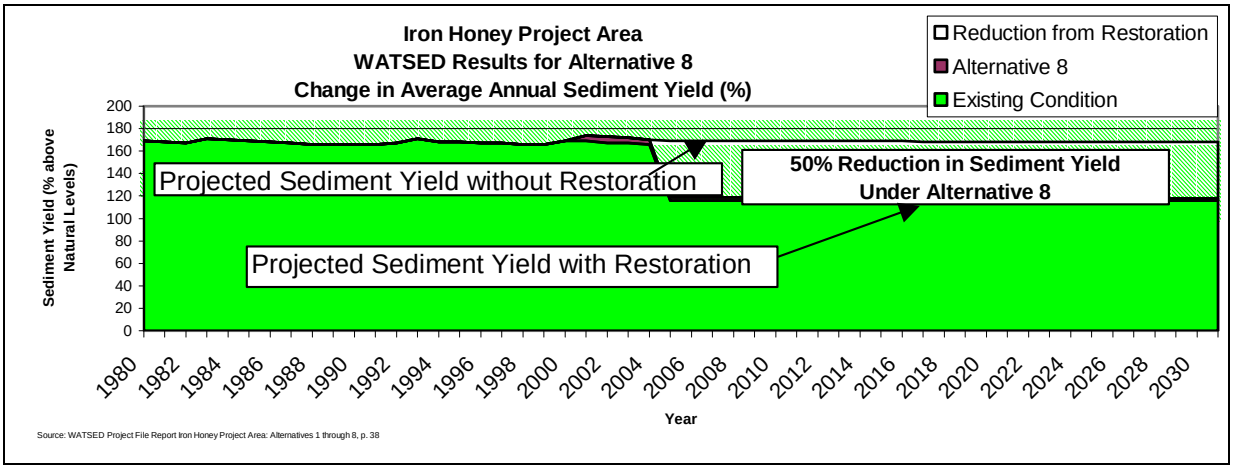


Figure III-10. WATSED results for Alternative 8 (change in average annual sediment yield).



The effects of implementing restoration opportunities were analyzed and are displayed as "Alternative 8+" in the figure below. This additional restoration would occur only if funding becomes available, as described in Chapter II (2.5 Opportunities).

Figure III-11. WATSED results of implementing restoration opportunities, displayed as Alternative 8+ (change in average annual sediment yield).

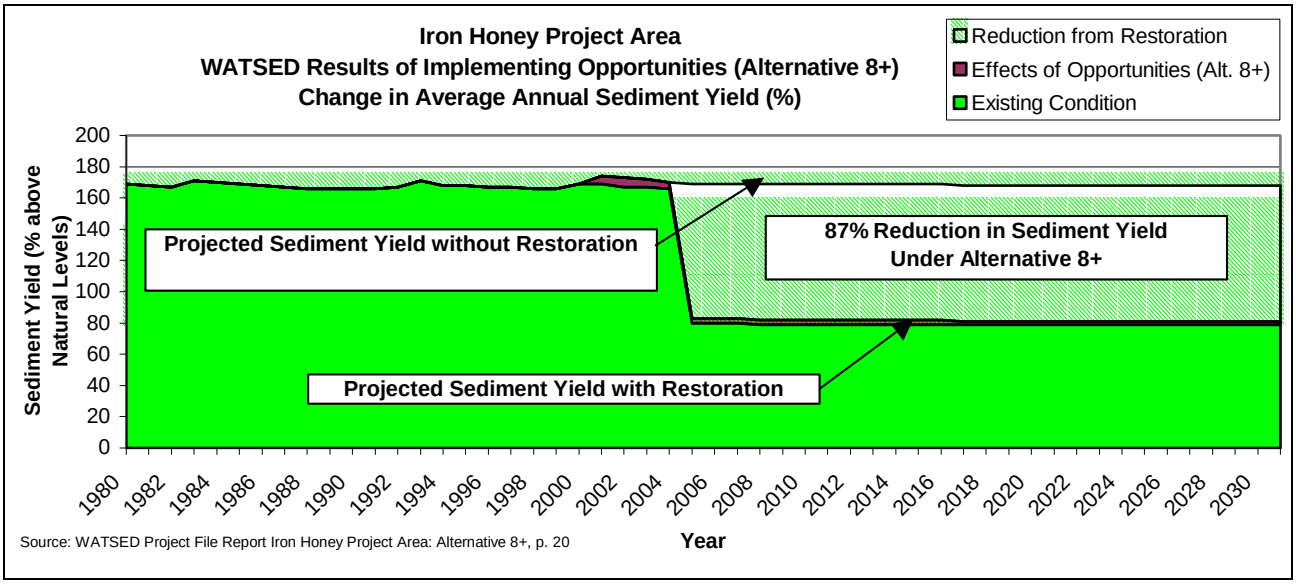


Table III-13. Approximate amount of sediment delivery risk associated with roads and stream crossing restoration activities.

HUC	Alt. 1 ST	Alt. 1 LT	Alt. 2 ST	Alt. 2 LT	Alt. 3 ST	Alt. 3 LT	Alt. 5 ST	Alt. 5 LT	Alt. 6 ST	Alt. 6 LT	Alt. 7 ST	Alt 7 LT	Alt. 8 ST	Alt. 8 LT
North Fork Coeur d' Alene (total, above and including Hudlow)	0/0	-50	0.7/1	-477	0.4/0	-158	11.4/5	-668	0/0	-1185	0.7/1	-565	5/4	-929
Hudlow – Middle Fork	0/0	0	0/0	0	0/0	0	0.8/0	0	0/0	0	0/0	0	0/0	0
Hudlow – East Fork	0/0	0	0/0	0	0/0	0	0/0	0	0/0	0	0/0	0	0/0	0
Hudlow – West Fork	0/0	0	0/0	0	0/0	0	0/0	-17	0/0	-17	0/0	0	0/0	0
Iron Creek (total)	0/0	0	0.7/1	-427	0/0	-15	0.7/1	-83	0/0	-458	0.7/1	-419	0.7/1	-425
Rusty Creek	0/0	0	0/0	NI	0/0	NI	0/0	NI	0/0	NI	0/0	NI	0/0	NI
Cataract	0/0	0	0.5/1	-116	0/0	0	0.5/1	-7	0/0	-116	0.5/1	-116	0.5/1	-116
Moose	0/0	0	0.2/0	NI	0/0	NI	0.2/0	NI	0/0	NI	0.2/0	NI	0.2/0	NI
Silver Run	0/0	0	0/0	NI	0/0	NI	0/0	NI	0/0	NI	0/0	NI	0/0	NI
Rablens Fork	0/0	0	0/0	-131	0/0	0	0/0	-0	0/0	-146	0/0	-131	0/0	-131
Upper Iron Creek	0/0	0	0/0	-15	0/0	0	0/0	0	0/0	-15	0/0	-15	0/0	-15
Little North Fork Coeur d'Alene River (above Iron Creek)	0/0	-50	0/0	-50	0.4/0	-154	4.6/4	-566	0/0	-708	0/0	-146		-504
Honey	0/0	0	0/0	0	0/0	0	1.7/0	-73	0/0	-75	0/0	0	0/0	-73
Lewelling	0/0	0	0/0	0	0.2/0	-70	0/0	-70	0/0	-79	0/0	-70	0/0	0
Sob	0/0	0	0/0	0	0.2/0	0	2.3/1	0	0/0	-32	0/0	0	0/0	-18
Solitaire	0/0	0	0/0	0	0/0	-21	0.6/1	-140	0/0	-153	0/0	-13	0.6/1	-140
Tom Lavin	0/0	-4	0/0	-4	0/0	-16	0/0	-16	0/0	-31	0/0	-4	0/0	-4
Upper Little North Fork	0/0	-40	0/0	-40	0/0	-40	0/0	-189	0/0	-243	0/0	-40	0/0	-189
Face drainages of the Little North Fork	0/0	-6	0/0	-6	0/0	-6	2.2/2	-80	0/0	-94	0/0	-6	2.2/2	-80

Sediment risk reduction values are those that would be delivered at the mouth of the stream or bottom of a reach. Data is for roads used in alternatives and inventoried stream crossings.

ST *(short term) effects = represented by the approximate miles of new road (temporary and permanent road miles) and the approximate number of new stream crossings (permanent, temporary, and reinstalled).*

LT *(long term) effects = represented by the potential reduction or addition of yearly sediment that could be delivered from the inventoried transportation system. Transportation systems include both non-system and system roads. Risk reduction includes the upgrading and/or removal of stream crossings (risk of failure multiplied by sediment volume).*

NI *(no inventory) = no risk sites were inventoried*

4. Increased Fish Passage

Alternatives that remove barriers to fish passage would be a benefit to the Management Indicator species. The greatest amount of habitat would be made available to fish under Alternative 6, followed by Alternatives 8, 2, 7, 5 3, and 1, respectively. The removal of barriers (through culvert removal and upgrades) allows the fish to utilize more habitat than is present under the existing conditions and may lead to more genetic diversity by reconnecting isolated stocks of fish. These projects would have no cumulative negative effects to the Management Indicator Species within the 15 cumulative watershed effect areas. In contrast, where passage is increased, there would likely be a direct benefit to the Management Indicator Species.

Table III-14. Miles of increased fish passage.

Watershed	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Little North Fork Coeur d' Alene River (total, above and including Hudlow)	0	1.7	0.4	0.8	2.5	1.7	2.1
Honey	0	0	0	0	0	0	0
Hudlow (Middle Fork and lower)	0	0	0	0	0	0	0
Hudlow (East Fork)	0	0	0	0	0	0	0
Hudlow (West Fork)	0	0	0	0	0	0	0
Iron Creek (Total)	0	1.7	0.4	0.4	1.7	1.7	1.7
Rusty Creek	0	0.4	0.4	0.4	0.4	0.4	0.4
Cataract	0	0	0	0	0	0	0
Moose	0	0	0	0	0	0	0
Silver Run	0	0.8	0	0	0.8	0.8	0.8
Rablens Fork	0	0.5	0	0	0.5	0.5	0.5
Little North Fork Coeur d'Alene River (above Iron)	0	0	0	0.4	0.8	0	0
Lewelling	0	0	0	0	0.4	0	0
Sob	0	0	0	0	0	0	0
Solitaire	0	0	0	0.4	0.4	0	0.4
Tom Lavin	0	0	0	0	0	0	0

5. Reduced Length of Encroachment by Roads

Alternatives that reduce the length of encroaching roads would have a short-term increase in sediment but would result in a long-term benefit to Management Indicator Species. Alternative 6 would remove the largest amount of roads encroaching on riparian habitat and flood prone areas, followed by Alternatives 8, 2, 7 and 5. In the short term, there would be an increase in fine sediment and reduction in cover where the road prism is currently in contact with the stream. Reduction of this encroachment over the long term would allow the stream courses to settle into a regime where the stream course would be able to interact with the flood plain. Large wood recruitment would improve over time as these areas regenerate to forest and provide fallen trees into the stream and riparian areas. Habitat complexity would increase and provide more pool and hiding/resting habitat for fish. There would be an immediate short-term increase with the addition of wood during the removal of the road and long-term increase with the recovery of the riparian area, the greatest being observed in Alternatives 6 and 8. Sediment would slowly go into storage behind these obstructions, and should result in less bedload movement through the system.

The short-term increase in sediment delivery in combination with the long-term benefit associated with the removal of encroaching roads would not result in a significant cumulative effect to the Management Indicator Species within the fifteen cumulative watershed effect areas. Given the amount of encroaching roads within the cumulative effects areas, the benefits of restoration activities would be very positive under Alternative 6 and 8, and to a lesser extent under Alternative 2, but is a necessary first step towards restoration of watersheds.

Table III-15. Reduction of encroaching roads (approximate miles) by alternative.

Watershed	Alt. 1 ST	Alt. 1 LT	Alt. 2 ST	Alt. 2 LT	Alt. 3 ST	Alt. 3 LT	Alt. 5 ST	Alt. 5 LT	Alt. 6 ST	Alt. 6 LT	Alt. 7 ST	Alt. 7 LT	Alt. 8 ST	Alt. 8 LT
Little North Fork Coeur d' Alene River (above and including Hudlow)	nc	0	s	2.1	nc	0	s	1.5	s	3.8	s	2.1		3.6
Hudlow (MF and lower)	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0
Hudlow (EF)	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0
Hudlow (WF)	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0
Iron Creek (total)	nc	0	s	2.1	nc	0	nc	0	s	2.1	s	2.1	nc	2.1
Rusty Creek	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0
Cataract	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0
Moose	nc	0	s	0.1	nc	0	nc	0	s	0.1	nc	0	nc	0
Silver Run	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0
Rablens Fork	nc	0	s	0.8	nc	0	nc	0	s	0.8	s	0.8	s	0.8
Little North Fork Coeur d'Alene River (above Iron)	nc	0	nc	0	nc	0	s	1.5	s	1.7	nc	0	s	1.5
Honey	nc	0	nc	0	nc	0	s	0.1	s	0.1	nc	0	s	0.1
Lewelling	nc	0	nc	0	nc	0	nc	0	s	0.1	nc	0	nc	0
Sob	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0
Solitaire	nc	0	nc	0	nc	0	s	0.1	s	0.1	nc	0	s	0.1
Tom Lavin	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0	nc	0
Upper Little North Fork	nc	0	nc	0	nc	0	s	0.3	s	0.3	nc	0	s	.03
Face drainages Little North Fork	nc	0	nc	0	nc	0	s	1.0	s	1.0	nc	1.0	s	1.0

LT (long term) = miles of encroaching roads reduced.
ST (short term) = a short-term increase in sediment; "nc" means there would be no change, "s" means there would be a short-term change.

D. Effects to Fisheries at the Cumulative Effects Area Scale (Hudlow Creek and Above)

Alternative 1 (No-Action): The watershed would continue to recover at a rate that is retarded by untreated sediment sources including stream crossings and encroaching roads.

The natural hydrologic and sediment regime of the Upper Little North Fork has been altered by past management. Sediment yields for the Iron Honey project area (Hudlow Creek and above) are estimated to be 169% of natural levels and peak flows are estimated to be elevated by 8% (Table III-22). Instream impacts from flumes and splash dams have not significantly recovered in many stream reaches. When the cumulative effects analysis area is extended to Skookum Creek, sediment yields are estimated to be 187% over natural levels and peak flows are estimated to be elevated by 8% (Table III-23).

In general, two watershed effects would be expected under the No-Action Alternative: a gradual decrease in the elevated peak flows along with an increase in sediment inputs. The natural streamflow regime would continue to recover from past management as the watershed revegetated. Elevated peak flows would and water yields would decrease into the future. The risk of rain-on-snow generated peak flows would also be reduced with vegetative recovery. However, encroaching streamside road segments in the Upper Little North Fork and its tributaries would continue to erode, degrading the stream channel and associated water quality. Particularly impacted reaches include the Upper Little North Fork between Sob and Solitaire Creeks, which is marked by an alternating pattern of severely downcut reaches interspersed with severely aggraded reaches (please refer to the figures below). Sediment eroded from the downcut reach of the Little North Fork Coeur d'Alene River has been deposited downstream to the aggraded reach. Aggradation is so severe that the flow has gone subsurface.

Figure III-12. Downcut Reach – Little North Fork.

Figure III-13. Aggraded Reach – Little North Fork.

In addition to encroaching roads, sediment inputs from stream crossing failures on old hillslope roads would continue to occur indefinitely into the future, particularly in the Iron Creek tributary. Watershed conditions are not likely to improve until sediment sources are removed, natural hillslope processes are restored, and stream channels are stabilized. Elevated sediment inputs would be expected to continue aggrading stream reaches causing accelerated bank erosion and in-channel sediment. The risk of channel deterioration would remain high well into the future. Without water resource improvement work, channel conditions in many stream reaches would get worse before they improve and delay recovery for long periods of time.

Historically, basins in the Iron Honey Resource Area had abundant populations of cutthroat trout and bull trout. Currently, only Lewelling, Tom Lavin and short reaches of the Little North Fork of the Coeur d' Alene River (above Iron Creek) have strong populations of cutthroat and none has a viable population of bull trout. The population trend of the cutthroat was in a rapid decline but now appears to be stabilizing.

The No-Action Alternative could increase the level of risk to these species although no actions will take place. Two watershed effects would be expected: a gradual reduction of water yields and an increase in sediment inputs. The streamflow regime would continue to recover from past timber harvest as the watershed revegetated. However, encroaching streamside road segments in the Upper Little North Fork and its tributaries would continue to erode, degrading the stream channel and associated water quality. Elevated sediment inputs from encroaching road and stream crossing failures, exceeding those under which the stream system developed would be expected to aggrade stream reaches causing accelerated bank erosion and inchannel sediment. As a result, the risk of channel deterioration would remain high well into the future. The No-Action Alternative would result in no change in the current condition or trend in the Management Indicator Species in any of the watersheds, which currently have a stable population of cutthroat in basins where private land owners have limited influence, a declining population of

adfluvial cutthroat in basins where private land owners alter stream channels, and a non-viable population of bull trout.

Ongoing and reasonably foreseeable activities would have no incremental negative effect that would result in a cumulative effect to any of the watersheds. There would be no measurable effects to fish under the No-Action Alternative.

Tables are provided for each alternative to portray cumulative effects of the ongoing and proposed activities on management indicator fish species (including the reasonably foreseeable activities described in Chapter II), and are designed to show the trend that would be attained with each of the alternatives, by watershed analysis area. These calls integrate the preceding evaluations of habitat components and the foreseeable actions described above, and indicate the composite rating of the cumulative effects of the all actions in an alternative on the Management Indicator Species and summarized by the cumulative watershed effects areas.

Definitions

NI - No impact means that there would likely be no net positive or negative effect to the population within the cumulative watershed effects areas. No change in riparian or streamconditions.

MI - May impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species indicates the action taken within the watershed is limited in nature but would result in a net benefit to individuals when compared to the existing condition, or indicates the action taken within the watershed is limited in nature but would result in a net harm to individuals when compared to the existing condition. Actions that result in the reduction of risk to individuals include isolated culvert upgrades and small scale reduction of encroaching roads with little increased risk associated with road building or riparian harvest. A change in stream and riparian conditions so that Riparian Management Objectives are trended towards at the segment or reach scale. Actions that result in the increased of risk to individual include road building or harvesting riparian areas without a widespread effort to upgrade culverts and reduction of encroaching roads. A change in stream and riparian conditions so that Riparian Management Objectives are trended away from at the segment or reach scale.

LI – Likely to impact individuals or habitat with a consequence that the action may contribute toward federal listing or result in reduced viability for the population or species indicates the actions is broad enough in scope to effect individuals throughout the basin thereby improving the condition of the population within the cumulative watershed effects area when compared to the existing conditions or indicates the action taken within the watershed is widespread and would result in a net harm to individuals when compared to the existing condition.. Actions that result in the reduction of risk to populations include widespread culvert upgrades, large-scale reduction of encroaching roads, and/or increased fish passage without increased risk associated with road building or riparian harvest. A significant change in stream and riparian conditions so that Riparian Management Objectives are trended towards at the subwatershed scale. Actions that result in the increased of risk to populations include widespread road building without a widespread effort to upgrade culverts and the reduction of encroaching roads.

BI - Beneficial indicates the action could affect individuals, but will be beneficial in the long term to individuals or populations. Actions that result in a benefit to individuals or populations include widespread culvert upgrades, large-scale reduction of encroaching roads, and/or increased fish passage without increased risk associated with road building or riparian harvest. A beneficial impact would mean a significant change in stream and riparian conditions at the subwatershed scale, trending toward Riparian Management Objectives.

Status: **NO BT** – No bull trout recently found within basin
Status: **NO WCT** – No westslope cutthroat trout recently found within basin

Table III-16. Direct and Indirect Effects to Management Indicator Fish Species, Alternative 1.

Watershed	Impact	Status	Positive Components	Negative Components
Little North Fork Coeur d' Alene River (above and including Hudlow)	NI	No BT	Reduced sediment risk (-50)	Increased short-term sediment
Hudlow (MF and lower)	NI	No BT	No change	No change
Hudlow (EF)	NI	No BT	No change	No change
Hudlow (WF)	NI	No BT	No change	No change
Iron Creek	NI	No BT	No change	No change
Rusty Creek	NI	No BT	No change	No change
Cataract	NI	No BT	No change	No change
Moose	NI	No BT	No change	No change
Silver Run	NI	No BT	No change	No change
Rablens Fork	NI	No BT	No change	No change
Little North Fork Coeur d'Alene River (above Iron Creek)	NI	No BT	No change	No change
Honey	NI	No BT	No change	No change
Lewelling	NI	No BT	No change	No change
Sob	NI	No BT	No change	No change
Solitaire	NI	No BT	No change	No change
Honey	NI	No BT	No change	No change
Tom Lavin	NI	No BT	No change	No change

Alternatives 2 and 7: The watershed benefits from improvement activities such as road obliteration and instream improvements are greater than the potential impacts from management activities.

The proposed management and estimated effects would be very similar under Alternatives 2 and 7. Sediment yields for the Iron Honey project area (Hudlow Creek and above) are estimated to increase 1% over Alternative 1, the No-Action Alternative (Table III-22). Peak flows are estimated to increase over the No-Action Alternative by 2% under both Alternatives 2 and 7. When the cumulative effects analysis area is extended to Skookum Creek, the projected increases for both sediment and peak flows become negligible (Table III-23). There would be no measurable changes expected over the No-Action Alternative as a result of timber harvest and related activities at either of these analysis scales.

Watershed improvements under Alternatives 2 and 7 would remove approximately 115 road channel crossings on 49 miles of road (Table III-22). In addition, approximately 2.1 miles of encroaching road would be removed in Iron Creek. These restorations activities combined with upgrades on Road 385 would reduce annual sediment risk by approximately 477 tons per year under Alternative 2 (576 tons per year under Alternative 7). These improvements would be expected to be observable within Iron Creek, but not at the cumulative effects scale of the Iron Honey project area.

Alternative 2 would result in no change in population condition at the scale of a stream segment in the Upper Little North Fork Coeur d'Alene River above Iron Creek and all tributary watersheds that flow into the Upper Little North Fork. The restoration activities (both vegetative and watershed) within Iron Creek and tributaries should trend habitat conditions in a manner that benefits Management Indicator Species. The actions within Iron Creek and tributaries would have effects at the stream reach scale, which means this project would have incremental effect at the scale of the watershed. It is anticipated that short-term negative effects would be realized at the stream reach scale. These effects would include a reduction in stream bank stability due to increase in water yields and sediment yields, which could reduce existing fish habitat conditions and populations in the short term. The actions should have long-term benefits at the

watershed scale. These benefits would include a reduction in sediment risk, but also the initiation of returning Iron Creek to a functioning watershed. This process could be sped up and some of the short-term effects reduced, if channel stabilizing efforts are also undertaken along with road removal efforts.

Although there would be cumulative effects from this project at the watershed scale, the overall effect of this project in combination with the past, present and reasonably foreseeable actions would be to maintain or increase the rate at which the Management Indicator Species recover within the project area. The effects to fish under Alternative 2 would be similar to those under Alternative 7.

Table III-17. Direct and Indirect Effects to Management Indicator Fish Species, Alternatives 2 and 7.

Watershed	Impact	Status	Positive Components	Negative Components
North Fork Coeur d'Alene (above and including Hudlow)	MI (BI)	No BT	Reduce sediment risk by 477 t/yr in Alt. 2 and 565 t/yr in Alt 7, reduce road encroachments by 2.1 mi., increase fish access by 1.7 mi.	Increase short-term sediment, increase water yield with potential short term degradation in unstable reaches below Iron Creek; harvest in Category 4 RHCA (1)
Hudlow (Middle Fork and lower)	NI	No BT	No change	No change
Hudlow (East Fork)	NI	No BT	No change	No change
Hudlow (West Fork)	NI	No BT	No change	No change
Iron Creek	MI (BI)	No BT	Reduce road encroachment by 2.1 mi.; reduce long term sediment risk by 427 t/yr in Alt 2 and 419 t/yr in Alt 7); increase fish access by 1.7 mi.	Increase riparian harvest in Category 4 RHCAs (1), increase water yields with potential short term and long term degradation in unstable reaches of Iron Creek
Rusty Creek	MI (BI)	No BT	Reduce sediment risk by upgrading pipes, increase fish access	Increase short-term sediment, increase sediment from increased water yields in unstable channels
Cataract	NI	No BT	Reduce long-term sediment risk by 116 t/yr	Increase riparian harvest in Category 4 RHCA (1)
Moose	NI	No BT	Decrease road encroachment	Increase short-term sediment with new road construction
Silver Run	MI (BI)	No BT	Increase fish access, decrease long-term sediment risk	Increase short-term sediment
Rablens Fork	MI (BI)	No BT	Increase fish access, decrease long-term sediment risk by 131 t/yr, decrease road encroachment by 0.8 mi.	Increase short-term sediment
Little North Fork CDA River (above Iron)	NI	No BT	Decrease long-term sediment risk by 50 t/yr under Alt. 2 and 146 t/yr under Alt. 7	No change under Alt. 2; increase short-term sediment under Alt. 7
Honey	NI	No BT	No change	No change
Lewelling	Alt. 2: NI Alt. 7: MI (BI)	No BT	No change under Alt. 2 decrease long-term sediment risk under Alt. 7 by 1,145 t/yr	No change under Alt. 2; increase short-term sediment under Alt. 7
Sob	NI	No BT	No change	No change
Solitaire	NI	No BT	No change	No change
Tom Lavin	NI	No BT	Decrease long-term sediment risk by 4 t/yr under Alt. 2 and 16 t/yr under Alt. 7	No change under Alt. 2; increase short-term sediment under Alt. 7

Alternative 3: Minor watershed benefits would occur from culvert upgrades under Alternative 3.

Alternative 3 consists of small harvest units scattered over the project area and the construction of 0.3 miles of temporary road. No measurable increase in sediment yields or peak flows over Alternative 1 would be expected for either the project area (Hudlow Creek and above) or the extended cumulative effects area above Skookum Creek (Table III-22, III-23). Watershed restoration would consist of 10 crossing removals on 8 miles of road and upgrading existing culverts under Alternative 3, which would reduce sediment risk by an estimated 169 tons per year. No encroaching road would be removed. Restoration activities would result in no measurable effects at the project area scale. The cumulative effects of Alternative 3 would be similar to those expected under Alternative 1. Alternative 3 could increase the level of risk to cutthroat and bull trout, although risk would be very low. Two watershed effects would be expected: a gradual reduction of water yields and an increase in sediment inputs. The streamflow regime would continue to recover from past timber harvest as the watershed revegetated. However, encroaching streamside road segments in the Upper Little North Fork and its tributaries would continue to erode, degrading the stream channel and associated water quality. Elevated sediment inputs from encroaching road and stream crossing failures, exceeding those under which the stream system developed would be expected to aggrade stream reaches causing accelerated bank erosion and channel sediment. As a result, the risk of channel deterioration would remain high well into the future. The effects of this alternative would result in no change in the current condition or trend in the Management Indicator Species in all watersheds, which currently have a stable population of cutthroat in basins where private land owners have limited influence, a declining population of adfluvial cutthroat in basins where private land owners alter stream channels, and a non-viable population of bull trout.

Ongoing and reasonably foreseeable activities would not have any negative incremental effect that would result in a cumulative effect to any of the watersheds. The effects to fish under Alternative 3 would be similar to the No-Action Alternative, and would show no measurable effects overall.

Table III-18. Direct and Indirect Effects to Management Indicator Fish Species, Alternative 3.

Watershed	Impact	Status	Positive Components	Negative Components
North Fork Coeur d' Alene (above and including Hudlow)	NI	No BT	Decrease long term sediment risk (-158), increased fish access	Increased short term sediment
Hudlow (Middle Fork and lower)	NI	No BT	No change	No change
Hudlow (East Fork)	NI	No BT	No change	No change
Hudlow (West Fork)	NI	No BT	No change	No change
Iron Creek	NI	No BT	Decrease long term sediment risks (-15)	Increase short term sediment
Rusty Creek	NI	No BT	Increase fish access	Increase short term sediment
Cataract	NI	No BT	No change	No change
Moose	NI	No BT	No change	No change
Silver Run	NI	No BT	No change	No change
Rablens Fork	NI	No BT	No change	No change
Little North Fork CDA River (above Iron)	NI	No BT	Decrease long term sediment risk (-154)	Increase short term sediment
Honey	NI	No BT	No change	No change
Lewelling	NI	No BT	Decrease long term sediment risk (-70)	Increase short term sediment
Sob	NI	No BT	No change	No change
Solitaire	NI	No BT	Decrease long term sediment risk (-21)	No change
Tom Lavin	NI	No BT	Decrease long term sediment risk (-16)	Increase short term sediment

Alternative 5: The watershed benefits from improvement activities such as road obliterating and instream improvements are greater than the potential impacts from management activities. However, there would be negative impacts in some sub-watersheds such as Iron Creek, Sob Creek and Honey Creek.

Sediment yields for the Iron Honey project area (Hudlow Creek and above) are estimated to rise 14% over Alternative 1 and peak flows are estimated to rise by 9% (Table III-22). When the cumulative effects analysis area is extended to Skookum Creek, the projected increases for sediment and peak flows are 5% and 4%, respectively. Observable changes over the No-Action Alternative from timber harvest and related activities could occur at the project area scale. Low-gradient reaches in Iron Creek, Solitaire Creek and the Little North Fork just above Solitaire would be expected to have the greatest impacts from increased sediment inputs, aggradation and bank erosion. These changes would not be expected to be observable at the scale of the extended cumulative effects area that extends to Skookum Creek (Table III-23).

The combined increase in peak flows and sediment yields for individual watersheds (e.g., Solitaire Creek, Iron Creek, Honey Creek) under Alternative 5 have the potential to change downstream runoff patterns. This may result in accelerated bed and bank erosion within the headwater tributaries and down stream reaches of individual watersheds, and in the mainstem of the Little North Fork just above Solitaire Creek. With additional routing of bedload to the upper reaches of the Little North Fork in association with increased runoff and stream velocities it can be expected that the filling of pools and the loss of native fish habitat would occur in the short term. Along with accelerated rates of channel erosion, the recurrence interval for these larger flows may become more frequent, delaying recovery for longer periods of time. Adverse effects to stream channel morphology can be expected as the changes to the hillslope hydrologic processes are altered.

Under Alternative 5, the combination of watershed restoration activities and foreseeable upgrades on Road 385 would reduce annual sediment risk by approximately 668 tons per year (Table III-22). Additional benefits would be derived from the removal of approximately 1.5 miles of encroaching road in the Upper Little North Fork. Restoration would occur in the Upper Little North Fork above Solitaire Creek where the encroaching road would be removed and instream restoration performed. The re-establishment of the flood prone area associated with the removal of the streamside roads will help reduce stream flow velocity by widening the flood-prone area and dissipating the energy across a broader area. The in-channel work will help stabilize the channel bed and banks, reduce erosional processes, and provide a greater resiliency to the potential increases in flows. This would result in long-term positive changes in population conditions at the scale of a stream reach in the Upper Little North Fork Coeur d'Alene River above Solitaire.

Iron Creek itself and the Little North Fork downstream of Iron Creek would be negatively impacted by activities under Alternative 5. Only 11 stream crossings on 8 miles of road in the Iron Creek drainage would be removed with no encroaching road or instream restoration. The watershed restoration actions within the Upper Little North Fork and tributaries would have positive effects at the stream reach scale, which means this project would have incremental effect at the scale of the watershed. Long-term effects would include an increase in streambank stability due to the long-term reduction of sediment yields. The direct effects of adding woody debris and stabilizing stream channels would be beneficial to Management Indicator Species (Young et al, 1999, Rosgen, 1996). These effects would increase existing fish habitat conditions and populations in the long term. The restoration activities (both vegetative and watershed) within Iron Creek and its tributaries should trend habitat conditions in a manner that would be beneficial to the Management Indicator Species.

The actions within Iron Creek and its tributaries would have effects at the stream reach scale, which means this project would have incremental effects at the scale of the watershed. It is anticipated that both short and long-term negative effects would be realized at the stream reach scale. These effects would

include a reduction in streambank stability due to increases in water and sediment yields. These effects would reduce existing fish habitat conditions and populations in the short term. The actions should have long-term negative effects at the watershed scale. The effects of increased sediment and an increased water yields could result in further degradation of the Iron creek watershed. This process places additional impacts on the Iron Creek watershed, while providing little restoration that could help offset the negative effects.

Although there would be cumulative effects from this project at the watershed scale, the overall effects of this project in combination with the past, present and reasonably foreseeable actions would be to maintain or decrease the rate at which the Management Indicator Species recover within the project area. The effects to fish under Alternative 5 would be negative. Because of varying risk to fish related to harvest and road construction proposed under the action alternatives, Alternative 6 would be the best for the Management Indicator Species, followed by Alternatives 8, 2 and 7 respectively. All three of these alternatives would be better than either Alternatives 3 or 1. The best alternative from a fisheries watershed perspective would be Alternative 6.

Table III-19. Direct and Indirect Effects to Management Indicator Fish Species, Alternative 5.

Watershed	Impact	Status	Positive Components	Negative Components
North Fork Coeur d'Alene (above and including Hudlow)	NI	X	Reduce long term sediment risk by 668 t/yr, reduce encroachment by 1.5 mi., increase fish access by 0.8mi.	Increase short-term sediment, increase riparian harvest in Category 4 RHCA (235 ft)
Hudlow (Middle Fork and lower)	LI	X	Decrease long term sediment risk (2)	Increase short term sediment risk, increase water yields
Hudlow (East Fork)	LI	X		
Hudlow (West Fork)	LI	X	Decrease long term sediment risk by 17 t/yr	Increase short term sediment risk, increase water yields
Iron Creek (Total)	LI	X	Decrease long term sediment risk by 83 t/yr; increase fish access	Increase short term sediment, riparian harvest Category 4 RHCAs (35 ft) Increase water yields.
Rusty Creek	LI	X		Increase short-term sediment, no change, increase riparian harvest in Category 2 or 4 RHCA
Cataract	LI	X	Reduce long term sediment risk by 7 t/yr	Increase riparian harvest in Category 2 or 4 RHCA's, increase short-term sediment risk, increase water yields.
Moose	LI	X		Increase short term sediment risk, increase riparian harvest in Category 4 RHCA, increase water yields
Silver Run	LI	X	Increase fish access, decrease long-term sediment risk, reduce road encroachment	Increase short term sediment risk, increase water yields
Rablens Fork	LI	X		Increase short term sediment risk, increase water yields
Little North Fork Coeur d'Alene River (above Iron Creek)	MI (BI)	X	Reduce long term sediment risk by 566 t/yr, reduce encroachment by 1.7 mi., increase fish access by 0.4 mi., increase channel stability and channel complexity	Increase short-term sediment risk, increase riparian harvest in Category 2 or 4 RHCA's
Honey	NI	X	Reduce long term sediment risk, 73 t/yr.	Increased riparian harvest in Category 2 or 4 RHCA, increased short term sediment risk, increase road miles and channel crossings
Lewelling	NI	X	Reduce long term sediment risk by 70 t/yr	
Sob	NI	X		
Solitaire	NI	X	Decrease long-term sediment risk by 140%	Increase riparian harvest in Category 4 RHCA's, increase short term sediment risk
Tom Lavin	NI	X	Decrease long term sediment risk by 16%	

Alternative 6: Alternative 6 provides the greatest watershed benefits from restoration activities such as road obliteration and instream improvements.

WATSED estimates an increase in sediment yields for the Iron Honey project area (Hudlow Creek and above) of 1% over Alternative 1. No increases in peak flows are predicted (Table III-22). Because of natural variability and other factors, these changes would not be measurable on the ground. No change is predicted at the extended cumulative effects scale (Table III-23). The partial timber harvest associated with this alternative is scattered throughout the project area within the Middle and West Forks of Hudlow, Upper Little North Fork, Honey, Solitaire, River Face, and Iron Creeks represents the large woody debris to be used in the in-channel modification work that would occur. The streamflow regime within those

tributaries in which the harvest is to occur would most likely not change from existing conditions and continue to recover, with runoff associated with peak flow events continuing to decrease into the future.

Roads constructed with inside ditches, usually found in conjunction with road channel crossings, increase the channel network by channeling flows from snow melt and rain events to streams. This increase in the channel network alters the natural characteristics of channel flow. The increase in flows this represents can cause an increase in peak flows. Removal of 85 percent of the road channel crossings within all the tributaries of the Upper Little North Fork will significantly reduce the length of the channel network and contributing area in these sub-watersheds. With this reduction in the contributing area, it also can be expected that peak flows will be reduced. The stream flow regime can be expected to recover at an increased rate over existing condition, reducing the stress on channel banks and in turn reducing the instream erosional processes.

Watershed improvement would be significant under Alternative 6. These restorations activities, combined with upgrades on Road 385 and fish passage improvements in Tom Lavin and Hudlow Creeks, would reduce annual sediment risk by approximately 1,185 tons per year under Alternative 6. Observable improvement would occur in the stream channels.

Most of the benefits from restoration under Alternative 6 would be realized in Iron Creek and the Upper Little North Fork above Solitaire Creek, where encroaching road is removed and instream restoration is performed. Instream restoration would replenish woody debris and modify the channel where appropriate to restore hydrologic condition and function. Alternative 6 would be the most beneficial for restoring natural watershed function and condition. Alternative 6 would result in positive changes in population condition at the scale of a stream segment in the Upper little North Fork Coeur d'Alene River above and including Hudlow Creek and all tributary watersheds which flow into the Upper Little North Fork. The watershed restoration activities within Iron Creek and its tributaries would also trend habitat conditions in a manner that benefits the Management Indicator Species. The actions within the Upper Little North Fork and tributaries (above and including Hudlow) would have effects at the stream reach scale, which means this project would have incremental effects at the scale of the watershed.

It is anticipated that short-term negative effects would be realized at the stream reach scale. These effects would include a short-term increase in sediment do to restoration activities. Long-term effects would include an increase in streambank stability due to the long-term reduction of sediment yields. The direct effects of increased woody debris and stabilizing stream channels would be beneficial to Management Indicator species (Young et al, 1999, Rosgen, 1996). These effects would increase existing fish habitat conditions and populations in both the short term and long term. The actions should have long-term benefits at the watershed scale. These benefits would be a reduction in sediment risk, but also the initiation of returning both the Little North Fork Coeur d’Alene River and Iron Creek to a functioning condition.

Although there are cumulative effects from this project at the watershed scale, the overall effects of this project in combination with the past, present and reasonably foreseeable actions would be to increase the rate at which the Management Indicator Species recover within the project area. The effects to fish under Alternative 6 would positive. Because of varying risk to fish related to harvest and road construction under the action alternatives, Alternative 6 would be the best for the Management Indicator fish Species, followed by Alternatives 8, 2, and 7 respectively (any of which would be better than Alternatives 1, 3, or 5).

Table III-20. Direct and Indirect Effects to Management Indicator Fish Species, Alternative 6.

Watershed	Impact	Status	Positive Components	Negative Components
North Fork Coeur d' Alene (above and including Hudlow)	MI (BI)	X	Decrease long term sediment risk by 1,185 t/yr; decrease encroaching roads by 3.8 mi., increase stream stability and complexity	Increase short-term sediment
Hudlow (Middle Fork and lower)	NI	X	Decrease long term sediment risk	
Hudlow (East Fork)	NI	X	Decrease long term sediment risk	Increase short-term sediment
Hudlow (West Fork)	NI	X	Decrease long term sediment risk by 17 t/yr.	
Iron Creek (total)	MI (BI)	X	Decrease long term sediment risk by 458 t/yr; decrease encroaching roads by 2.1 mi., increase stream stability and complexity	Increase short term sediment risk
Rusty Creek	MI (BI)	X	Decrease long term sediment risk, decrease encroaching roads, increase fish passage	Increase short term sediment,
Cataract	MI (BI)	X	Decrease long term sediment risk by 116 t/yr.	Increase short term sediment
Moose	MI (BI)	X	Decrease long term sediment risk, decrease encroaching roads	Increase short term sediment
Silver Run	MI (BI)	X	Decrease long term sediment risk , increase fish passage	Increase short term sediment
Rablens Fork	MI (BI)	X	Decrease long term sediment risk by 146 t/yr, decrease encroaching roads, increase fish passage	Increase short term sediment
Little North Fork Coeur d'Alene River (above Iron Creek)	MI (BI)	X	Decrease long term sediment risk by 708 t/yr, decrease encroaching roads, increase fish passage, increase stream stability and complexity	Increase short term sediment
Honey	MI (BI)	X	Decrease long term sediment risk by 75 t/yr	Increase short term sediment
Lewelling	MI (BI)	X	Decrease long term sediment risk by 79 t/yr	Increase short term sediment
Sob	MI (BI)	X	Decrease long term sediment risk by 32 t/yr	Increase short term sediment
Solitaire	MI (BI)	X	Decrease long term sediment risk by 153 t/yr	Increase short term sediment
Tom Lavin	MI (BI)	X	Decrease long term sediment risk by 31 t/yr	Increase short term sediment risk

Alternative 8: The watershed benefits from improvement activities such as road obliteration and instream improvements are greater than the potential impacts from management activities.

WATSED outputs, which are relative indicators of cumulative effects, suggest that the watershed is currently in a period of recovery from management activities in the 1980's and early 1990's (Project Area WATSED Report, pp. 22-23, Table III-22). Annual sediment yield and peak flow are currently estimated at 169% and 8% over natural conditions, respectively, and are projected to decrease with recovery. Monthly peak flows are currently decreasing and projected to continue to decrease. Sediment yields have stabilized. WATSED results estimate an additional 5% increase in sediment yield and 4% increase in peak flow over existing conditions as a result of proposed harvest activities (Project Area WATSED Report, pp. 36-39). These modeled increases, which would peak immediately following harvest and

progressively decline to pre-treatment levels, represent an interruption in the current recovery of the watershed of approximately five to nine years. It is unlikely, however, that the increases predicted by WATSED would produce measurable changes in Iron Creek. For example, assuming the 5% increase predicted by WATSED in average annual sediment yield is accurate, it would not be measurable on the ground because a 5% change in annual sediment yield is well within the normal range of variability for a natural stream (for further discussion, see Appendix D, "Watershed Hydrologic Response Estimates And WATSED", and the interpretation section of the WATSED reports).

The same trends are observed in the larger cumulative effects analysis area extending down to Skookum Creek, but to a lesser extent (Table III-23). According to WATSED, the cumulative effects area is currently in a period of recovery from management activities in the late 1980's and 1990's (Extended Cumulative Effects Area WATSED Report, pp. 22-23). Annual sediment yield and peak flow are currently estimated at 187% and 8% over natural conditions, respectively, and are projected to decrease with recovery. WATSED results estimate an additional 3% increase in sediment yield and 2% increase in peak flow over existing conditions as a result of proposed management activities (Project Files, Aquatics: Extended Cumulative Effects Area WATSED Report, p. 36-39). For reasons discussed above, these modeled increases will not translate into measurable impacts in the Little North fork at Skookum Creek (see discussion in Appendix D, Watershed Hydrologic Response Estimates and WATSED).

Cumulative effects are not expected to be quantifiable at the scale of the project are or extended cumulative effects area. These findings are consistent with analysis results for individual watersheds. Direct and indirect effects of management activities within individual watershed are discussed in detail in the individual watershed sections. In general, low-gradient reaches in Iron Creek, Solitaire Creek and the Little North Fork just above Solitaire Creek would have the greatest potential for channel widening, accelerated bank erosion and other channel impacts. Restoration activities, combined with upgrades on the 385 and 209 roads in Tom Lavin and Hudlow Creeks, would reduce annual sediment risk by approximately 850 tons per year.

Alternative 8 would result in positive changes in population condition at the scale of a stream segment in the Upper little North Fork Coeur d'Alene River above Hudlow Creek and all tributary watersheds which flow into the Upper Little North Fork. No changes would be observed in Hudlow, Tom Lavin and Lewelling creek. Most of the benefits from restoration under Alternative 8 would be realized in Iron Creek and the Upper Little North Fork above Solitaire Creek, where an encroaching road is removed and instream restoration is performed. Instream restoration would replenish woody debris and modify the channel where appropriate to restore hydrologic condition and function. The watershed restoration activities within Iron Creek and its tributaries would also trend habitat conditions in a manner that benefits the Management Indicator Species. The actions within the Upper Little North Fork above Hudlow, tributaries and Iron creek would have effects at the stream reach scale, which means this project would have incremental effects at the scale of the watershed.

It is anticipated that short-term negative effects would be realized at the stream reach scale. These effects would include a short-term increase in sediment and a loss of existing streamside vegetation do to restoration activities. Long-term effects would include an increase in streambank stability due to the long-term reduction of sediment yields. The direct effects of increased woody debris and stabilizing stream channels would be beneficial to Management Indicator species (Young et al, 1999, Rosgen, 1996). These effects would increase existing fish habitat conditions and populations in both the short term and long term. The actions should have long-term benefits at the watershed scale. These benefits would be a reduction in sediment risk, but also the initiation of returning both the Little North Fork Coeur d'Alene River and Iron Creek to a functioning condition. These effects would increase existing fish habitat conditions and populations in the long term. The restoration activities (both vegetative and watershed) within Iron Creek and its tributaries should trend habitat conditions in a manner that would be beneficial to the Management Indicator Species.

Although the potential exists for non-measurable cumulative effects from this project at the watershed scale, the overall effects of this project in combination with the past, present and reasonably foreseeable actions would be to increase the rate at which the Management Indicator Species recover within the project area. The effects to fish under Alternative 8 would be positive. Because of varying risk to fish related to harvest and road construction under the action alternatives, Alternative 6 would be the best for the Management Indicator Species, followed by Alternatives 8, 2 and 7 respectively. Any of these three alternatives would be better than Alternatives 1, 3, or 5.

Table III-21. Direct and Indirect Effects to Management Indicator Fish Species, Alternative 8.

Watershed	Impact	Status	Positive Components	Negative Components
North Fork Coeur d' Alene (above and including Hudlow)	MI (BI)	X	Decrease long term sediment risk by 929 t/yr; decrease encroaching roads by 3.6 mi.; increase stream stability and complexity	Increase short-term sediment
Hudlow (MF and lower)	NI	X	Decrease long term sediment risk	
Hudlow (East Fork)	NI	X	Decrease long term sediment risk	Increase short-term sediment
Hudlow (West Fork)	NI	X	Decrease long term sediment risk	
Iron Creek (total)	MI (BI)	X	Decrease long term sediment risk by 425 t/yr; decrease encroaching roads by 2.1 mi., increase stream stability and complexity	Increase short term sediment risk
Rusty Creek	MI (BI)	X	Decrease long term sediment risk, decrease encroaching roads, increase fish passage	Increase short term sediment
Cataract	MI (BI)	X	Decrease long term sediment risk by 116 t/yr.	Increase short term sediment
Moose	MI (BI)	X	Decrease long term sediment risk, decrease encroaching roads	Increase short term sediment
Silver Run	MI (BI)	X	Decrease long term sediment risk, increase fish passage	Increase short term sediment
Rablens Fork	MI (BI)	X	Decrease long term sediment risk by 131 t/yr , decrease encroaching roads, increase fish passage	Increase short term sediment
Little North Fork Coeur d'Alene River (above Iron Creek)	MI (BI)	X	Decrease long term sediment risk by 504 t/yr , decrease encroaching roads, increase fish passage, increase stream stability and complexity	Increase short term sediment
Honey	MI (BI)	X	Decrease long term sediment risk (-73) Increased stream stability and complexity	Increased short term sediment
Lewelling	NI	X	Decrease long term sediment risk	Increased short term sediment
Sob	NI	X	Decrease long term sediment risk by 18 t/yr	Increased short term sediment
Solitaire	MI (BI)	X	Decrease long term sediment risk by 140 t/yr	Increased short term sediment
Tom Lavin	NI	X	Decrease long term sediment risk (-4)	Increased short term sediment risk,

E. Cumulative Effects Beyond the Project Area (to the Coeur d'Alene River above Skookum Creek)

As described under section 3.2.2 Methodology, the potential effects were evaluated at three scales: the local site or tributary, the cumulative effects scale of the project area, and an extended cumulative effects area. The following addresses effects at the extended cumulative effects area scale (to the Coeur d'Alene River above Skookum Creek). This area was used to reflect cumulative effects because it represents the maximum extent for which cumulative effects might be measurable. No physical response would extend to or be measurable in the Coeur d'Alene River or Coeur d'Alene Lake below the project watersheds. Coeur d'Alene Lake flows into the Spokane River, which eventually combines with the Upper Columbia River far downstream. No effects would reach either point.

Table III-22. Projected watershed response in the Cumulative Effects Analysis Area [Project Area] Hudlow Creek and above.

WATERSHED NAME: Project Area	HUC:170301034800
TRIBUTARY: Total Little North Fork above and including Hudlow Creek	HUC:170103010327

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt 8+
Sediment yield (%) (1)	169	170	170	183	170	170	174	N/A
Peak flow (%) (2)	8	10	8	17	8	10	12	N/A
Net stream crossings (#) (3)	0	-117	-10	-76	-334	-113	-176	-148
Net associated risk (t/yr) (4)	-50	-477	-169	-668	-1185	-576	-929	-241
Net roads (miles) (5)	0	-49	-8	-39	-158	-48	-81	-75
Net reduction of encroaching road (miles) (6)	0	-2.1	0	-1.5	-3.7	-2.1	-3.6	-.1

1 Project Area WATSED Report, pp. 7-14, graphs pp. 22-51.
2 Project Area WATSED Report, pp. 7-14, graphs pp. 22-51.
3 GIS coverage of Project Area: stream crossings.
4 GIS coverages of Project Area: road restoration by Alternative.
5 Sediment Risk Analysis, pp. 5-8 (see Project Files).
6 Encroaching road inventories (see Project Files).

Table III-23. Projected watershed response in the Extended Cumulative Effects Area (Coeur d'Alene River above Skookum Creek).

WATERSHED NAME: Extended Cumulative Effects Area	HUC: 170301034800
TRIBUTARY: Little North Fork above Skookum Creek	HUC: 1701030103+

Measure of Change	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Percent sediment yield (1)	187	188	188	193	188	188	190
Percent peak flow (2)	8	9	8	12	8	9	10

1 Extended Cumulative Effects Area WATSED Report, pp. 7-14, graphs pp. 22-51.
2 Extended Cumulative Effects Area WATSED Report, pp. 7-14, graphs pp. 22-51.

There are a number of **ongoing and reasonably foreseeable activities** that will occur under any alternative (identified in Chapter II, 2.4 Ongoing and Reasonably Foreseeable Activities). Each of these activities has the potential to contribute to various aspects of fisheries resource conditions. Protective measures were recommended and incorporated into the designs for most of these projects allowing fisheries resources to be maintained.

Planned activities associated with ongoing salvage sales and previously-harvested timber sales are expected to help maintain fisheries resources. Salvage sales were designed to be in agreement with Inland Native Fish Strategy standards and guidelines. Analyses predicted that fish habitat would be

maintained. Although cumulative effects associated with previous timber sales are negatively influencing the rate of recovery for fisheries resources in the cumulative effects area, future activities (such as fisheries, watershed, and silviculture improvement projects) associated with these timber sales are expected to contribute to the desired long-term trend in the affected watersheds.

Direct effects to stream conditions as a result of grazing would consist of localized areas of bank trampling and erosion, primarily in the lower reaches of Iron and Hudlow Creeks (USDA Forest Service, 2001, Draft Grazing EA, pp. 66-67). Cumulative effects could include delayed vegetative recovery in portions of the riparian area, but would not affect overall stream conditions. In terms of water quality, nutrient loading and pathogens would not decrease and could inhibit support of beneficial uses, including cold-water biota and salmonid spawning (USDA Forest Service, 2001 Draft Grazing EA, p. 70).

Routine road and trail maintenance would continue regardless of the alternative selected. Regular use and maintenance of native surface or gravel surface roads can contribute sediment to streams and affect fish habitat conditions. This is particularly true where an appreciable length of road is adjacent to streams and drift material from surface grading is accidentally or intentionally sidecast. However, careful maintenance of road surface conditions and cross drains can help reduce stream sedimentation from established roads by preventing water from collecting on running surfaces and contributing to surface erosion. Brushing along roads near streams can also affect fish habitat conditions by inhibiting the development of streamside shade and vegetative cover for fish. Clearing wind blown trees off roads and trails can effect large woody debris recruitment to streams and likewise influence fish habitat conditions. Maintenance of roads and trails will contribute to cumulative effects of fisheries resources.

Recreational use within the cumulative effects area is expected to increase during the analysis period. This is likely to put additional stresses on aquatic resources. In addition, indirect effects from other recreational users will increase as recreationists look for new areas near water to camp. The increased demand for camping sites will expand from the current dispersed areas (primarily along the Little North Fork and Hudlow Creek). Woodcutting within riparian areas for campfires as well as firewood for heating homes would incrementally reduce large woody debris recruitment to streams and have long-term effects on fish habitat diversity and complexity. Soil compaction and displacement from streamside campsites could degrade riparian conditions. Increased motorized use (specifically motorcycles and ATVs) could increase soil displacement and degrade riparian conditions. In addition, sanitary waste disposal could become a water quality issue (as well as a public health issue), particularly in the vicinity of Horse Heaven. Recreational use in the cumulative effects area is more likely to become a concern for fisheries resources sometime after this analysis period. Nonetheless, the various uses contribute to cumulative effects on fisheries resources.

Mining will also continue regardless of the alternative selected. Past mining has resulted in minimal effects to stream channels and fisheries resources. The relative inactivity of the mines in Honey and Iron Creeks and the requirement for filed plans of operations for future mining is expected to result in minimal future affects to fisheries resources.

Contributions to cumulative effects on native fish populations from some biotic factors will be largely unaffected by the alternative selected. Rieman and McIntyre (1993) report that the elimination or isolation of different life history forms, predation, competition, or hybridization with exotic species, and increased variation of population dynamics are critical mechanisms leading to population declines or extinction. Some of these mechanisms, particularly isolation of life history forms and competition and hybridization with exotic fish species, are contributing to cumulative effects for native trout populations within the analysis area. Effects from predation, competition, hybridization, and variation of population dynamics are not expected to be altered by any alternative.

Additional **opportunities** to accomplish watershed restoration projects (such as road obliteration, removal or improvement of stream crossings and stream stabilization to benefit fish habitat) have the potential to

be funded with this project (Chapter II, section 2.5 Opportunities). The effects of these opportunities are discussed under Alternative 6 for each watershed.

Timber stand improvement activities would have no effect if conducted outside stream buffers.

3.2.5 Consistency with Forest Policy and Legal Mandates

A. Consistency With the Forest Plan (as amended by the Inland Native Fish Strategy)

Inland Native Fish Strategy: All action alternatives would be consistent with the Forest Plan as amended by the Inland Native Fish Strategy. Specific riparian management goals and objectives have been developed, and Riparian Habitat Conservation Areas are defined and delineated. Riparian management and Riparian Management Objectives (RMO's) are addressed using site-specific analysis and supportive data and watershed analyses. Specific features (standards and guidelines) have been incorporated into the alternatives as described in Chapter II (2.6.9 Features Common to All Action Alternatives, A. Features Designed to Protect Aquatic Resources).

No new projects would be implemented under Alternative 1; therefore application of the Inland Native Fish Strategy standards and guidelines would not be required.

Under any action alternative there are proposed stand treatments that would be initiated by the harvesting of timber. Standards and guidelines from Inland Native Fish Strategy were used specifically to protect water and aquatic biota within the project area (Chapter II, 2.6.9 Features Common to All Alternatives, A. Features Designed to Protect Aquatic Resources). Standard widths for defining interim Riparian Habitat Conservation Areas were utilized without modification. The road management *standards and guidelines* were applied only to roads used or affected by the proposed project activities (timber sale, obliterated, closed or used for slash disposal or reforestation). The road management *objectives* were applied only within the project area boundary, and only on those roads used for the harvesting or hauling of timber.

The Forest Plan identifies several standards related to fisheries. Although each is superceded by one or more of the standards and guidelines under the Inland Native Fish Strategy, information has been provided below describing how fisheries resources would be protected under the proposed activities in the Iron Honey Resource Area.. The following addresses consistency with amended Forest Plan standards for water (Inland Native Fish Strategy Record of Decision, p. A-12 and Forest Plan, page II-33); and Forest Plan standards for fish (Forest Plan, page II-29 through II-31).

Watershed and Habitat Restoration (WR-) 1: Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and contributes to attainment of Riparian management objectives.

As discussed under "Effects to Fisheries at the Watershed Area Scale" (page III-52), Alternative 2, 5, 6, 7, 8 and 8+ all include watershed restoration activities that are consistent with INFS Standard WR-1. Alternatives 1 and 3 do not include watershed restoration activities and are not consistent with INFS Standard WR-1.

Watershed and Habitat Restoration (WR-) 2: Cooperate with Federal, State, local, and Tribal agencies, and private landowners to develop watershed-based Coordinated Resource Management Plans (CRMPs) or other cooperative agreements to meet Riparian Management Objectives.

The Forest Service has coordinated with the U.S. Fish and Wildlife Service, the Army Corps of Engineers, the Idaho Department of Environmental Quality and all other appropriate agencies to achieve consistency with INFS Standard WR-2.

<u>Fish Standard 1</u>: Activities on National Forest System lands will be planned and executed to maintain existing water uses. To maintain is defined as "limiting the effects from National Forest management activities to maintain at least 80 percent of fry emergence success in identified fishery streams."

And

<u>Fish Standard 2</u>: Streams providing spawning and rearing habitat, which are considered critical to the maintenance of river and lake populations of special concern, will be managed at a standard higher than the 80 percent standard.

The IPNF Forest Plan contains standards for fry emergence that are no longer valid since the Inland Native Fish Strategy was developed. This section explains why.

The objectives for fisheries in the Forest Plan state that the forest "will be managed to maintain and improve fish habitat capacities in order to achieve cooperative goals with the State Fish and Game Department and to comply with state water quality standards. Sediment arising from land management activities will be managed so that in forest fisheries streams the objective is to maintain 80 percent fry emergence success as measured from pristine condition." (II-7). The first two standards for fish use similar language (II-29). The Fishery/Watershed Analysis to determine effects of land management activities on fry emergence is described in Appendix I (I-1, 2).

Appendix I requires that if, during the environmental assessment process, that cumulative effects of the proposed and past activities on stream sedimentation are projected to result in greater than 20% reduction in fry emergence, then additional detailed analysis will be undertaken. The analysis is then used to determine the significance of the project on water resources. If the project is judged to have a "significantly negative effect" on water resources, it will be reviewed by the State for conformance with water quality standards prior to the final decision.

At the time the Forest Plan was written, models determining fry emergence (e.g., Stowell *et al.* 1983) were popular. These empirical models were later found to have limited application and were unreliable outside of where they were developed (J. Kershner, personal communication). In addition, the use of fry emergence survival (regardless of the threshold) as a surrogate for viability came into question, primarily for two reasons:

- First, fry emergence is highly variable. This can be due to changing natural conditions (e.g., floods, temperature regimes, geology) or human-induced causes (e.g., increased sediment input, chemical spills). Both agents are at work in most cases so it is difficult to determine what proportion of egg-to-fry mortality is due to each cause. As a result the underlying relationship between sediment in redds and survival is difficult to predict (Chapman 1988).
- Second, and more important, egg-to-fry mortality is usually density-independent (i.e., a percentage of fry will survive regardless of the number of eggs). This means that in most cases there are enough fry to inhabit all available habitat within a stream. Therefore fry-to-smolt (sub-adult) survival, where density dependent mortality plays a significant role, is a more effective and appropriate predictor of population viability than egg-to-fry survival (for a review of these concepts see Hilborn and Walters 1992). Currently the indicator used as a surrogate of fry-to-smolt survival is stream habitat characteristics.

The 1989 Forest Plan Evaluation and Monitoring Report documents the change away from use of the fry emergence standard (Item G-1, pages C-1 and C-2). The findings were that it was not a good monitoring tool to report stream health. G-1 was combined with item G-3, which includes a comprehensive array of fisheries and hydrology parameters.

The Inland Native Fish Strategy (INFS; USDA 1995) amended the Forest Plans "…except where existing Plan direction would provide more protection" for inland native fish habitat (page 4). All INFS standards and guidelines are intended to either make progress toward Riparian Management Objectives (which describe "good" fish habitat within the context of what is capable of the watershed) or to ensure that activities will not retard the natural rate of recovery of RMOs in a watershed (USDA 1995, A6-A16). In addition, the strategy states that actions that reduce habitat quality, whether existing conditions are better or worse than objective values, are not consistent with INFS direction (USDA 1995, A-3).

INFS supercedes the original IPNF Forest Plan direction because it offers far more protection to inland native fish habitat for the following reasons:

- INFS directs the establishment of Riparian Habitat Conservation Areas (RHCAs) and only allows activities within RHCAs that maintain or improve, and do not retard, the attainment of the RMOs. The original Forest Plan direction actually permitted degradation of water resources at the discretion of the line officer, and allowed "significant" degradation after review by the State.
- Activities that reduce habitat quality to any extent are contrary to INFS direction, regardless of whether RMOs have been attained. The original Forest Plan direction allowed for apparent degradation of fish habitat by permitting up to a 20 percent reduction of potential fry emergence.

In conclusion, this project complies with original Forest Plan direction because, although fry emergence was not computed, a detailed analysis of the effects to fish habitat and water resources was developed as required in Appendix I; and the project is has been determined to be fully consistent with the INFS Forest Plan amendment and state water quality standards for supporting beneficial uses (see INFS discussion on previous page and the discussion under the Clean Water Act and Water Quality Limited Listings later in this section).

***Fish Standard 3*: Streams listed under this standard of the Forest Plan will be managed as low access fishing opportunities to maintain a diversity of fishing experiences for the public and to protect sensitive fish populations. Special road management provisions will be used to accomplish this objective.**

This standard does not apply under this project, since none of these streams are within the project area (Forest Plan, page II-30).

***Fish Standard 4*: Provide fish passage to suitable habitat areas by designing road crossings of streams to allow fish passage or by removing instream migration barriers.**

The existing condition does not meet this Forest Plan standard. The No-Action Alternative would not correct any fish migration barriers present in the analysis area, and would therefore not meet this standard. The action alternatives would upgrade the roads used for harvest operations and those areas to be restored within the project area boundaries. The effects to fish passage (represented by the reduction in stream crossings) are displayed in Table III-22. Reducing the number of stream crossings would increase fish passage, resulting in a trend toward the standards set by Inland Native Fish Strategy.

***Fish Standard 5*: Utilize data from stream, river, and lake inventories to prepare fishery prescriptions that coordinate fishery resource needs with other resource activities. Pursue fish habitat improvement projects to improve habitat carrying capacities on selected streams.**

Data and inventories have been and will continue to be collected on selected streams across the district and within the Iron Honey analysis area. This data, together with on-the-ground experience and other research, was used in the formulation of the Purpose and Need of the Iron Honey EIS, plus the design of the resulting alternatives that were analyzed. Most of the action alternatives combine, at varying levels,

the restoration of *both* the vegetation and aquatic resources. All of the action alternatives that were fully developed in the Iron Honey EIS propose work that would improve fish habitat. Alternatives 5, 6 and 8 feature in-stream fish habitat improvement projects. This work is listed under Opportunities for the rest of the action alternatives. Based on these conditions, this has been met.

***Fish Standard 6*: Coordinate management activities with water resource concerns as described in Management Area 16 (riparian corridors), Appendix I, and Appendix O.**

No new management activities would occur under Alternative 1, therefore this standard would not apply. Design of the action alternatives were fully coordinated with the specifications found in the Forest Plan (Appendices I and O), and standards and goals stated for Management Area 16. Class I and II streams would receive protection beyond the requirements of the Forest Practices Act under any action alternative. The action alternatives were not designed to move all streams toward meeting Riparian Management Objectives. Generally the design was to reduce the effects of roads on stream channels within the project area. Changes in large woody debris were not addressed in the short term.

***Water Standard 1*: Management activities on Forest lands will not significantly impair the long-term productivity of the water resource and ensure that state water quality standards will be met or exceeded.**

Based on Sediment Risk analysis, WATSED results, and the other indicators for the project area as discussed in the "Effects to Fisheries at the Watershed Area Scale section", all Alternatives would not significantly impair the long-term productivity of the watershed and are consistent with Forest Plan Standard #1.

***Water Standard 2*: Maintain concentrations of total sediment or chemical constituents within State standards.**

Based on Sediment Risk analysis, WATSED results, and the other indicators for the project area as discussed in the "Effects to Fisheries at the Watershed Area Scale section", all Alternatives are consistent with the Forest Plan and would maintain or reduce total sediment in the project area. Application of BMPs in all action alternatives would ensure consistency with state water quality standards.

***Water Standard 3*: Implement project level standards and guidelines for water quality contained in the Best Management Practices (Appendix S, available upon request), including those defined by State regulation or agreement between the State and Forest Service such as:**

- ***a. Idaho Forest Practices rules***
- ***b. Rules and Regulations and Minimum Standards for stream channel alterations***
- ***c. Best Management Practices for road activities***

As discussed in the document, BMPs will be implemented in all action alternatives to meet consistency requirements with Standard #3.

***Water Standard 4*: Cooperate with the states to determine necessary instream flows for various uses. Instream flows should be maintained by acquiring water rights or reservations.**

and

***Water Standard 5*: Manage public water systems for multiple use by balancing present and future resources with public water supply needs. Project plans for activities in public water systems will be reviewed by the water users and the State. (Public water supplies are typically greater than 12 hook ups or 25 users). Streams not defined as public water systems, but used by individuals for such purposes, will be managed to the standards stated below or to the fisheries standards, whichever is applicable.**

These standards would not apply to the Iron Honey Resource Area because there are no public water systems, and no water rights or reservations that would conflict with flows.

***Water Standard 6*: Activities within non-fishery drainages, including first and second order streams, will be planned and executed to maintain existing biota. Maintenance of existing biota will be defined as maintaining the physical integrity of these streams. Best Management Practices (Appendix S), Appendix O, and riparian guidelines will be used to accomplish this Standard.**

BMPs would be applied under all action alternatives to achieve consistency with this standard. Riparian guidelines in Appendix O have been amended by standards and guidelines of the Inland Native Fish Strategy, as discussed at the beginning of section 3.2.5 (A).

***Water Standard 7*: It is the intent of this plan that models be used as a tool to approximate the effects of National Forest activities on water quality values. The models will be used in conjunction with field data, monitoring results, continuing research and professional judgment, to further refine estimated effects and to make recommendations.**

A combination of WATSED and a Sediment Risk model were used in all alternatives in conjunction with encroaching road surveys, GIS data, Forest Plan monitoring data and recent watershed research as contained in the project files to comply with Standard 7 of the Forest Plan.

B. Consistency With Legal Mandates

Clean Water Act and Water Quality Limited Listings: The Little North Fork of the Coeur d'Alene River from the headwaters to Laverne Creek is a 303d listed stream segment for flow alteration, habitat alteration and sediment. No TMDL has been established. The current requirement for this reach according to the TMDL rule (1998 Idaho Administrative Code IDAPA 16.01.02.054.05) is that the Forest Service implements the "best management practices for nonpoint sources deemed necessary to prohibit further impairment of the designated or existing beneficial uses." The Forest Service has agreements with the State to implement Best Management Practices (BMPs) or Soil and Water Conservation Practices for all management activities to meet the objectives for Forest Practices.

Under authority of the Clean Water Act, the EPA and States must develop plans and objectives (TMDLs) that will eventually restore listed stream segments. In lieu of those plans, the Forest Service will demonstrate that their actions will result in a net decrease in the pollutant of concern or prohibit or delay potential recovery (IDHW, 1997; USDA Forest Service, 1995). Based on Sediment Risk analysis, WATSED results, and the other indicators for the project area as discussed in the "Effects to Fisheries at the Watershed Area Scale" section; the management Alternatives would result in a decrease in the pollutant of concern. Beneficial uses would not be further impaired and recovery would not be compromised. All Alternatives are consistent with the Clean Water Act and Water Quality Limited Listings at the scale of the project area. However, short-term sediment increases could occur in certain tributaries (particularly Iron Creek, Sob Creek and Honey Creek) under some alternatives, particularly 1, 3 and 5. These increases would not further impair the designated or existing beneficial uses for the 303d listed segment.

National Forest Management Act: The National Forest Management Act requires the Forest Service to maintain the viability and habitat for native and desirable non-native species. The environmental consequences discussion for Aquatics discussed each alternative and the effects of the activities on viability of fish populations within the project area and cumulative effects analysis area. There would be no change to habitat or populations. Current conditions for species viability would be maintained or enhanced as a result of maintaining stream temperature, dissolved oxygen, aquatic habitat diversity, cover complexity, and channel stability. There would be possible increases in habitat diversity, cover complexity and channel stability where long-term reductions in risk would occur.

Endangered Species Act, Section 7: Within Section 7, federal agencies are required to carry out programs to conserve endangered and threatened species. Consultation is required to ensure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

Based on existing conditions, proposed activities, and alternative design features to protect aquatic resources, there would be no impact to bull trout or westslope cutthroat trout at the tributary or cumulative effects area scales under Alternatives 1 and 3. There would be either no impact or a beneficial impact anticipated at the tributary scale under Alternatives 2, 6, 7 and 8, with a beneficial impact at the cumulative effects area scale. Under Alternative 5, proposed activities would have no impact in five tributaries, and a beneficial impact at the Little North Fork Coeur d'Alene River above Iron Creek. In the remaining nine tributaries the proposed activities would likely impact individuals or habitat with a consequence that the action may contribute toward federal listing or result in reduced viability for the population or species. There would be no impact at the cumulative effects analysis area scale (North Fork Coeur d'Alene above and including Hudlow Creek).

Documentation of these effects to fish species is provided in the effects analysis and tables in section 3.2.4 Environmental Consequences, displaying the determination of effects. A Biological Assessment was prepared for all Threatened and Endangered species (Project Files, “Biological Assessments and Evaluations”).

Recreational Fishing (Executive Order 12962, 1995): Information on the effects to fish species are discussed in section 3.2.4 Environmental Consequences. Tables are used to display the potential effects by alternative and watershed. The analysis discusses both habitat and populations. As populations and habitat are affected either negatively or positively the recreational fishing should respond similarly. A discussion of access changes due to road restoration and how that could affect recreational fishing is also presented.

3.3 FOREST VEGETATION

3.3.1 Regulatory Framework

Regulatory framework for the management of vegetative resources includes the Idaho Forest Practices Act, Multiple Use Sustained Yield Act of 1960 (USDA, 1983), Endangered Species Act of 1971 (USDA, 1983), Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) (USDA, 1983), National Forest Management Act of 1976 (NFMA) (USDA, 1983), and Forest Service regulations and policies.

RPA as amended by NFMA (RPA sec. 3 (d) (1) and NFMA sec. 4) states, "It is the policy of Congress that all forested lands in the National Forest System be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth, and conditions of stand designed to secure the maximum benefits of multiple use sustained yield management in accordance with land management plans." RPA and NFMA (sec. 6 (g)) indicate that plans will be developed which specify guidelines to

- *identify the suitability of lands for resource management;*
- *provide for the diversity of plant and animal communities based on the suitability and capability of land areas to meet multiple-use objectives;*
- *where appropriate, to the degree practicable, preserve the diversity of tree species similar to that existing in the planning area;*
- *insure that timber will be harvested from National Forest System Lands only where soil, slope, or other watershed conditions will not be irreversibly damaged; the lands can be adequately restocked within five years after harvest; protection is provided for streams, stream banks, shorelines, lakes, wetlands, and other bodies of water where harvests are likely to seriously and adversely affect water conditions and fish habitat; and the harvesting system used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber.*

This section of RPA and NFMA goes on to state that any cut designed to regenerate an even-aged stand of timber must be determined to be appropriate to meet the objectives and requirements of the land management plan and, in the case of clearcutting, is the optimum method; has had an interdisciplinary review of impacts and the cuts are consistent with the multiple use of the general area; will be shaped and blended, to the extent practicable, with the natural terrain; meets established, suitable size limits; and is carried out in a manner consistent with protection of soil, watershed, fish, wildlife, recreation, esthetic resources, and the regeneration of the timber resource.

NFMA amended RPA (RPA and NFMA sec. 6 (m) (1)) requires that prior to harvest, stands of trees shall generally have reached the culmination of mean annual increment of growth. This does not preclude the use of sound silvicultural systems such as thinning and other stand improvement measures, and allows salvage or sanitation harvest following fire, wind throw, or other catastrophe or within stands in imminent danger of insect and disease attack.

Forest Service policy (FSM 2470.3) (USDA, 1990) and Regional Guide (USDA, 1983) directs land managers to:

1) *Use only those silvicultural practices that are best suited to the land management objectives for the area. Consider all resources, as directed in the appropriate forest plan.*

2) *Prescribe treatments that are practical in terms of cost of preparation, administration, transportation systems, and logging methods.*

3) *Monitor practices, using procedures specified in forest plans to ensure objectives are met.*

4) *Before scheduling stands for regeneration harvest, ensure, based on literature, research, or local experience, that stands to be managed for timber production can be adequately restocked within 5 years of final harvest. Five years after final harvest means five years after clearcutting, final overstory removal in shelterwood cutting, the seed tree removal cut in seed tree cutting or after selection cutting.*

5) *Perform all silvicultural activities in the most cost effective manner consistent with resource management objectives.*

6) *The size of tree openings created by even-aged silvicultural methods will normally be 40 acres or less. With some exceptions, creation of larger openings will require 60 day public review and Regional Forester approval.*

7) *For management purposes, cut areas created by even-aged management will no longer be considered openings when both vegetation and watershed conditions meet management objectives established for the management area.*

Management activities will promote programs that provide a sustained yield of forest products consistent with the multiple-use goals established in Regional Guides and the Forest Plan (Forest Plan II-8). Timber management activities will be the primary process used to minimize the hazards of insects and diseases and will be accomplished primarily by maintaining stand vigor and diversity of plant communities and tree species (Forest Plan II-8).

Protection of timber stands from insect and disease problems will center around the silvicultural treatments prescribed for timber management activities (Forest Plan II-10) and use of silvicultural methods and schedule cultural practices which reduce the development and/or perpetuation of pest problems (Forest Plan II-39).

Proposed activities will be consistent with Management Area objectives. Descriptions and objectives of these Management Areas are briefly described in Chapter II (section 2.2.12) of this environmental impact statement and further detailed in the Forest Plan (Forest Plan, Chapter II).

3.3.2 Methodology

A. Assessment of Existing Conditions

The information provided comes from a variety of sources. Information for National Forest lands on habitat types, forest cover types, forest structural stage and past harvest activity are based on existing data bases (Timber Stand Management Record System, TSMRS and field sampled vegetation, FSVeg) that were developed from stand exam information, historical records and aerial photo interpretation. Maps of forest cover types, habitat types and past harvest activity are available in the project file. Silvicultural diagnosis information associated with potential treatment units are also found in the project file. Findings of the Geographic Assessment are very similar to more broad-scale conclusions found at the Columbia Basin and Northern Region scales, in terms of vegetation disturbance.

The structural stage categories are quite broad and are based on stand age. The shrub/seedling/ sapling stage includes forest stands that are less than 35 years old. These stands have resulted from past regeneration harvests or natural event such as fire. These stands may consist of seedlings less than one year old or trees planted in clearcuts in the 1960s that are now 30-40 feet tall. Some stands may retain a considerable number of overstory trees for shelterwood purposes, while others may have no large tree component.

The pole and small-to-medium timber structural stage consists of stands that are 36 to 100 years old. These stands may represent natural regeneration left after selective removal of the large, valuable overstory trees or may have resulted from fires or timber harvest in the early part of this century. Many of these stands are quite dense with high stocking levels; some are rather open, particularly where commercial thinning harvests or thinning from stem decays and root disease has taken place.

The mature, large timber structural stage includes stands of trees that are over 100 years old. These stands generally resulted from fires prior to 1900 and are quite varied in appearance. Stand conditions may be quite open as a result of past harvest activity, root disease and other pathogens, fire or soil conditions. Stands unaffected by these events will be dense with fairly closed canopies.

A subset of the mature, large timber structural stage is allocated old growth. These stands of old forest meet Forest Plan definitions and are allocated as old growth. They generally display large trees and ages over 150 years in the large tree portion of the stand. They include both allocated old growth and potential or recruitment old growth. They generally resulted from fires or other natural disturbance prior to 1850. In the Iron Honey area however, these areas have often been highly fragmented and/or display mixed age classes due to past harvests. Existing allocated and potential old growth stands will vary in composition and canopy closure based on past harvest activity, root disease, fire and/or soil/habitat conditions.

There is very little detailed information on areas harvested prior to the 1950s. Therefore, the tables do not include acres harvested prior to this time. Also, many areas have had more than one harvest entry, particularly commercial thinning and sanitation/salvage harvests.

B. Assessment of Environmental Consequences

Refer to the tables in Appendix E for unit-by-unit descriptions of harvest prescriptions, logging systems and fuels treatments proposed under each alternative.

The condition descriptions of the Geographic Assessment were used to characterize the analysis area. Findings of the Geographic Assessment (p. 28-31, 33, 36-37), at least in relation to vegetation disturbance, are very similar to more broad-scale conclusions found at the Columbia Basin and Northern Region scales:

1. *Disturbance and successional regimes have been altered since the Euro-settlement in North Idaho.*

2. *There has been a substantial reduction in the percent of the landscape composed of long lived early seral species such as western white pine, ponderosa pine, and larch. This is primarily the result of fire suppression, timber harvest and the introduction of white pine blister rust.*

3. *There has been a major reduction in old growth forest structure while intermediate aged forest has increased dramatically. This is primarily the result of timber harvest focusing in older trees, fire suppression and the introduction of white pine blister rust.*

4. *Landscape patterns have been modified by timber harvest and exclusion of fire. Current landscape patterns are more uniform. Old growth patches are smaller in size. Approximately the same percentage of the landscape is in openings but the openings are more numerous, smaller in size, and scattered across the watersheds.*

The purpose of the Geographic Assessment was to develop a scientifically based understanding of the processes and interactions occurring in the project area, so that activities can be developed to promote healthy ecosystems. In order to maintain healthy, sustainable ecosystems, it is important that species are well adapted to the environmental variability inherent in the ecosystem and to maintain forest structures necessary to support ecosystem diversity and productivity. This is consistent with the Columbia Basin Assessment (ICBEMP) and the Northern Region Assessment. The Geographic Assessment identified the risks associated with conversion to shade tolerant, drought and fire intolerant species from shade intolerant, drought and fire tolerant species. Understanding that a single resource risk cannot be considered in isolation, the Geographic Assessment identified the risks to hydrologic, aquatic, wildlife and recreation along with the interrelationships of these risks. The Geographic Assessment strategy for risk management strove to be both integrated and adaptive. This approach is consistent with the Columbia Basin Assessment (ICBEMP). The project interdisciplinary team considered these recommendations as they developed the proposed alternatives.

The Geographic Assessment for the Coeur d'Alene River Basin found that all the watersheds within the project area are a priority for vegetation restoration due to the effects of white pine blister rust, past harvest activities, and fire exclusion. Species composition has changed dramatically from historical conditions with increases in western hemlock, grand fir and Douglas-fir corresponding reductions in the amount of white pine and larch.

Historic stand structures have also been altered. Old growth structure has been reduced below historic levels and stands have been fragmented by harvests. Remaining old growth is often lacking the component of large, old early seral remnants such as white pine and larch. Shrub/seedling/sapling structural stages tend to occur in smaller stands and are fragmented and scattered over larger areas as a result of timber harvests. One criteria for comparison of alternatives in this analysis area will be changes in species composition from shade tolerant, late seral species to shade intolerant, early seral species. Another criteria will be how the proposed treatments affect forest structural stage and how these shifts in structural stage occur across the landscape.

3.3.3 Overview

A. Introduction

The vegetation in northern Idaho is a result of the prevailing climatic pattern in which westerly winds carry maritime air masses from the northern Pacific across the northern Rocky Mountains during winter and spring. This weather pattern is characterized by precipitation occurring mainly between November and February, with only 12 percent of the annual precipitation occurring between July and September (Geographic Assessment, p. 12). The inland maritime airflow provides northern Idaho with abundant moisture (25-55 inches per year) and moderate temperatures.

The subbasins of northern Idaho contain diversity of habitats and plant communities, many of which contain plant species that are known or thought to be rare. Of the estimated 1,200 to 1,500 plant species known or thought to occur here, about 10 percent are considered rare or uncommon. There are no federally listed endangered plants for the Idaho Panhandle National Forests (IPNF). Three species are listed as threatened for the IPNF: water howellia (*Howellia aquatilis*), Ute ladies' tresses (*Spiranthes divuvialis*) and Spalding's catchfly (*Silene spaldingii*). There are no documented occurrences of these species although suitable habitat is thought to occur. Thirty-one species of sensitive plants are known or suspected to occur within the sub-basin. For additional information, please refer to Appendix B and the Project Files (TES Plants).

B. Habitat Types

The vegetation in the Coeur d'Alene sub-basin reflects the climatic conditions discussed above. "Habitat typing" is a land classification system based on the potential climax natural vegetation that could occupy a site. Habitat types are named for the potential climax community type or plant association, which is denoted by the climax tree species (usually the most shade tolerant tree adapted to the site), and the dominant or indicator undergrowth species of the plant association (Cooper et al. 1991). The climax tree species denoted in a habitat type is not necessarily dominant or even present on the site. A very high percentage of forested landscapes reflect some degree of disturbance resulting in a preponderance of early seral stages. Forest Habitat Types of Northern Idaho: a Second Approximation (Cooper et al. 1991) was the basis for determining habitat types in the Coeur d'Alene sub-basin.

Within the Iron Honey project area, the most common habitat type is western hemlock/queencup beadlily which accounts for approximately 54 percent of National Forest lands. The western hemlock/wild ginger habitat type occupies approximately 13 percent of the area, while grand fir/queencup beadlily and western red cedar/lady fern habitat types are each present on about 8% percent of the area. The remaining 17 percent is made up of a variety of other habitat types.

Threatened and Sensitive plants and Forest species of concern can be assigned to one or more rare plant guilds. These guilds are artificial assemblages based on similar habitat requirements used for the purpose of analysis. For the Idaho Panhandle National Forests, the rare plant guilds are aquatic, deciduous riparian, peatlands, cold forest, wet forest, moist forest, dry forest and subalpine. Rock seeps and springs are another habitat that can support certain sensitive plants, however these can occur across all guilds and are not identifiable at a coarse scale (please refer to Appendix B for specific plant guild descriptions).

Although every habitat type is unique in some way, they can be grouped based on similarities in natural disturbance regimes, successional patterns and structural characteristics of mature stands (USDA Forest Service, Region One, 1996, p. 3).

The vast majority (88%) of the habitat types within the project area are in the Warm/Moist Habitat Type Groups. Approximately 6% are in the Cool/Moist Habitat Type Groups and about 5 % of the area consists of Warm/Dry Habitat Type Groups. Cool/Dry Habitat Types account for approximately 1% of the area.

Warm, Moist Habitat Type Group*:* The habitat types of this group within the Iron Honey Analysis Area consist primarily of western hemlock/queencup beadlily with much lesser amounts of western hemlock/wild ginger, grand fir/queencup beadlily, and western red cedar/lady fern. The current forest cover types are dominated by grand fir (49 percent), western hemlock (25 percent), and Douglas-fir (12 percent). Subalpine fir and larch are the major species on six percent and four percent, respectively, of the area within the moist habitat type group while white pine and lodgepole pine make up the remainder.

Prior to the introduction of blister rust, with over 40 percent of these areas dominated by white pine, the area was known as the "white pine type". Currently, two percent of the Iron Honey Analysis Area is classified as western white pine forest cover type and most of this is in stands that have been recently harvested and planted to white pine. Historically, these habitat types had fire-free intervals of 50 to 200 years or more (USDA, 1996). Stand replacement fires, while infrequent, could be severe during times of drought. Sensitive plants of the moist and wet forest guilds are most likely to be located within these habitat types.

Cool, Moist and Cool, Dry Habitat Type Groups: These habitat type groups account for about seven percent of the Iron Honey Analysis Area. The major types in the group include western hemlock/fool's huckleberry with much lesser amounts of subalpine fir/queencup beadlily, subalpine fir/menziesia, and subalpine fir/bear grass. Historically, these habitat types had fire-free intervals of 50 to 130 years or more and stand replacing fire intervals of 90 to 150 years (USDA, 1996). Sensitive plants of the subalpine forest guild are most likely to be located within these habitat types.

Warm, Dry Habitat Type Group: The habitat types of this group within the Iron Honey project area consist primarily of Douglas-fir/ninebark and grand fir/ninebark types. The current forest cover types are dominated by Douglas-fir (52 percent) and grand fir (32 percent), with lodgepole pine and subalpine fir being the major species on eight percent and six percent, respectively, of the dry habitat types. These dry habitat types tend to occur in scattered stands on south through southwest facing slopes.

Because these habitat types cover such a small percent of the area, it is difficult to determine the natural disturbance regimes. Where these habitat types form a larger component of the landscape; stands were often maintained in open-grown stands of ponderosa pine and Douglas-fir with grass and brush understories (USDA Forest Service, Region One, 1996, p. 4). The natural fire-free interval was approximately five to 50 years and stand replacement fires were relatively infrequent. However, in the Iron Honey Analysis Area the disturbance regime in these widely scattered stands may have been heavily influenced by the disturbance pattern of the more abundant moist habitat types. Sensitive plants of the dry forest guild are most likely to be located within these habitat types.

C. Disturbance and Successional Patterns

Fire*:* Prior to European settlement in the Coeur d'Alene River subbasin, fire was the most important disturbance occurring across the landscape. Zack (1994) described fire history within the Coeur d'Alene sub-basin as having a mean fire return interval for lethal fires of 203 years and a mean fire return interval for all fires of 84 years. Zack (1994) also indicated that fires covering greater than five percent of this forest occurred on an average of approximately once every 19 years.

In the denser forested environments further removed from Native American settlements, such as the Iron Honey Resource Area, lightning caused fires were probably more important in determining vegetation patterns across the landscapes. Lightning is a common occurrence in the Coeur d'Alene sub-basin. These fires probably burned in a variable pattern depending on weather conditions preceding and following the fire starts. In "normal" years low and mixed severity fires may have burned a few acres to several hundred acres (depending on how long they crept) before being stopped by summer rains. These fires tended to increase structural complexity within stands and heterogeneity across the landscape (Smith and Fisher, 1997). In particularly dry years when fire starts were followed by high wind events, high intensity fires could cover tens of thousands to hundreds of thousands of acres. These intense fires often killed most trees and ground

vegetation within the fire perimeter, leaving islands of trees and widely scattered individual trees in moist areas or where recent low intensity fires had removed ladder fuels from the understory. This mixture of moderately frequent, mixed severity fires and infrequent high intensity fires created a landscape of large blocks of old and mature forest with smaller areas of younger age classes. It also created large blocks of younger forests with smaller areas of mature and old age classes (Geographic Assessment, p. 29). In addition, in terms of the occurrence pattern across landscapes within the basin, the Coeur d'Alene Fire Study (Zack, 1994) showed that over the last 450 years there was a major stand replacing fire episode somewhere in the river basin on an average of every 19 years. The 1920 fire alone burned approximately 24% of the Coeur d'Alene National Forest. From 1889 through 1934 (45 year period) a series of large fires cumulatively burned over almost 50% of the Coeur d'Alene National Forest. A series of large fires between 1810 and 1862 (a 52 year period) cumulatively burned a similar or larger percentage of the Coeur d'Alene. Previous major fire events of the same magnitude were clustered around 1772 and 1580. During major fire events some watersheds were almost entirely burned over, while large areas were unaffected.

Forest vegetation in north Idaho was historically dominated by species such as white pine, western larch and ponderosa pine. These long-lived tree species typically establish after some form of disturbance and have the potential to occupy a site for two to three hundred years. Stands of these trees were adapted to the variable intensity fire regimes and weather patterns common to the area. Natural levels of insect populations, along with wind and winter storm damage, contributed to stand mortality and, over time, created conditions for large stand-replacing fires.

In the mesic upland areas, the mosaic created by moderately frequent, low and mixed severity burns with infrequent high intensity fires has been altered. Fire suppression efforts have largely eliminated the low and mixed severity fires as a significant disturbance agent. This successful fire suppression has temporarily increased security of human life and property and made it easier to practice forestry. However, as a result of the suppression of fire in a very productive ecosystem, woody dead fuels and multistory stand structures are building up (USDA, 1998). On drier south facing slopes that would have contained mixed open stands of ponderosa pine, larch and Douglas-fir with little understory now have denser tree cover with a higher component of Douglas-fir and grand fir and understories of dense shrubs or shade- tolerant reproduction. In general, drier sites have become more susceptible to stand replacing fires because of dense multi-storied structures. The shift to more Douglas-fir and grand fir has also made stands much more susceptible to root diseases.

Logging*:* Euro-settlement since the latter part of the 1800s has also influenced forest vegetation in the Coeur d'Alene basin. In some cases, trees were cut to clear land for agricultural uses, and in other cases the objective was to provide a variety of wood products. Through the early part of this century, most trees harvested for wood products were the largest and most valuable; generally white pine, western larch and ponderosa pine. White pine mortality, caused by white pine blister rust and mountain pine beetle, led to an aggressive effort to salvage this species to recover its economic value. These economic focused species-selective harvests that tended to leave stands of poor quality and/or damaged grand fir, Douglas-fir and western hemlock. Only in stands that were burned accidentally or to treat slash did early seral species of white pine, western larch and ponderosa pine have an opportunity to regenerate. Even where white pine seedlings could become established, they were often quickly killed by blister rust, thus allowing other species to dominate the site.

In the latter part of this century, timber harvests have often tended to remove the lower quality species as well as the more valuable ones. These types of harvests were on a smaller scale than natural disturbance regimes, creating a highly fragmented landscape of old growth patches adjacent to newly regenerated stands of 20 to 100 acres in size. Before the introduction of blister rust resistant white pine planting stock, these regenerated stands were often planted with Douglas-fir. Once blister rust resistant stock became available and the insect and disease problems of Douglas-fir were more fully recognized, planting shifted to white pine, ponderosa pine and western larch.

Root Disease*:* Historically, root diseases were significant factors in reducing the competition from Douglas-fir and grand fir to maintain western white pine, western larch and, on some sites, ponderosa pine. Douglas-fir tended to regenerate readily in the early stages of stand development, but dropped out as a significant component due to high rates of root disease caused mortality (Byler and Zimmer-Gorve 1990). Western white pine, ponderosa pine and larch have a higher level of resistance at this stage of stand development and were able to capitalize on this reduced competition. Fire exclusion and the loss of these species through logging and blister rust have reduced the opportunity for early seral species to become established in root disease areas. Root disease is currently the most prominent landscape altering process in the Coeur d'Alene sub-basin (Geographic Assessment, p. 30).

Insects: Major insect pests of the Coeur d'Alene River Basin include mountain pine beetle, western pine beetle, Douglas-fir beetle and fir engravers. Historically, mountain pine beetle played a major role in mature white pine forests (Geographic Assessment, p. 29). Outbreaks were recorded in the early 1900s that killed up to 50% of the mature white pine in some stands and spread over thousands of acres. Many of the killed or infested trees were harvested or felled and burned (Geographic Assessment, p. 30). With the decline of white pine due to blister rust and harvesting, the importance of mountain pine beetle has also declined. Western pine beetles were common on the Rathdrum Prairie and drier portions of the upland forest, killing individual trees or small groups of ponderosa pine. In particularly dry years mortality could increase dramatically. Due to the reduced amount of ponderosa pine in the ecosystem overall, western pine beetles are no longer as prominent; although site-specific areas stressed by drought and/or dense stand conditions can lead to high mortality. Douglas-fir beetles and fir engravers have always been present throughout the Coeur d'Alene sub-basin but large increases in grand fir and Douglas-fir across the landscape have led to increased endemic levels. The presence of root disease in many of the Douglas-fir forest types has resulted in high endemic levels of the Douglas-fir beetle and the propensity for rapid beetle population build ups during favorable conditions (Lockman and Gibson 1998). Douglas-fir beetle outbreaks occur following disturbances such as windfall, snow breakage or fire. In particularly dry years, insect infestations and mortality could increase dramatically. Short-term increases in fuel loading may have led to increased crowning of moderate severity fires and created small to large openings for the reintroduction of seral species. In some cases, these insect infestations may have contributed to large stand replacing fires (Geographic Assessment, p. 30).

Loss of White Pine: White pine blister rust was introduced into this area in the early 1900s. Blister rust is a fungal disease that forms cankers on branches or stems of trees that eventually kill or weaken the tree. Weakened trees become susceptible to other diseases or to insect attack. Eventually, white pine was infected over the entire Coeur d' Alene sub-basin; trees were either killed or there was an accelerated harvest to recover their economic value. Efforts were made to control blister rust through eradication of the alternate hosts, current and gooseberry. These Ribes plants were pulled from the ground or bulldozed into piles, and/or sprayed with herbicides. Although these methods had been somewhat successful in the eastern United States; the topography and landscape scale in the west prevented success and the program was dropped in 1968 (Neuenschwander et al, 1999, p. 5, 8, 10, 12). The loss of mature white pine and the continuing mortality of younger trees due to blister rust have led to the increase in Douglas-fir, grand fir and hemlock which we now see across the landscape.

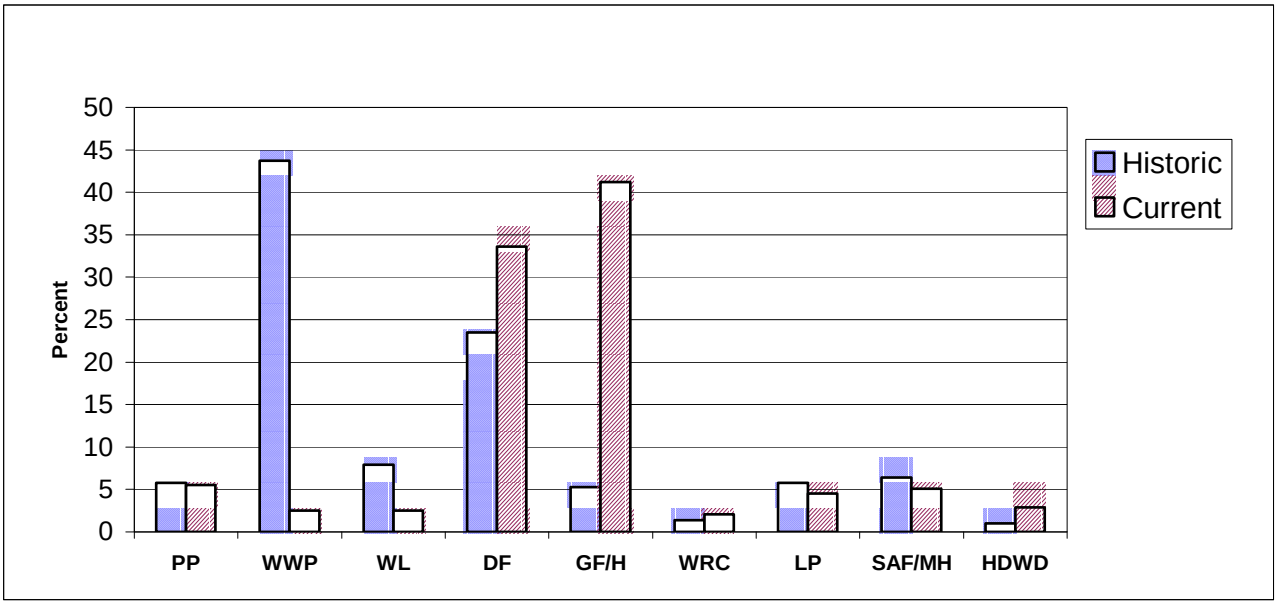
Applications of antibiotics also proved unsuccessful and emphasis has shifted to developing genetically rust resistant trees that can be planted throughout the natural range of white pine. Efforts to improve tree resistance, plant resistant stock in suitable locations, and improve survival through cultural treatments such as pruning and thinning are continuing.

D. Coeur d'Alene Basin Current Situation

The findings of the Geographic Assessment indicate that there has been a tremendous change in both species composition and stand structure and landscape pattern within the Coeur d'Alene River Basin. Long-lived seral species (western white pine and western larch) have declined within the Coeur d' Alene sub-basin as a result of white pine blister rust and timber harvesting that tended to remove these species while leaving species such as grand fir, hemlock and Douglas-fir. Fire suppression has allowed the development of much denser stands over larger areas and increases in the fuel loadings.

The white pine cover type has declined by more than 94 percent in the past 100 years (Geographic Assessment, p. 37). Grand fir/western hemlock cover types increased by 677 percent (Geographic Assessment, p. 31 and 37). Larch forest types have decreased by 68 percent, and the Douglas-fir type has shown a 40 percent increase (Geographic Assessment, p.37).

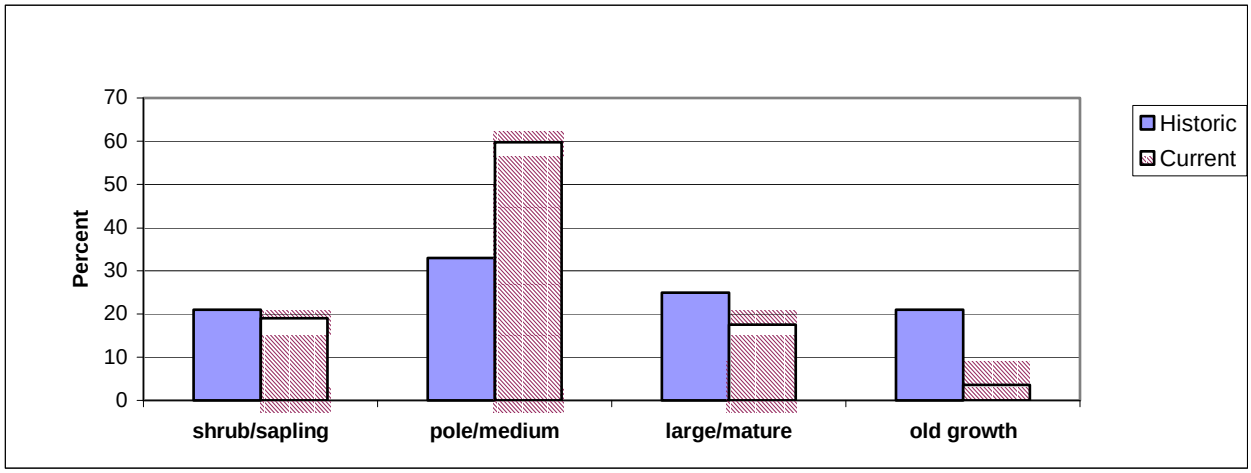
Figure III-14. Changes in forest types in the Coeur d'Alene River Basin.



In terms of forest structure, the greatest changes in the Coeur d'Alene basin have been in the amount of old growth and pole/medium-sized timber found on the landscape. Old growth has declined from a historic average of about 21 percent of the area to less than 4 percent. This was generally the result of the aggressive harvest of economically valued species (white pine and larch) and the loss of white pine to blister rust. The large fires in the first half of this century also played an important part in reducing the old forest component. Today, old growth on National Forest lands within the Coeur d'Alene sub-basin tends to be in areas not burned in the 1910 fires; it also tends to be fragmented by past timber harvest.

Stands of grand fir, western hemlock and Douglas-fir that have replaced white pine and larch in the ecosystem and the Douglas-fir and grand fir encroaching on the ponderosa pine on drier sites are very susceptible to root disease and insect attack. These stands are unlikely to provide the same mature and old growth structure containing large white pine and larch that was once a major component of the Coeur d'Alene River Ranger District. Although these stands may contain large old trees and provide some old growth characteristics, openings caused by root diseases and other pathogens and insects may be common and a key component of remnant white pine and larch will be missing. Old growth may also be more susceptible to disturbance and be less persistent as Douglas-fir on mesic sites is generally not long lived.

Figure III-15. Changes in forest structure in the Coeur d'Alene River Basin.



E. Existing Conditions in the Iron Honey Resource Area

Elevations in the Iron Honey Resource Area range from 2,900 feet at the mouth of Hudlow Creek to 5,665 feet at the top of North Chilco Mountain. The analysis area is dominated by moist habitat types (19,050 acres) of western hemlock, grand fir and western red cedar, indicative of the heavy rainfall that occurs. In contrast, warm, dry Douglas-fir and grand fir habitat types comprise 1,100 acres. Cool, moist to wet subalpine fir habitat types occur on about 1,300 acres and cool dry subalpine fir types occur on 200 acres within the analysis area.

Historically, the major disturbances in this area would have been fires that occurred at intervals of 50 to 200 or more years. Due to the generally moist conditions, stand replacement fires would be rare but occurred during periods of drought, especially when associated with high wind events. Low and mixed severity fires were common but would seldom remove canopies and regenerate stands. This disturbance pattern would have created large patch sizes that would often develop into mature or old growth forests. Long lived seral species such as white pine and western larch would have dominated many of these stands. Mountain pine beetles played a major role in killing individual trees and groups of white pine.

Because most of this area did not burn in the large fires of the late 19th and early 20th centuries; there was an abundance of large white pine that attracted the logging industry in the first half of the century. In the late 1930s and early 1940s a logging railroad extended to Iron and Honey Creeks to facilitate removal of the logs (Strong, Webb, 1970, p. 123). Flumes and log chutes were used to transport logs from the forest to the railhead. These early harvests were generally quite selective, removing only the large pine and larch and leaving stands of poor quality and/or damaged hemlock and grand fir. Where white pine did regenerate, it was susceptible to blister rust with few trees surviving to maturity. More intensive management began in the late 1950's with clearcutting tending to fragment the landscape into smaller patch sizes. Salvage of the remaining white pine often took place between harvest units.

There have been approximately 3,900 acres of clearcut harvests, 1,350 acres of stands that have had seed tree and shelterwood harvests, 3,200 acres of overstory removal and liberation harvests, 1,750 acres of commercial thinning, 1,850 acres of salvage logging, and 1,200 acres of selective harvest within the analysis area. Most areas harvested in the 1930s and 1940s are not included in these figures since accurate information was not available for that time period. Also, many stands have been harvested several times. The most intensive harvests occurred in the 1960s with over 5,900 acres harvested, of which 2,400 acres were clearcuts. The most recent treatments are salvage harvests associated with the West Hudlow Ice Salvage Sale in the Hudlow Creek drainage. This sale consisted of 89 acres of salvage harvesting to remove trees that were

killed and damaged by ice and snow in the winter of 1996/97. Post-sale activities (such as site preparation and noxious weed treatment) are still ongoing.

The early logging to remove the economically valuable white pine, continued salvage efforts and white pine blister rust have combined to effectively eliminate white pine as an important forest cover type in this area. Historically, white pine was probably the dominant cover type on over 50% of the analysis area, whereas it is currently dominant on less than 1% of the area. Grand fir and western hemlock were historically the dominant cover type on less than 10% of the Coeur d'Alene basin while they now cover 67% of the analysis area. Douglas-fir is currently the dominant species on 15% of the area followed by subalpine fir on 9% of the area. Western larch and lodgepole pine each occupy 4% of the area. Ponderosa pine is a very small component in the analysis area as would be expected in the generally moist habitat types present.

Early and continuous harvest and blister rust mortality within the analysis area has eliminated most of the old growth forest. There are 1,144 acres of designated old growth and potential or recruitment old growth, most of which are western hemlock and grand fir cover types. The Iron Honey Resource Area has a low percentage of old growth primarily due to historic timber harvest. The area was not burned in the early 1900's and maintained its mature component. These large trees were then harvested early in the history of the Coeur d'Alene Mountains. The old growth is primarily in the hemlock habitat type. Like most of the Coeur d'Alene Mountains, old growth white pine, larch, ponderosa pine and cedar is under-represented from a historical perspective.

Old Growth Management Units 20, 23 and 12 are within the analysis area. Old Growth Management Unit 20 includes Compartments 304 and 312. Only Compartment 304 is within the Iron Honey Resource Area. Within Old Growth Management Unit 20 there are a total of 686 acres of allocated old growth, of which 459 acres are within the boundary of the Iron Honey Resource Area. Overall, 5.6% of Old Growth Management Unit 20 is allocated old growth. Within Old Growth Management Unit 23 there are a total of 589 acres of allocated old growth of which 370 is within the Iron Honey Resource Area. Overall, 5.5% of the Old Growth Management Unit 23 is allocated old growth. Old Growth Management Unit 12 has 315 acres of allocated old growth, all of which is within the Iron Honey Resource Area. Overall, 3.5% of Old Growth Management Unit 12 is allocated old growth. Existing allocated and potential or recruitment old growth is displayed on the enclosed alternative maps.

About 14% (3,050 acres) of the analysis area is less than 35 years old. Generally these stands are the result of the regeneration harvests that have occurred since the 1960s. Over 54% of the area (11,750 acres) is 35-100 years old, mostly resulting from the selective removal of white pine and large western larch in the first half of the century but also including some early regeneration harvests. Approximately 31% (6,750 acres) are over 100 years old.

Stem decays and root disease are the major pathogens within the analysis area and is most prevalent in stands with early partial harvests. Approximately 4,100 acres have active stem decay with 1,800 acres of this having decay in more than half the trees. Root disease occurs on over 4,700 acres with 2,700 acres having more than 5% of the trees infected. There is overlap in these figures since stem decays and root disease often occur together. Blister rust is an important factor in those stands that still contain western white pine, but there are few areas where white pine is a major stand component.

Although there has been an increase in Douglas-fir beetle activity in the Coeur d'Alene Basin over the last few years, the Iron Honey Resource Area does not have the same epidemic levels of beetles that many other areas are experiencing. There are several major factors responsible for this. One is that there was relatively little ice and snow damage in this area during the winter of 1996/97. Therefore, there was little down material for the beetles to build populations. Another factor is that Douglas-fir are not as common here as in Douglas-fir Beetle Project Area. Douglas-fir is the forest cover type on only 15% of the Iron Honey Analysis Area while it was about 44% of the Beetle Project Area. A third factor is that dry habitat types comprise only 5% of this analysis area compared to 16% of the Douglas-fir Beetle Project Area. Trees on these dry habitat types

would have been more stressed during drought conditions than those on wetter sites. The Douglas-fir beetle mortality in the analysis area tends to be associated with root disease pockets and as a disturbance agent the Douglas-fir beetle is killing the larger diameter and older trees. This trends stands toward increasing amounts of grand fir and western hemlock. About 4 percent of the analysis area consists of lodgepole pine stands that are 80 to 100 years old. Although there is little mountain pine beetle activity in these stands at present, as tree diameter and age increase the potential for an insect epidemic also increases.

Western larch within the analysis area is commonly 80 to 100 years old although there are a few stands with much older individuals and some recent plantations with a high component of the species. While young, larch will commonly grow much faster in height than its more shade-tolerant associates. This advantage lasts 30 to 40 years, at which time the gap in growth rate begins to narrow (Schmidt and Shearer 1995). Because larch is shade-intolerant, increased competition with grand fir, hemlock and Douglas-fir will cause lower portions of larch crowns to die. Larch can maintain itself in mixed stands only as long as it holds a dominant position in the crown canopy (Schmidt, Shearer and Roe 1976). As tree vigor declines in many of the mixed species stands, mortality can be expected to increase. Whereas larch is potentially capable of living over 500 years, between the ages of 80-150 years it can be squeezed out of the dominant crown position by grand fir and hemlock unless disturbance takes place.

Information on private lands within the project area is limited and generally based on aerial photo interpretation. The parcel of private land along Iron Creek is an old airstrip that is generally maintained free of trees. This is probably a subalpine fir habitat type with lodgepole the dominant species where trees occur. The other parcel of private land is a mining claim in the Honey Creek drainage. Most of this parcel has been harvested removing the largest trees and leaving the smaller, younger age classes on the site. The habitat types are in the warm, moist habitat type group with grand fir/queencup beadlily and hemlock/queencup beadlily being most common. Forest tree cover is generally grand fir, hemlock and Douglas-fir with some larch.

For vegetation analysis purposes, the Iron Honey Analysis area has been divided into nine watersheds including Hudlow Creek, Lewelling Creek. Tom Lavin Creek, Honey Creek, Sob Creek, Solitaire Creek, Iron Creek, upper reaches of the Little North Fork of the Coeur d'Alene River, and the face drainages of the Coeur d'Alene River. The following discussions identify the existing conditions and anticipated direct, indirect and cumulative effects in each of these watersheds.

3.3.4 Iron Creek Watershed

A. Existing Conditions

This watershed includes Iron Creek and its tributaries, Rablens Fork and Cataract Creek. Approximately 99 percent of this watershed (6,320 acres) is National Forest System land (approximately 50 acres are in private ownership). The private land within this watershed is an old airstrip that has been permanently cleared of forest vegetation.

Approximately 91 percent of this watershed is dominated by the warm, moist habitat types of western hemlock and grand fir, with some western red cedar. Warm, dry Douglas-fir and grand fir habitat types cover 6 percent of the area and cool, moist habitat types make up the remainder.

Grand fir is the dominant forest cover type, accounting for 56 percent of the forested land. Western hemlock and Douglas-fir comprise 19 and 12 percent of the cover types while subalpine fir and larch account for 9 and 4 percent respectively. There are minor amounts of lodgepole and white pine.

The pole and small-to-medium saw timber structural stage in stands that are 35-100 years old is present on 47 percent of the watershed, but a substantial portion (37 percent) is also in mature and large sawtimber. About 14 percent is shrubs, seedlings, or saplings. There are 231 acres of potential or recruitment old growth within

the watershed. Western hemlock/queencup beadlily and grand fir/queencup beadlily are the most common habitat types in the old growth stands and western hemlock and grand fir are the dominant forest cover types.

As in the other watersheds in the analysis area, timber harvesting began as early as the 1930s when a railroad was constructed into the area. More intensive forest management generally began in the 1960s and continued through the 1970s and 1980s. Approximately 41 percent of the area has been treated with regeneration harvests. The most recent harvests were salvage and thinning treatments that occurred in 1985 between earlier regeneration harvests. There was a 30-acre fire in this watershed in 1959; the stand has regenerated to mainly grand fir.

Table III-24. Vegetative conditions in Iron Creek watershed.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 2 and 3)	380	6
Warm/Moist (Groups 4, 5, and 6)	5,750	91
Cool/Moist (Group 7)	190	3
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	730	12
Grand fir	3,535	56
Western Hemlock	1,220	19
Western Larch	230	4
Subalpine Fir	580	9
Lodgepole Pine	10	0.2
White Pine	15	0.2
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	870	14
Poles/small-medium timber	2,970	47
Mature/large timber	2,480	37
Allocated old growth	0	0
Allocated potential old growth	231	4
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	1,294	20
Seed Tree & Shelterwood	1,178	19
Overstory Removal	939	15
Sanitation/Salvage	1,213	19
Commercial Thinning	738	12
Selection Harvest	136	2
Fires since 1950	0	0

B. Environmental Consequences

Alternative 1

About 87 percent of the watershed is dominated by grand fir, hemlock and Douglas-fir. Mature forest structures are present on 39 percent of the area with grand fir, hemlock and subalpine fir the major species. These stands, particularly the old growth, have been highly fragmented by past harvest. Most of the old growth has also had some type of salvage harvesting in the past. These stands will provide some old growth structure in the future, although root disease and other pathogens are likely to increase opening size and maintain a higher shrub and small tree component. Mature forest structure does occur in somewhat larger blocks but is still highly fragmented.

Alternatives 2, 7 and 8

These alternatives would restore white pine and other early seral species approximately 1,100 acres and create the larger patch sizes associated with stand replacing fires. This is about 18% of the Iron Creek watershed and only 5% of the analysis area. By harvesting larger blocks and leave strips between previous harvest units, the pattern of stand replacing fires in the Iron Creek drainage can be simulated. Approximately 66% of the proposed harvest would occur within stands that have had some harvest activity within the last 40 years.

Approximately 30% of the basal area of each harvest unit would be retained (70% would be harvested). Since total basal area varies from stand to stand, the leave tree basal area would also vary. The desired trees would be retained as individual trees scattered throughout each harvest unit and as groups of trees from 3 to 5 acres in size. The exact proportion of each would depend on the species available to be left, the size of potential leave trees, and the site preparation that will take place following harvest. Logging slash, and in some cases, understory vegetation would need to be treated prior to reforestation efforts. Underburning is the preferred method because it allows the reintroduction of fire to the ecosystem, it's efficient, and most slopes are too steep for mechanical treatments. Where fire resistant tree species of large diameter are present, it may be advantageous to leave more individual trees and have fewer leave groups. Where potential leave trees are susceptible to fire damage and are of small diameter, it may be advantageous to leave fewer individual trees and more blocks of trees that can be avoided during burning operations. Certainly some mortality of leave trees would be expected and acceptable. There would be no removal of these leave trees regardless of whether or not they survive underburning.

Silviculture terminology to be used for this type of harvesting is not definitive. Shelterwood with reserves seems most appropriate because the leave trees are expected to provide a seed source and moderate the regeneration environment. However, the most important function of these leave trees may be providing structural diversity within the harvest areas. This structural diversity provides refugia for elements of biological diversity that might otherwise be lost in harvested stands (Franklin et al, 1997, p. 115). Franklin refers to this type of harvest as a "variable retention harvest system" (Franklin et al, 1997, p. 115).

Maintaining shelterwood trees would be important because most of the harvest areas are on southeast through southwest-facing slopes. Conditions will be somewhat harsh during the dry summer months. Although white pine requires adequate sunlight for germination and growth, seedlings survive in full sunlight only if moisture is plentiful (Haig et al, 1941; and Smith, Jane K., Fischer, William C., 1997, p. 109). Stocking levels of natural regeneration within interior cedar-hemlock-white pine forests increases with increases in residual basal area on south slopes (Ferguson, Dennis E., 1993, p. 240). However, too much residual overstory could preclude establishment and growth of shade intolerant species and favor the regeneration of shade tolerant species.

Blister rust and past harvesting have removed most of the white pine from the analysis area and seed crops of western larch and ponderosa pine are not consistent enough to rely on natural regeneration. Although these species are preferred as leave trees, harvest units need to be planted with a mixture of rust resistant white pine, western larch and some ponderosa pine to ensure adequate seral regeneration. Natural regeneration of Douglas-fir and grand fir would also occur, and, in some stands, western hemlock and lodgepole pine may also become established. Harvest units would range from about 48 acres to 266 acres in size.

Approximately 800 acres of additional potential or recruitment old growth would be allocated within the Iron Creek drainage. There is also the potential for a portion of funds generated by the timber harvest to be utilized in improving riparian vegetation along Iron Creek.

Alternative 3

Approximately 75 acres (1 percent of the Iron Creek watershed) are proposed for harvesting in 15 units under this alternative. Harvest treatments would be clearcut with reserves. All except one of the 15 units have had

some past harvest treatments. Stands are dominated by grand fir with some hemlock and Douglas-fir. Mortality from root disease is particularly high in areas of past harvest were Douglas-fir is a major component of the stand. Clearcut areas would be planted with white pine, western larch, and some ponderosa pine following site preparation and fuel treatment by underburning.

Alternative 5

Approximately 1,159 acres (18 percent of the National Forest System lands within the watershed) are proposed for harvesting in this alternative. Harvest treatments would be shelterwood with reserves. About 66 percent of the proposed harvest area has been treated in the past with salvage, selection and shelterwood harvests. Stands are dominated by grand fir with some hemlock and Douglas-fir. Mortality from root disease is particularly high in areas of past harvest were Douglas-fir is a major component of the stand. Harvest areas would be planted with white pine and western larch following site preparation and fuel treatment by underburning.

Alternative 6

Approximately 147 acres (2 percent of the Iron Creek watershed) would be harvested in stands that are dominated by grand fir and hemlock. These species are likely to regenerate in any small openings that are created. Planting vegetation in riparian areas would be concurrent with any in-stream rehabilitation. Approximately 800 acres of additional potential or recruitment old growth would be allocated within the Iron Creek drainage.

3.3.5 Hudlow Creek Watershed

A. Existing Conditions

The Hudlow Creek area encompasses approximately 3,480 acres, all of which is National Forest land. Lands within this analysis area are dominated by warm, moist habitat types of western hemlock and grand fir with some western red cedar. About 97 percent (3,380 acres) of the area is in these habitat types. The remaining 3 percent are warm, dry Douglas-fir and grand fir habitat types comprising about 100 acres.

Grand fir is the dominant forest cover type on 43 percent of the analysis area. Lodgepole pine and western hemlock are the dominant species on 19 percent and 17 percent of the area respectively. These are followed by white pine with 7 percent and subalpine fir and Douglas-fir with 5 percent each. Western larch is the major species on most remaining areas but there is some non-forested ground and some ponderosa pine. Most of the white pine and larch forest types occur in areas planted following regeneration harvests in the 1990s.

Most of this analysis area is in the pole and immature sawtimber structural stage or the mature forest structural stage. These account for 43 and 42 percent of the watershed respectively. Approximately 15 percent of the analysis area is in the shrub/seedling/sapling structural stage. There is only 1 acre of potential or recruitment old growth within the watershed. The habitat type is mountain hemlock/fool's huckleberry with larch the dominant tree species.

The earliest harvests in this watershed probably took place in the 1930s or 40s when a railroad was constructed into the area. Harvests have occurred in every decade since that time. The most recent harvests occurred in 1998 and 1999, with approximately 89 acres being salvage harvested as a result of severe ice and snow damage that occurred during the winter of 1996/97. There have been no fires in recent history (last 40 years) that would have altered stand structure, although there have been many small lightning fires.

Table III-25. Vegetative conditions in the Hudlow Creek Watershed.

Habitat Type Group	**Approximate Acres**	**%of Forest Lands**
Warm/Dry (Groups 1,2,3)	110	3
Warm/Moist (Groups 4, 5, and 6)	3,370	97
Cool/Moist (Groups 7 and 8)	0	0
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	175	5
Grand fir	1480	43
Western Hemlock	600	17
Ponderosa Pine	10	0.3
Western Larch	100	3
Lodgepole Pine	675	19
Subalpine fir	180	5
Western White Pine	240	7
Non Forest	20	0.6
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	520	15
Poles/small-medium timber	1480	43
Mature/large timber	1480	42
Allocated old growth	0	0
Allocated potential old growth	1	0
Past Timber Harvest and Fires*	**Approximate Acres**	**% of Forest Lands**
Clearcuts	445	13
Seed Tree & Shelterwood	1	0
Overstory Removal	230	7
Sanitation/Salvage	240	7
Commercial Thinning	105	3
Selection Harvest	1	0
Fires since 1950	0	0

**Some stands have been harvested several times so actual acreage impacted is considerably less.*

B. Environmental Consequences

Alternatives 1, 2 and 8

No vegetative treatment would occur in the Hudlow Creek watershed under any of these alternatives. Grand fir and hemlock are the dominant species on about 59 percent of the Hudlow Creek drainage. Most stands are 80 to 100 years old, so root disease and stem decay are expected to increase substantially as these trees grow older. Lodgepole pine is the dominant species on approximately 19% of the watershed. There is more lodgepole pine in this watershed than in the rest of the analysis area combined. These stands of lodgepole pine are also 80-100 years old. As stand age increases and average stand diameter increases, these stands will become more susceptible to attack by mountain pine beetle. Beetle epidemics in natural stands generally occur when stand age is over 80 years, average diameter is over 8 inches, and there are a substantial number of trees over 12 inches in diameter (Schmidt, Alexander, 1985, 202) (Amman, 1989, p. 9). The white pine and western larch stands in the watershed consist of recently harvested and planted areas that should continue to develop with proper thinning and pruning. 42 percent of the drainage is mature forest structural stage, most of which is grand fir and hemlock cover types. Much of this has been fragmented by past regeneration harvests.

Alternative 3

Approximately 54 acres (about 2 percent of the Hudlow Creek watershed) would be harvested under Alternative 3. About 49 acres of this total are lodgepole pine stands that would be clearcut harvested.

Although trees would be retained for structure and long-term site productivity, it is doubtful that many would survive fuels treatments and site preparation since lodgepole is not fire resistant. In addition, lodgepole pine is quite susceptible to wind throw. Wherever possible, large fire resistant trees of other species would be retained. Prolific lodgepole pine with some larch and Douglas-fir natural regeneration is expected following site preparation so no planting is planned for these stands. Unit 14 is dominated by grand fir and Douglas-fir that is being severely impacted by root disease. This unit will also be clearcut but reserve trees are more likely to survive under burning and are less likely to wind throw than lodgepole pine. However, these reserve trees may succumb to root disease shortly after harvest. In order to assure regeneration of early seral species, white pine and western larch would need to be planted following fuels treatment/site preparation.

Alternative 5

Approximately 1,171 acres would be harvested in the Hudlow Creek watershed under Alternative 5. About 371 acres of this total are lodgepole pine stands that would be clearcut harvested (with reserve trees). Although trees would be retained for structure and long-term site productivity, it is doubtful that many would survive fuels treatments and site preparation since lodgepole is not fire resistant. In addition, lodgepole pine is quite susceptible to wind throw. Wherever possible, large fire resistant trees of other species will be retained or trees will be retained in groups that can be avoided during post harvest treatments. Prolific lodgepole pine with some larch and Douglas-fir natural regeneration is expected following site preparation so no planting is planned for these stands. The remaining 800 acres will be harvested using the shelterwood with reserves method. White pine and western larch with some ponderosa pine will be planted.

Unit 22 and portions of Units 21, 33, and 35 are on soils in which potassium may be limited. Recent research indicates that there may be a link between potassium deficiency and severity of root disease. Since the majority of potassium in the tree is located in the needles and small branches, limbing and topping would occur in the units (not at the landings). Additionally, the logging slash would be allowed to remain in the unit over one winter to allow nutrients to leach back into the soil prior to treatment for fuels reduction and site preparation.

Approximately 34% of the Hudlow Creek watershed would be harvested in this alternative. Approximately 46 percent of the watershed would be in created openings when recent (less than 20 years old) regeneration harvests are also considered.

Alternative 6

Approximately 130 acres (4% of the Hudlow Creek watershed) would be harvested in the Hudlow Creek watershed. Most of the trees to be removed would be grand fir but there would also be some Douglas-fir and hemlock. Grand fir would likely regenerate in any small openings created. Planting vegetation in riparian areas would be concurrent with any in-stream rehabilitation.

Alternative 7

Approximately 15 acres (less than 1% of the Hudlow Creek watershed) would be harvested in the Hudlow Creek watershed. About 10 acres of this total would be a lodgepole pine stand that will be clearcut (with reserve trees). Although trees will be retained for structure and long-term site productivity, it is doubtful that many will survive fuels treatments and site preparation since lodgepole is not fire resistant. In addition, lodgepole pine is quite susceptible to wind throw. Wherever possible, large fire resistant trees of other species will be retained. Prolific lodgepole pine with some larch and Douglas-fir natural regeneration is expected following site preparation so no planting is planned for this stand. The remaining 5 acres will be harvested using the shelterwood with reserves method. White pine and western larch with some ponderosa pine will be planted.

3.3.6 Tom Lavin Creek Watershed

A. Existing Conditions

All of the lands in the Tom Lavin Creek watershed are part of the National Forest System. This watershed is dominated by warm, moist habitat types of western hemlock and grand fir, with some western redcedar. About 78 percent of the area (2,070 acres) is in these moist habitat types. Cool, moist habitat type groups cover 15 percent of the watershed, mainly subalpine fir habitat types at higher elevations. About 4 percent of the watershed has cool, dry habitat types, again mainly at higher elevations. Only 3 percent of the area has warm, dry habitat types of Douglas-fir and grand fir.

Grand fir and western hemlock are the dominant forest cover types within the watershed, accounting for 34 and 23 percent of the forested land respectively. Subalpine fir is the major species on 18 percent of the watershed while Douglas-fir dominates on 12 percent. The rest of the stands are in larch and lodgepole pine 8 and 5 percent respectively).

Most (79 percent) of this watershed is in the pole and small-to-medium saw timber structural stage in stands that are 35-100 years old which resulted from a fire in 1918 that burned about 1300 acres. Approximately 15 percent of the watershed is greater than 100 years old and less than 6 percent is in the shrub/seedling/sapling structural stage. There are only 67 acres of allocated old growth and 70 acres of potential or recruitment old growth within the watershed. All of the allocated old growth is on moist red cedar habitat types with western hemlock the major species. The potential or recruitment old growth is also on moist habitat types but includes some western hemlock types as well as red cedar types. Western hemlock, grand fir and Douglas-fir are the major species.

Intensive management began in the 1960s and the most recent harvests have occurred in the 1970s. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires.

Table III-26. Vegetative conditions in the Tom Lavin watershed.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 2 and 3)	60	3
Warm/Moist (Groups 5 and 6)	1,620	78
Cool/Moist (Group 7)	310	15
Cool/Dry (Group 9)	80	4
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	240	12
Grand fir	705	34
Western Hemlock	470	23
Lodgepole Pine	115	5
Western Larch	160	8
Subalpine Fir	380	18
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	115	6
Poles/small-medium timber	1,650	79
Mature/large timber	305	15
Allocated old growth	67	0.3
Allocated potential old growth	70	3
Past Timber Harvest and Fires*	**Approximate Acres**	**% of Forest Lands**
Clearcuts	208	10
Seed Tree & Shelterwood	71	3
Overstory Removal	498	24
Sanitation/Salvage	0	0
Commercial Thinning	89	4
Selection Harvest	201	10
Fires since 1950	0	0

**Some stands have been harvested several times so actual acreage impacted is considerably less.*

B. Environmental Consequences

Alternative 1

Grand fir, hemlock, and Douglas-fir are the dominant species on 69 percent of the Tom Lavin Creek watershed. Most stands are 70 to 100 years old, so root disease and stem decay are expected to increase substantially as these trees grow older. Subalpine fir is the major species on 18 percent of the area. These stands do not appear to be at risk of serious insect and disease problems over the next 20 years. Approximately 8 percent of the watershed is dominated by western larch. These stands are generally 80 to 100 years old. Larch within these stands would likely become less vigorous where they grow in conjunction with other more shade tolerant species. Mature forest structure makes up only 15 percent of the watershed, These are mixed stands of grand fir, Douglas-fir and hemlock whose future development will be strongly affected by root disease and stem decays. This mature forest is highly fragmented due to past harvests.

Alternatives 2 and 8

No treatments would occur in the Tom Lavin Creek watershed under Alternatives 2 or 8, so the effects would be the same as under Alternative 1. However, additional allocation of potential or recruitment old growth areas were identified in these watersheds to increase the patch size or to interconnect existing allocated old growth or potential/ recruitment old growth areas. Approximately 100 acres in Tom Lavin Creek are proposed as additional allocated potential or recruitment old growth.

Alternative 3

Approximately 131 acres (6 percent) of the Tom Lavin Creek watershed would be harvested. Nine acres would be clearcut (leaving reserve trees) in a stand dominated by Douglas-fir and grand fir that are sustaining mortality from root disease. The remaining 122 acres will be commercially thinned to improve the health and vigor of western larch growing is association with more shade tolerant species. Clearcut areas would be planted with white pine and western larch following site preparation and fuel treatment by underburning.

Alternative 5

Approximately 122 acres (about 6 percent of the Tom Lavin Creek watershed) would be commercially thinned in the Tom Lavin Creek watershed to improve the health and vigor of western larch growing is association with more shade tolerant species.

Alternative 6

There would be no harvest treatments within the Tom Lavin watershed. Planting vegetation in riparian areas would be concurrent with any in-stream rehabilitation. Approximately 100 acres in the Tom Lavin Creek watershed are proposed as additional allocation of potential or recruitment old growth.

Alternative 7

Approximately 122 acres (about 6 percent of the Tom Lavin Creek watershed) would be commercially thinned in the Tom Lavin Creek watershed to improve the health and vigor of western larch growing is association with more shade tolerant species.

3.3.7 Lewelling Creek Watershed

A. Existing Conditions

All of the lands in the Lewelling Creek watershed (1,400 acres) are part of the National Forest System. Seventy-eight percent of the area is in warm, moist habitat types, sixteen percent is in cool, moist habitat types and six percent is in cool, dry habitat types. Western hemlock, Douglas-fir, subalpine fir and grand fir are the dominant forest cover types within the watershed, accounting for 25, 22, 20, and 20 percent of the forested land respectively. Western larch is the major species on six percent of the area while lodgepole pine and white pine are dominant on 4 and 2 percent respectively.

Most (68 percent) of this watershed is in the pole and small-to-medium saw timber structural stage in stands that are 35-100 years old. Approximately 27 percent of the watershed is over 100 years old and about 5 percent is less than 35 years old. There are 8 acres of allocated old growth and 225 acres of potential or recruitment old growth within the watershed. Habitat types in these old-growth stands are in the warm, moist groups and subalpine fir, Douglas-fir, larch and hemlock are the major species.

The earliest harvests in this watershed probably took place in the 1930’s or 1940’s when a railroad was constructed into the area. The most recent and intensive harvests occurred in the 1960’s. These harvests were generally overstory removal harvests and commercial thinning but there were some clearcuts and other regeneration harvests. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires.

Table III-27. Vegetative conditions in the Lewelling Creek Watershed.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Moist (Groups 4, 5, and 6)	1,100	78
Cool/Moist (Groups 7 and 8)	225	16
Cool/Dry (Group 9)	75	6
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	310	22
Grand fir	280	20
Western Hemlock	350	25
Western Larch	90	6
Lodgepole Pine	60	4
Subalpine Fir	280	20
White Pine	30	2
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	65	5
Poles/small-medium timber	955	68
Mature/large timber	380	27
Allocated old growth	8	.5
Allocated potential old growth	226	16
Past Timber Harvest and Fires*	**Approximate Acres**	**% of Forest Lands**
Clearcuts	92	6
Seed Tree & Shelterwood	92	6
Overstory Removal	174	12
Sanitation/Salvage	0	0
Commercial Thinning	244	17
Selection Harvest	11	1
Fires since 1950	0	0

** Some stands have been harvested several times so actual acreage impacted is considerably less.*

B. Environmental Consequences

Alternatives 1, 2 and 8

No vegetative treatment would occur in the Lewelling Creek watershed under Alternatives 1, 2 or 8. Hemlock, Douglas-fir, and grand fir are the dominant species on 67 percent of the Lewelling Creek watershed. Most stands are 70 to 100 years old so root disease and stem decay are expected to increase substantially as these trees grow older. Subalpine fir is the major species on 20 percent of the area. These stands do not appear to be at risk of serious insect and disease problems over the next 20 years. Western larch is a minor component of the watershed and is likely to become less vigorous where it grows in natural stands in conjunction with other more shade tolerant species. About 27 percent of the watershed is in mature forest structure, but the stand size is relatively small due to fragmentation by past timber harvest. Most of these stands are dominated by Douglas-fir and grand fir and in the future, root disease and other pathogens are likely to increase opening size and maintain a higher shrub and small tree component.

Alternative 3

Approximately 23 acres (about 2 percent of the Lewelling Creek watershed) would be harvested in the Lewelling Creek watershed. Five acres would be clearcut harvested with reserve trees in a stand dominated by Douglas-fir being impacted by root disease. The remaining 19 acres would be commercially thinned to improve the health and vigor of western larch growing is association with more shade tolerant species. Clearcut areas would be planted with white pine and western larch following site preparation and fuel treatment by underburning.

Alternative 5

Approximately 19 acres (2 percent of the Lewelling Creek watershed) would be commercially thinned in the Lewelling Creek watershed to improve the health and vigor of western larch growing is association with more shade tolerant species.

Alternative 6

Approximately 31 acres (2 percent of the Lewelling Creek watershed) would be harvested in the Lewelling Creek watershed. Most of the trees to be removed would be hemlock or grand fir but there would also be some Douglas-fir. Hemlock and grand fir are likely to regenerate in any small openings created. Planting vegetation in riparian areas would occur at the same time as any instream rehabilitation.

Alternative 7

Approximately 19 acres (2 percent of the Lewelling Creek watershed) would be commercially thinned in the Lewelling Creek watershed to improve the health and vigor of western larch growing is association with more shade tolerant species.

3.3.8 Honey Creek Watershed

A. Existing Conditions

Approximately 93 percent of the Honey Creek watershed (1,500 acres) is National Forest System (approximately 115 acres of lands are in private ownership). National Forest lands within this watershed are dominated by warm, moist habitat types (75 percent) of western hemlock and grand fir, with some western red cedar. Approximately 14 percent is cool moist habitat types of subalpine fir and about 11 percent of stands are warm, dry habitat types of Douglas-fir and grand fir.

Grand fir and Douglas-fir are the dominant forest cover types, dominating 77 percent of the stands. Western hemlock is the major species on 22 percent of the area and subalpine fir is dominant on only 1 percent.

The dominant structural stage (50 percent) this watershed consists of poles and small to medium sawtimber. The shrub/seedling/sapling stage is the next most abundant, covering 26 percent of the watershed. Mature timber accounts for 24 percent of the area. There are 120 acres of allocated and 7 acres of potential or recruitment old growth within the watershed. Western hemlock is the dominant tree species in these stands and habitat types are red cedar/lady fern and hemlock/oak fern.

Intensive management began in the 1960s and the latest harvests occurred in the 1970s. Approximately 25 percent of the area has been treated with regeneration harvests. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires.

There are approximately 115 acres of private land within the watershed. These lands are old mining claims that have been logged at least one time removing most of the larger trees. These stands are generally stocked with sapling to small sawtimber sized grand fir and Douglas-fir.

Table III-28. Vegetative conditions in the Honey Creek watershed.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 2 and 3)	165	11
Warm/Moist (Groups 4, 5, and 6)	1,125	75
Cool/Moist (Group 7)	210	14
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	575	38
Grand fir	585	39
Western Hemlock	330	22
Subalpine Fir	10	1
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	380	26
Poles/small-medium timber	755	50
Mature/large timber	365	24
Allocated old growth	120	8
Allocated potential old growth	7	0
Past Timber Harvest and Fires*	**Approximate Acres**	**% of Forest Lands**
Clearcuts	374	25
Seed Tree & Shelterwood	0	0
Overstory Removal	40	3
Sanitation/Salvage	38	2
Commercial Thinning	60	4
Selection Harvest	0	0
Fires since 1950	0	0

** Some stands have been harvested several times so actual acreage impacted is considerably less.*

B. Environmental Consequences

Alternative 1

Grand fir, Douglas-fir, and western hemlock are the dominant species on 99 percent of the Honey Creek watershed so root disease and stem decay are expected to increase substantially as these trees grow older. Old and mature forest structures are mainly hemlock cover types and are present on 24 percent of the watershed. However, as in other watersheds, these stands are highly fragmented due to past harvest activity. About 25% of the area has been regenerated within the last 40 years, so there is a substantial component of saplings.

Alternatives 2 and 8

No vegetative treatment would occur in the Honey Creek Watershed under Alternatives 2 or 8, so effects would be the same as discussed under Alternative 1. However, additional allocation of potential or recruitment old growth was identified to increase the size of or to interconnect existing allocated old growth or potential/recruitment old growth areas. Approximately 211 acres in Honey Creek are proposed as additional potential or recruitment old growth.

Alternative 3

Six acres (less than 0.5 percent) are proposed for harvesting in the Honey Creek watershed. Treatment method would be a clearcut with reserves in a stand dominated by Douglas-fir with some grand fir. Root disease pockets are scattered throughout the stand. Clearcut areas would be planted with white pine, western larch, and some ponderosa pine following site preparation and fuel treatment by underburning.

Alternative 5

Approximately 498 acres (33 percent of the National Forest System lands) are proposed for harvesting in the Honey Creek watershed. Treatment method would be a shelterwood with reserves in stands dominated by Douglas-fir and grand fir. Root disease pockets are scattered throughout the stands. Harvested areas would be planted with white pine, western larch, and some ponderosa pine following site preparation and fuel treatment by underburning. None of the areas proposed for treatment has been harvested in the past.

Alternative 6

Approximately 17 acres (1 percent of the Honey Creek watershed) would be harvested in stands that are dominated by Douglas-fir. Douglas-fir and grand fir would likely regenerate in any small openings created. Planting vegetation in riparian areas would be concurrent with any in-stream rehabilitation. Approximately 211 acres in Honey Creek are proposed as additional potential/recruitment old growth.

Alternative 7

Approximately 5 acres (less than 1 percent of the National Forest lands within the watershed) are proposed for harvesting in the Honey Creek watershed. Treatment method would be clearcut harvest with reserves in a stand dominated by Douglas-fir. Harvested areas would be planted with white pine, western larch, and some ponderosa pine following site preparation and fuel treatment by underburning. None of the areas proposed for treatment has been harvested in the past.

3.3.9 Sob Creek Watershed

A. Existing Conditions

All of the lands in the Sob Creek watershed (795 acres) are part of the National Forest System. National Approximately 76 percent of National Forest System lands within this watershed are dominated by warm, moist habitat types of western hemlock, grand fir, and western red cedar. Approximately 23 percent of the area consists of cool, moist subalpine fir habitat types occurring along the highest ridges. Warm, dry types account for only 1 percent of the stands.

Grand fir is the dominant forest cover type, accounting for 55 percent of the area. Western hemlock follows with 24 percent. Douglas-fir and subalpine fir are the major species on 15 and 6 percent of the watershed respectively.

Forest structure is fairly evenly distributed in this watershed with half mature and half young to medium. Poles and small-to-medium timber stands that are 35-100 years old are the dominant structural stage on 33 percent of the watershed. Forty-six percent is in mature forest and 21 percent in shrubs, seedlings and saplings. There are 191 acres of allocated old growth within the watershed. These stands are dominated by western hemlock and are generally on western red cedar/lady fern habitat types.

The Sob Creek watershed has not been entered for timber harvest since the 1970s. Clearcut and selection harvests were the most common treatments.

Table III-29. Vegetative conditions in Sob Creek watershed.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Group 3)	10	1
Warm/Moist (Groups 5 and 6)	600	76
Cool/Moist (Group 7)	185	23
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	120	15
Grand fir	435	55
Western Hemlock	190	24
Subalpine Fir	50	6
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	165	21
Poles/small-medium timber	265	33
Mature/large timber	365	46
Allocated old growth	191	24
Allocated potential old growth	0	0
Past Timber Harvest and Fires*	**Approximate Acres**	**% of Forest Lands**
Clearcuts	167	21
Seed Tree & Shelterwood	0	0
Overstory Removal	17	2
Sanitation/Salvage	0	0
Commercial Thinning	0	0
Selection Harvest	141	18
Fires since 1950	0	0

** Some stands have been harvested several times so actual acreage impacted is considerably less.*

B. Environmental Consequences

Alternative 1

Grand fir, western hemlock, and Douglas-fir are the dominant species on 94 percent of the Sob Creek watershed, so root disease and stem decay are expected to increase substantially as these trees grow older. Mature forest structures comprise 46 percent of the watershed. While almost half of the mature timber (generally the allocated old growth) is composed of hemlock cover types on north facing slopes, the other half is mainly Douglas-fir which will provide some old growth structure in the future, although root disease and other pathogens are likely to increase opening size and maintain a higher shrub and small tree component. Mature forest structures are highly fragmented due to past harvest activity. About 21% of the area has been regenerated within the last 40 years, so there is a substantial component of saplings.

Alternatives 2 and 8

No vegetative treatment would occur in the Sob Creek watershed under Alternatives 2 or 8, so effects would be as discussed in Alternative 1 (No Action). However, additional potential or recruitment old growth areas were identified in these watersheds to increase the size of, or to interconnect existing allocated old growth or potential/recruitment old growth areas. Approximately 268 acres in Sob Creek are proposed as additional allocation of potential or recruitment old growth.

Alternative 3

Twenty acres (2 percent of the watershed) in two units are proposed for harvesting within the Sob Creek watershed. Treatment method would be clearcut with reserves. Douglas-fir and grand fir are the major species and root disease pockets are scattered throughout the stand.

Alternative 5

About 279 acres (35 percent of the watershed) are proposed for harvesting within the Sob Creek watershed. Treatment method would be shelterwood with reserves. Douglas-fir and grand fir are the major species and root disease pockets are scattered throughout the stand. None of the areas proposed for treatment has been harvested in the past.

Alternative 6

There would be no harvest treatments within the Sob Creek watershed under this alternative. Planting vegetation in riparian areas would be concurrent with any in-stream rehabilitation. Approximately 268 acres in Sob Creek are proposed as additional potential/recruitment old growth.

Alternative 7

About 10 acres (less than 1 percent of the watershed) are proposed for harvesting within the Sob Creek watershed. Treatment method would be clearcut with reserves. Douglas-fir and grand fir are the major species. The area proposed for treatment has not been harvested in the past.

3.3.10 Solitaire Creek Watershed

A. Existing Conditions

All of the lands in the Solitaire Creek watershed (1,660 acres) are part of the National Forest System. This watershed is dominated by warm, moist habitat types (88 percent) of western hemlock and grand fir. Warm, dry grand fir and Douglas-fir habitat types cover a approximately 11 percent of the area and cool, wet subalpine habitat types occur on only 1 percent on the watershed.

Grand fir is the dominant forest cover type, accounting for 72 percent of the forested land. Western hemlock and Douglas-fir are the major species on 17 and 8 percent of the area respectively. Lodgepole pine and subalpine fir account for the remainder. Most (61 percent) of this watershed is in the pole and small-to-medium saw timber structural stage in stands that are 35-100 years old, but a substantial portion (24 percent) is also in mature and large sawtimber. Approximately 15 percent is shrubs, seedlings, or saplings. There are no areas of allocated old growth but there are 73 acres of potential or recruitment old growth within the watershed. These stands are dominated by grand fir on western hemlock/queencup beadlily habitat types.

Intensive forest management in the Solitaire Creek watershed began in the 1950s, but most of the drainage was harvested in the 1970s. The type of treatments has been variable, but overstory removals and clearcut harvests have dominated. There have been no fires in recent history that would have altered stand structure, although there have been many small lightning fires.

Table III-30. Vegetative conditions in the Solitaire Creek watershed.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Group 3)	180	11
Warm/Moist (Groups 4 and 5)	1,460	88
Cool/Moist (Group 7)	20	1
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	130	8
Grand fir	1,200	72
Western Hemlock	280	17
Lodgepole Pine	30	2
Subalpine Fir	20	1
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	245	15
Poles/small-medium timber	1,020	61
Mature/large timber	395	24
Allocated Old growth	0	0
Allocated potential Old growth	73	4
Past Timber Harvest and Fires*	**Approximate Acres**	**% of Forest Lands**
Clearcuts	379	23
Seed Tree & Shelterwood	14	1
Overstory Removal	587	35
Sanitation/Salvage	72	4
Commercial Thinning	143	9
Selection Harvest	126	8
Fires since 1950	0	0

Some stands have been harvested several times so actual acreage impacted is considerably less.

B. Environmental Consequences

Alternatives 1 and 2

There would be no vegetative treatment in the Solitaire Creek watershed under either Alternative 1 or 2. Grand fir is the dominant species on 72 percent of the watershed with hemlock accounting for another 17 percent. Root disease and stem decay are expected to increase substantially as these trees grow older. Mature forest structure is present on 24 percent of the area and is usually grand fir cover type with some hemlock and Douglas-fir. Mature stands tend to be relatively small and separated by past regeneration harvests. These stands will provide some old forest structure in the future, although root disease and other pathogens are likely to increase opening size and maintain a higher shrub and small tree component.

Alternative 3

Eleven acres in two units (1 percent of the Solitaire Creek watershed) would be treated with the clearcut with reserves method in this alternative. These stands are dominated by Douglas-fir and grand fir with root disease a common cause of mortality. Both units have been harvested in the past.

Alternative 5

Approximately 324 acres (20 percent of the Solitaire Creek watershed) would be treated with the shelterwood with reserves method in this alternative. These stands are dominated by grand fir with some Douglas-fir and hemlock. Root disease is a common cause of mortality. Approximately 50 percent of the proposed harvest area has been treated in the past by salvage, overstory removal, and selection harvests.

Alternative 6

Approximately 30 acres (2 percent of the Solitaire Creek watershed) would be harvested in stands that are dominated by grand fir. Grand fir is likely to regenerate in any small openings created. Planting vegetation in riparian areas would be concurrent with any in-stream rehabilitation.

Alternative 7

About 5 acres (less than 1 percent of the Solitaire Creek watershed) would be treated with the shelterwood with reserves method in this alternative. This stand is dominated by grand fir. The proposed harvest area has been treated in the past by overstory removal. There are a few acres of shelterwood harvest on the ridge between Solitaire and Iron Creek but the major portion of these proposed units is in Iron Creek watershed.

Alternative 8

Approximately 321 acres (20 percent of the Solitaire Creek watershed) would be treated with the shelterwood with reserves method. These stands are dominated by grand fir with some Douglas-fir and hemlock. Root disease is a common cause of mortality in the stands to be treated. Approximately 50 percent of the proposed harvest area has been treated in the past by salvage, overstory removal, and selection harvests.

3.3.11 Upper Little North Fork of the Coeur d'Alene River Watershed

A. Existing Conditions

Virtually all of the lands in the Upper Little North Fork watershed (1,125 acres) are in the National Forest System (there are about 5 acres of private ownership). Approximately 86 percent of this watershed is dominated by warm, moist habitat types of western hemlock and grand fir with some western red cedar. The higher elevations are dominated by cool, wet and cool, dry habitat types which account for 12 and 2 percent of the watershed respectively. Douglas-fir, grand fir, and western hemlock are the dominant forest cover types within the watershed, accounting for 86 percent of the forested land. Subalpine fir is the major species on 12 percent of the area and larch and lodgepole pine account for the remainder.

Most (51 percent) of this watershed is in the pole and small-to-medium saw timber structural stage. The shrub/seedling/sapling structural stage is present on 30 percent of the watershed and 19 percent is in the mature forest structural stage. There are approximately 68 acres of allocated old growth and 59 acres of potential or recruitment old growth within the watershed. These are in the warm, moist habitat type group with hemlock/queencup beadlily and hemlock/oak fern habitat types. Forest cover is dominated by western hemlock and grand fir.

This watershed was extensively and intensively harvested in the 1960s. Large areas were clearcut and overstory removals were accomplished on many additional areas. The latest harvests occurred in the 1970s and were generally overstory removal harvests.

Five acres of private land appears to have been selectively logged in the past, removing the largest trees and leaving a mixture of seedling/saplings to sawtimber sized mixture of species dominated by grand fir and hemlock.

Table III-31. Vegetative conditions in the Upper Little North Fork Coeur d'Alene watershed.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Moist (Groups 4, 5, and 6)	970	86
Cool/Moist (Group 7)	135	12
Cool/Dry (Group 9)	20	2
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	350	31
Grand fir	310	27
Western Hemlock	310	28
Western Larch	10	1
Lodgepole Pine	10	1
Subalpine Fir	135	12
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	335	30
Poles/small-medium timber	580	51
Mature/large timber	210	19
Allocated old growth	68	6
Allocated potential old growth	59	5
Past Timber Harvest and Fires*	**Approximate Acres**	**% of Forest Lands**
Clearcuts	395	35
Seed Tree & Shelterwood	0	0
Overstory Removal	491	44
Sanitation/Salvage	25	2
Commercial Thinning	28	2
Selection Harvest	70	6
Fires since 1950	0	0

** Some stands have been harvested several times so actual acreage impacted is considerably less.*

B. Environmental Consequences

Alternatives 1 and 2

No vegetative treatment would occur in the Upper Little North Fork of the Coeur d'Alene River under either Alternative 1 or 2. The Upper Little North Fork watershed is dominated by Douglas-fir, hemlock and grand fir which are the major species on 86 percent of the area. Root disease and stem decay are expected to increase substantially as these trees reach maturity. Subalpine fir is also a major species, dominating 12 percent of the watershed. No serious insect or disease problems are expected to affect these stands over the next 20 years. 30 percent of the area is in the shrub/seedling/sapling structural stage as a result of past regeneration harvests. Mature forest structure is present on about 19 percent of the area, mainly dominated by western hemlock.

Alternative 3

Approximately 10 acres (1 percent of the Upper Little North Fork watershed) would be harvested in two units using the clearcut with reserves method in stands that are dominated by grand fir with some Douglas-fir. These stands have been harvested in the past but are still sustaining losses due to root disease. Clearcut areas would be planted with white pine and western larch following site preparation and fuel treatment by underburning.

Alternative 5

Approximately 129 acres (11 percent of the Upper Little North Fork watershed) would be shelterwood harvested in stands that are dominated by grand fir and Douglas-fir. About two-thirds of this has had overstory removal or commercial thinning harvests in the past. Harvested areas would be planted with white pine, western larch, and some ponderosa pine following site preparation and fuel treatment by underburning.

Alternative 6

Approximately 14 acres (1 percent of the Upper Little North Fork watershed) would be harvested in stands that are dominated by grand fir. Grand fir is likely to regenerate in any small openings created. Planting vegetation in riparian areas would be concurrent with any in-stream rehabilitation.

Alternative7

Approximately 5 acres (less than 1 percent of the Upper Little North Fork watershed) would be clearcut harvested (with reserves) in a stand dominated by grand fir. The stand was previously treated with an overstory removal harvest. Harvested areas would be planted with white pine and western larch following site preparation and fuel treatment by underburning.

Alternative 8

Approximately 127 acres (11 percent of the Upper Little North Fork watershed) would be treated using the shelterwood harvest method in stands dominated by grand fir, Douglas-fir and western hemlock. Approximately 75 percent of the area was previously treated with overstory removal or commercial thinning harvests. Harvested areas would be planted with white pine and western larch following site preparation and fuel treatment underburning.

3.3.12 North Fork Coeur d'Alene River Face Watersheds

A. Existing Conditions

All of the lands in the Coeur d'Alene Face watersheds (3,200 acres) are part of the National Forest System. Warm, moist habitat types of western hemlock and grand fir, with some western red cedar are present on 96 percent of the watershed; with warm, dry Douglas-fir and grand fir habitat types covering the remaining 4 percent of the area.

Grand fir and western hemlock are the dominant forest cover types, accounting for 38 and 27 percent of the forested land respectively. Douglas-fir and subalpine fir are the major species on 16 and 10 percent of the watershed. Larch is the dominant species on 5 percent of the area; lodgepole and white pine account for the remaining 4 percent.

Most (65 percent) of this watershed is in the pole and small-to-medium saw timber structural stage in stands that are 35-100 years old. Approximately 24 percent of the area is in mature forest structure and 11 percent is in shrub/seedling/sapling structure. There is only one acre of allocated old growth and 22 acres of potential or recruitment old growth identified in the watershed.

Intensive forest management in the Coeur d'Alene Face watersheds began in the 1960s. The most recent harvests have been sanitation/salvage harvests that occurred in the mid 1990s. There have been no fires in recent history that would have altered stand structure, although there have been small lightning fires.

Table III-32. Vegetative conditions in the Coeur d'Alene Face watersheds.

Habitat Type Group	**Approximate Acres**	**% of Forest Lands**
Warm/Dry (Groups 2 and 3)	125	4
Warm/Moist (Groups 4, 5, and 6)	3,075	96
Forest Cover Types	**Approximate Acres**	**% of Forest Lands**
Douglas-fir	500	16
Grand fir	1215	38
Western Hemlock	880	27
Western Larch	175	5
Lodgepole Pine	50	2
Subalpine Fir	315	10
White Pine	65	2
Structural Stage	**Approximate Acres**	**% of Forest Lands**
Shrubs/Seedlings/Saplings	350	11
Poles/small-medium timber	2,090	65
Mature/large timber	760	24
Allocated old growth	1	0
Allocated potential old growth	22	1
Past Timber Harvest and Fires	**Approximate Acres**	**% of Forest Lands**
Clearcuts	546	17
Seed Tree & Shelterwood	0	0
Overstory Removal	207	6
Sanitation/Salvage	253	8
Commercial Thinning	345	11
Selection Harvest	501	16
Fires since 1950	0	0

B. Environmental Consequences

Alternatives 1, 2, 3 and 7

No vegetative treatment would occur in the Coeur d'Alene River Face watersheds under Alternatives 1, 2, 3 or 7. Grand fir, hemlock and Douglas-fir are the major species on 81 percent of the watershed. Mature forest structure is present in 23 percent of the area with grand fir, hemlock and subalpine fir the dominant species in these stands. Mature stands tend to be relatively small and separated by past regeneration harvests. Root disease and stem decay are expected to increase substantially as these trees grow older.

Alternative 5

About 634 acres are proposed for harvesting within the Coeur d'Alene River Face watersheds. Treatment method would be shelterwood with reserves. Grand fir and Douglas-fir are the major species with some hemlock. Approximately 20 percent of the proposed harvest area has been treated in the past by salvage and selection harvests.

About 20 percent of the face watersheds would be harvested in this entry. Approximately 24 percent of the watershed would be in created openings when recent (less than 20 years old) regeneration harvests are also considered.

Alternative 6

Approximately 11 acres (less than 1 percent of the Coeur d'Alene face watersheds) would be harvested in stands that are dominated by grand fir. Grand fir is likely to regenerate in any small openings created. Planting vegetation in riparian areas would be concurrent with any in-stream rehabilitation.

Alternative 8

Approximately 352 acres (11 percent of the Coeur d'Alene face watersheds) would be harvested within the Coeur d'Alene River Face drainages, using the shelterwood with reserves method. Grand fir is the major species, with Douglas-fir and hemlock also present in these stands. None of the areas proposed for treatment have been harvested within the past 40 years.

3.3.13 Direct and Indirect Effects at the Resource Area Scale

Specific features and objectives of the alternatives are briefly discussed here as they affect forest vegetation across the Iron Honey Resource Area. Please refer to Chapter II (2.6 Alternatives) and Appendix E (Specific Unit Information) for additional details of the alternatives.

Recreational snowmobile use of harvest openings may take place with any alternative. However, because of the usual deep snows and anticipated minimal level of snowmobile use, this activity may effect individual trees but have minimal effect on vegetation composition or structure overall.

Alternative 1

Under this alternative, there would be no activities to restore forest vegetation to more closely mimic historical species composition and structure. Root disease and decay would continue to cause deterioration of those stands dominated by grand fir, Douglas-fir, and western hemlock; particularly where partial harvesting has occurred in the past. Douglas-fir would gradually become less prevalent due to root disease and bark beetle mortality. Mortality due to insects and pathogens would continue to increase as stands age and older stands would tend to be more pure grand fir and hemlock. Generally on upland sites, higher mortality could lead to fuel buildup and increase in fire risk. In the absence of natural disturbance, such as fire, the regeneration to fill gaps in the canopy would be limited to the same species as the overstory (grand fir and hemlock). Even if fire were to create sites for regeneration of early seral species such as white pine and western larch, past harvest and white pine blister rust may have eliminated seed sources from many areas; and blister rust would likely kill any naturally regenerated white pine prior to the trees reaching maturity. Planting would be necessary to insure early seral regeneration and establishment.

The short-term effects of this alternative would be continued losses of Douglas-fir, hemlock and grand to root disease, decay and associated insect attacks. Over the long term, the limited component of western larch and white pine that are now present would continue to decline and grand fir and hemlock would become increasingly dominant components in the analysis area.

Alternative 2

The objective of this alternative is to restore vegetation composition and structure to more closely resemble historical patterns within the Iron Creek subwatershed. Intensive harvest treatments would occur over large areas within the Iron Creek subwatershed within a short period, but additional treatments would excluded from the watershed for an extended period (30 to 40 years). Approximately 1,100 acres would be harvested (in Management Area 1) using the "shelterwood with reserves" method. The shelterwood regeneration method complies with Forest Plan standards (Forest Plan, page III-3), which states that even-aged regeneration systems will generally be used in this management area. This type of harvest is intended to

simulate the extent of natural disturbances that occurred historically in this area and provides for the retention of individual trees and groups of trees that may have survived a natural fire. Following harvest, underburning would be utilized to reduce fuels and to prepare a suitable site for planting. This is consistent with the Forest Plan standard that prescribed fire be used to meet silvicultural objectives (Forest Plan, page III-4). Blister rust-resistant white pine, western larch with some ponderosa pine will be the species planted. This complies with Forest Plan direction that reforestation will normally feature seral tree species utilizing a mixture of species (Forest Plan, page II-32). This would promote stand structures and compositions which reduce susceptibility to future insect and disease damage. Approximately 1,379 acres of additional potential or recruitment old growth would also be identified for allocation within the analysis area, increasing the percent of allocated old growth to 12% in Old Growth Management Unit (OGMU) 12, to 6% in OGMU 23, and to 10% in OGMU 20.

Openings created through timber harvests do not duplicate all aspects of stand replacing fires. Trees killed by fires prior to Euro-American settlement were not harvested. The dead trees remained standing until decay progressed to a point where they fell over. Some snags may have stood for decades. Regeneration was dependent on surviving, scattered remnant trees (usually fire resistant species), seed that survived on dead trees, or seed carried by wind and animals from adjacent unburned stands. Due to their fast initial growth; early seral species such as larch, white pine, lodgepole pine, and, on some sites, Douglas-fir gained an advantage over their shade-tolerant counterparts and could dominate sites for many years. Lodgepole pine has a relatively short life span and was likely to fade from stands as their age reached 90-120 years (Zack, Arthur C., 1994). Douglas-fir, although potentially long lived, was also likely to fade from stands as the trees reached maturity due to root disease (Zack, Arthur C., 1994) (Byler, 1990). Harsh sites or sites a long distance from seed sources may have remained shrub fields for very long periods of time.

Alternative 3

The objective of this alternative is to create small openings for the regeneration of early seral tree species and thin stands of western larch, while minimizing the increase in water yield. These types of regeneration treatments occur on a relatively small portion of a watershed; but are repeated at regular, short intervals. Approximately 190 acres would be regeneration harvested in 31 units of 5 to 10 acres scattered throughout the analysis area. Some of these regeneration harvests would be considered clearcuts and some clearcuts with reserves. Commercial thinning would occur on approximately 141 acres. This alternative provides for no change in the number of acres of old growth allocated in respective old growth management units.

Some aspects of Alternative 3 simulate natural disturbance regimes; but in general, this type of treatment has no historical counterpart in these moist habitat types. Although mixed-severity fires might create small openings in the forest canopy in which some early seral species could regenerate, this would be unlikely to happen to the extent or within the time frames associated with Alternative 3.

The purpose of thinning larch stands is to simulate the low intensity fires that occurred between stand replacing fires. These low-intensity fires would have killed trees depending on fire resistance of the species with grand fir and hemlock having little resistance and Douglas-fir having variable resistance depending on age and fire severity. Low intensity fires may also have "thinned" almost pure stands of larch depending on the age and diameters of the trees. Larch displays very rapid early growth and can quickly dominate sites following a major disturbance. However, it is very shade intolerant. In the absence of fire, lower branches are shaded out by the dense canopies of shade tolerant conifers. Between ages 100 and 150, the crowns of larch can become so sparse that the trees begin to decline and lose their dominant position in the stand (Zack, Arthur C., 1994). Commercially thinning larch stands can increase the amount of sun reaching the lower crown and thereby maintain tree vigor. Thinning would also improve growth rates, so trees reach larger diameter in a shorter period. This is consistent with Forest Plan standards, which state that intermediate harvests will be used to meet timber management goals (Forest Plan, page III-3). The large-diameter larch component was removed from most stands in the analysis area during past harvests.

The creation of small openings would allow the regeneration of early seral species, as directed by the Forest Plan. Approximately 80% of the basal area within the openings would be removed while 20% would be retained for site improvement and to provide structural diversity. Where possible, leave trees would be the largest fire-resistant trees available. Individual trees or small groups of 3 to 8 trees would be left. Retention of more trees or larger groups would not be necessary because of the small opening size. Units 33 through 38 are in stands dominated by lodgepole pine. Lodgepole pine has very poorly developed root systems, particularly in dense stands; so although some of the leave trees would remain standing for a time after harvest, most would be expected to fall over. It is also unlikely that lodgepole pine would survive burning to remove slash and prepare a site for regeneration. Leave trees of other species would be selected whenever possible. Even if most leave trees fall down, they would provide important woody debris on the site and eventually organic matter to the soil.

Logging slash and, in some cases, understory vegetation would need to be treated in order to provide a site for regeneration in stands harvested using the clearcut or clearcut with reserves method. Underburning and broadcast burning are the preferred methods because they allow reintroduction of fire to the ecosystem and its related effects to shrubs, forbs and advance regeneration such as hemlock and grand fir (although on a very small scale), are efficient, and because most sites are too steep for mechanical treatments.

White pine has been severely impacted by blister rust and both white pine and larch have been heavily harvested in the past. Natural regeneration cannot be relied upon in most stands because of an inadequate supply of seed trees and inconsistent seed crops of western larch. Although these species are preferred as leave trees, regeneration harvest units would need to be planted with a mixture of rust resistant white pine and western larch to ensure adequate desired regeneration. Natural regeneration of Douglas-fir, grand fir and, in some stands, western hemlock may also become established. Those units dominated by lodgepole pine would be interplanted with white pine and larch. Prolific natural regeneration of lodgepole pine following site preparation would be expected.

This alternative provides an opportunity to restore or maintain early seral species on approximately 190 acres through regeneration harvests of 5-10 acres in size. This is less than 1% of the analysis area. Approximately 60% of the area proposed for regeneration harvests has had some previous harvest treatment. The advantage of this type of treatment is that regeneration harvests can be located in stands scattered throughout the analysis area to remove trees from root disease pockets or in stands where growth has stagnated. Disadvantages are that this type of harvesting tends to fragment large areas into smaller blocks and requires a more extensive road system for post harvest treatments. Approximately 21.9 miles of existing roads would be needed for stand tending, in addition to the basic transportation system. Because such a small portion of the analysis area would be harvested, similar stand type harvests would be anticipated every 10 to 15 years. This would cause further fragmentation and require additional stand tending roads.

This alternative also provides for the commercial thinning of 141 acres of mixed western larch. This would help maintain larch within the analysis area and provide future areas of large-diameter fire and disease-resistant trees, which have been largely removed from the area by past harvesting practices. Because these stands do not require any post harvest treatment, no stand-tending roads would be necessary; yarding trees by helicopter would be a viable option.

Alternative 5

The objective of this alternative is to restore vegetation composition and structure to more closely resemble historical patterns within the entire analysis area. Intensive harvest treatments would occur over large areas within a short period, but would not be repeated in the analysis area for an extended period (30 to 40 years).

Landscapes within the analysis area and most of the Upper Little North Fork of the Coeur d'Alene River contain a heavily roaded, fragmented matrix that provide neither large blocks of mature/old forest or large areas with potentially long lived early seral tree species (Geographic Assessment, p. 63). These landscapes

are high priority for aggressive vegetation restoration, should be regenerated in watershed-sized large blocks of potentially long lived early seral species, and should have road densities reduced and watersheds restored through timber-related activities (Geographic Assessment, p. 63).

This type of harvest is intended to simulate the same kind of stand replacing fires discussed in Alternative 2; but on a much larger scale. Major regeneration harvests would occur in all sub-watersheds except Lewelling and Tom Lavin Creeks. Aquatic systems in these drainages are considered fully functional under the Geographic Assessment, so harvest would be limited to commercial thinning in stands where larch is a major component. The shelterwood harvest method would be the same as described for Alternative 2. Approximately 70% of the basal area in each harvest unit would be removed while the rest would be retained as individual trees or small groups of 3 to 5 acres. Clearcut with reserves is a more applicable term than shelterwood with reserves for Units 20, 22, and 35. These units are in stands dominated by lodgepole pine where individual leave trees are likely to fall over shortly after harvest or be killed during burning for slash reduction and site preparation for natural regeneration. Most leave trees in these units would be in 3 to 5-acre groups, although individual trees would be retained to provide down woody debris for long-term soil productivity and also to provide some biological diversity. Wherever possible, trees other than lodgepole pine would be retained. Regeneration harvest areas, which may include more than one unit, would range from 40 to 476 acres in size. In the Hudlow Creek watershed, proposed harvest areas are adjacent to recently regenerated stands. Therefore, total opening size could be as large as 756 acres.

All regeneration harvest units would be underburned to reduce slash concentrations, prepare a site for planting and/or natural regeneration, and to reintroduce fire to the ecosystem. Most harvest units would be planted with rust-resistant white pine, western larch and some ponderosa pine to ensure adequate early seral regeneration. Natural regeneration of Douglas-fir and grand fir would be anticipated, with some hemlock and lodgepole pine. Prolific natural regeneration of lodgepole pine would be expected in Units 20, 22, and 35, so only interplanting would be necessary.

Alternative 5 would restore white pine and other early seral species to approximately 3,823 acres, maintaining lodgepole pine on 371 acres, and creating the larger patch sizes associated with stand-replacing fires. This is about 19% of the analysis area. An additional 141 acres would be thinned to enhance growth and structure in stands where larch is a major component. About 35% of the area proposed for harvest has had some previous harvest activity within the last 40 years. In addition to roads needed to provide general access, an additional 19.2 miles of road would be necessary for stand-tending purposes.

Approximately 800 acres of additional allocated potential/recruitment old growth would be established in the Iron Creek drainage. This increases allocated old growth in old growth management unit (OGMU) 12 to 12% and leaves OGMU 23 and OGMU 20 unchanged at 5% and 6% respectively. A portion of the funds generated from timber harvesting would be available for restoration of riparian vegetation throughout the analysis area.

Following harvest, less than 35% of the National Forest land within the analysis area would be greater than 80 years old. Mortality and growth loss from root disease and stem decay would be greatly reduced, but would continue in mature stands dominated by Douglas-fir, grand fir, and hemlock, particularly where partial harvest may have occurred in the past.

Alternative 6

The objective of this alternative is to improve watershed function; concentrating most efforts in watersheds that are functional or functioning at risk. This would be accomplished through projects that reduce the sediment and water yield associated with roads and restoring natural watershed processes through in-stream improvement projects, removal of roads from riparian areas, and restoring riparian vegetation to historic conditions.

No timber harvest would occur as part of this alternative except for removal of trees for in-stream use. It is estimated that approximately 380 acres of forestland would need to be treated to supply enough trees for this work. Areas to be treated were selected as close to open roads as possible and stands with less than 45% slope were preferred to allow tracked excavators to remove trees with root wads attached. Trees will be pushed over where feasible but larger trees may need to be cut. All trees removed from these stands will be utilized within the analysis area. Less than 50% of the trees over 12 inches in diameter would be removed from each stand. This treatment will be designed such that it is not a regeneration harvest so no reforestation is scheduled. Natural regeneration of shade tolerant species is expected where small openings might be created. Some treatment of logging slash will be necessary to reduce fire hazard on these sites. Excavator grapple piling would be appropriate as underburning is likely to damage the residual stand.

Watershed restoration would take place throughout the analysis area. Vegetation restoration would be limited to riparian areas and immediately adjacent uplands where timber harvest and/or site preparation are not a prerequisite for establishing the desired species. Over the long term, restoration of natural watershed processes will lead to restoration of riparian vegetation.

Timber harvest and associated vegetation restoration in the uplands would be precluded until all sub-watersheds within the analysis area are fully functional. Root disease and stem decays would continue to cause mortality and growth loss in those stands dominated by Douglas-fir, grand fir, and hemlock. As these stands age, the losses would become more serious. Openings in the forest canopy created by root disease would become larger and more persistent. Large areas dominated by shrubs would likely develop. Early seral species such as western larch, white pine, and ponderosa pine would continue to decline in the absence of disturbance. Overtime, as fuels and dead trees increase, risk of fire will also increase.

Approximately 1,379 acres of additional potential/recruitment old growth would also be identified within the analysis area, increasing the percent of allocated old growth to 12% in Old Growth Management Unit (OGMU) 12; to 6% in OGMU 23, and to 10% in OGMU 20.

Besides the road system necessary to provide general access to the area, about 4.4 miles of stand tending roads would be needed in the Hudlow Creek drainage to access previously harvested stands.

Alternative 7

This alternative combines features of Alternative 2 with portions of Alternative 3. The objective is to restore vegetation composition and structure to more closely resemble historical patterns within the Iron Creek subwatershed, improve growth and structure in stands where larch is a major component, and provide for regeneration of early seral, disease-resistant species in small openings.

The portion of this alternative within the Iron Creek drainage would be identical to that under Alternative 2, and is intended to simulate the extent of natural, stand-replacing disturbances that occurred historically in this area. The commercial thinning portion of this alternative is intended to simulate low-severity fires that would tend to kill small diameter, non fire-resistant species in the understory and thin small diameter fire-resistant co-dominants. The clearcuts and "clearcuts with reserves" are intended to simulate mixed severity fires that would create small openings suitable for regeneration of early seral species. These small openings are placed in stands where root disease is a major problem or in lodgepole pine stands where growth has stagnated.

Alternative 7 would restore white pine and other early seral species to approximately 1,140 acres and create a mix of large and small patch sizes to simulate high-severity stand-replacing fires and mixed-severity fires. About 5% of the analysis area would be treated with regeneration harvests. Additionally, 141 acres in which larch is a major component would be thinned to improve growth and maintain the species in the stands. This type of treatment simulates a low intensity fire, which would have tended to remove shade-tolerant understory species. Besides the road system needed to provide general access to the area, 15.7 miles of existing roads would be utilized to provide access for stand tending following harvest.

Approximately 800 acres of potential/recruitment old growth would be established in the Iron Creek drainage. This increases allocated old growth in old growth management unit (OGMU) 12 to 12% and leaves OGMU 23 and OGMU 20 unchanged at 5% and 6% respectively. A portion of the funds generated from timber harvesting would be available for restoration of riparian vegetation throughout the analysis area.

Because such a small portion (5%) of the analysis area would be treated, loss of trees to pathogens would continue at a high rate. Root diseases and stem decays would cause increasing mortality within stands dominated by Douglas-fir, grand fir and western hemlock (83% of the analysis area), particularly those which have had some partial harvesting in the past.

Alternative 8

The objective of this alternative is to restore vegetation composition and structure to more closely resemble historical patterns within the Iron Creek and Solitaire Creek sub-watersheds and the face drainages of the Upper Little North Fork of the Coeur d'Alene River. Intensive harvest treatments would occur over large areas within a short period, but additional treatments would be excluded from the watershed for an extended period (30 to 40 years). Approximately 1,899 acres would be harvested (in Management Area 1) using the "shelterwood with reserves" method. This type of harvest is intended to simulate the same kind of stand replacing fires discussed in Alternative 2, but on a larger scale. The shelterwood harvest method would be the same as described under Alternative 2. Approximately 70% of the basal area in each harvest unit would be removed while the rest would be retained as individual trees or small groups of 3-5 acres. Approximately 1,379 acres of additional allocation of potential/recruitment old growth would also be identified within the analysis area to provide links between existing allocated old growth stands and/or to increase the old forest structure over time. This increases allocated old growth in old growth management unit (OGMU) 12 to 12%; OGMU 23 to 6% and OGMU 20 to 10%.

Landscapes within the analysis area and most of the Upper Little North Fork of the Coeur d'Alene River contain a heavily roaded, fragmented matrix that provide neither large blocks of mature/old forest or large areas with potentially long lived early seral tree species (IPNF, 1998). These landscapes are the highest priority for aggressive vegetation restoration, should be regenerated in watershed-sized large blocks of potentially long lived early seral species, and should have road densities reduced and watersheds restored through timber-related activities (IPNF, 1998).

This alternative restores white pine and other early seral species to approximately 1,899 acres and creates the larger patch sizes associated with stand replacing fires. This is about 9% of the analysis area. About 58% of the area to be harvested has had some previous harvest activity within the last 40 years. In addition to roads needed to provide general access, an additional 10.1 miles of road would be necessary for stand tending purposes.

3.3.14 Cumulative Effects at the Watershed Scale

Cumulative Effects Common to All Alternatives

Private Lands

None of the privately-owned lands within the analysis area would be affected by any of the alternatives, nor are there any anticipated activities contributing effects from these lands. Private lands are described briefly in Chapter II (2.4 Ongoing and Reasonably Foreseeable Activities) and Chapter III (3.1.1 Overview of the Area).

Opportunities

Precommercial Thinning and Pruning: Opportunities for vegetation restoration include 956 acres of precommercial thinning and 587 acres of white pine pruning as identified in Chapter II (2.5 Opportunities). The effect of these treatments would be to improve the growth and vigor of planted or naturally regenerated trees in stands that were harvested in the past. Precommercial thinning stands are prioritized to treat those stands with a large component of early seral species (white pine, western larch and ponderosa pine) first. Next priority will be to increase growth and vigor of other species. This would allow these species to better compete with the more shade-tolerant species so they can better provide the desired forest structure and composition. Even though early seral species are favored during thinning operations, other species are also maintained in the stands.

Pruning of white pine reduces the potential of infection by white pine blister rust and also improves the tree's ability to survive infection by removing infected branches. Pruned trees have a better chance of reaching maturity and contributing to the desired forest structure and composition.

Opportunities to precommercially thin stands and prune white pine are applicable to all alternatives. Please refer to Appendix H for a list of stands proposed for thinning and/or pruning.

Watershed and Wildlife Restoration: Roads proposed for permanent closure or obliteration in some action alternatives would eventually provide forest cover, although they would be likely to go through a prolonged period of grass, forbs and/or shrub dominance. Closure of some roads would restrict access to some areas, making stand-tending operations such as pruning and precommercial thinning more difficult.

Alternative 1

The stands of grand fir, Douglas-fir, and hemlock within the analysis area are very susceptible to root disease, drought and/or stem decays. Since these species are the dominant forest cover on 81% of the area, mortality and loss of wood fiber are expected to continue. As stands increase in age, these losses are also expected to increase.

Currently, about 10 percent of National Forest lands within the project area are dominated by early seral species including lodgepole pine, western larch, and white pine; compared to an historic level of approximately 57 percent. Only 600 acres (less than 3%) of the analysis area has been cut and replanted with these species to date. Most of this disparity between historic and current species composition is due to the loss of white pine from blister rust and subsequent salvage logging. Lodgepole pine is probably close to historic levels in the analysis area while loss of western larch, (although a small percentage) has occurred mainly in the larger and older size classes. Alternative 1 would not result in an increase in early seral species, nor would it begin to approach the historically much higher levels of these long-lived species.

Approximately 31 percent of National Forest System land within the project area is in mature structural stages, compared to historic levels of 46 percent. Since the species composition would not change under Alternative 1, future stands would continue to be susceptible to the same insect and disease pests as the existing stands. These future stands would be unlikely to provide the same closed canopy, multi-storied mature and old growth structure containing large white pine and larch that was once a major component of the Coeur d'Alene sub-basin. Although these stands may contain large old trees and provide some old growth characteristics, they would continue to break down, from openings caused by root disease, and a key component of remnant white pine and larch would be missing.

All of the harvest activities associated with ongoing timber sales within the project area have been completed, resulting in the 600 acres of thrifty white pine and larch plantations. There would be no additional cumulative effect from the remainder of the ongoing or reasonably foreseeable activities (please refer to Chapter II, 2.4 Ongoing and Reasonably Foreseeable Activities).

Alternative 2

Early seral species would be planted in stands totaling approximately 1,100 acres, all within the Iron Creek watershed. This would result in about 1700 acres (about 8%) of the analysis area being cultured to produce mature white pine and larch, but still far below the historic 50-60 percent of this disappearing forest type. This minor change in species composition is also discussed as changes to habitat, in the Wildlife section.

The timber harvest in this alternative reduces mature structural stage by 3 percent, primarily in stands of disease-prone Douglas fir and grand fir. This will create a minor reduction in the losses currently attributable to stem and root decay. The planted seral species are less susceptible to root disease than Douglas-fir and grand fir, so as these stands mature, the white pine and larch are more likely to provide a long-term improvement in stand structure, and more resiliency to native pathogens.

Patch sizes change with this alternative. The Fragstats model was used to compare alternatives (see project file). Harvest would fragment the pole/immature and mature structural stages, to increase the average patch size of the areas containing early seral seeding/sapling structural stage. Allocated old growth and potential or recruitment old growth patch sizes would increase, helping to meet Forest Plan standards and goals for old growth management. Alternatives 2, 6 and 8 would provide the largest increase in old growth patch size and core area. Changes to old growth forests are also discussed in section 3.6 Wildlife.

Alternative 3

Early seral species would be planted or naturally regenerated in stands totaling approximately 190 acres scattered throughout the analysis area. Added to the current 600 acres of plantations, this alternative accumulates less than 4% of the analysis area in these desirable species. Additionally, commercial thinning on 141 acres would improve the growth and vigor of western larch, by removing competing, and less desirable Douglas fir, grand fir and hemlock. Because of the lack of stands containing larch that could benefit from commercial thinning, there is little opportunity for any additional cultural treatments (other than planting) to sustain stands of this desirable species.

Harvest to accommodate the planting discussed above would reduce mature structural stage by less than 0.4 percent. This will create a very minor reduction in the losses currently attributable to stem and root decay. The planted seral species are less susceptible to root disease than Douglas-fir and grand fir, so as these stands mature, the white pine and larch are more likely to provide a long-term improvement in stand structure, and the wildlife habitats that these forests provide.

The Fragstats model was used to compare the landscape pattern of alternatives (see project file). Fragmentation would increase from harvest in the seedling/sapling, pole/immature, and mature structural stages while allocated old growth and potential or recruitment old growth would remain unchanged from the current condition. This alternative does not assist in blocking up old growth into the more desirable larger tracts, to retain their value as interior habitats for wildlife species.

Alternative 5

Early seral species would be planted or naturally regenerated on approximately 4,194 acres, resulting in an accumulated 4800 acres or 22% of the analysis area in this desirable species mix. This alternative comes the closest to the historic 50 to 60% of the analysis area in these species In addition, about 141 acres of existing western larch stands would be cultured with thinnings to retain larch's competitive advantage over the less desirable Douglas fir and grand fir. Additionally, lodgepole pine would be regenerated on approximately 2 percent of the analysis area.

The harvest and planting described above reduces mature structural stage (primarily Douglas fir, grand fir and hemlock) by about 8 percent, in order to promote early seral species that are less susceptible to root disease than Douglas-fir and grand fir. This constitutes the most reduction in the losses currently attributable to stem and root decay of any alternative. These planted and cultured stands are more likely to provide a long-term improvement in stand structure, species composition, and stand resiliency. The Fragstats model was used to compare the landscape pattern of alternatives (see project file). Fragmentation occurs in patches of over-represented pole/immature and mature structural stages. This is a tradeoff to block up larger areas of early seral species, as well as increase the average patch size of allocated and potential or recruitment old growth, helping to meet Forest Plan standards and goals for old growth management.

Alternative 6

The no action alternative (Alternative 1, above) describes the cumulative effects for this alternative also. Any small opening created by the removal of trees for watershed improvement projects are likely to regenerate to shade tolerant species, because of the lack of full sunlight in small openings. There are no regeneration harvests associated with this alternative so the only opportunity to increase the seral species component within the analysis area would be connected to riparian areas planted in conjunction with rehabilitation efforts. Over the long term, improvements in watershed function will result in more improvements to riparian vegetation and the intrinsic wildlife habitats these areas provide, such as beaver ponds and other vegetated wetlands.

Although some removal of trees occurs in the mature forest structural stage, this is not expected to change the structural stage classification, landscape pattern, nor the wildlife habitats they provide. The Fragstats model was used to compare the landscape pattern of alternatives (Project File, Vegetation). This alternative proposes an increase in the area dedicated to allocated old growth management, helping to meet Forest Plan goals.

Alternative 7

Early seral species would be planted or naturally regenerated on approximately 1140 acres, and harvests that thin to improve existing western larch stands would be completed on another 141 acres. This results in a cumulative 6 percent of National Forest lands within the project area covered by an improved species composition, but still not close to the 50-60% historically present.

Harvest and planting of mature reduces this structural stage by about 3 percent to promote stands of early seral species that are less susceptible to root disease than the currently-present Douglas-fir and grand fir. There is a higher-than-historic proportion of this less desirable species composition. By changing to the more desirable white pine and larch types, these stands would be more likely to provide a long-term improvement in stand structure and composition, and more resiliency. The Fragstats model was used to compare the landscape pattern of alternatives (Project File, Vegetation). This regeneration harvest increases the average patch for the seeding/sapling structural stage and for allocated and potential or recruitment old growth. This alternative along with alternatives 2 and 8 provide the largest increase in old growth patch size and core area, desirable traits that were historically more abundant.

Alternative 8

Early seral species would be planted on approximately 1,899 acres, accumulating to about 2,500 acres of the analysis area in this desirable species mix. This is an improvement of species composition on about 12 percent of the analysis area over the last 30 years.

This harvest, to accommodate the planting of white pine and larch, reduces mature structural stage (primarily Douglas fir, grand fir and hemlock) by about 3 percent. However, allocated old growth would not be harvested. Early seral species are less susceptible to root disease than Douglas-fir and grand fir, so these

stands would also be more likely to provide a long-term improvement in stand structure and resiliency to native pathogens. The Fragstats model was used to compare the landscape pattern of alternatives (see project file). Fragmentation is increased in the over-represented pole/immature and mature structural stages while average patch sizes are increased for the seeding/sapling structural stage and allocated/potential/recruitment old growth are blocked up into larger, more desirable tracts for core interior forest habitats. This alternative, along with alternative 2, provides the largest increase in old growth patch size and interior forest core area.

The following tables provide summary information on how each alternative would affect stand structure and species composition within the analysis area. The proposed changes in species composition from Douglas-fir and grand fir to more resilient and thus more desirable white pine and larch would occur at the time of planting in harvested stands. We would expected these seral species to be managed throughout the life of the stand and they would therefore be more likely to provide the desired mature and old growth structure than more root disease and resilient to environmental factors than Douglas-fir, hemlock and grand fir. Under Alternatives 3, 5, and 7, commercial thinning would help maintain larch as an important and desirable component of mixed species stands.

In the following table, the "Existing Condition" for Structural Stage and Cover Type incorporates all past activities that have occurred over the landscape, such as timber harvest, tree planting, and fires. It also includes ongoing activities, such as active timber sales and associated planting. Changes shown to existing condition under each alternative would be the result of the proposed action and of other reasonably foreseeable future actions (described in Chapter II, 2.4 Ongoing and Reasonably Foreseeable Activities).

There would be no change to the amount of allocated old growth under any alternative; changes to potential or recruitment old growth are displayed in the table. There would be no change to the amount of ponderosa pine or non-forest cover types under any alternative.

Table III-33. Approximate acres and percent* of structural stages in the Iron Honey Resource Area.

Structural Stage	Existing	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Shrub/Seedling /Sapling	3,045 (14%)	3,045 (14%)	4,140 (19%)	3,235 (15%)	7,230 (34%)	3,045 (14%)	4,180 (19%)	4,945 (23%)
Pole/Small-medium Timber	11,765 (55%)	11,765 (55%)	11,350 (53%)	11,660 (54%)	9,355 (43%)	11,765 (55%)	11,325 (53%)	10,815 (50%)
Mature/Large Timber	6,740 (31%)	6,740 (31%)	6,060 (28%)	6,655 (31%)	4,975 (23%)	6,740 (31%)	6,045 (28%)	5,795 (27%)
Allocated old growth	455 (2%)	455 (2%)	455 (2%)	455 (2%)	455 (2%)	455 (2%)	455 (2%)	455 (2%)
Potential old growth	689 (3%)	689 (3%)	2,068 (10%)	689 (3%)	1,489 (7%)	2,068 (10%)	1,489 (7%)	2,068 (10%)

**Represents the percent of National Forest Land affected within the Iron Honey Resource Area.*

Table III-34. Approximate acres and percent* of cover types in the Iron Honey Resource Area.

Cover Type	Existing	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Douglas-fir/ Grand fir	12,875 (60%)	12,875 (60%)	11,855 (55%)	12,725 59%)	9,485 (44%)	12,875 (60%)	11,800 (55%)	11,185 (52%)
Western Hemlock	4,630 (21%)	4,630 (21%)	4,550 (21%)	4,620 (21%)	4,165 (19%)	4,630 (21%)	4,550 (21%)	4,420 (21%)
Ponderosa Pine	10 (<1%)	10 (<1%)	10 (<1%)	10 (<1%)	10 (<1%)	10 (<1%)	10 (<1%)	10 (<1%)
Subalpine Fir	1,950 (9%)	1,950 (9%)	1,950 (9%)	1,950 (9%)	1,915 (9%)	1,950 (9%)	1,950 (9%)	1,950 (9%)
Western Larch	765 (4%)	765 (4%)	1,040 (5%)	845 (4%)	1,780 (9%)	765 (4%)	1,095 (5%)	1,240 (6%)
Lodgepole Pine	950 (4%)	950 (4%)	950 (4%)	925 (4%)	925 (4%)	950 (4%)	925 (4%)	950 (4%)
Western White Pine	350 (2%)	350 (2%)	1,175 (6%)	455 (2%)	3,250 (15%)	350 (2%)	1,200 (6%)	1,775 (8%)
Non-Forest	20 (<1%)	20 (<1%)	20 (<1%)	20 (<1%)	20 (<1%)	20 (<1%)	20 (<1%)	20 (<1%)

**Represents the percent of National Forest Land affected within the Iron Honey Resource Area.*

3.3.15 Consistency With Forest Policy and Legal Mandates

Forest Plan direction for the Idaho Panhandle National Forests provides that timber management activities will be the primary process used to minimize the hazards of insects and diseases and will be accomplished by maintaining stand vigor and diversity of plant communities and tree species (Forest Plan, p. II-8). Forest direction regarding vegetation is guided by the Forest Plan standards for wildlife (old growth habitat) (Forest Plan, p. II-29), timber (Forest Plan, pp. II-31-32), and forest protection (Forest Plan, pp. II-38-39).

A. Standards for Old Growth Habitat Management

Forest Plan direction for management of old growth is found in the Forest Plan and clarified by the Forest Supervisor (Project Files, Vegetation).

Wildlife 10.a. A definition for old growth is being developed by a Regional Task Fork and will be used by the Forest when completed. As an interim guideline, stands classified as old growth should meet the definition given by Thomas (1979).

Analysis of existing and affected old growth in the Iron Honey Resource Area was based on the Regional Task Force's report "Old Growth Forest Types of the Northern Region" (Green and others, 1992; Project Files, Vegetation). This analysis was based on current and widely accepted science and provides the current Forest Plan old growth definitions.

Wildlife 10.b. Maintain at least 10 percent of the forested portion of the IPNF as old growth.

and

Wildlife 10.c. Select and maintain at least five percent of the forested portion of those old-growth units that have five percent or more of existing old growth.

The Forests' 10% old growth allocation (231,000 acres) was distributed among the districts as documented in the Forest Supervisor's May 7, 1991 letter concerning the subject "Forest Plan Explanation: Implementing Old Growth Standards," (Project Files, Vegetation, identified as Appendix B to the May 22, 1993 letter

regarding "Follow-up on Implementing Old Growth Standards"). The Coeur d'Alene River Ranger District was responsible for allocating 56,000 acres for old-growth management (with 18,000 acres on the former Fernan Ranger District and 38,000 acres on the former Wallace Ranger District). The district currently has a total of 60,122 acres of allocated old growth (1999 Forest Plan Monitoring Report, p. 57-59). The Forest as a whole has identified and allocated 250,776 acres (10.9% of the forested acres), which exceeds this Forest Plan standard.

The original allocation of old growth met Forest Plan standards and was agreed upon by representatives of the Audubon Society and Inland Empire Public Lands Council in 1991 and again in 1994 (Project Files, Vegetation), based on direction provided by the Forest Supervisor in his June 22, 1993 letter regarding "Follow-up on Implementing Old Growth Standards," (Project Files, Vegetation).

In preparation for development of the next Forest Plan, all old growth within the district is undergoing a verification process. Results of this office and field verification will be available in late 2002.

Current allocated old growth is described under the Coeur d'Alene Basin Current Situation discussion in this chapter (section 3.3.3 Overview, (D) Existing Conditions in the Iron Honey Resource Area) and by each watershed. Changes in allocated potential or recruitment old growth are also described (Table III-33). Alternatives 2, 5, 6, 7 and 8 propose additional old growth allocation, which would increase the amount of allocated old growth to at least 5% where it exists in the old growth management unit. Alternative 3 would not meet Forest Plan standards because it would not increase the old growth management unit allocation to a minimum of 5% where it exists.

Wildlife 10.d. Existing old-growth stands may be harvested when there is more than 5% in an old-growth unit, and the Forest total is more than 10%.

No harvest is proposed in allocated old growth areas under any alternative.

Wildlife 10.e. Old-growth stands should reflect approximately the same habitat type series distribution as found on the IPNF.

The allocated old growth within the Iron Honey Resource Area and elsewhere on the Coeur d'Alene River Ranger District does reflect approximately the same habitat type series distribution as found on the IPNF.

Wildlife 10.f. One or more old-growth stands per old-growth unit should be 300 acres or larger. Preferences should be given to a contiguous stand; however the stand may be subdivided into stands of 100 acres or larger if the stands are within one mile. The remaining old-growth management stands should be at least 25 acres in size. Preferred size is 80 plus acres.

The Fragstats model (USDA, 1995) was used to compare the landscape pattern of alternatives for all structural stages, including allocated and potential old growth (see project file). The mean patch size of old growth for alternatives 1 (exisiting/no action) and 3 is 82 acres. The mean patch size for old growth for alternatives 5 and 7 is 139 acres and for alternatives 2, 6 and 8 is 211 acres. In OGMU 20 the smallest block size is 12 acres. In OGMU 20, for alternatives 1, 3, 5 and 7 the largest block size is 168 acres and the largest block size for alternatives 2, 6 and 8 is 589 acres. In OGMU 23, the smallest block size is 14 acres and for all alternatives the largest block size is 236 acres. In OGMU 12, the smallest block size is 41 acres. In OGMU 12 for alternatives 1 and 3 the largest block size is 85 acres; for alternatives 5 and 7 the largest block size is 452 acres and in alternatives 2, 6 and 8 the largest block size is 452 acres.

Wildlife 10.g. Roads should be planned to avoid old-growth management stands to maintain unit size criteria.

No new road permanent road construction is proposed under any alternative. Temporary road construction would not occur in allocated old growth under any alternative.

Wildlife 10.h. A long-term objective should be to minimize or exclude domestic grazing within old-growth stands. No new allotments will be issued in old-growth stands.

It is unlikely that grazing would occur within the allocated old growth in the Iron Honey Resource Area or if it did occur the effects/pressure would be minimal; since old growth structure does not normally provide much forage for these animals, they do not spend much time in the old forest structure of allocated old growth.

Wildlife 10.i. Goals for lands to be managed as old growth within those lands suitable for timber production are identified in the management area prescriptions.

No harvest treatments are proposed within allocated old growth under any alternative.

B. Standards for Timber

Timber 1. Both even-aged and uneven-aged silvicultural systems will be employed on the IPNF and will meet resource and vegetation management objectives identified in the Forest Plan.

The action alternatives (Alternatives 2, 3, 5, 7 and 8) include both even and uneven aged silvicultural treatments through the use of shelterwood with reserves, clearcut with reserves, commercial thinning, partial/selective harvests and precommercial thinning and pruning.

Timber 2. Timber stands that are substantially damaged by fire, windthrow, insect or disease attack, or other catastrophe may be harvested where this salvage is consistent with silvicultural and environmental standards. All management areas are open to this potential salvage activity except Management Areas 11 and 14.

Salvage of damaged timber is integrated into the silvicultural treatments proposed under the action alternatives.

Timber 3. Recommended changes in timber resource land suitability from the approved Forest Plan will be based upon the criteria contained in 36 CFR 219.14(a) and the rationale displayed in environmental assessments. Changes from suitability classification will be done in accordance with the procedures outlined in Appendix M.

There are no changes in suitability proposed under any alternative.

Timber 4. Reforestation will normally feature seral tree species, with a mixture of species usually present. Silvicultural practices will promote stand structure and species mix that reduce susceptibility to insect and disease damage.

All regeneration areas would be regenerated with site adapted species/seed source and resulting stands would be dominated by resilient potentially long-lived seral species (Chapter II, 2.6.9 Features Common to All Alternatives, (B) Features Designed to Improve Vegetation Management).

Timber 5. Project design will provide for site preparation and slash hazard reduction practices that meet reforestation needs of the area.

Site preparation and/or fuel treatment may include a combination of prescribed burning, underburning, grapple piling, and hand piling, depending on post harvest conditions and regeneration treatment needs (Chapter II, 2.6.9 Features Common to All Alternatives, (B) Features Designed to Improve Vegetation Management).

Timber 6. Timber harvest schedules and access will be coordinated with intermingled landowners where applicable.

Access to private property in the Iron Honey Resource Area (at Horse Heaven and along the Bunco Road) would be maintained under any alternative (Chapter II, 2.6.9 Features Common to All Alternatives, (I) Long-term Transportation Plan Common to All Alternatives)

Timber 7. Openings created by even-aged silviculture will be shaped and blended to forms of the natural terrain to the extent practicable; in most situations they will be limited to 40 acres. Creation of larger openings must conform to current Regional guidelines regarding public notification, environmental analysis and approval.

and

Timber 8. An area of National Forest land will no longer be considered an opening when vegetation meets management goals established for the management area in accordance with the Regional Guide. Lands in other ownership within or adjacent to National Forest land will be included in the analysis when planning openings.

The public was informed in March, 1998 that regeneration openings in excess of 40 acres were proposed under some alternatives (Project Files, Public Involvement). A letter requesting approval to exceed the 40 acre opening size, with appropriate interdisciplinary analysis and documentation, will be sent to the Regional Forester before implementation of this project. The proposed openings, in conjunction with previously regenerated areas, will create openings on the landscape of the scale and pattern that are more appropriate relative to the historic disturbance regimes for this analysis area. Proposed harvest openings greater than 40 acres are identified in Appendix G.

Timber 9. The silvicultural prescription for each stand will establish the level of management intensity compatible with the management area goals. Preferred species management as identified in the silvicultural prescription will consider both biological and economic criteria.

All vegetative treatments would have silvicultural prescriptions approved by a certified silviculturist. Prescriptions would consider site-specific factors (such as physical site, soils, climate, habitat type, and current vegetative composition and conditions) as well as interdisciplinary objectives and Forest Plan goals, objectives and standards (Chapter II, 2.6.9 Features Common to All Alternatives, (B) Features Designed to Improve Vegetation Management).

C. Standards for Forest Protection

Forest Protection 1. Use integrated pest management methods that provide protection of Forest resources with the least hazard to humans, wildlife, and the environment.

and

Forest Protection 2. Use silvicultural methods and schedule practices that reduce the development and/or perpetuation of pest problems.

As described earlier in this chapter (3.3.3 Overview, (D) Coeur d'Alene Basin Current Situation and (E) Existing Conditions in the Iron Honey Resource Area), loss of the long-lived seral components (white pine and western larch) in the ecosystem is a major reason for lack of vegetative resiliency. Use of various regeneration and intermediate treatments to trend toward species compositions with increased resistance is a major component of all action alternatives except Alternative 3. In combination with alternative design features (Chapter II, 2.6.9 Features Common to All Action Alternatives, (B) Features Designed to Improve Vegetation Management), these treatments would minimize adverse effects and maximize a range of objectives. All alternatives would meet these two Forest Plan standards.

Forest Protection 3. Vegetation management will favor the use of fire, hand treatment, natural control, or mechanical methods wherever feasible and cost effective. Direct control methods, such as chemical or mechanical, may be used when other methods are inadequate to achieve control.

Proposed vegetative treatments would utilize a combination of fire, hand treatment, natural and mechanical methods. Forest vegetative treatment using chemicals is not proposed under any alternative.

3.4 SOIL PRODUCTIVITY

3.4.1 Regulatory Framework

The regulatory framework providing direction for protecting a site's inherent capacity to grow vegetation comes from the following principle sources:

- *The Multiple Use-Sustained Yield Act of 1960,*
- *The National Forest Management Act of 1976 (NFMA),*
- *The Code of Federal Regulations for Forest Planning (36, CFR 200.1),*
- *The Forest Plan and Regional Soil Quality standards (FSM 2550 Watershed and Air*
- *Management, Chapter 2550 Soil Management and R-1 Supplement 2500-99-1)*

The Multiple Use-Sustained Yield Act of 1960 directs the Forest Service to achieve and maintain outputs of various renewable resources in perpetuity without permanent impairment of the land's productivity.

Section 6 of the National Forest Management Act of 1976 (NFMA) charges the Secretary of Agriculture with ensuring research and continuous monitoring of each management system to safeguard the land's productivity.

The Code of federal Regulations for Forest Planning that followed NFMA requires the Forest Service to measure effects of prescriptions, including "Significant changes in land productivity" (Code of Federal Regulations 36, CFR Part 200, Section 1, 1987).

To comply with NFMA, the Chief of the Forest Service has charged each Forest Service Region with developing soil quality standards for detecting soil disturbances indicating a loss in long-term productive potential. These standards and guidelines are built into Forest Plans.

Consistency with Forest Plan and legal mandates is provided in the effects discussion for each alternative.

3.4.2 Methodology

Analysis of the soil resource was carried out utilizing a project level landtype map that was developed utilizing the parameters of elevation, stream course configurations, base geology, landform and vegetation. Landtype ratings identify the relative probability of downslope movement of masses of soil material (a map displaying landtypes in the Iron Honey Resource Area is provided in the Project Files, Soils). These ratings consider slope gradient, soil depth, surface drainage characteristics, soil texture, bedding structure, and orientation, slope dissection density, and water input. Landtypes with a “high” landslide potential rating have steep to very steep slopes, impervious materials over a large portion of the area, saturated soil conditions, non-cohesive soils, bedding plances parallel to the slope, high dissection density, and high intensity storms, with rain-on-snow events. There is one landtype with a “high” rating within activity areas under the Iron Honey Resource Area (Landtype 479). Based on past management activities (including timber harvest and road work) and taking into consideration site-specific conditions such as surface soils, type of bedrock, and proximity of bedrock to the surface), lands in the Coeur d'Alene River Ranger District are generally more stable than indicated by this landtype rating (Project Files, Soils).

A progressive soil resource inventory has been conducted at the Forest level according to procedures in the Natural Resource Conservation National Soil Handbook and FSH 2509.18, Soil Management Handbook. At the project level the soils have been selectively examined as a field verification method in order to describe, classify, map and access their characteristics according to the Soil Taxonomy of the USDA. Soil landtype data was employed to access the project area’s capability, suitability and limitations associated with proposed harvest units and their interrelationship to the soil resource. This systematic procedure was incorporated into each action alternative to allow for the various harvest unit proposals and to identify those units that would require design modifications, if necessary to achieve the Forest Plan management direction (Niehoff, 1998).

Data lists were developed for all the proposed treatment units in each alternative; the existing condition for those units, including acres of constructed or designated trails, roads (permanent/temporary) within or adjacent to harvest units and logging systems. The activities were compiled into lists from an aerial photo series (1958 through 1996), timber stand (TSMRS) and road data bases. Calculations were performed utilizing the data sheets to determine the disturbance factor for each activity area. The disturbance factors represent an average percentage of detrimentally disturbed soils, which has been obtained through past monitoring methodology on existing harvest units. Forest plan Monitoring and Evaluation Reports (1988, 1993, 1997 and 1999) are on file in the Forest Supervisor's Office, Idaho Panhandle National Forest.

All of the proposed harvest's related actions were compared to the existing conditions and the mitigation measures common to the action alternatives as a rough evaluation for each unit and their relation to the Forest Plan Standards. Areas of low potassium that are associated with the Prichard and St. Regis geologic formations were distinguished on a map overlay with the proposed project units. The following design and management criteria relate to soil productivity in the Iron Honey Project.

1. Detrimentally disturbed soils within activity areas (harvest units).

All action alternatives would comply with Forest Plan Standards and Regional Soil Quality Standards (Bosworth, June 14, 2000; and Niehoff, February 7, 2000) related to detrimentally disturbed soils.

Compliance with these standards requires that a least 85 percent of an activity area (harvest unit and any adjacent roads or landings) must be in a condition of acceptable productivity for trees and other managed vegetation; that is, no more than 15 percent of an activity area may have detrimentally disturbed soils. This standard is based on the lowest magnitude of adverse change detectable, given current monitoring technology (Powers et al. 1990).

The soils in an activity area are considered detrimentally disturbed when the following soil conditions exist as a result of Forest practices.

Soil displacement results in the loss of either one inch of or half of the humus-enriched surface layer (A-soil horizon), whichever is less. The loss of the litter layer alone could be detrimental on some marginal sites. Roading, ground-based yarding, dozer piling and cable corridors are the major contributors to displacement.

Soil compaction that results in a 20 percent or more increase in bulk density, or a 50 percent reduction in water infiltration rates typical for volcanic ash influenced surface soils. Soil compaction reduces the supply of air, water and nutrients to plants. Roading, ground based yarding and piling are the major contributors to compaction.

Fire consumes most woody debris and the entire duff and litter layer, exposing mineral soil. Burn ash that is white or reddish color, indicates that much of the carbon was oxidized by fire (Burned-Area Emergency Rehabilitation Handbook FSH 2509.13). Burns which create very high temperatures at the soil surface when soil moisture content is low results in almost complete loss of surface and upper soil horizon organics. Many of the nutrients stored in these organics can be lost to the atmosphere through volatilization and removed from the site in fly-ash (Garrison and Moore, 1998).

2. Low Potassium Sites - Sites containing geologic formations that are naturally deficient in potassium bearing minerals.

This item relates to the natural deficiency of potassium in the Prichard and St. Regis geologic formations. The Prichard and St. Regis Formations contain only traces of potassium feldspars. The other geologic formations that occur as part of the Belt metasedimentary structure have percentages of potassium feldspar within their mineral composition, that range from 2 to 12 percent (Harrison and Campbell, 1963). The entire project area is underlaid with Belt metasedimentary rock. Unlike many other soil nutrients, potassium is derived almost entirely from the underlying rock formations. On some sites, 45 percent of the potassium is held in trees, with the remainder being held in subordinate vegetation, forest floor and soil pools. Within the trees, about 85 percent of the potassium is held in the branches, twigs and foliage (Garrison and Moore, 1998). In most natural circumstance the potassium returns to the soil when the tree dies. If potassium is removed from the site, the loss is long-term. Whole tree yarding, removal of treetops, and grapple piling lead to the direct loss of potassium (Morris and Miller, 1994).

Some very preliminary research being done by the Intermountain Forest Tree Nutrition Cooperative (IFTNC) is showing a possible link to potassium deficiency and the lack of tree resistance to root rot.

First year results from the seedling establishment/nutrition experiment conducted by the Intermountain Forest Tree Nutrition Cooperative showed that potassium was non-limiting from a tree growth standpoint on the Flat Creek Belt metasedimentary site, (Garrison, 1998). This Belt metasedimentary site is on the Striped Peak

formation, and according to Harrison and Campbell contains about seven percent potassium feldspar in its mineral composition.

The Intermountain Forest Tree Nutrition Cooperative (IFTNC) is continuing to research potassium contents within tree species and different rock types in order to establish more definite minimum thresholds and affects on tree growth and resistance to root diseases. Until these minimum thresholds are developed through research, the Idaho Panhandle National Forest is using management recommendations from the IFTNC as a guideline for maintaining sufficient potassium on a site.

The IFTNC has made the following management recommendations to retain the maximum partible potassium on site after logging:

- *Practice conventional removal (lop and scatter) rather than whole-tree removal. The lop and scatter technique should be practiced during intermediate as well as final harvest operations.*
- *Let slash remain on site over winter so mobile nutrients such as potassium can leach from fine materials back to the soil.*
- *Light broadcast burn or underburn for release of potassium and other nutrients.*
- *Avoid mechanical site preparation.*
- *Plant species appropriate to the site.*

3. Maintenance of large woody debris and organic matter.

The third soil productivity criterion common to all action alternatives relates to the management of coarse woody debris and organic matter, which would follow the research guidelines contained in (Graham et al., 1994). The optimum level of fine organic matter is 21 to 30 percent and this equates to 1 to 2 inches of surface litter and humus. Optimum levels of fine organic matter relate to ectomycorrhizae fungus which form a strong and positive relationship. Ectomycorrhizae is a good indicator of healthy forest soil. In moist western hemlock and cedar habitat types strong levels of ectomycorrhizae exists when organic levels exceed 30 percent. Soil survey data indicates that most forest sites have adequate organic matter levels to support strong ectomycorrhizae populations.

This soil productivity criteria is addressed as a mitigation requirement only and is not part of the alternative evaluations, because project alternatives are designed to meet the large woody debris guidelines.

3.4.3 Existing Conditions

Soil productivity is the output of a specified plant or group of plants under a defined set of management practices, or total plant mass-produced annually per unit area.

The most productive part of the project area's soil occurs near the surface at the contact between the forest litter and the mineral soil. Here the litter has been highly decomposed into dark colored amorphous material, which is the richest and most productive part of the soil. This layer is frequently only a few inches thick but its presence is much more important than its thickness would indicate. This organic matter rich layer contains most of the soil nitrogen, potassium and mycorrhiza, which must be present for a site to be productive.

Below the soil's organic horizon is volcanic ash, which occurs at the surface layer of the mineral soil. In north Idaho, the ash layer is typically 16 inches thick, ranging between 7 and 24 inches on most sites. The top part of the ash is usually enriched in organic matter that also contributes nitrogen, potassium and mycorrhizae to

this part of the soil. The lower part of the volcanic ash has less organic matter and is not as fertile as the upper part. The ash has a high water holding capacity and nutrient holding capacity both of which are important for soil productivity.

Below the volcanic ash, the subsoil and substratum tend to be medium textured in the Belt, metasedimentary soils. These subsoil and substratum materials are very weakly weathered. They tend to have a high component of rock fragments, although this can be quite variable, particularly in the alluvial bottoms and outwash materials. A map displaying landtypes in the analysis area is provided in the Project Files (Soils).

Past harvest has occurred within some of the proposed harvest units. One 5-acre unit was harvested using tractor yarding; 22 units (3,017 acres) were logged with a combination of cable and tractor yarding; and 26 units (515 acres) were cable yarded. There are 116 acres that do not meet the Forest Plan Soil Quality Standards. These acres were harvested prior to establishment of Forest Plan soil protection guidelines.

3.4.4 Environmental Consequences

A. Direct and Indirect Effects at the Analysis Area Scale

Soil productivity would not be compromised beyond Forest Plan soil quality standards under any alternative, due to the specific features designed to protect soils (described in Chapter II, 2.6.9. Features Common to All Action Alternatives, (C) Features Designed to Protect Soils).

Direct, indirect and cumulative effects on soil productivity typically occur at the site scale. Detrimental soil disturbances such as compaction, displacement and potentially severe burning would increase under all action alternatives, except possibly Alternative 6 (which proposes limited timber harvest and no fuels treatment). Compaction, displacement and severe burning affect soils physical, chemical and biological properties that indirectly can affect the growth and health of trees and other plants. The greatest amount of soil disturbance would occur with road building and tractor harvest units where additional designated skid trails are planned. Minor disturbances would occur in skyline and cable units and where fire lines are mechanically constructed around units.

Harvesting trees and leaving slash on site would remove the least amount of potassium and other essential nutrients from the site. On the contrary, harvesting trees with the tops attached would remove the most nutrients. The significance of the potassium removal in relation to site productivity increases when harvest activities occur on low potassium sites, but measuring the effects on site productivity due to the loss of potassium cannot be predicted with certainty until more research information becomes available.

A positive affect occurs when the foliage and branches of harvested Douglas-fir trees are allowed to recycle on site, thereby, releasing stored nutrients, such as potassium and nitrogen back to the soil. Douglas-fir consumes and stores more potassium than most other trees. The release and availability of this stored potassium would benefit larch and western white pine, which require less potassium for growth and maintenance (Garrison and Moore, 1998). These more potassium efficient trees would be planted in all regeneration harvest units and favored within the improvement harvest units.

Alternative 1 (No Action)

Throughout the silvicultural landscape tree mortality would continue as in the past from pathogens and weather events, which have a direct influence on the area's recycling of organic matter and changes in fuel loading. In moist habitat sites the increase in organic matter is beneficial to overall soil productivity. In dry habitat types increases of organic matter may result in a negative response. Soil damage risks could increase

as fuel loading levels rise should a high severity fire occur. The effects of such a fire would result in a greater loss to the soil of organic matter, nutrient availability, and reduced water infiltration.

Areas that presently have existing conditions that may not meet soil quality standards for detrimentally disturbed soils would remain adversely disturbed.

There are potential effects to low potassium sites. Some risk of potassium loss could occur through fly ash removal should a high severity fire occur. If a high severity fire does not occur then potassium would be made available through biomass decomposition.

Alternative 2

There would be an increase in detrimental soil disturbances such as compaction and displacement on about 4 acres where new road construction is proposed, on 8 acres where machine fire line would be constructed, and on 220 acres of tractor-yarded units where additional designated skid trails are proposed. The combined effect from road and machine fire line construction and those proposed harvest units with prior tractor work increases detrimental soil disturbances 4.2 percent. Minor disturbance would occur on 900 acres where skyline yarding would occur and where hand fire line would be constructed around units.

All harvest units are proposed for a low intensity underburn and most of the tree foliage/tops would remain inside the unit. Using this management technique throughout the project area would maximize partible potassium on the site after logging and would meet the recommendations of the IFTNC. Potassium deficiency is not a concern since none of the proposed harvest units are associated with those particular geologic formations lacking in potassium feldspar.

Alternative 2 does not propose any units where existing conditions may not meet Forest Plan soil quality standards. There is one unit (49 acres) where existing conditions are marginal. Implementation of specific alternative design features (described in Chapter II, 2.6.9. Features Common to All Action Alternatives, (C) Features Designed to Protect Soils) would either maintain or reduce existing detrimental soil disturbance levels.

Alternative 3

There would be an increase in detrimental soil disturbances such as compaction and displacement on about 2 acres where machine fire line would be constructed, and on 63 acres where tractor yarding is proposed. The combined effect from machine fire line construction and proposed harvest units with prior tractor work increases detrimental soil disturbance 5.0 percent. Minor disturbances would occur on 270 acres where skyline and helicopter yarding is proposed and where hand fire line would be constructed around units. Compaction, displacement and severe burning affect soils physical, chemical and biological structure, which can indirectly affect the growth and health of trees and other plants.

Under Alternative 3, 191 acres would receive low intensity underburning treatments. Top yarding is proposed on the remaining acreage. Underburning would retain the maximum partible potassium on site after logging and would meet the recommendations of the IFTNC. On the top-yarded units, about 50 percent of the potassium containing foliage and branches would remain on site. This would result in a net loss of usable potassium, but the loss should not measurably reduce site productivity since each proposed harvest unit is not associated with a potassium-deficient geologic formation.

Under Alternative 3, 20 units (116 acres) are proposed where existing conditions may not meet Forest Plan soil quality standards. Existing conditions are marginal in one 5-acre unit. Of the twenty units that do not meet the standards, 17 are the result of past road construction which is situated either above or below the unit

or both. As stated in R-1 Supplement 2500-99-1,.the roads are part of the District's system travelways and are not a disturbance factor. All of the proposed units that may not meet Forest Plan soil quality standards (including the marginal unit) would follow the alternative design features common to all action alternatives listed in Chapter II, 2.6.9. Features Common to All Action Alternatives, (C) Features Designed to Protect Soils. Upon implementation of the alternative design features these units would either maintain or reduce existing detrimental soil disturbance levels.

Alternative 5

There would be an increase in detrimental soil disturbances such as compaction and displacement on 58 acres where new road construction is proposed, on 21 acres where machine fire line would be constructed, and on 402 acres where tractor yarding is proposed. The combined effect from road and machine fire line construction and proposed harvest units with prior tractor work increases detrimental soil disturbance 3.0 percent. Minor disturbances would occur on 3,933 acres where skyline and helicopter yarding is proposed and where hand fire line would be constructed around units. Compaction, displacement and severe burning affect soils physical, chemical and biological structure which can indirectly affect the growth and health of trees and other plants.

A low intensity underburn is proposed on 4,195 acres under Alternative 5. Yarding top-attached trees is proposed on an additional 141 acres from three helicopter units. Underburning would retain the maximum partible potassium on site after logging and would meet the recommendations of the IFTNC. In the top-yarded units, about 50 percent of the potassium containing foliage and branches would remain on site. This would result in a net loss of usable potassium, but the loss should not measurably reduce site productivity since these proposed harvest units are not associated with a potassium deficient geologic formation. The one low potassium site (Unit 22, 169 acres) is proposed as a lop-and-scatter skyline unit. Once underburned, the available potassium within the unit should return to the soil profile.

Alternative 5 does not propose any units where existing conditions may not meet Forest Plan soil quality standards. There is one unit (49 acres) where existing conditions are marginal. In the marginal unit, activities would follow the alternative design features common to all action alternatives listed in Chapter II, 2.6.9. Features Common to All Action Alternatives, (C) Features Designed to Protect Soils. Upon implementation of the alternative design features these units would either maintain or reduce existing detrimental soil disturbance levels.

Alternative 6

Harvest proposed under Alternative 6 would be for the exclusive purpose of obtaining instream wood structure material that would be utilized during stream enhancement work. There would be an increase in detrimental soil disturbances of 8.5 percent as related to compaction and displacement on 385 acres where tractor yarding is proposed on previously harvested tractor ground in the designated thinning units. Compaction and displacement affect soil's physical, chemical and biological structure, which can indirectly affect the growth and health of trees and other plants.

In all of the proposed units, top-attached yarding would be implemented. The retention of maximum partible potassium would remain on site and would meet the recommendations of the IFTNC. Potassium retention in the sites biomass would be maintained since 50 percent of the potassium containing foliage and branches would remain on site throughout each tractor unit. The only low potassium site (Unit 6, 85 acres) would not reduce potassium nutrients due to the additional slash added to the existing ground organic component. Over all, the proposed management activities should not result in a net loss of usable potassium because the units existing organic layer would remain intact with additional organic material incorporated from the harvest activity slash. Use of prescribed burning is not a management consideration on any of the units.

Alternative 6 does not propose any units where existing conditions may not meet Forest Plan soil quality standards. Where feasible, the soil attached to the root wads would be removed so that a majority of the soil is retained on site to promote revegetation.

Alternative 7

There would be an increase in detrimental soil disturbances such as compaction and displacement on about 8 acres where new road construction is proposed, on about 9 acres where machine fire line would be constructed, and on 232 acres where tractor yarding is proposed. The combined effect from road and machine fire line construction and proposed harvest units with prior tractor work increases detrimental soil disturbances 6.5 percent in alternative 7. Minor disturbances would occur on 1,053 acres where skyline and helicopter yarding is proposed and where hand fire line would be constructed around units. Compaction, displacement and severe burning affect soils physical, chemical and biological structure, which can indirectly affect the growth and health of trees and other plants.

Under Alternative 7, approximately 1,144 acres are proposed for underburning treatments. The remaining acreage will have the tops yarded from the units. If not severe, broadcast burning will contribute to the overall retention of partible potassium on site after logging and would meet the recommendation of the IFTNC. In the top-yarded units, about 50 percent of the potassium containing foliage and branches would remain on site in these areas. This would result in a net loss of usable potassium, but the loss should not measurably reduce site productivity since each proposed harvest unit is not associated with a potassium deficient geologic formation.

Alternative 7 does not propose harvest units where existing conditions may not meet Forest Plan soil quality standards. There are three proposed harvest units (59 acres) where marginal soil conditions exist. Activities in all of the marginal units would follow the alternative design features common to all action alternatives listed in Chapter II, 2.6.9. Features Common to All Action Alternatives, (C) Features Designed to Protect Soils. Upon implementation of the alternative design features, these units would either maintain or reduce existing detrimental soil disturbance levels.

Alternative 8

There would be an increase in detrimental soil disturbances such as compaction and displacement on about 3 acres where new road construction is proposed, on 5 acres where machine fire line would be constructed, on 229 acres of tractor yarded units where additional designated skid trails are proposed and where harvest would occur to obtain instream wood structure material for stream enhancement activities (279 acres). The combined effect from road and machine fire line construction and proposed harvest units with prior tractor work increases detrimental soil disturbance 1.6 percent in alternative 8. Minor disturbances would occur on 1,691 acres where skyline and helicopter yarding is proposed and where hand fire line would be constructed around units. Compaction, displacement and severe burning affect soils physical, chemical and biological structure, which can indirectly affect the growth and health of trees and other plants.

A low intensity underburn is proposed on all of the 1,920 acres of commercial harvest (no prescribed fire would be used in the units where timber would be removed for stream enhancement activities). Where prescribed, underburning would retain the maximum partible potassium on site after logging and would meet the recommendations of the IFTNC. On the yard top units about 50 percent of the potassium containing foliage and branches would remain on site in these areas. This would result in a net loss of usable potassium, but the loss should not measurably reduce site productivity since these proposed harvest units are not associated with a potassium deficient geologic formation. The one low potassium site would not experience nutrient reduction due to the additional yarding slash that would be added to the existing organic component.

Alternative 8 does not propose any units where existing conditions may not meet Forest Plan soil quality standards. There is one unit (49 acres) where existing conditions are marginal. In the marginal unit, activities would follow the mitigation measures listed in Chapter II, 2.6.9. Features Common to All Action Alternatives, (C) Features Designed to Protect Soils. Upon implementation of the mitigation measures, these units would either maintain or reduce existing detrimental soil disturbance levels.

B. Cumulative Effects at the Analysis Area Scale

Cumulative effects at a site are a function of past harvest methods and proposed harvest methods, described for each alternative below.

Alternative 1

The risk of damages caused by a severe wildfire would remain approximately the same throughout the project area under the No-Action Alternative. Some additional fuel loading may occur as a result of trees succumbing to local pathogens. Severe wildfires would have a moderate to high impact on soil nutrients and a loss in soil structure. These losses would depend upon the time of year, aspect, stand densities, and soil moisture. A catastrophic fire could reduce reforestation efforts, tree growth and insect and disease resistance. If such a fire does not occur, the additional potassium would stay on site to be slowly released through biomass recycling.

Alternatives 2 and 7

Roading, ground-base harvesting (tractor yarding), and cable corridors which operate outside of existing roads or easily identifiable skid trails would increase the percentage of detrimental soil compaction and displacement on proposed harvest sites. Alternative 2 proposes 220 acres of tractor yarding, with 232 acres proposed under Alternative 7. The average detrimental impact to the soil resource across all the proposed units in Alternative 2 is 6.7 percent and the average for Alternative 7 is 6.2 percent. Detrimental compaction is less likely to occur on some sites that have higher rock fragment content in the surface ash soil. Under Alternatives 2 and 7, all harvest units would meet Forest Plan soil quality standards (although three units are marginal). The cumulative impacts resulting from detrimental soil disturbance would produce slower growing trees, somewhat less stand volume and possibly less resistance to root rot. On all sites where management actions are proposed and present conditions are marginal, mitigation measures would be implemented to maintain or reduce existing detrimental soil levels. Impacts to the affected soils can be reduced where more potassium efficient trees i.e. white pine, western larch and Ponderosa pine are planted or favored and when subsoiling (by grapple rake) of compacted soils occur.

Neither alternative proposes grapple piling as a fuel treatment type. Top-attached helicopter yarding would occur on 141 acres under Alternative 7, in association with three harvest units that are not considered low potassium sites.

Alternative 3

Roading, ground-base harvesting (tractor yarding), and cable corridors which operate outside of existing roads or easily identifiable skid trails would increase the percentage of detrimental soil compaction and displacement on proposed harvest sites. Of all alternatives, Alternative 3 proposes the least amount of tractor yarding (63 acres). The average detrimental impact to the soil resource for all proposed units in Alternative 3 is 7.4 percent. Detrimental compaction is less likely to occur on some sites that have a high rock fragment content in the surface ash soil. Under this alternative, twenty proposed units (108 acres) currently may not meet Forest Plan soil quality standards and one unit is rated as marginal. If existing Forest development roads

are not factored in on those units that do not meet the Forest Plan the number falls to three units (15 acres). The cumulative impacts resulting from detrimental soil disturbance would be predicted to produce slower growing trees, somewhat less stand volume and possibly less resistance to root rot. On all sites where management actions are proposed and present conditions may not meet Forest Plan standards or are marginal, mitigation measures would be implemented to maintain or reduce existing detrimental soil levels. Impact to soils can be reduced where more potassium efficient trees i.e. white pine, western larch and Ponderosa pine are planted or favored and where subsoiling (by grapple rake)of compacted soils occur.

Grapple piling is not proposed as a fuel treatment method. Top attached helicopter yarding would occur on 141 acres associated with three harvest units which are not considered low potassium sites.

Alternative 5

Roading, ground-base harvesting (tractor yarding), and cable corridors which operate outside of existing roads or easily identifiable skid trails would increase the percentage of detrimental soil compaction and displacement on proposed harvest sites. Alternative 5 proposes 402 acres of tractor yarding. The average detrimental impact to the soil resource for all proposed units in Alternative 5 is 5.04 percent. Detrimental compaction is less likely to occur on sites that have high rock fragment content in the surface ash soil. Under this alternative, all harvest units would meet the Forest Plan soil quality standards (although one unit is rated marginal). The cumulative impacts resulting from detrimental soil disturbance would be predicted to produce slower growing trees, somewhat less stand volume and possibly less resistance to root rot. Overall, sites where management actions are planned and present conditions are marginal, mitigation measures would be implemented to maintain or reduce existing detrimental soil levels. Impact to soils can be reduced where more potassium efficient trees i.e. white pine, western larch and Ponderosa pine are planted or favored and where subsoiling (by grapple rake) of compacted soils occur.

Grapple piling is not proposed as a fuel treatment method. Top-attached helicopter yarding would occur on 141 acres associated with three harvest units that are not considered low potassium sites. One harvest unit (169 acres) is on a low potassium site. This unit would meet the recommendation of the IFTNC because the tops will be left in the unit for biomass remediation.

Alternative 6

Roading and ground-based (tractor yarding) outside of existing identifiable skid trails would increase the percentage of detrimental soil compaction and displacement in the proposed harvest units. Alternative 6 proposes 385 acres of tractor yarding. The average detrimental impact to the soil resource for all proposed units in Alternative 6 is 7.0 percent. Detrimental compaction is less likely to occur on some sites that have a high rock fragment content in the surface ash soil. Under Alternative 6, all harvest units would meet Forest Plan soil quality standards. The cumulative impacts resulting from detrimental soil disturbance would produce slower growing trees, somewhat less stand volume and possibly less resistance to root rot. On all sites where management actions are proposed, mitigation measures would be implemented to maintain or reduce existing detrimental soil levels. Impact to soils can be reduced where more potassium efficient trees i.e. white pine, western larch and Ponderosa pine are planted or favored and where subsoiling (by grapple rake) of compacted soils occur.

Grapple piling is not proposed as a fuel treatment method. One harvest unit (85 acres) is proposed on a low potassium site. This unit would meet the recommendation of the IFTNC because harvest slash would augment the site's existing surface organic component as part of the overall biomass remediation.

Alternative 8

Roading, ground-base harvesting (tractor yarding), and cable corridors which operate outside of existing roads or easily identifiable skid trails would increase the percentage of detrimental soil compaction and displacement on proposed harvest sites. Of all alternatives, Alternative 8 proposes the most tractor yarding (229 acres in commercial harvest units with an additional 279 acres in units where timber will be removed for instream activities). The average detrimental impact to the soil resource for all proposed units in Alternative 8 is 5.3 percent. Detrimental compaction is less likely to occur on sites that have a high rock fragment content in the surface ash soil. Under this alternative, all harvest units would meet the Forest Plan soil quality standards (although one is marginal). The cumulative impacts resulting from detrimental soil disturbance would be predicted to produce slower growing trees, somewhat less stand volume and possibly less resistance to root rot. Overall, sites where management actions are planned and present conditions are marginal, alternative design features would be implemented to maintain or reduce existing detrimental soil levels. Impact to soils can be reduced where more potassium efficient trees i.e. white pine, western larch and Ponderosa pine are planted or favored and where subsoiling (by grapple rake) of compacted soils occur.

Two fuel treatment methods (grapple piling and top-attached yarding) can detrimentally affect soils. Grapple piling is not proposed as a fuel treatment method. Top-attached yarding would not be implemented except in the harvest units where timber will be removed for instream activities. The only low potassium site (Unit 6, 85 acres) would not have a potassium nutrient reduction due to the additional slash added to the existing ground organic component.

Effects of Ongoing and Reasonably Foreseeable Activities

Also considered in the cumulative effects analysis were ongoing and reasonably foreseeable activities (described in Chapter II, 2.4 Ongoing and Reasonably Foreseeable Activities). There is one grazing allotment under permit in the Iron Honey Resource Area. The livestock use has not resulted in any concern for soils in the allotment (Range Monitoring Results, 2550 Soil Surveys, October 2, 2001). Other ongoing and reasonably foreseeable activities would not impact soils in the analysis area.

Effects of Opportunities

Wildlife and Watershed Improvements: Road obliteration would begin the restoration of soil productivity on those impacted sites by decompacting the soil and reestablishing some of the topsoil that was buried under the road fill during the initial construction.

Noxious Weed Treatments: This would have a positive affect on soil productivity by reducing or eliminating competing vegetation that interferes with reforestation needs.

Other Opportunities: None of the other opportunities identified in Chapter II would affect soil productivity.

3.4.5 Consistency with the Forest Plan and Other Legal Mandates

All action alternatives would meet all Forest Plan soil quality standards, as described below.

1. Soil disturbing management practices will strive to maintain at least 80 percent of the activity area in a condition of acceptable productivity potential for trees and other managed vegetation. Unacceptable productivity potential exists when soil has been detrimentally compacted, displaced, puddle, or severely burned as determined in the project analysis.

Soil disturbing management practices will maintain at least 85 percent of the activity area in a condition of acceptable productivity potential for trees and other managed vegetation.

2. Projects should strive to maintain sufficient large woody debris to maintain site productivity. Large woody debris is essential for maintenance of sufficient micro-organism populations.

Large woody debris remediation will follow the research guidelines of Graham et al, 1994, which would insure the maintenance of site productivity.

3. In the event of whole tree logging, provisions for maintenance of sufficient nutrient capital should be made in the project analysis.

Overwintering of slash is required on all harvest units. Harvest slash would augment the site's existing surface organic component as part of the overall biomass remediation.

3.5 FIRE/FUELS

3.5.1 Regulatory Framework

The IPNF Forest Plan objective is to implement efficient fire protection and use programs based on management objectives, site-specific conditions, and expected fire occurrence and behavior. Management area standards and goals provide direction for appropriate response. Fire management plans are to be guided by the following standards:

- *Human life and property will be protected.*
- *The appropriate suppression response for designated old-growth stands in all management areas except in wilderness will result in prevention of old growth loss.*
- *Activity fuels will be treated to reduce their potential rate of spread and fire intensity so the planned initial attack organization can meet initial attack objectives.*
- *Prescribed fire will be used as needed to meet silvicultural objectives as prescribed in the Stand Silvicultural Prescription.*

The primary Forest Plan Management Areas within the Iron Honey Project Area include goals to manage suitable lands for timber production for the long-term growth and production of commercially valuable wood products. The fire protection standard to achieve that goal is to use initial attack strategies (confine, contain and control) appropriate to achieve the best benefit based on commercial timber values and where appropriate, big-game winter range values.

Forest Service Manual (FSM) 5150 defines fuel as combustible wildland vegetative materials, living or dead. Agency direction is to evaluate, plan and treat wildland fuel to control flammability and reduce resistance to control including mechanical, chemical, biological, or manual means (FSM 5150). This includes the use of prescribed fire to support land and resource management objectives.

The objectives of fuels management under this project are to:

- *Reduce fire hazard to a level where cost effective resource protection is possible should a wildfire ignition occur. Fire hazard is the potential fire behavior (intensity and rate of spread) of a fire burning in a given fuel profile and its ability to be suppressed by firefighting forces.*
- *Reduce the potential fire severity.*

Fire suppression policy from the early 1900's until the late 1970's has been that of total suppression. Only recently has fire policy been modified to recognize the importance of fire in balancing vegetation cycles within the temperate forest. The Federal Wildland Fire Management Policy and Program Review was chartered by the Secretaries of the Interior and Agriculture to examine the need for modification of and addition to Federal fire policy. The review recommended a set of consistent policies for all Federal wildland fire management agencies. In adopting the policy, the Federal Agencies recognized that wildfire has historically been a major force in the evolution of wildlands, and it must be allowed to continue to play its natural role wherever possible. It was also recognized that all Agencies will not necessarily employ all identified procedures on all administrative units at all times (USDI, USDA, 1995; USDI, USDA, 1996). The severe wildfire seasons in northern California and Oregon in 1987, in Yellowstone Park and the Northern Rocky Mountains in 1988, throughout much of the West in 1994, Florida and Texas in 1998, Nevada and northern California (again) in 1999, the Northern Rockies in 2000, and the Northwest and Northern Rockies (again) in 2001 have made it clear that fire cannot be excluded from fire-dependent ecosystems. On the other hand, because of developed areas, and commercial forests, fire cannot be fully restored to its historic character without severe consequences to humans, except perhaps in a few of the largest wilderness areas (USDA, 1996.)

3.5.2 Methodology

Of primary concern to fuels management is the long-term fuel loading increase and subsequent changes in fire intensity and severity that may occur. The Forest Vegetation Simulator (FVS) widely used by forest managers throughout the United States and Canada to predict the effects of various vegetation management actions on future forest conditions was used for this additional analysis. The Fire and Fuels Extension to FVS (FFE-FVS) integrates FVS with elements from existing models of fire behavior and fire severity. Model output displays fuels, stand structure, snags, and potential fire behavior over time and provides a basis for comparing proposed fuel treatments (USDA, 1998b; USDA 1997b). A full description of the model is contained in the Fuels/Fire portion of project files of the Douglas-fir Beetle FEIS.

Other modeling tools are available to measure the effect of these changes on wildfire behavior should one occur. Fire behavior depends on forest density, composition, amount of surface fuel, its arrangement, moisture content, prevailing weather, and physical setting. To characterize surface fire behavior, 13 fire behavior fuel models are available that describe the fuel complex, fuel loading, fuel bed depth, and moisture of extinction (upper limits of fuel moisture beyond which a fire will no longer spread with a uniform burning front) in dead and live fuels for grass, shrub, timber, and logging slash groups. These models in combination with dead and live fine fuel moisture, slope angle, and wind speed provide a basis for predicting both fire spread rate and intensity (USDA, 1999a).

Fire spread rates and intensities can be predicted for various fuel types using the BEHAVE model. BEHAVE is an interactive computer model designed to predict or estimate fire behavior characteristics needed for fire management purposes. It is composed of the latest state-of-the-art simulation models developed for fire and associated fuel and environmental parameters. BEHAVE has evolved over several years in conjunction with the material developed for training fire behavior officers at the National Advanced Resource Technology Center in Marana, Arizona. One of the parameters that are affected by the described stand changes is the fuel

model. As altered timber stands go through successional changes, the fuel model that describes how a fire would react within the stand would also change.

Although fire was historically a significant disturbance on the landscape, its intensity and severity was variable as discussed above. It is important to separate fire line intensity from fire severity. Intensity is the energy release rate per unit length of fire line and is a physical parameter that can be related to flame length. It can be determined from the product of biomass consumption (energy) and rate of spread of the fire. Fire severity is an ecological parameter that measures, albeit somewhat loosely, the effects of the fire on vegetation and soils. Two fires of the same fireline intensity can have quite different effects between an old-growth mixed-conifer forest and a young stand of similar species because the smaller trees will be shorter, their limbs will be closer to the ground, and have thinner bark, thus will be more easily scorched. An intense fire in old growth dominated by seral species may be of low severity while even a fire of low intensity in a young stand may be of high severity. Land managers are generally more interested in fire severity, but must approach severity first by estimating fire line intensity and then using other models such as FOFEM (First Order Fire Effects Model, USDA, 1987c) to predict tree mortality from fire line intensity (Agee, J.K. 1996, page 1).

Approximately 5 years following death from insects or disease, snags (dead standing trees) contain sufficient rot in the top third of the tree that they would burn off in a few hours (Harvey and Wright, 1967). Federal Wildland Fire Management Policy is to provide for firefighter and public safety as one of the first priorities. The deaths of 34 firefighters in 1994 focused the fire community's attention on wildland fire, and resulted in numerous initiatives at the federal and state levels to improve firefighter safety. One such study was conducted on wildland fire fatalities in the United States from 1990 to 1998 (USDA Forest Service, 1999b). Falling snags (dead standing trees without leaves or needles in the crowns) killed four wildland firefighters. Although this hazard has resulted in comparatively few deaths, and none have occurred in the past four years, the risk of death or injuries from falling snags remains a serious concern to wildland firefighters.

Snags typically have much lower fuel moistures than live green trees and burn more readily. In the process, they often burn through more quickly than green trees, falling with little or no warning. The risk of injuries from falling snags increases during the night operational period when visibility is greatly reduced. While the cooler nights are generally a more effective time to gain control on wildfires, the increased risk from unseen falling snags may limit the widespread use of crews at night in areas of dead and dying timber.

Where larger fires involve numerous snags per acre, a serious safety hazard exists. In such cases, because of increased safety awareness, it has become common practice for the firefighters to back away from a fire's edge a sufficient distance to allow time to create a safe work environment to construct, burn out, and hold fire lines. This form of fire fighting is often referred to as "indirect attack." Indirect attack often results in more acreage burned and increases the risk of escaped fire.

The benefits of a snag component in an ecosystem are discussed primarily in section 3.6 Wildlife. These benefits must be weighed against the safety hazards snags pose to firefighters and the potential for larger and hotter wildfires that may result from a change to indirect firefighting tactics to reduce risk of injury to fireline personnel.

3.5.3 Existing Conditions

Fire is the major disturbance factor that produces vegetation changes in our ecosystems. If the role of fire is altered, or removed, this will produce significant changes in the ecosystem. Fire has burned in nearly every ecosystem and nearly every square meter of the coniferous forests and summer-dry mountainous forests of northern Idaho, western Montana, eastern Washington and adjacent portions of Canada (extremely wet sites

such as bogs, fens and ancient cedar groves rarely burn.) Fire was responsible for the widespread occurrence and even the existence of western larch, lodgepole pine, and western white pine. Fire maintained ponderosa pine on sites throughout its range at the lower elevations and killed ever-invading Douglas-fir and grand fir (Spurr and Barnes 1980). Many ecosystems are regularly recycled by fire; life for many forest species literally begins and ends with fire. The effects of the historic disturbance factors (mostly associated with fire) and their current absence are discussed in more detail in the Forest Vegetation section of this chapter.

In the discussion that follows, "severity" refers to the degree to which a site may be altered or disrupted by a fire and "return interval" refers to how often a particular type of fire occurs.

There are generally three types of fires that occur in forested ecosystems:

- ***Nonlethal fires*** *- fires that kill 10% or less of the dominant tree canopy. A much larger percentage of small understory trees, shrubs and forbs may be burned back to the ground line. These are commonly low severity surface and understory fires, often (but not always) with short return intervals (a few decades).*
- ***Mixed severity fires*** *- fires that kill more than 10%, but less than 90% of the dominant tree canopy. These fires are commonly patchy, irregular burns, producing a mosaic of different burn severities. Return intervals on mixed severity fires may be quite variable.*
- ***Lethal fires*** *- fires that kill 90% or more of the dominant tree canopy. These are often called "stand-replacing" fires and they often burn with high severity. They are commonly (but not always) crown fires. In general (but not always), lethal fires have long return intervals (140-250+ years apart), but affect large areas when they do occur. Local examples of these types of fires would be the Sundance and Trapper Peak fires of 1967 that burned over 80,000 acres in a relatively short time period during late summer drought conditions. The Coeur d'Alene drainage historically had a variable fire regime of long interval, large, lethal fires mixed with shorter return interval non-lethal and mixed severity fires. Fires were more frequent in watersheds on the periphery of the Coeur d'Alene Basin, adjacent to and downwind from the drier, pine dominated Rathdrum Prairie (Zack and Morgan, 1994).*

The fire history analysis of the Coeur d'Alene Basin conducted by Zack and Morgan in 1994 drew the following conclusions:

- *In addition to cycling carbon and nutrients, the infrequent large lethal fires played a dominant role in resetting the successional sequence and structuring the vegetation matrix across the landscape. However, the nonlethal and mixed severity fires were also important. Most stands (within the Coeur d'Alene Basin) apparently experienced an average of one to three of these low severity burns between lethal fires. These lower severity fires would reduce ground fuels, reduce ladder fuels, thin stands, and favor larger individuals of fire resistant species (larch, Douglas-fir, and ponderosa pine), than if these mixed severity and nonlethal fires had not occurred.*
- *Lower severity fires structured how the landscape responded when a lethal severity fire did occur. The lower severity fires increased the proportion of the landscape with big trees and open canopies that would not sustain a crown fire. Reduction of ladder fuels would mean that even high intensity fire might not reach tree canopies in some cases. The larger trees that grew as a result of this thinning would be more likely to survive even intense fires. The net result would be that even lethal severity fires would be likely to leave more individual residual trees and patches of residual trees*

than if the lower severity fires had not occurred. The effects of lethal fire events would be less uniform as a result of the lower severity fires

- *Regional climate change operating on the scale of decades and centuries may be implicated in the major fire patterns observed. The historical record shows that some relatively recent fires were quite large. In particular, the 1919, 1910, and 1889 burns were very large and severe both in the Coeur d'Alene Basin and throughout the Northern Rocky Mountains. Other dates such as 1542, 1738, 1764, 1772, 1814, 1830, and 1859 appear to be regional episodes. This strongly suggests that regional climate patterns are responsible for many of the major fire episodes on the Coeur d'Alene.*

There are several reasons for the departure from historic stand structure in the Coeur d'Alene River Basin. When timber harvesting began in the 1890's, ponderosa pine, white pine and cedar were highly valuable; larch and Douglas-fir were used for railroad ties and mine timbers. By 1900, a major portion of mature ponderosa pine stands had been harvested and either converted to other uses or was regenerating to dense, often mixed species stands. Prior to 1960, many upland areas were high-grade logged removing only the valuable species, resulting in major stand conversions to grand fir, hemlock, and Douglas-fir. Accounts of early-day logging are presented in detail in the Forest Vegetation section of this chapter.

Since the late 1930's, fire control efforts have become effective. The primary impact of fire control has been to eliminate underburns and mixed severity fires which served as the thinning agents that favored larch and ponderosa pine. These mixed severity fires also generated some large fuels, and did not occur frequently enough to maintain open understories across large landscapes. Overall, in northern Idaho, moist habitat types tended to be a mosaic of forest stand structures and densities, but dense stands were common.

In 1909, white pine blister rust was accidentally introduced to western North America. This Eurasian disease devastated white pine forests (Zack, 1995). In undisturbed stands, western larch begins to decline rapidly by age 80 and ponderosa pine by age 130 (USDA 1994, PNW-GTR-320). These cumulative effects of 100 years of past activities have created large amounts of relatively young stands comprised of shade-tolerant and fire-intolerant species.

The changes that have occurred to western warm dry forests have been well documented. Harvey (1984, page 87) states:

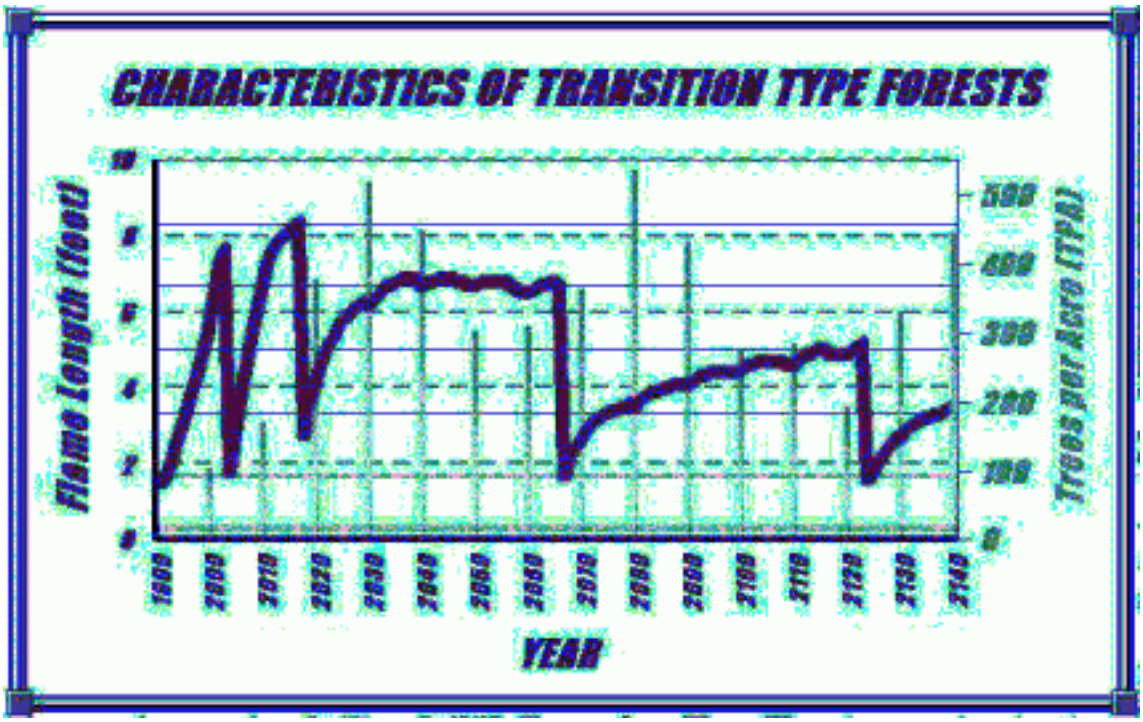
> *"With effective exclusion of natural underburning in this century, dry forests quickly became overstocked, often exceeding carrying capacity. In the absence of fire, native insects and pathogens regulate stocking by killing susceptible individuals and species. Frequent underburning also prevented excess accumulation of carbon and nutrients in woody biomass (Harvey 1994, Mutch 1994). The balance between fire and biological decomposition in regulating carbon accumulations in these forests has been disrupted (Olsen 1981). A current danger is stand-replacing wildfire with fuel accumulations so high that burns are extremely hot, resulting in critical reductions of stored nutrients, with accompanying losses in potential productivity (Harvey et al. 1994a). The effectiveness of fire prevention and suppression has permitted increased ground-fuel accumulations and stratified fuels (both living and dead) to the point where many fires cannot be easily contained or confined. They now burn hotter and more extensively than even 10 years ago (Auclair and Bedford 1994, Baker 1992, Brown 1983). This effect has been especially evident in dry forests that historically experienced fire every 5 to 25 years (Mutch 1994).*

Since warm, dry forest types comprise less than 5% of the Iron Honey area, they will not be discussed further here. The Douglas-fir Beetle Final EIS (IPNF, 1999) has a more complete examination of this forest type.

In contrast with warm, dry forests, biological decomposition in warm, moist forests is substantial and the role of fire in nutrient cycling is reduced. Conversion of tall, well-spaced white pine forests to low, densely stratified Douglas-fir and true fir forests results in hazardous fuel ladders. Transition forests (warm, dry to warm, moist) possess most of the features of both dry and moist forests. Landscapes were historically a complex patchwork of stands resulting from fires that produced both lethal and nonlethal effects. Due primarily to the influences of fire exclusion and selective logging, as discussed above, modern day transition forests are far more homogeneous than historical forests. Loss of landscape diversity is primarily associated with increasing dominance and layering of shade-tolerant species in stands previously dominated by open-growing ponderosa pine, western Larch, or other seral species. On areas that transition to moist forest types, the historic forest species composition was mixed, with fire resilient pines and larch playing a more dominant role than that of today. (For a more complete discussion of vegetation changes and consequences, refer to section 3.3 Forest Vegetation.)

Mixed severity fires are now an improbable occurrence in many transition forests (Harvey, et.al. 1995, p. 88; and USDA 1999a). Data collected on the IPNF suggests that the historic fire return interval on the Idaho Panhandle National Forests is highly variable (Zack and Morgan 1994). On the Bonners Ferry Ranger District, fire return intervals in transition forests ranged from approximately 23 to 63 years on Hall Mountain and Skin Creek transition sites (refer to the supporting data in the Douglas-fir Beetle EIS Project Files, "Fuels/Fire"). The figure below displays modeled simulations of the effects that a 50 to 60-year fire return interval could have on a mixed species forest over a 140-year time period. Values displayed represent potential flame lengths over time should a wildland fire occur, and the number of trees per acre that could occupy the site over time.

Figure III-16. Estimated trees per acre under a 50 to 60-year fire return interval in transition-type forests, and predicted flame length should a wildland fire occur.



Although increases in volume and stocking are not as evident in moist forests as in dry and transition forests, some excessive fuel buildups have developed. Fuel accumulations associated with blister rust mortality can be substantial, and increasing accumulations of dead Douglas-fir and true firs associated with root disease and insect mortality is to be expected. Additionally, conversion of tall, well-spaced white pine to low, dense, stratified fir results in hazardous fuel ladders. Thus, significant changes in fire behavior are also a characteristic of modern-day, moist interior forests. Such changes in fire behavior threaten future fire control and place neighboring forest ecosystems at risk (Harvey, 1984, p. 88).

If a significant change from common historic patterns is indicative of unhealthy conditions, then application of this concept to most north temperate and boreal forests characteristic of the western interior of the United States suggests many are unhealthy, especially where historical fire regimes have been significantly interrupted (Harvey, 1984, U.S. GAO, 1999a and 1999b). The Government Accounting Office (GAO) report and testimony address the extent and seriousness of problems related to the health of national forests in the interior West, the status of efforts by the Department of Agriculture's Forest Service to address the most serious of these problems, barriers to successfully addressing these problems, and options for overcoming them.

From the landscape perspective, between 1540 and 1931 there was an average of one major fire episode every 19 years, somewhere in the Coeur d'Alene River basin. Since 1931, there has not been any major fire episodes recorded within the basin (Zack and Morgan, 1994). The last major fire in the Iron Honey analysis area was when the majority of the Tom Lavin Creek drainage burned in 1918. Currently, fire occurrence on the Idaho Panhandle National Forests averages 163 fires per year, with a burned acreage average of 665 acres (IPNF annual fire reports; Fire Stat Database). With the exception of the Sundance and Trapper Peak fires in 1967, fires on the Idaho Panhandle since 1931 have not been to the same scale as historic fires. Recent fire history in the Iron Honey area is an average of one fire every other year with the average burned area at less than one acre.

Most stands within the Coeur d'Alene River Basin are the result of fire occurrence in the 1870's, 1889, and in 1910. On particular sites where there have been weather and insect-related disturbances, fuel is accumulating. The same types of disturbances under historic conditions would have led to similar fuel accumulations. Historically, these disturbances were often a precursor to stand-replacing fires that followed when suitable weather conditions presented themselves (Spurr and Barnes, 1980). Between 1540 and 1992, the mean fire return interval within the Interior North Fork of the Coeur d'Alene River was 84 years. The mean fire return interval on the Rathdrum Prairie face and the Hayden Lake watershed was 62 years (Zack and Morgan, 1994). Most areas sampled were moist forest types; little data came from dry forest types.

The Idaho Panhandle National Forests Draft Wildfire Prevention Plan (1998) evaluated areas of the Forests as they pertain to wildfire risk. The major components in this evaluation included fire history, fuels, topography and values at risk. The Iron Honey Resource Area is addressed by three compartments under the prevention plan: the Coeur d'Alene Face, Honeysuckle, and Cascade Compartments. For the Coeur d'Alene Face Compartment, the results of this evaluation determined the wildfire risk was high as it relates to the annual average number of years; high as it relates to current fuel accumulations; and high as it relates to values at risk. For the Honeysuckle Compartment, the results of this evaluation determined the wildfire risk was moderate as it relates to the annual average number of years; moderate as it relates to current fuel accumulations; and moderate as it relates to values at risk. For the Cascade Compartment, the results of this evaluation determined the wildfire risk was moderate as it relates to the annual average number of years; high as it relates to current fuel accumulations; and moderate as it relates to values at risk. A Wildfire Hazard Risk Assessment for the Coeur d'Alene River Ranger District completed in 2001 (Jerome, 2001) confirmed that the Iron Honey Analysis Area is in a high risk hazard of intense uncontrolled wildfires. Opportunities to reduce the present trend toward fuel accumulation and stand composition risk are available through silvicultural treatments followed by mechanical or prescribed fire activity fuels treatments.

3.5.4 Environmental Consequences

Direct and Indirect Effects Common to All Alternatives

Once forest canopies are opened, structural changes begin to take place in the surface vegetation. As more sunlight reaches the ground, more grass and brush species can grow and conifer regeneration begins. Fuel models used for estimating fire behavior would also change. Stands reviewed on the Idaho Panhandle National Forests (USDA 1998a) containing root rot or mortality ten years following an insect infestation demonstrated the expected surface fuel changes. In adjacent portions of the stands that were unaffected by forest pests, the fuels represented those typical of closed canopy timber stands (fuel models 8 and 10). Fire in the portions of these stands altered by disease and insects reducing the forest canopy would now react as a shaded grass fuel model (model 2) or a brush model (model 5 or 6). This condition would last for several years. Rates of spread would increase compared to a model 8 or 10 (please refer to the table below). Since the stands would be more open, atmospheric conditions would have more effect on the fuel, fuels would dry quicker and more wind could penetrate the forest canopy to fan flames.

Trees that are killed by pests will stand for several years and therefore will not immediately become available ground fuel that would influence fire activity. By 15 years all branches and large limbs will have fallen, approximately 50 percent of the snags will have fallen also; greater than 90 percent of the snags will fall within 35 years (USDA, 1998b). The fuel accumulation rate will far exceed the decay rate for several decades. Decay rates for material greater than 3 inches in diameter can be expected to be near 1.5 percent per year; decay rates for limbs in the 1 to 3 inch size class should be near 9 percent per year (USDA 1998b). In affected stands, within 10 to 15 years, fuel conditions will start to resemble a fuel model 10, a timber stand with heavy down material and fuel ladders that enable a surface fire to climb into the crowns or a fuel model 11 or 12, a stand with heavy debris or often referred to as a slash model. Since the stands would still be fairly open and contain more grass and brush or regeneration than a dense timber stand, spread rates may resemble a grass or brush model while intensities may start to resemble that of a fuel model 10, 11, or 12.

These conditions are similar to those found by Leiberg (1897) that historically contributed to severe stand-replacing fires in the Coeur d'Alene basin. Values in the table below were predicted using the BEHAVE model and constant weather and fuel moisture conditions to show changes in fire behavior as fuel models change. Two sets of values were used for calculations. The first set represents fuel conditions commonly found during normal summers in the inland Northwest and the second set represents fuel conditions commonly found during drought conditions (NWCG, 1992). The differences between a fuel model 8 and a grass model 2 or brush model 5 or 6 is even more pronounced during drought conditions.

Table III-35. Estimated rate of fire spread and flame length, during normal and drought conditions.

Fuel Model	Rate of spread[1] (chains per hour) normal/drought	Flame length[2] (feet) normal/drought
2	25/32	5.3/6.3
5	11/27	3.4/6.7
6	28/34	5.6/6.4
8	2/2	1.0/1.2
10	7/10	4.5/5.7
11	6/7	3.4/3.7
12	13/15	7.9/9.0

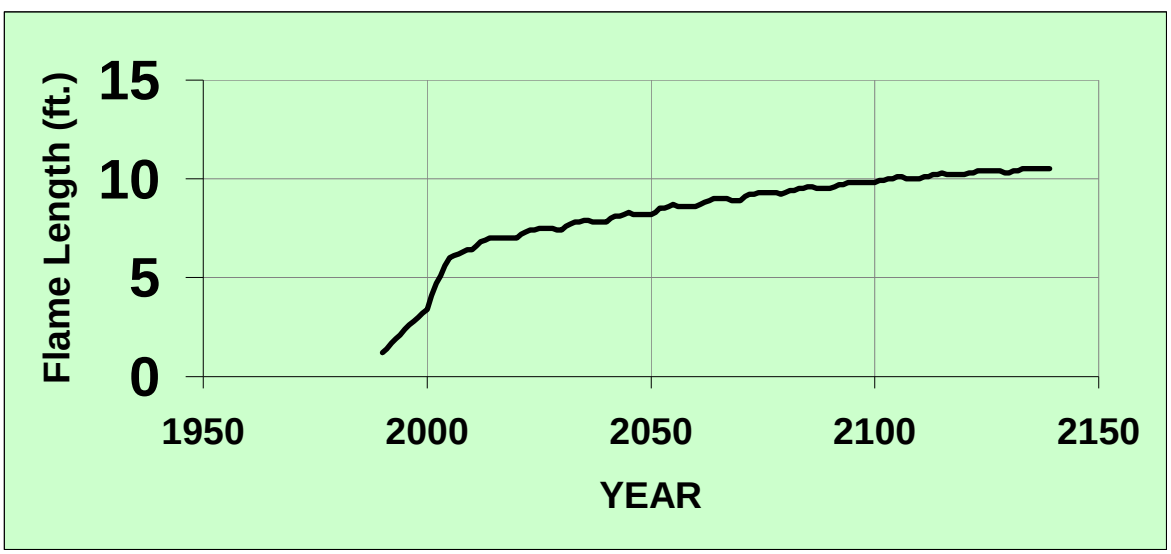
*1 **Rate of spread**. Forward rate of spread of the fire, expressed in chains per hour. One chain equal 66 feet.*
*2 **Flame Length**. The distance measured from the tip of the flame to the middle of the flaming zone at base of the fire, is valuable in determining type of resources necessary to fight fire by direct attack methods. Hand crews can normally suppress fires with flame lengths up to 4 feet, equipment is necessary when flame lengths are between 4 and 8 feet , aerial support is needed for fires with flame lengths up to 11 feet. Direct attack is not effective on fires with flame lengths over 11 feet.*

The effects of forest pest agents and fire exclusion on affected forested areas are an acceleration of the successional changes that naturally occur. The Iron Honey Resource Area is confined to less than 3% of the total acres of the Coeur d'Alene River Ranger District. As a percentage, this is rather insignificant and would not in itself lead to catastrophic large stand-replacing wildfires. As stated earlier, most large, stand-replacing fires on the Idaho Panhandle Forests are wind driven or the result of regional climactic patterns, higher fuel loadings from an area as small as this would have minimal affect on such an event. Of significance is the fact that this is a continuation of trending forested ecosystems further outside their range of historic species composition (see Chapter III, 3.3 Forest Vegetation).

Alternatives 1 and 6

The following figure displays the effects of a natural process of fuel accumulation and change in stand structure over time, if no actions are taken.

Figure III-17. Flame length potential over time in a typical stand unaltered by management or wildfire.



Similar changes in ecosystem structure in the past have undoubtedly contributed to the fires, from lethal stand-replacing fires to low severity underburns that recycled inland ecosystems. However, prolonged buildup of fuel may eventually lead to fires more catastrophic and destructive to the site than typically occurred in the native forest. After fire occurrence, the fuel loading and potential flame lengths would be reduced for a short period until more fuel accumulated from trees killed by the fire. After several years of fuel accumulation, the potential would rapidly increase, which would explain the repeat burns historically common to inland forests (Leiberg, 1897; Zack and Morgan 1994). Following these reburns the potential intensities would be lower for several years as forests became reestablished. This same process controls stand density levels and species composition.

The Douglas-fir Beetle FEIS explored the results of the FFE-FVS model outputs for stands on the Coeur d'Alene District. These results were typical for stands modeled throughout the Northern Region and represent a mid-range effect (Reinhardt, 1999). As expected, fuel loadings and flame lengths of a wildfire would be expected to increase over time as a forested stand matures and surface fuels accumulate faster than the decay rate. Because of the effects of forest pest or weather event-induced changes in stand structure, these changes would occur at an accelerated rate. The immediate effect would be for increased wind penetration into forested stands, which, in the event of a fire start, would increase flame lengths and rates of spread. In successive years, the model depicts the effects of surface fuel loading changes as portions of limbs and tops from the pest killed trees fall to the ground. As the dead fuel accumulation from the dead trees slows, increases in regeneration provide fine fuels necessary to maintain flame lengths and spread rates. Fire professionals know that heavy fuels increase flaming and smoldering, thus increasing severity, even though the existing generation of fire behavior models do not account for this characteristic (Reinhardt, personal communication, 1999). As discussed previously under Existing Conditions, maintaining seral species is an important step in sustaining forested environments that can adapt and sustain disturbances within the range of natural variability.

Alternatives 2, 3, 5, 7 and 8

Direct and Indirect Effects

The change from historic vegetation composition in the analysis area presents long-term fire and fuels consequences. Significant accumulations of additional fuel and increased mortality from forest pest agents result in an increase in snag density. With pest induced thinning in the overstory, regeneration of species tolerant to insects and disease will begin to occur. This provides the fine fuels necessary for a fast moving fire and the heavy down fuel loadings, contributing to higher than normal fire intensities. These conditions could persist for several decades; combined they present serious safety hazards to firefighters when suppressing fires in affected stands.

It is not possible or desirable to "fireproof" fire-dependent ecosystems, but the potential of severe fire can be reduced by proactive land management. Federal land management agencies can mimic natural disturbances, but it is essential for managers to consider that current conditions may be considerably different than those conditions that occurred historically. Reintroduction of native processes such as fire without modification of structural patterns, fuel loadings, and spatial distributions can produce unpredictable and undesirable effects (USDA, USDI, 1996). Multiple treatments will be needed to regulate vegetation structure, composition, and associated biomass loadings. Long management horizons may be required to restore unhealthy ecosystems to more sustainable conditions. The most effective means to restore long-term forest health will be tree density and fuels management, plus regulation of species composition to improve the dominance and distribution of seral species (Harvey, et.al. 1995, USDA 1999a). The use of prescribed fire alone for stand restoration would be largely ineffective (with spring burns), or downright harmful and wasteful (with dry season burns) (Barrett, S. W. 1994). In the case of the Idaho Panhandle National Forests, the lack of an adequate seral species seed

source in many of the current, altered timber stands would assure long term failure of vegetative restoration efforts without artificial regeneration of seral species.

Timber harvest would significantly affect both short and long-term fuel loading. Timber harvest converts unavailable aerial fuels into available surface fuels. Thus the risk of crown fire may be reduced while the risk of surface fire can be increased by adding fuel to the ground. An increased fire hazard and risk of ignition from timber harvest may result. Utilizing various treatment alternatives of created fuels immediately after harvest reduces these risks.

The potential for a fire outside of proposed harvest areas, the overall fuel mosaic on the landscape, and future vegetation and fuel succession must be considered when planning fuels treatments. Natural stands and particularly partial-cut stands that are not treated for fuels reduction, could experience greater fuel buildup over time than treated managed stands. The treating of risk areas where harvest takes place in a timber sale entry provides an opportunity to reduce fuel loading and continuity of stands over the entire analysis area. Appropriate treatment of the created fuels has been considered and is included in each action alternative.

Any type of human activity increases the possibility of ignition and wildfire. Common ignition sources include; equipment and vehicle operation, smoking, and arson. A timber purchaser would be required to have fire suppression equipment on site, and to take necessary fire precautions to prevent a wildfire from occurring. In the event of extreme fire conditions, harvest activities would be regulated or suspended until conditions improved. A timber sale administrator closely monitors the fire prevention requirements of the timber contract throughout the timber harvest operations.

The preferred fuels treatment for all units would be broadcast burning or underburning (if they contain fire resistant species). In some units, slash may be piled and burned where slopes permit. While these alternatives would treat some areas where fuel accumulation and presence of snags would be a concern, they do not treat all stands. In general, for comparing alternatives, the more acres treated by silvicultural manipulation and subsequent treatment of created fuels, the better to decrease long term fire risk.

The Douglas-fir Beetle FEIS modeled different management scenarios. One scenario was a regeneration harvest system (shelterwood with reserves) followed with underburning. Regeneration harvesting followed with burning appeared to be the best treatment to reduce fuel loads and reestablish seral species. As discussed previously, under the Characterization and Existing Conditions section, maintaining seral species is an important step in sustaining forested environments that can adapt and sustain disturbances. (Historic species composition is discussed in section 3.3 Forest Vegetation.)

Another aspect in comparing alternatives from a fire suppression standpoint is miles of open road. Any road closures would have a negative impact on fire suppression activities by reducing firefighter access therefore increasing response time for initial attack and decreasing access for equipment such as engines for fire suppression activities.

Table III-36. Approximate proposed acres of stand treatments and miles of road access.

Feature	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Clearcut with reserve trees	0	0	190	680	0	40	0
Commercial thinning	0	0	140	140	0	140	0
Shelterwood with reserves	0	1,100	0	3,520	0	1,100	1,900
Selective (for instream use)	0	0	0	0	380	0	230
Total treatment acres	0	1,100	330	4,340	380	1,280	2,130
Roads open for immediate access post-sale (miles)	76	57	51	54	57	40	57

Cumulative Effects

As stated earlier, most very large stand-replacing fires on the Idaho Panhandle National Forests are wind driven or the result of regional climactic patterns. The scattered nature of regeneration units with underburning would have minimal affect on such an event. Alternatives 2, 3, 5, 7 and 8 would contribute to restoration of historic species composition, albeit in a small and scattered nature under Alternatives 2, 3, and 7. For further discussion, please refer to section 3.3 Forest Vegetation.

Cumulative Effects on Private Lands

Most often, timber harvests on private lands tend to be partial cuts that remove trees of the highest economic value (usually the largest) and typically removes large fire resistant seral species. Natural regeneration is relied on to fill most created openings. This tends to favor shade tolerant Douglas-fir and grand fir over early seral species such as pine and larch. As previously discussed, the historic fire adapted vegetation structure was lost early in the century. With increased values for private timber, and historic harvest practices on private lands, it is probably safe to say that inherent disturbance regimes and historic vegetation patterns will never be re-established on private lands within the analysis area. The parcel of land along Iron Creek is an old airstrip that is generally maintained free of trees. The other parcel of private land is a mining claim in the Honey Creek drainage. Most of this parcel has been harvested, removing the largest trees and leaving the smaller, younger age classes on site. The current pattern of vegetation change is expected to continue on private lands within the analysis area.

Effects of Reasonably Foreseeable Actions

Reasonably foreseeable actions are described in Chapter II (section 2.4). These future actions are not individually or cumulatively of a scale similar to historic disturbance patterns. Disturbances similar to historic proportions would be necessary to facilitate the vegetation restoration that is needed to change trends in potential fire intensities and severities. Foreseeable future actions would result in vegetation restoration only at the stand scale.

Effects of Opportunities

Timber Stand Improvement (Precommercial Thinning and Pruning): Stands identified as future thinning needs are identified in the project file. Thinning redistributes growth and adjusts species composition for the future. Thinning would favor healthy trees of desired species adapted to the various habitat types. The seral species of ponderosa pine, western larch, and white pine would be favored when present on the appropriate growing sites. Over the long term, the effects of this would be to move stands towards historic species composition and make them more resilient to disturbances such as wildfire. In the short run, increases in dead fine fuels would increase wildfire intensity should one occur.

Watershed and Wildlife Restoration: Restoration opportunities that may be accomplished predominately consist of road obliteration. The ignition density analysis for the Idaho Panhandle National Forests shows that most of the highest ignition densities are in developed areas. Decreasing the road density could result in a small decrease in human-caused wildland fires, although the change may not be noticeable because there would not be a significant change in road densities or use patterns on the travel zones that have the highest ignition density. Road obliteration and closing roads with earthen barriers would tend to decrease firefighting efficiency.

Cumulative Effects at the Overall Project Scale

The effects of 100 years of past human activity on inland forested ecosystems has resulted in a significant change from historic patterns and is indicative of unhealthy ecosystem conditions. Timber harvesting began in the 1890s. By 1900, a major portion of mature ponderosa pine stands had been harvested and either converted to other uses or was regenerating to dense, often mixed species stands. Prior to 1960, many upland areas were high-grade logged removing only the valuable species, resulting in major stand conversions to grand fir, hemlock, and Douglas-fir. Since the late 1930s, fire control efforts have become effective. The primary impact of fire control has been to eliminate natural underburns and mixed severity fires which served as the thinning agents that favored larch and ponderosa pine. In 1909, white pine blister rust was accidentally introduced to western North America. This Eurasian disease devastated North Idaho's white pine forests (Zack 1995). Because of this change in species composition and structure, low and mixed severity fires are now an improbable occurrence in many forests; severe stand replacing fires are more likely.

The No-Action Alternative and Alternative 6 would take no steps to interrupt this trend. Alternatives 2, 3, 5, 7 and 8 propose stand treatments followed by various actions to reduce fuel accumulations and reintroduce seral species (ponderosa pine, white pine and larch), making progress towards reducing potential intensities and severities of wildfire. Even with this treatment, untreated areas will continue to trend toward conditions that favor potential high intensity wildland fires.

Each action alternative also carries a negative impact in that road closures would most likely reduce firefighting efficiency and increase initial attack response times. A positive side of road closures may be a slight reduction in human caused fires due to the reduced access.

3.5.5 Consistency With Forest Policy and Legal Mandates

The goal of the Forest Plan is to provide efficient fire protection and fire use to help accomplish land management objectives (Forest Plan, Chapter II, pages II-10 and II-38). Alternative 1 (No Action) excludes fuels treatment and Alternative 6 treats a very minor portion of the acreage, therefore, there would be little difference between it and Alternative 1. The continued succession of fuels and vegetation, mortality from insect disease, and the exclusion of fire will create areas where the trend in fire behavior characteristics will in time exceed the goals, objectives and standards established in the Forest Plan.

Alternatives 2, 3, 5, 7 and 8 would make progress towards reducing the potential intensities of wildfire in areas affected by past activities and fire suppression. By inference, the more area treated to restore and maintain stands toward historical species composition, the better the alternative meets the forest plan goals. Even with treatments proposed in the action alternatives, untreated areas would continue to trend toward characteristics that exceed the goals, objectives and standards established in the Forest Plan.

All action alternatives would close some roads and would therefore negatively impact the efficiency of fire protection in the analysis area and possibly adjacent areas where access and travel routes are affected in some way. The more extensive the road closures, the greater the negative impacts.

3.6 WILDLIFE

3.6.1 Regulatory Framework

The regulatory framework providing direction for the protection and management of wildlife habitat comes from the following principle sources:

- *Endangered Species Act of 1973 (as amended)*
- *Migratory Bird Executive Order*
- *National Forest Management Act of 1976*
- *Forest Plan*

Section 7 of the Endangered Species Act directs federal agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any Threatened or Endangered species or result in the destruction or adverse modification to their critical habitat.

On January 10, 2001, President Clinton signed an Executive Order describing the Responsibilities of Federal Agencies to Protect Migratory Birds, directing executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act (Project Files, "Wildlife"). Section 3 of the Order states, "Each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the Fish and Wildlife Service (Service) that shall promote the conservation of migratory bird populations." Item e-6 directs that each agency shall "ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern."

The analysis of effects to wildlife in the Iron Honey Resource Area included effects of the proposed activities on neotropical (migratory) birds. As more information and direction related to this Executive Order becomes available, the analysis and documentation related to the Iron Honey project will be reviewed to determine whether a correction, supplement, or revision to the EIS is necessary, in compliance with Forest Service Handbook 1909.15 (Chapter 18).

The National Forest Management Act (NFMA) provides for balanced consideration of all resources. It requires the Forest Service to plan for diversity of plant and animal communities. Under its regulations the Forest Service is to maintain viable populations of existing and desired species, and to maintain and improve habitat of Management Indicator Species.

The Forest Plan, in compliance with NFMA, establishes Forest-wide management direction, goals, objectives, standards and guidelines for the management and protection of wildlife habitat and species, including old-growth habitat, Management Indicator Species, Sensitive Species, and Threatened and Endangered Species.

3.6.2 Methodology

A. Introduction

USDA Forest Service policy (Forest Service Manual 2670.32, page 5) requires a documented review or Biological Assessment of Forest Service programs or activities in sufficient detail to determine how an action may affect Threatened, Endangered, Proposed, or Sensitive species. Consultation with U.S. Fish & Wildlife

Service is mandatory if the Biological Assessment concludes that a proposed action may have an effect on federally listed species or habitat.

For each species analyzed in this chapter, the cumulative effects area has been determined based on the species' or guilds' relative home range size in relation to its available habitat, topographic features (watershed boundaries) which relate to how species move and utilize their home range, and boundaries that represent the furthest extent of effects. Maps depicting wildlife habitat by species are provided in the Project Files ("Wildlife").

This analysis is tiered to the following documents, which provide the primary direction and methods used to develop the analysis for potential effects on wildlife.

- *Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin*
- *Toward an Ecosystem Approach: An Assessment of the Coeur d'Alene River Basin*
- *IPNF Forest Plan*
- *Available Conservation Assessments and Strategies for wildlife species*
- *Douglas-fir Beetle Project Final EIS*
- *Additional scientific literature as appropriate*

The analysis is done at different levels of intensity (for example, from course filter to medium filter to fine filter) as appropriate to address the issues and concerns. Some elements of wildlife habitat require detailed analysis to determine potential effects on wildlife species. Other elements may either not be impacted, impacted at a level which does not influence use/occurrence or the decision to be made, or can be adequately addressed through design of the project. These elements do not necessarily require in depth analysis. The level of analysis is dependent on a number of variables including but not limited to: the existing condition, the cause and effect relationship, the magnitude or intensity of effects, the contrast in effects between alternatives, the risks to resources, and the information necessary for an informed decision. The analysis is commensurate with the importance of the impact (CEQ 1502.15), the risk associated with the project, the species involved, and the level of knowledge already in hand (USDA Forest Service, 1992, pages 1-19).

The wildlife analysis considered direct, indirect, and cumulative effects. Cumulative effects are defined as impacts to the environment that result from the incremental impact of an action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time. The relative scope of the cumulative effects analysis has both a temporal and a spatial component. Refer to Chapter II (2.4 Ongoing and Reasonably Foreseeable Activities) for a list of foreseeable and ongoing projects.

Based on habitat relationships, appropriate indicators of habitat with a potential to be impacted by the proposed action have been measured. Queries of the timber stand data base (TSMRS) were developed to identify capable and suitable habitat within each wildlife analysis area (Project Files, Wildlife, "Query Data"). The changes in habitat for each relevant species are disclosed with a discussion of the effects on species.

B. Species Relevancy Screen

Some elements of wildlife habitat require a detailed analysis and discussion to determine potential effects on a particular species. Other elements may not be impacted; be impacted at a level which does not influence use, occurrence or the decision to be made; or can be adequately addressed through design of the project. These elements do not necessarily require in-depth analysis. The level of analysis is dependent on a number of variables, including but not limited to the existing condition, the cause and effect relationship, the magnitude

or intensity of effects, the contrast in effects between alternatives, the risks to resources, and the information necessary for an informed decision. The analysis is commensurate with the importance of the impact (CEQ 1502.15), the risk associated with the project, the species involved, and the level of knowledge already in hand (USDA Forest Service, 1992).

Threatened, Endangered and Sensitive species (including Proposed Sensitive species) and other Management Indicator Species that are known to occur on the IPNF were screened for their relevancy to the Coeur d'Alene drainage and the analysis areas by reviewing sighting records, planning documents and other sources, such as scientific literature. Relevancy was determined if there is evidence of species or habitat present within the affected area, and whether any such species or habitat could potentially be affected by the proposed actions. Species relevancy for this project is specific to the Coeur d'Alene drainage and the conditions/situation that exists in the drainage and the analysis areas. Some habitat and species may occur within the Coeur d'Alene River drainage but may not be applicable to any or all analysis areas. A course filter screen was applied at the Coeur d'Alene River drainage level and then a finer filter screen was used to assess species relevancy at the analysis area level.

No further discussion or analysis is necessary for those species or suitable habitat that are not found within the assessment area. These species and the rationale for dismissing them from further consideration is provided in Appendix A ("Issues Not Addressed in Detail) and the Project Files (Wildlife, Document WL-2) for those species dismissed from further discussion.

Some wildlife species or their habitat are found to be present in the assessment area, but not measurably affected because they would not be impacted by the proposed actions, the impacts would be at a level which would not influence their use or occurrence, or their needs can be adequately addressed through the design of the project. Species for which it has been determined there would be no measurable effects are not discussed and analyzed. NEPA directs the agency to focus on a full and fair discussion of significant issues, and identify and eliminate from detailed study the issues that are not significant. Supporting rationale is provided in Appendix A ("Issues Not Addressed in Detail in This EIS") and in the Project Files (Wildlife).

C. Threatened and Endangered Species

The USDI Fish and Wildlife Service provides a site-specific list of Threatened and Endangered species that may occur in the project area (USDI Fish and Wildlife Service, July 23, 2001, No. 1-9-01-SP-613). Iron Honey Analysis area is not a recovery area for any threatened or endangered species. The Fish and Wildlife Service identified one Threatened species (gray wolf) and three Endangered species (grizzly bear, bald eagle, and Canada lynx) that could exist on the Coeur d'Alene River Ranger District. Gray wolf, bald eagle, and lynx are addressed. There would be no significant effects to the grizzly bear under any alternative, therefore they are not addressed in detail in this environmental impact statement, as discussed in Appendix A.

In February 2000, a Lynx Conservation Assessment and Strategy was released. The purpose of the document is to provide a consistent and effective approach to conserve lynx and avoid or reduce adverse effects from the range of management activities.

In an effort to address management of lynx, the following protocols are used as the most current information to evaluate effects on lynx habitat and facilitate Section 7 conferencing and consultation with U.S. Fish and Wildlife Service:

- *Within each Lynx Analysis Unit (LAU), no more than 30% of lynx habitat can be unsuitable at any time. Management activities will not change more than 15% of lynx habitat into unsuitable condition within a 10-year period.*

- *Within a LAU, maintain denning habitat on at least 10% of the area that is capable of producing stands with these characteristics. Denning habitat should be well distributed and in patches larger than 5 acres.*

- *Manage for no net increase in open road miles in lynx habitat. Allow no net increase of regularly used or groomed over-the-snow routes and play routes. Open road densities should be managed to not exceed 2 miles per square mile within the LAU.*

- *Maintain vegetative structure that facilitates movement of lynx along important connectivity corridors (e.g. riparian areas, saddles, ridges).*

It is the intent of this analysis that the information base reflect changes in habitat conditions (such as stand structure), resulting from past, present and reasonably foreseeable actions. Except where specifically mentioned, it is assumed that private lands did not provide habitat. These lands were analyzed as not providing habitat in order to most conservatively analyze impacts of past, present and future activities on these lands. That assumption may not always be correct, however the Forest Service has no jurisdiction over the management of these lands and are not informed when management activities occur on adjacent private lands. This requires that a more conservative approach is necessary when analyzing cumulative effects on adjacent National Forest lands.

D. Sensitive Species

Sensitive species that may occur on the Coeur d'Alene River Ranger District include boreal toad, Northern leopard frog, Townsend's big-eared bat, common loon, harlequin duck, goshawk, peregrine falcon, wolverine, fisher, black-backed woodpecker, flammulated owl, and Coeur d'Alene salamander.

There would be no effect to boreal toads, Northern leopard frogs, Townsend's big-eared bats, common loons, or harlequin ducks; therefore they are not discussed in detail in this environmental impact statement, as addressed in Appendix A (Issues Not Addressed in Detail in this EIS). The remaining species (goshawk, wolverine, fisher, black-backed woodpecker, flammulated owl, white-headed woodpecker, and Coeur d'Alene salamander) are addressed in detail.

E. Big-Game Management Indicator Species

The Forest Plan (Appendix L-4) identified elk as a management indicator species because elk are one of the main issues of the IPNF identified through public involvement; elk are the priority big game species of Idaho Fish and Game; elk hunting is a significant economic factor in the States economy; and elk are a general forest seral species easily affected by management activities.

Moose frequently use the bottomlands associated with the Little North Fork of the Coeur d'Alene River and deer are present. However, elk are the primary species using the area. Since elk are the management indicator species for all big game, the analysis for big game will focus on elk. Compartments are groups of stands topographically delineated and used for tracking of current condition and land management activities. Compartments are smaller in area than Elk Habitat Units; the size of compartments better meet the acreages for which the model was intended (Correspondence with Idaho Fish and Game). Effects are diluted in the model for the larger Elk Habitat Unit. Therefore, the tables display the percent elk habitat potential and acres of elk security prior to, during, and after post-sale activities (including road closures) are completed for the EHU and each compartment. Elk habitat potential was calculated for both Elk Habitat Units 2 and 10 and the Iron Honey Resource Area (Compartments 304, 305, 302 and 303).

Cumulative impacts considered and incorporated into this analysis include past harvest, roads, and mineral exploration. Past, present and future grazing, timber stand improvement (i.e. thinning), and recreation use were also considered.

F. Old-Growth Management Indicator Species

The Forest Plan designated three management indicator species for the monitoring of old growth or late successional conditions. These species are: pine marten, pileated woodpecker, and goshawk. The status of these species indicates the ability of Forest habitat to support wildlife and plant populations that inhabit older forests. Goshawks have been placed on the list of Sensitive species for Region 1, and are addressed under the "Sensitive Species" discussion.

Additional discussion regarding how the Timber Stand Data Base (TSMRS) was used in modeling of habitat suitability index and habitat queries to analyze management indicator species and certain sensitive species is provided in the Project Files, Wildlife (Pileated Woodpecker HSI, Marten HSI, Species Queries).

Old growth is discussed in more detail in the "Forest Vegetation" section of Chapter III. This discussion tiers to that information.

Pine Marten

Habitat data collected through timber stand exams was analyzed by a habitat suitability model to rate existing habitat quality for marten (HSI) in individual stands and polygons (Taylor and Deiter 1993) (Warren 1990). Suitable stands were rated on a habitat suitability index of 0.0 (no value) to 1.0 (optimum value) based on the vegetative characteristics described above for optimum habitat.

The timber stand database (TSMRS) that was queried for this database does not provide accurate samplings of standing and downed dead tree component. Estimates of a dead wood component were based on discussion with District Silviculturist, knowledge of the on-the-ground stand conditions and the value of the information in the TSMRS database. For a more detailed description of how the TSMRS data was used to calculate HIS ratings for the pine marten, please refer to the wildlife project files (Marten HSI). Subwatersheds were used as home ranges for modeling purposes since their size most closely correlated to the home range of a pine marten. The HSI values are not able to incorporate road densities data or risk of trapping.

Pileated Woodpecker

Habitat data collected through timber stand exams was analyzed by a habitat suitability model to rate existing habitat quality for pileated woodpeckers (HSI) in individual stands and polygons. Suitable stands were rated on a habitat suitability index of 0.0 (no value) to 1.0 (optimum value) based on the vegetative characteristics listed above for optimum habitat. The timber stand database (TSMRS) that was queried for this database does not provide accurate samplings of standing and downed dead tree component. Estimates of a dead wood component were based on discussion with District Silviculturist, knowledge of the on-the-ground stand conditions and the value of the information in the TSMRS database. For a more detailed description of how the TSMRS data was used to calculate HSI ratings for the pileated woodpecker. Please refer to the Project Files, Wildlife, (Pileated Woodpecker HSI). Subwatersheds were used as home ranges for modeling purposes, since their size most closely correlated to the home range of a pileated woodpecker.

Goshawk

Suitable nesting habitat has been identified in the project area based on forest structure and continuity. Maps with goshawk sightings and suspected active nests were compared to the suitable nesting habitat map.

Foraging habitat of at least 5,000 acres was mapped around nesting habitat. Three current nesting pair territories were delineated in the Iron Honey Analysis area (one of these territories includes habitat outside the sale area). For a map displaying goshawk habitat, please refer to the Project Files, Wildlife. The territories and their sizes are displayed in section 3.6.4 Sensitive Wildlife Species (Goshawk, Existing Conditions).

G. Nongame

Nongame species are those not managed as a hunted species. They include, but are not confined to species such as amphibians, rodents, songbirds, furbearers and raptors. Other non-game species (such as neotropical migrant birds) and those considered as Management Indicator species or Sensitive species are addressed separately from nongame. Nongame species are particularly important as prey for other species such as furbearers and large predators like wolves, lynx and bears. Changes to vegetation composition and structure are used to assess changes to non-game species. Two basic types of forest have changed dramatically over the last 100 years on the analysis area: the riparian areas, with their unique character based on an abundance of water; and old forests dominated by long-lived seral conifers like white pine and larch. The effects of human activities on these two forest types are analyzed, and the changes to populations of non-game species dependent upon these forests are discussed.

H. Neotropical (Migrant) Birds

Neotropical birds are those that breed and nest in one area and migrate to another area to winter. These birds are impacted in a variety of ways including loss of habitat due to agriculture, logging, and urbanization. The Upper Columbia Basin Draft EIS (USDA Forest Service et.al.) states that breeding bird surveys on National Forests found an increase of 10 species of neotropical birds and a decrease of 5 species. Often the increases in populations are of less desirable species such as the brown-headed cowbird (Collopy and Smith 1995 in Upper Columbia River Basin Draft EIS). Changes in habitats that may favor less desirable species, or that may lead to fewer of the more desirable species are discussed in a qualitative manner. It must be noted that there are many species of neotropical migrant birds for which there is very little population or habitat data available, and changes that may increase one species may, at the same time, have undesirable effects on other species.

3.6.3 Threatened and Endangered Wildlife Species

A. Gray Wolf

Reference Condition: In the past, substantial declines in numbers of wolves resulted from control efforts to reduce livestock and big game depredations. By the 1940s, the Rocky Mountain wolf was essentially eradicated from its range. The northern Rocky Mountain wolf (a subspecies of the gray wolf) was listed as endangered in 1973. However, based on enforcement problems and a trend to recognize fewer subspecies of wolves, the entire species was listed as endangered throughout the entire lower 48 states, except Minnesota, in 1978 (USDI 1987).

Wolves are highly social animals requiring large areas to roam and feed. Conservation requirements for wolf populations are not fully understood, but the availability of prey and limiting risk of human-caused mortality are considered key components (USDI 1987. Northern Rocky Mountain Wolf Plan; Tucker et al 1990). The risk of human-caused mortality can be directly related to the density and distribution of open roads.

In 1994, final rules in the Federal register made a distinction between wolves that occur north of Interstate 90 and wolves that occur south of Interstate 90, in Idaho. Gray wolves occurring north of Interstate 90 are listed as endangered species and receive full protection in accordance with provisions of the Endangered Species Act. Gray wolves occurring south of Interstate 90 are listed as a nonessential experimental population, with

special regulations defining their protection and management, as outlined in the Final Rules published in the Federal Register on November 22, 1994 (Volume 59, Number 224).

Existing Conditions: The project area lies north of I-90 and wolves that would use the project area fall under the protection of the Endangered Species Act. The gray wolf is thought to be a transient species on the Forest. The wolf is believed to occasionally travel south from Canada along the crest of the Rocky Mountains into Idaho. Once in Idaho, they may wander randomly in forested areas (Hansen 1986). The potential dispersal corridor for North Idaho runs along the Idaho-Montana border (US Fish and Wildlife Service , 1988. Interium Wolf Plan). However, Hansen states, "The portion of the Coeur d'Alene River upstream from Shoshone Work Camp and including Shoshone, Independence, and Tepee Creeks is believed to provide a natural corridor for wolves moving from the Kaniksu portion of the Idaho Panhandle National Forests to the St. Joe portion. Its importance is similar to that of the St. Joe River, in that wolves inhabiting the Idaho side of the Bitterroot divide could be expected to follow ungulates to wintering areas along the river and tributaries" (Hansen, 1986).

A known gray wolf pack is currently occupying habitat south of the St. Joe Divide on the South Zone of the Idaho Panhandle National Forests, approximately 50 miles south of the project area. Dispersing wolves from this pack could find their way to the Coeur d'Alene Mountains as young wolves leave the pack (Holt personal communication during consultation).

Probable sightings of wolves in northern Idaho have been reported by Hansen (1986) and Siddall (1989). Nearly all of these reports are either near the Idaho-Montana border, or close to major big-game wintering areas. There were several probable wolf sightings in the area northeast of Hayden Lake around 1979-1983 (Hansen, 1986). In 1981, probable wolf tracks were found just outside the Iron Honey Resource Area in the Spades Mountain vicinity.

Key elements in gray wolf habitat include a year-round prey base, secluded areas for raising pups, and isolation from frequent human disturbance (Hansen, 1986). Studies suggest that there is a strong relationship between key big game summer ranges and calving and fawning areas, and reliable reports of wolves (US Fish and Wildlife Service, 1987).

Access and security for the wolf is important primarily to meet the needs of its prey and as it relates to direct human-caused mortality. Wolf packs have recently been found occupying areas in Montana with high road densities (greater than 2 miles per square mile). Reducing human-caused mortality is an important factor in maintaining wolf populations. Reducing access becomes an issue only when human-caused wolf mortality cannot be reduced. The primary method of reducing human-caused wolf mortality is through public education (Koch and Fontaine, 1993 per. com.).

The Iron Honey Resource Area is used by elk and deer during the spring, summer and fall months. The riparian areas provide potential calving and fawning habitat. Urbanization outside the forest, which has the potential to increase forest recreation use, could increase the potential for conflict between wolves and humans and human-induced mortality.

The most likely area for any potential use by wolves would be the unfragmented area around Chilco Mountain. Ridges and riparian areas within the unfragmented area would be the preferred route of travel for any wolves that traveled through the area. Natural expansion of wolf packs in Montana and success of the wolf reintroduction program in other parts of Idaho could result in displaced wolves re-occupying now unused habitat, such as the Coeur d'Alene Mountains.

Direct and Indirect Effects: There would be no change to wolf habitat under Alternative 1, since no new activities are proposed. Under all action alternatives, the restoration and road removal from riparian systems

should enhance the habitat for the prey of the wolf and therefore improve habitat for the wolf. Reduction in road densities throughout the area would also positively impact the wolf.

During the duration of the sale activity, within the sale area, prey of the wolf (big game) would be displaced. Because of cumulative activities occurring in West Gold Creek to the north and associated with the Douglas-fir beetle there are limited areas for big game and displaced wolves to relocate while activities occur in Iron Honey. Tom Lavin Creek drainage provides the only secure area during sale activities. Animals could also displace into the adjacent Independence Creek drainage. Restricting activities through the establishment of subdivisions within the timber sale area could mitigate some of the negative impacts of security loss by providing undisturbed areas within the project area.

During sale activity, prey of the wolf would be displaced within the sale area. Disturbance would be greatest under Alternative 5 and slightly less under Alternatives 7 and 8. Because of activities occurring in Gold Creek to the north (associated with the Douglas-fir Beetle Project) there are limited areas for displaced wolves to relocate. Alternative 2 would concentrate all activity in the Iron Creek drainage, which would allow for displacement of wolves into the north and west portions of the Iron Honey Resource Area. Although harvest units under Alternative 3 would be smaller, they would be scattered across the landscape and would result in disturbance throughout the entire Iron Honey Resource Area. However, this disturbance would be of shorter duration than would occur under Alternatives 2, 5, 7 or 8.

Forage for big game would increase with the implementation of Alternatives 2, 5, 7, 8 and to a much lesser extent in Alternative 3. Adequate cover for big game would still be provided within the analysis area. Displacement resulting from sale activities would last a minimum of 5 to 8 years or for as long as 10-15 years. This would most likely be a seasonal displacement during the summer and fall months. Watershed restoration and other post sale activities would extend the period of displacement an additional 3-5 years.

Total road density (both drivable and undriveable roads) for the Iron Honey Resource Area is currently 9.3 miles of road per square mile of area. Many of these roads are brushed in or are closed roads; there is an open road density of 2.1 miles per square mile. Under all alternatives, there would be an open road density of 1.6 miles per square mile for standard vehicles (cars and trucks), with 0.4 miles per square mile of trail available to motorized use. The watershed restoration and removal of streamside roads after project activities are complete should enhance habitat for the prey of the wolf and therefore improve habitat for the wolf. Reduction in road densities throughout the area would also positively impact the wolf, by reducing human caused mortality and providing secure habitat for its prey.

Cumulative Effects/ Determination: Currently there are no restrictions on motorized trail use within the Iron Honey Analysis area and the full extent of use is unknown. All alternatives would result in the same amount of roading and trails per square mile, post sale, because of implementation of the District's new Travel Plan. Type of closure varies between alternatives. Planned precommercial thinning would temporarily reduce hiding cover for prey (elk) for the wolf. Within 3-5 years, these precommercial thinning areas would again provide adequate cover for the prey for the wolf.

There would be a short-term (10 to 15-year) disturbance to big game. This could reduce the prey base in the Resource Area during sale activities. The area lacks important winter range for big game. There is no known gray wolf pack using the Coeur d'Alene Mountains at the present time. Over the long term, the prey base would be maintained with a reduction in open road densities and improved road closures. Therefore, this project **may affect, but is not likely to adversely affect** the gray wolf.

B. Bald Eagle

Reference Condition: All of the area covered by this EIS is included in Zone 7 as designated in the Pacific States Bald Eagle Recovery Plan (1982). Historically, this area was likely to have more bald eagles than currently because of the abundant fisheries. At the time of federal listing, bald eagles were uncommon in this zone. Recovery has progressed considerably in Zone 7. Currently, key areas in northern Idaho have contributed enough new territories to reach and exceed goals listed in the Recovery Plan.

Bald eagles are winter visitors and yearlong residents of northern Idaho and northeast Washington. They are attracted to the area's larger lakes and rivers that provide most of their foraging opportunities (i.e. fish, waterfowl). Accordingly, bald eagles select isolated shoreline areas with larger trees to pursue such activities as nesting, feeding, loafing, etc. Nesting habitat include proximity to sufficient food supply, dominant trees, and within line-of-sight of a large body of water (often within 0.25 mile of water). Nest trees typically are large ponderosa pine, Douglas-fir, western larch or cottonwood trees with open crowns in areas that are relatively free from human disturbance (Montana Bald Eagle Working Group 1991).

Perch sites, roost sites and access to prey are the essential components of winter habitat. Bald eagles generally use traditional communal roost sites in the winter, especially during periods of severe weather. Roosts are often located in large trees at the head of sheltered draws that provide protection from wind and inclement weather. Although proximity to food resources is not critical, roosts are often in the closest available forest stand. Roosts at greater distances from food sources will require more energy expenditure by eagles as they travel between feeding and roosting sites (Montana Bald Eagle Working Group, 1991).

Existing Conditions: Bald eagles (*Haliaeetus leucocephalus)* are a Threatened species. Habitat is directly tied to large bodies of water. Bald eagle use on the district consists of feeding and resting along the shorelines of the Coeur d'Alene Lake and Hayden Lake, nesting in the Chain of Lakes area around Mission Flats, Hayden Lake, Fernan Lake and the South Fork of the Coeur d'Alene River. There is also some seasonal use of the North Fork of the Coeur d'Alene River during migration in late November through mid-January. There are no district or Conservation Data Center records of bald eagle sightings in the Iron Honey Resource Area. The area is potential bald eagle habitat that could be used for feeding and resting, primarily during the migration.

Direct and Indirect Effects: There would be no change to bald eagle habitat under Alternative 1, because no new activities are proposed. Under all action alternatives, the relocation of Road 209 away from the riparian area and stream restoration work would enhance bald eagle habitat for the long term. There could be some loss of perching habitat with the implementation of Alternative 5 or 8. These are the only alternatives that propose harvest near the Little North Fork Coeur d'Alene River. All harvest units would be 300 feet away from the streambanks.

Cumulative Effects /Determination: As a result of historic mining and logging practices that degraded the rivers and streams on the Coeur d'Alene River Ranger District, prey (fish) populations have decreased. Little information can be found but it is suspected that the area probably had nesting bald eagles in higher numbers than are found today (personal communication with Audubon, Susan Weller). Watershed restoration efforts in the Coeur d'Alene Mountains should trend the area towards a more historic condition and improve habitats for the bald eagle. Some habitats will never be completely restored. For example, the North Fork of the Coeur d'Alene River has a major roadway along much of the river and has human development along its corridor. Flooding during the 1990s reduced kokanee populations in Lake Coeur d'Alene, where wintering bald eagles feed on the spawning salmon. High water levels during this flooding event resulted in many kokanee washing over the Post Falls dam, which maintains the water level of the lake.

Due to the long-term improvement of the watershed and fisheries in the Little North Fork resulting from the implementation of this project and low probability of eagle occurrence, based on the lack of historical records of bald eagles using the Little North Fork, this project **would have no effect upon the bald eagle** or its survival.

C. Lynx

Reference condition: The lynx is one of the three species of wild cats that occur in the temperate forests of North America. Lynx are relatively common throughout forested areas of Alaska and Canada, although intensive trapping in the past has eliminated or reduced numbers in localized areas. The conservation of lynx populations is of greatest concern in the western mountains of the contiguous United States, at the southern periphery of the species' range.

Lynx occupy regions in North America of arctic or boreal influence. They are restricted to forested habitats within this region and are found from western Alaska to the eastern edge of New Foundland. The northern boundary of this range coincides with the northern extension of the boreal forests. The southern boundary of lynx range is along the high elevation or boreal-forested areas of the Cascades and Rocky Mountains into Washington, Idaho, Montana, Wyoming, Colorado, and Utah.

Lynx are considered low-density species with home ranges averaging 24 square miles, depending on prey abundance. They occur primarily in moist habitat in Northern Idaho above 3,000 to 4,000 feet in elevation (Weaver personal communication 1998**).** Even though lower elevations can be important in some instances, evidence suggests lynx tend to use these areas less because of competition with other predators and overheating in the summer.

The Iron Honey Analysis Area is not considered to provide habitat for the lynx, does not lie within an LAU, and lynx are probably an infrequent visitor to the area. The area is too low in elevation to be preferred habitat for the lynx and lacks spruce- fir habitats. Lynx may move through the area and may occasionally look for prey during their movements. This analysis will focus on the travel corridors provided within the Iron Honey Resource Area.

Existing Conditions

Lynx (*Lynx Canadensis) are* the only members of the cat family in North America adapted to the cold winters and deep snows of northern latitudes. Lynx occur above 4,000 feet in Washington, Idaho, and Montana, and above 6,500 feet in Wyoming, and above 8,000 feet in Colorado and Utah. Low numbers and a dispersed population make lynx vulnerable to over exploitation and habitat disruption (Koehler and Aubrey 1994). Lynx habitat includes subalpine fir, spruce, and lodgepole pine forests above 4,000 feet in Idaho. The home range of females is from 15 to 30 miles. At least 80% of their diet consists of snowshoe hares, which require deciduous browse and dense lodgepole pine and/or subalpine fir canopies. Lynx also need mature forests for denning and cover. Lynx avoid large openings (greater than 330 feet from cover) and very large openings may disrupt movement between isolated populations (Koehler and Aubry, 1994). They prefer to hunt in sapling stands adjacent to old growth.

A few lynx have been sighted over the past 15 years. In 1995, a lynx was sighted in the analysis area near the West Fork of Hudlow Creek. Outside the analysis area, lynx were sighted in the Leiberg area in 1985 and in Stewart Creek in 1991. Tracks were also found on Myers Saddle in 1993. Lynx habitat units (identified as lynx analysis units, or LAU's) were defined for the Coeur d'Alene River District during the summer of 1999 under the direction of the U.S. Fish and Wildlife Service. The LAU boundaries were based on elevations and available lynx habitat. There is lynx habitat along Chilco Mountain. However, this habitat is isolated and not in or connected to an LAU and is unlikely to be used by lynx except for travel.

Direct and Indirect Effects

Features Common to Alternatives 2, 3, 5, 7 and 8: The Iron Honey does not lie within an LAU (lynx analysis unit) and the area is not managed as lynx habitat (Refer to LAU map in wildlife project files). Because of occasional sightings in or near the area, travel corridors for lynx were considered in the analysis of the project area. Because maintaining travel corridors is the only issue for lynx within the Iron Honey Analysis area, only roads and large openings were considered in the analysis. Alternatives 2, 5, 7 and 8 would create large openings within the Iron Honey analysis area. Until these stands reach 6 feet in height (15-50 years) and 200 stems per acre, these openings in Iron Creek would be avoided by traveling lynx. Under all action alternatives, roads are proposed for obliteration and closure, which would result in a long-term benefit to lynx. As stated in Chapter II (2.6.10 Mitigation, (D) Mitigation to Reduce Effects to Wildlife), lynx sightings would continue to be recorded. If it is determined that there is a pattern of lynx use (based on lynx sightings in the area), current LAU boundaries may require modification (Holt, personal communication). Any modification of LAU boundaries would be done in cooperation with U.S. Fish and Wildlife Service and the Idaho Fish and Game Department.

Alternative 1: There would be no change to lynx habitat under Alternative 1, since no new activities are proposed.

Alternative 2: Fragmentation in the Iron Creek drainage would result from large harvest openings. Lynx do not cross large openings and would likely not move across the area until harvest units are 30 years or more in age. Lynx habitat along Chilco Mountain would be maintained, however this habitat is isolated and not connected to an LAU.

Alternative 3: Openings created under this alternative would be small and could be crossed by lynx. Fragmentation of habitat in the Iron Creek drainage would not occur under this alternative. Thinning would occur in units near Chilco Mountain, resulting in short-term disturbance. Based on the level and type of activities proposed under this alternative, it is likely that the area would be re-entered for vegetative management (including timber harvest) within approximately 10 years, making the area less secure for travel by the lynx.

Alternative 5: This alternative would have the same fragmentation effects in the Iron Creek drainage as would Alternative 2. Thinning would occur in units near Chilco Mountain, resulting in short-term disturbance. In addition, there would be harvest in the Hudlow drainage. This alternative would have the greatest short-term impact to lynx (15 to 50 years) because it would result in the most fragmentation of all the alternatives.

Alternative 6: This alternative would have little negative impact on the lynx. There may be some displacement during watershed restoration work. No fragmentation of habitat would occur. Lynx would benefit from reduced road densities. In the long term there would be a shortage of trees in the 15-50 year age class, therefore a forage shortage for the lynx.

Alternative 7: Fragmentation in the Iron Creek drainage would result from large harvest openings. Lynx do not cross large openings and would likely not move across the area until harvest units are 30 years or more in age (Koehler and Aubry 1994). Thinning would occur in units near Chilco Mountain, resulting in short-term disturbance.

Alternative 8: Fragmentation in the Iron Creek drainage would result from large harvest openings. Lynx do not cross large openings and would likely not move across the area until harvest units are 30 years or more in age. There would be additional fragmentation in the Sob, Honey and Solitaire Creek drainages.

Cumulative Effects/ Determination of Effects:

The Iron Honey Analysis area is inherently poor quality habitat for the lynx due to low elevation and lack of spruce/fir habitats. The Bitterroot Divide and the St. Joe Divide provide the best habitat for the lynx found on the Coeur d'Alene River Ranger District. Past timber harvest in these divide areas have altered habitats for the lynx and probably have resulted in decreased populations of snowshoe hares. Precommercial thinning has reduced habitat for the snowshoe hare for at least 10-20 years following thinning operations. There is currently a moratorium on thinning within lynx habitat on the National Forest. Past legal trapping of lynx along the Bitterroot Divide most likely has contributed to reductions in populations (BLM, et al). The increase in snowmobile use and the packed trails resulting from their use in the last 15 years may have increased other predators ability to access and compete with the lynx in high elevation habitats.

Evidence from tagging indicates that a large proportion of lynx mortality in many areas is human caused, mostly from trapping (Hatler 1988, Carbyn etal. 1983, Mech 1980). Lynx are particularly vulnerable to habitat fragmentation due to roads because of the large spatial requirements of individuals and populations (Ruediger, unpublished). Roads provide access for hunters and trappers, destroy habitat for the snowshoe hare, and substantially disrupt travel and hunting patterns (Koehler and Brittel, 1990 p.3). Impacts from roading involves direct loss of habitat, as well as indirect loss of habitat by avoidance of human activity areas, greater accessibility to the legal trapper or hunter, and greater vulnerability to poaching (Koehler 1989). Under all alternatives, the District Travel Plan will reduce road densities within the Iron Honey Analysis Area. In addition riparian road closures under Alternatives 2, 6, 7 and 8 would further increase security and result in a long-term benefit to lynx and their movement.

There have been 2 lynx sightings since 1991 in or near the project area. Fragmentation would occur under Alternatives 2, 5, 7 and 8 that could alter the movements of lynx traveling through the area. Alternatives 3 and 6 would not result in any fragmentation that would alter lynx movements. The area is not in or connected to a LAU and lynx are considered only an infrequent visitor through the area. Based on these considerations, it has been determined that all alternatives **may affect, but are not likely to adversely affect the lynx or its survival.**

D. Grizzly Bear

The Iron Honey Area does not lie within a recovery area and there have been no sightings of grizzly bears in the area within the last 10 years. The project would not result in the long-term degradation of grizzly bear habitat, nor would any expansion of human settlement occur. In addition, there would be no increase in unnatural food sources as a result of this project. The implementation of this project would result in a decrease in road densities, post sale.

Determination: Because there is no known use of the area by grizzly bears and there would be no long term degradation of the habitat under any of the alternatives, there would be **no effect upon the grizzly bear** or its survival.

3.6.4 Sensitive Wildlife Species

A. Goshawk

Existing Conditions

Goshawks occupy coniferous and mixed forests throughout much of the northern hemisphere (Wattel 1981 in Warren 1990). Goshawks have been documented in the Coeur d'Alene River Basin. Region 1 has defined

viability for the goshawk as one pair per every 10,000 acres (Warren 1990). There is one known occupied territory in the Iron Honey Analysis area and potentially two additional territories that could be occupied. This is in compliance with the R1 viability standard (ibid).

Goshawks prefer to nest in mature to overmature coniferous forests with large trees (generally averaging about 20 inches in diameter), and canopy coverages of 60 to 80% (Hayward 1983, Saunders 1982). They nest in stands greater than 25 acres, with gentle to moderate slopes and small, scattered openings (Hayward 1983). North-facing slopes are often preferred for nesting (Hennessey1978, Reynolds et.al. 1982). They use single-storied to multi-storied stands, but prefer stands with open understories for hunting (Hayward 1983). The most important factors in goshawk habitat include dense forest canopies (greater than 70% canopy closure is optimal), large overstory trees (greater than 20 inches in diameter), high snag densities (greater than 10 per acre), large nest stands (greater than 125 acres), and moderate slope (less than 20%). Preferred home ranges are about 5,000 acres of contiguous forest (Warren, 1989).

Goshawks use snags for plucking and consuming their prey. Prey species include small mammals, songbirds, and waterfowl (Hayward et al 1990 in Warren 1990). Goshawks are sensitive to disturbance, and may leave a nest if activity occurs nearby.

The Iron Honey area provides dense canopies. However, snags and large diameter overstory trees are in short supply. Habitat queries found 584 acres of suitable goshawk habitat within the Iron Honey analysis area. There are an additional 3,931 acres of capable habitat in the analysis area. (Project Files, Wildlife, model runs for goshawks dated January 2, 2000) Capable habitats do not currently provide for the needs of the goshawk, but could over time. Goshawks have been sighted several years in the Iron Creek vicinity. Responses to beg calls were heard during the nesting season in 1997. Further field review indicated that goshawks may be nesting in the Colt Mountain area in the vicinity of proposed harvest Unit 6. Specific mitigation measures would be applied to protect these units and any others as applicable (please refer to Chapter II, 2.6.10 Mitigation, (D) Mitigation to Reduce Effects to Wildlife).

Recommendations have been established for management of the Northern goshawk in the Southwestern United States (Reynolds et al. 1992). These recommendations suggest goshawk home ranges are about 6,000 acres in size and are made up of a nesting area, a post-fledging family area (PFA), and a foraging area. The Southwestern Recommendations establish nest areas for each known pair of nesting goshawks. Nest areas are made up of three suitable nest stands and three replacement nest stands of 30 acres each for a total nest area of 180 acres. Suitable nest stands include stands with known active nests, followed by stands with known historic nests (alternate nest areas), followed by the best remaining nearby suitable habitat. The three replacement nest areas are established as near to the stand they are intended to replace and are selected based on the condition of the effective or suitable nest stand and the likely time frame needed to provide for a replacement area.

Suitable nesting habitat has been identified in the project area based on forest structure and continuity. Maps with goshawk sightings and suspected active nests were compared to the suitable nesting habitat map. Foraging habitat of at least 5,000 acres was mapped around nesting habitat. Three current nesting pair territories were delineated in the Iron Honey Analysis area (one of these territories includes habitat outside the sale area). For a map displaying goshawk habitat, please refer to the Project Files, Wildlife. The territories and their sizes are displayed in the table below.

Table III-37. Goshawk territories in the Iron Honey Resource Area.

Territory	Total acres in territory	Acres of nesting habitat	Acres of future nesting habitat
Honey	6,454	153	1,000
Upper Iron	6,079	372	1,628
Tom Lavin	6,559	78	1,840
Lower Iron	5,712	317	1,034
River Face	3,791	25	614

The river face area was considered too small and lacked sufficient nesting habitat to function as a nesting territory. The Tom Lavin territory was of sufficient size, but at the present time lacks nesting habitat. However, because of the presence of future nesting habitat this area could function as a nesting territory in the future. For the purpose of the Iron Honey Analysis only the Honey territory, Upper Iron territory and Lower Iron territory were analyzed as current nesting territories (one is confirmed to be occupied). As discussed in Chapter II (2.6.10 Mitigation, (D) Mitigation to Reduce Effects to Wildlife), if nesting goshawks are found, the nesting and post-fledgling habitat would be maintained. Any activities within one-half mile of the nest would occur after August 15 and prior to March 1.

Direct and Indirect Effects

No short-term effects or changes would result from the implementation of Alternative 1. Over the long term natural mortality would result in snag and downed log recruitment. Mature stands would move towards old growth. The three nest territories would continue to support pairs of goshawks.

With the implementation of any of the action alternatives the three nesting territories would have sufficient nest and foraging habitat to support 3 pairs of nesting goshawks. The Honey territory would lose 3 acres of nesting habitat under Alternative 8. There would be no loss of nesting habitat in the Honey territory under the other alternatives. Only Alternative 6 would not reduce nesting habitat in the Upper Iron territory. The other alternatives would still maintain over 300 acres of nesting habitat in the Upper Iron territory. There would be no change in the amount of nesting habitat in the Lower Iron territory under any of the alternatives.

Table III-38. Acres of nesting habitat within goshawk territories of the Iron Honey Resource Area.

Territory	Alt 1	Alt 2	Alt 3	Alt 5	Alt 6	Alt 7	Alt 8
Honey	153	153	153	153`	153	153	150
Upper Iron	371	312	366	312	371	312	312
Lower Iron	317	317	317	317	317	317	317

Cumulative Effects/ Determination of Impact of Alternatives: Implementation of the District's new Travel Plan may increase security for the goshawk during critical nesting periods. Managing ATV use along specific corridors and eliminating other pioneered ATV trails could protect post fledgling habitat from disturbance.

Private lands within the analysis area were not considered as habitat for the goshawk during the analysis. These private lands probably do not provide nesting habitat, but may provide habitat for the prey of the goshawk.

Future precommercial thinning in the analysis area would promote a larger diameter tree and, over time (approximately 100 years), these areas could provide suitable nesting habitat for the goshawk.

Under all alternatives, sufficient habitat would be maintained to support 3 nesting goshawk pairs. Three nesting territories would continue to provide suitable nesting and foraging habitat for the goshawk. (Refer to wildlife project files: Goshawk Habitat Map) The Region 1 viability criteria of 1 goshawk nesting pair for each 10,000 (Warren 1990) acres would continue to be met with the implementation of all alternatives. Implementing the mitigation measures described in Chapter II (2.6.9 Mitigation, Mitigation to Reduce Effects to Wildlife) would ensure the viability of the goshawk within the Iron Honey Analysis Area.

B. Wolverine

Existing Conditions

When Europeans first arrived in the United States the wolverine was found in the northern U.S. from Maine to Washington. By the early 1800's its range was greatly reduced. Present distribution of the wolverine in the U.S. includes Alaska, northern Washington, Wyoming, Oregon, northern California, northern Idaho, central Idaho, western Montana, and along the Idaho-Montana border to approximately Fremont county, Idaho (Nowak 1973) (Groves 1987). In the western United States and the interior Columbia basin, wolverines occur widely at very low densities, but only in northwestern Montana are wolverine populations considered to be healthy and thriving (Butts 1992 in Witmir et. al. 1998).

Wolverines are rare inhabitants of montane forests. They are primarily nocturnal, but will also hunt during the day. Their primary food source is big game carrion, but they also eat small mammals such as marmots, gophers, and mice. Males seem to be territorial (Chapman et al. 1982). Wolverines are solitary animals that have large territories. A male's home range may be up to 790 square miles. Their habitat includes mature or younger forests with natural openings, riparian habitats, and high-elevation subalpine fir areas (USDA-Forest Service R1, 1989). Wolverines are particularly fond of marshy areas, and are most at home in regions with snow on the ground during winter. They are most successful in capturing big game in the winter where the snow is deep (Chapman et al 1982) and are often associated with wilderness (Krott 1960; Van Zyll de Jong 1975; Hornocker and Hash 1981; Whitman et. al. 1986; Banci 1994; all in Austin 1998). Female wolverines in Idaho appear to use subalpine cirque basins for natal denning and kit rearing; home ranges in Idaho vary from 80 to over 700 square kilometers (Copeland 1995 in Idaho Fish and Game 1995, p. 104).

Wolverines have been sighted on the Coeur d'Alene River Ranger District. Within the last 20 years wolverine have been sighted in the Tepee Creek area and on Crooked Ridge, along the Iron Honey Resource Area boundary. More recently a wolverine was sighted south of the resource area in Skitwish Creek in 1993.

Wolverines are wide-ranging generalists and a home range for this species is probably much larger than the Iron Honey project area. The wolverine, with its large home range, would most likely use the area periodically during its long distance movements. Because of the lack of big-game winter range within the resource area it is unlikely that wolverine would use the area for a carrion source during the winter months. The Iron Honey Resource Area also lacks high elevation cirque basins that could be used by denning female wolverines.

Idaho Fish and Game (1995) in the Habitat Conservation Assessment (HCA) and Conservation Strategies for Forest Carnivores in Idaho states that habitat connectivity with Montana, Canada and northern Washington most likely provide subpopulations of wolverines interspersion throughout the northern region of Idaho. The HCA also emphasizes the importance of dispersal corridors for linking subpopulations and the presence of tracks or relatively undisturbed "refugia" areas to protect wolverines from human activities (Idaho Fish and Game 1995).

Potential habitat for the wolverine lies primarily in the Chilco Mountain area, the Iron Creek drainage, along the Little North Fork, and in the Honey Mountain area and the headwaters of Honey Creek. The habitat is

bisected by a high density of roads, except in the Chilco Mountain area. The presence of these roads increases the likelihood for incidental trapping.

Witmer et al (1998) in the USDA's "Forest Carnivore Conservation and Management in the Interior Columbia Basin: Issues and Environmental Correlates" describe three issues of concern to wolverine conservation and management in the Columbia Basin.

Issue 1: Maintenance of large, remote areas of habitat (including denning habitat).
Issue 2: Prey populations
Issue 3: Incidental trapping and predator control mortality

Issue 1 is probably the most important factor affecting wolverine in the Iron Honey Analysis area. None of the Iron Honey area was delineated as potential "refugia" (large, remote areas of habitat) in the HCA; the area lacks any wilderness or Roadless Areas (Idaho Fish and Game 1995 p. 114). The Iron Honey analysis area is heavily used by recreationists, primarily ATVs. In addition, the area is well roaded and does not provide large, remote areas of habitat. The area also lacks ungulate winter range to provide prey populations. There is little trapping activity currently occurring in the area. However, a slight potential of incidental trapping of wolverine exists because occasional trapping still occurs.

The Iron Honey Analysis Area provides some prey and travel habitat for the wolverine but due to the lack of denning habitat and wilderness, high recreational use by humans and the lack of winter range the area is not considered optimal habitat. Wolverines are likely a sporadic traveler through the area.

Direct and Indirect Effects

Effects Common to All Alternatives: Large patches of unroaded habitat lie approximately 7 miles from the project area in the Upper reaches of the Coeur d'Alene River. These patches are greater than 2,500 acres in size and all lie more than ¼ mile from a road. These patches of habitat could function as travel habitat or security for the wolverine in the Coeur d'Alene Mountains (Geographic Assessment, pages 42, 46). However, because these patches lack wilderness quality and are small in area they do not function as "refugia" for the wolverine. The location of these large patches also facilitates dispersal of the wolverine between the Coeur d'Alene Mountains and western Montana populations.

Alternative 1: No short term effects or changes would result from the implementation of Alternative 1. Over the long term, natural mortality would result in snag and downed log recruitment. Mature stands would move towards old growth. Watershed restoration would not occur therefore, large ranging furbearers such as wolverine and fisher would not trend towards an improved condition. Road closures, resulting from the implementation of the access management plan, would still occur. Reducing road densities could improve the ungulate prey base for wolverine and reduce trapping risks.

Alternative 2: Alternative 2 would concentrate disturbance in the Iron Creek drainage. Wolverine would be displaced during the duration of the sale (approximately 10 years) from the area; however, adjacent habitat would be available.

Alternative 3: Over the short term, Alternative 3 would create some small openings within wolverine habitat, probably not be large enough for wolverine to avoid. This disturbance would be distributed throughout the resource area and would last approximately 5 years. However, based on the level and type of activities proposed under this alternative, it is likely that the area would be re-entered for vegetation management activities after approximately 10 years, which could result in additional effects to wolverine habitat.

Alternative 5: Alternative 5 would have the greatest impacts on the wolverine. Habitat impacts would occur in the Solitaire, Honey, and Hudlow Creek drainages. Harvest would occur within the Sob Creek drainage. Alternative 5 would result in an intense, widespread disturbance that would displace wolverine during activities for approximately 10-15 years. Once watershed work is completed and roads removed the area would again provide habitat for the wolverine. Over the long term, this type of harvest could benefit wolverine if no further entry occurred for at least 50 years – riparian restoration work would improve nongame wetland habitat; proposed recruitment old growth would provide large diameter trees, snags and downed logs over time; and large harvest units would provide interior forest habitat in 80 to 100 years.

Alternative 6: The greatest benefits to the wolverine would occur with the implementation of Alternative 6. Disturbance would be short term (approximately 5 years) and riparian habitats would be restored. However, based on the level and type of activities proposed under this alternative, it is likely that the area would be re-entered for vegetation management activities after approximately 10 years, which could result in additional effects to wolverine habitat.

Alternative 7: Alternative 7 would have the same impacts to wildlife habitat in the Iron Creek drainage as would Alternative 2. There would also be small, scattered harvest areas outside of the Iron Creek drainage that would result in disturbance. However, since the openings would be small, wolverine would probably continue to move across the openings post-sale. In addition, some thinning would occur. Thinned stands would continue to provide wolverine habitat after activities are completed. Activities would result in a disturbance period of approximately 10 years.

Alternative 8: Under Alternative 8, impacts are the same in Iron Creek drainage as described under Alternative 2. In addition, openings would be created in the Sob, Honey and Solitaire Creek drainages. Both during and after sale activities, wolverine could be displaced into Goose Creek and Independence Creek drainages. There would be 950 acres of security in Compartment 303, within the Iron Honey Resource Area, during the duration of the sale. Wolverine could also displace into this security area. Disturbance would occur for approximately 10-15 years.

Cumulative Effects/ Determination of Effects

Implementation of the District Travel Plan would, over time, would improve security for the wolverine across the Coeur d'Alene River Ranger District. Active management of access would reduce the pioneering of roads and trails, which have the potential to bisect security areas. Planned precommercial thinning in the Iron Honey Resource Area may decrease some prey species for the short term (10-20 years) until canopies of thinned trees fill out. The private lands within the Iron Honey Analysis area were not considered to provide habitat for the wolverine. These private lands receive a high amount of human use and are probably avoided by wolverines.

Under all alternatives, large patches of unroaded habitat in the Upper Coeur d'Alene River drainage would provide security and travel habitat for the wolverine and other large ranging carnivores (Geographic Assessment, page 42) approximately 7 miles from the project area. The large patches would also help facilitate movement of wolverine between the Coeur d'Alene River Basin and Montana, where "refugia" is provided. Providing for "refugia" and movement corridors are consistent with management recommendations by Idaho Fish and Game in the Habitat Conservation Assessment and Conservation Strategy for Forest Carnivores in Idaho (1995).

Under all action alternatives, except Alternative 6, there would be harvest of habitat that could be used by wolverine in their sporadic movements through the area. Over the long term these harvest areas would continue to be managed as forested habitat and would continue to provide habitat for the wolverine. All alternatives would reduce road densities through road removal.

The Iron Honey Resource Area provides some habitat for the wolverine but due to the lack of denning habitat and wilderness, high recreational use by humans and the lack of winter range the area is not considered optimal habitat. Wolverines are likely a sporadic traveler through the area.

Due to the unlikely occurrence of wolverine, the absence of denning habitat and winter range, current high recreational use, the presence of a security approximately 7 miles from the project area and the reduction in road densities due to the project; all of the alternatives **may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species**.

C. Fisher

Existing Conditions

During most of the twentieth century, fishers were found primarily in northern coniferous forests (Powell 1982 in Arthur 1989). However, fishers probably inhabited more southern areas of deciduous forest before European settlement (Hagemeier 1956 in Arthur 1989). Fishers are susceptible to over trapping and habitat loss. During the late 1800's and 1920's, fisher pelts were worth up to $300 and demand was high. Over trapping, habitat losses from settlement and logging, and the widespread use of poisons as a predator control agent caused population reductions in many areas (Heinemeyer 1995 in Idaho Fish and Game). Today the range of the fisher in the United States includes: portions of the Appalachian Mountains from New England south to West Virginia, northern Wisconsin, Minnesota, Michigan, northern Idaho, western Montana, and as far south as northern California along the West Coast (Allen 1983 in: Washington Department of Wildlife 1990). The largest population of fisher in Idaho appears to occupy the area north of the Salmon River north to the Silver Valley (J. Jones, USFS Eastside Assessment Team, Maj and Garton 1994 all in Idaho Fish and Game 1995). Reports of fisher are few north of the Silver Valley (P. Harrington, IPNF; May and Garton 1994 all in Idaho Fish and Game 1995). Large fires between 1910 and 1934 were probably responsible for declines in fisher in Idaho (Jones 1991 in Idaho Fish and Game 1995).

Fishers den in hollow logs, under rocks, and in holes in trees. They are mostly arboreal and hunt in the trees. However, they also forage on the ground. Fishers have been trapped in the past on the Coeur d'Alene River Ranger District, confirming their presence. A query for fisher habitat (late successional forest at low to mid elevations) in the Iron Honey Resource Area found 1,555 acres of suitable fisher habitat and 6,329 acres of capable habitat. Of this capable habitat, approximately two-thirds would be suitable for fishers in 50 years or less. The habitats are well distributed across the resource area primarily along the riparian corridors.

In "Forest Carnivores in Idaho Habitat Conservation Assessments and Conservation Strategies (1995, Figure 1, page 32)," Idaho Fish and Game mapped the Coeur d'Alene Mountains (including the Iron Honey Resource Area) as fisher habitat. The only linkage corridor mapped on Coeur d'Alene River Ranger District is the St. Joe Divide, over 20 miles south of the project area. The Iron Honey Project Area is analyzed as two home ranges for fisher. Home ranges vary from 1 fisher per 2.6 square kilometers to 1 fisher per 20.0 square kilometers (about 12.5 square miles)(Arthur et al. 1989a; Coulter 1966; Kelly 1977 all in USDA Tech Rep RM-254 1994).

Witmer et al (1998) describes the major issues of concern to fisher conservation and management in the Columbia River basin in "Forest Carnivore Conservation and Management in the Interior Columbia Basin: Issues and Environmental Correlates":

- *Issue 1:* Conservation of late successional forest at low to mid elevations- Past decades of timber harvest in many areas of the basin have fragmented forest habitat, thereby reducing the contiguous area and creating barriers to movement. Fishers can probably tolerate small patch cuts or other small-scale disturbances, provided these occur in a larger matrix of relatively dense, closed canopy, late successional forest (Powell and Zielinski 1994, page 64). The Habitat Conservation Assessment and Conservation Strategy for Forest Carnivores in Idaho" (Idaho Fish and Game et. al. 1995, page 55) state that drainages with moderate quality fisher habitat should be managed for 40% late successional habitat in preferred or suitable habitat types for the fisher.
- *Issue 2:* Maintenance of links between populations- Barriers to movement may include large nonforested openings and highways.
- *Issue 3:* Maintenance of riparian corridors for use by individuals and populations- Riparian corridors provide travel routes and often are found at the lower elevations fishers prefer within a given area.
- *Issue 4:* Trapping pressure and human disturbance- Fisher trapping in Idaho is closed. Road densities of less than 1 mile per square mile are a deterrent to incidental trapping of fisher.

Direct and Indirect Effects

Under all alternatives the riparian road along Iron Creek and the upper portion of the Little North Fork are proposed for removal. The removal of these roads would benefit the fisher, a species that is easily trapped. In addition, recruitment of mature riparian stands over time to old growth would benefit this canopy dependent species.

Alternatives can be ranked by their risk to incidental trapping of fishers based on the number of roads that would be left in place for stand tending. Even closed roads pose a risk since they provide access for snowmobiles during the peak trapping season. Despite the low amount of harvest acres, Alternative 3 actually poses the greatest risk to incidental trapping of the fisher because of the amount of roads that would be maintained for stand tending. At a slightly lower risk are Alternatives 5, 7 and 8. Of the action alternatives, Alternatives 2 and 6 pose the least risk for incidental trapping.

Under all alternatives, large patches of unroaded habitat in the Upper Coeur d'Alene River would provide security for the fisher and other large ranging carnivores (Geographic Assessment, page 42) approximately 7 miles from the project area. The large patches would also help facilitate movement of fisher between the Coeur d'Alene basin and Montana. Providing security and movement corridors that link to "refugia" areas in western Montana are consistent with management recommendations by Idaho Fish and Game in the Habitat Conservation Assessment and Conservation Strategy for Forest Carnivores in Idaho (1995, pages 45-47).

Issue 1- Late successional forest

If 40 percent of a drainage is in late successional stage, the drainage provides moderate quality habitat for fishers (Idaho Fish and Game et. al. 1995; and USDA Forest Service. Douglas-fir Beetle Project Final EIS. Fisher Methodology). Historically in the Coeur d'Alene Basin late successional stage forest (mature and old growth) was found across 23% to 55% of the landscape (mean value of 46%) (Geographic Assessment, Appendix A: Report #2). The loss of late successional habitat in the Coeur d'Alene Mountains is probably the most important issue for the fisher in this area. Currently the across the Coeur d'Alene Basin about 31% of the forest is in late successional stage (mature and old growth) forest (Geographic Assessment, p. 39). Because the Iron Honey area was spared from fire during the early 1900s, this area stills provides more late successional stage forest than much of the basin.

Table III-39. Acres of late successional stage forest in the Iron Honey Resource Area.

Structural Stage	Alt 1	Alt 2	Alt 3	Alt 5	Alt 6	Alt 7	Alt 8
Late Successional	6,740	6,060	6,655	4,975	6,740	6,045	5,795
Percent of total area	43%	38%	42%	31.5%*	43%	38%	37%

**considered a trigger for significant effects*

Issue 2- Linkages

The Iron Honey Area is outside the primary linkage corridor delineated in Forest Carnivores in Idaho Habitat Conservation Assessment and Conservation Strategies (1995). Another linkage area lies outside the Iron Honey Analysis Area in the upper Coeur d'Alene River drainage (refer to the wolverine discussion). Within the Iron Honey Analysis area old growth and recruitment old growth stands provide additional travel corridors (Project Files, Wildlife: Late Successional Forests).

Table III-40. Acres to be managed as old growth or recruitment old growth.

	Alt 1	Alt 2	Alt 3	Alt 5	Alt 6	Alt 7	Alt 8
Total acres of old growth and recruitment old growth	1,144	2,523	1,144	1,944	2,523	1,944	2,523

Issue 3- Riparian habitat

Where riparian habitats are restored, historical fisher habitat would be reestablished.

Table III-41. Miles of riparian habitats restored.

	Alt 1	Alt 2	Alt 3	Alt 5	Alt 6	Alt 7	Alt 8
Miles of riparian restoration	0	2.1	0	1.5	3.8	2.1	2.1

Issue 4- Trapping risks

All action alternatives would reduce road density to below 2 miles of road per square mile of area, although none would reduce road density to the optimal 1 mile of road per square mile, which would reduce the threat of trapping. The existing condition (Alternative 1) would maintain the current road density of 2.5 miles of open road/ square mile (excluding trails).

Based on these values, the restoration alternative (Alternative 6) would be the most beneficial to fisher because stands would be allowed to age, old growth would be recruited and 3.8 miles of riparian habitat would be restored (Project Files, Wildlife, "Ranking of Fisher Habitat" and "Late Successional Forest Analysis-Fisher"). Alternative 5 rates lowest for the fisher, because it would significantly reduce late successional stage forest. Of the remaining alternatives, Alternatives 2 and 8 would maintain close to the optimal 40% in late successional stage forest (Project Files, Wildlife, Proposed Recruitment). These two alternatives would also restore the same distance of riparian habitat (2.1 miles). Over time, Alternatives 2, 6, 7 and 8 would trend the Iron Honey Resource Area toward more suitable habitat for the fisher because of increases to near optimal levels of late successional forest habitat, riparian restoration to improve corridors for the fisher, and reduced road densities. Based on these changes, these alternatives would impact individuals but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Alternative 3 would maintain above optimal levels of late successional forested habitat to meet the needs of fisher in moderate quality subdrainages. However, riparian travel corridors would not improve because this alternative would not implement the same amount of riparian restoration that would be accomplished under Alternatives 2, 6, 7 and 8. This alternative would impact individuals but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Alternative 5 would reduce late successional stage habitat (considered a trigger of significance); and would therefore impact individuals or habitat with a consequence that the action may contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

Cumulative Effects/ Determination of Effects

The implementation of the District Travel Plan should increase security for the fisher across the Coeur d'Alene River Ranger District. Planned precommercial thinning areas would have a short term decrease in prey populations for the short-term (10-20 years) until canopies of thinned trees are once again closed. Riparian corridors through private land, within the analysis area, probably provide a movement corridor for fisher. However, since Forest Service has no control in future management of these private lands, they were not considered as habitat for fisher in the analysis.

The status of the fisher in the Western United States is poorly known but generally perceived as precarious and declining (Powell and Zielinski 1994 in USDA 1998, pages 65-66). Current populations may be extremely vulnerable to local and regional extirpation because of their lack of connectivity and their small numbers (USDA Forest Carnivore Conservation and Management in the Interior Columbia Basin 1998, page 14). Alternatives 1, 2, 3, 6, 7 and 8 would impact individuals but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Alternative 5 would reduce late successional stage habitat (considered a trigger of significance); and would therefore **impact individuals or habitat with a consequence that the action may contribute to a trend towards Federal listing or cause a loss of viability to the population or species.**

D. Black-backed woodpecker

Existing Conditions

The black-backed woodpecker is found within insect-infested forests of North America, Cascade Mountains, and northern portions of the Sierra Nevada and Rocky Mountains (Washington Department of Wildlife 1991). The black-backed woodpecker has been sighted during their breeding season on the Coeur d'Alene River Ranger District.
Black-backed woodpeckers have been found in Washington in scattered locations throughout the state. Heaviest concentrations seem to be east of the Cascade crest. Their distribution in Idaho is unknown. They forage for insects in the bark of live trees such as lodgepole pine and larch; however, they may prefer to forage on burned snags (Dixon et. al. 2000). Post-fire habitat should be considered to have the greatest value as source habitat for black-backed woodpeckers (O'Connor et al. 2001 p. 13). They forage in various levels of the canopy, and have been seen foraging from ground level to 60 feet high or more (Jewett, et al. 1953). It is likely that the species inhabits the analysis area because potential habitat exists within the old growth stands and similar habitat in Washington is occupied. In addition, there is some larch, which is a preferred breeding area, found within the analysis area. Root disease has probably resulting in insect infestations that provide foraging opportunities for the black-backed woodpecker.

The Iron Honey Resource area is inherently low in habitat for the black-backed woodpecker because of the lack of lodgepole pine and larch. Little information is available on the benefits of white pine to wildlife, but

this species may have provided habitat for the black-backed woodpecker in the resource area historically. Besides that lack of lodgepole and larch another concern with black-backed woodpecker is the already low numbers of large-diameter snags within the Iron Honey Resource Area as a result of past harvest practices (based on field review by district wildlife biologist and discussions with district silviculturist). Habitat queries for potential habitat show limited habitat for the black-backed woodpecker. There are 50 acres of black-backed forage habitat and 323 acres of nesting habitat within the resource area. The queries could under represent the habitat of the black-backed woodpecker because, in most cases, information on snags is not found in the database. The majority of the habitat for this species is found near the confluence of Iron Creek and the Little North Fork.

Direct and Indirect Effects

Table III-42. Acres of harvest in black-backed woodpecker nesting habitat (323 acres existing).

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Regeneration harvest acres	0	0	0	11	0	0	0
Thinning acres	0	0	30	30	0	27	0

Table III-43. Acres of harvest in black-backed woodpecker forage habitat (50 acres existing).

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Regeneration harvest acres	0	0	44	0	0	0	0
Thinning acres	0	0	0	0	0	0	0

Since this area provides less than optimal black-backed woodpecker habitat, there would be limited effects upon habitat delineated as black-backed woodpecker habitat. No short-term effects or changes would result from the implementation of Alternative 1. Over the long term, natural mortality would result in snag and downed log recruitment. Mature stands would move towards old growth. Landbirds, marten, pileated woodpecker, goshawks and black-backed woodpeckers would benefit from these long-term changes.

There would be no reduction in nesting habitat with the implementation of Alternatives 1, 2, 6 or 8. Nesting habitat would be enhanced by thinning larch stands under Alternatives 3, 5 and 7. Thinning of these stands would result in a stand with larger diameter larch in the future. Live larch provides both a preferred nesting and forage habitat. Only Alternative 3 would reduce habitat that was delineated as black-backed woodpecker forage habitat. Increasing old growth over time would have positive effects upon nesting and foraging habitat for the black-backed woodpecker.

Cumulative Effects/Determination of Effects

Past harvest and historic fires have reduced the number of large snags across the Coeur d'Alene basin. The Iron Honey Resource area reflects this loss of snags in the landscape. Over the long term, implementation of the District's new Travel Plan will protect snags from harvest by firewood gatherers (some currently open roads will be closed and unavailable for fuelwood gatherers). Private lands within the Iron Honey Resource Area may provide some habitat for the black-backed woodpecker, however these lands were not considered in the analysis since the Forest Service has no authority over future management of these lands. Over time, precommercial thinning within the analysis area would provide a larger diameter tree for black-backed woodpecker foraging. In untreated areas, forest pests and diseases would continue to provide foraging opportunities for the black-backed woodpecker. Fire scorched trees provide an important source habitat for black-backed woodpeckers. Site treatment (burning) prior to planting could have some beneficial impacts for the black-backed woodpecker by creating forage habitat. Salvaging these future fire scorched trees could have a detrimental impact on the black-backed woodpecker (O'Connor et al. 2001, p. 14). Under any action

alternative, in the event trees are fire scorched during site preparation activities, all of the fire-scorched trees would be retained for black-backed woodpecker habitat.

Some snag loss would occur in harvest units that have not been delineated as black-backed woodpecker habitat. This could impact habitat for the black-backed woodpecker. Under alternatives where shelterwood harvests are implemented, mature trees would be retained that would provide some black-backed woodpecker habitat in the future. These retained trees would also provide a future snag component and provide another age class as the stand regenerates. Adhering to snag guidelines developed in association with the Upper Columbia River Basin (UCRB EIS as described in Bull et. al. 1997 (4-6 per acre in harvest units) would ensure viability of black-backed woodpeckers (UCRB EIS, Appendix K) under all alternatives. Therefore, the implementation of any of the alternatives **may impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.**

E. Flammulated Owl and White-headed Woodpecker

Existing Conditions

Because of habitat similarities with flammulated owls, white-headed woodpeckers are addressed with flammulated owls in this document. Flammulated owls are a neotropical migratory species with a range that extends from the Canadian border through Mexico, including Washington, Wyoming, Idaho, California, Nevada, Utah, Colorado, New Mexico, Texas, and Arizona (Johnsgard 1988 in Atkinson 1990). Distribution and abundance of flammulated owls in Idaho is poorly known (Stephens and Sturts 1991 in Moore 1991). Flammulated owls seem to prefer old growth ponderosa pine habitats, sometimes mixed with Douglas-fir (Bergman, 1983). Both Hayward and Bull found that flammulated owls tended to nest in two or three layered old growth ponderosa pine stands (Hayward 1986).

Moths make up the largest part of its diet, with grasshoppers, beetles and other insects making up the rest (Bergman 1983). Hayward (1986) found that an incubating owl consumed about 22 insects per day. Flammulated owls nest in cavities of snags. Their coloration (browns and rusts) is a good camouflage in ponderosa pine trees. "As a cavity nester, it is especially vulnerable to forest management and firewood cutting, which eliminate snags" (Bergman 1983). Flammulated owls have been identified during nighttime calling surveys on the Coeur d'Alene River Ranger District. There are no records of flammulated owls within the Iron Honey Resource Area. However, wherever suitable habitat is found management considers the effects to habitat for the flammulated owl. Because of the lack of ponderosa pine in the Iron Honey Resource Area habitat for the flammulated owl is limited. Habitat queries for the flammulated owl found only 382 acres of capable habitat in the resource area. Capable habitat does not currently provide habitat for the flammulated owl. Presently, there is no suitable flammulated owl habitat within the analysis area.

Direct and Indirect Effects

The Iron Honey Analysis Area lacks habitat for the flammulated owl. It is unlikely that flammulated owls inhabit the area. Under any alternative the amount of flammulated owl habitat within the Iron Honey Resource Area would continue to be very limited. This is primarily due to the inherent lack of ponderosa pine communities and dry Douglas-fir sites. No short-term effects or changes would result from the implementation of Alternative 1. Over the long term natural mortality would result in snag and downed log recruitment. Mature stands would move towards old growth. However, this old growth would not be in the more desirable ponderosa pine or dry Douglas-fir types that are preferred by the flammulated owl. Due to lack of habitat for the flammulated owl, implementing Alternatives 1, 2, 3, 6, 7 or 8 would have no impact upon the flammulated owl or its habitat (Project Files, Wildlife, "Flammulated Owl Comparison of Alternatives to Evaluate Effects," and "Alternative 8 Changes dated 12-19-00").

Only Alternative 5 would reduce flammulated owl habitat, with shelterwood harvest occurring on 23 acres of flammulated owl habitat. These stands are considered capable habitat and are not currently providing suitable habitat for the flammulated owl. Since the thinned stands would trend towards a larger diameter larch over the long term, habitat for the flammulated owl could be improved slightly. The implementation of Alternative 5 may impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Project Files, Wildlife, "Flammulated Owl Comparison of Alternatives to Evaluate Effects").

Cumulative Effects/Determination of Effects

Implementation of the District's new Travel Plan would have little impact upon flammulated owl habitat within the Iron Honey analysis area since habitat for the owl is limited. However, across the Coeur d'Alene River Ranger District, flammulated owls may benefit where roads are closed that bisect dry habitat types. Where these roads are closed, snags would not be lost to firewood harvest. Planned precommercial thinning within the Iron Honey analysis area would have little impact upon the owl. Outside the analysis area, thinning in dry types would over the long term benefit the owl. Private lands within the analysis do not provide habitat for the flammulated owl and were not considered as habitat for the species in the analysis.

Alternatives 1, 2, 3, 6, 7 or 8 would have no impact upon the flammulated owl or its habitat (Project Files, Wildlife, "Flammulated Owl Comparison of Alternatives to Evaluate Effects," and "Alternative 8 Changes dated 12-19-00"). The implementation of Alternative 5 **may impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species** (Project Files, Wildlife, "Flammulated Owl Comparison of Alternatives to Evaluate Effects").

F. Coeur d'Alene Salamander

Existing Conditions

Coeur d'Alene salamanders inhabit wet stream zones, such as the spray zones of waterfalls and riffles, spring seeps, and cascading creeks. They are often associated with low elevation areas with dense canopies (USDA-Forest Service R1, 1989). They are found in the crevices between fractures rocks, such as below talus slopes. Their habitat can be altered by changes in stream flows. Surveys for Coeur d'Alene salamanders found populations in Lewelling Creek. In addition, later surveys found several potential habitat sites within the Iron Honey Resource Area, including the Little North Fork of the Coeur d'Alene River, Tom Lavin Creek, Rablens Creek and Iron Creek.

Indirect and Direct Effects

Any changes in peak flows could have detrimental effects upon the Coeur d'Alene salamander by either flooding or drying the habitat for the salamander (Cassirer et al 1994). Alternative 2, 5, 7 and 8 would result in a possible slight increase in peak flows within the Iron Creek drainage (please refer to section 3.2 Aquatics in this document). Under Alternatives 1 and 3, peak flow trends would remain the same. Alternative 5 would result in possible increases in peak flows in Honey, Sob, Solitude and Hudlow Creeks. Alternative 8 would result in possible increases in peak flows in Solitaire Creek. There would be no detrimental effects in Lewelling and Tom Lavin Creeks or to the Coeur d'Alene salamander in these streams under any of the alternatives. There would be some reduction in peak flows with the implementation of Alternative 6. Coeur d'Alene salamander habitat could be negatively affected where changes in peak flows occur. Under all alternatives, removing roads from riparian areas would have short-impacts but long-term benefits to the Coeur d'Alene salamander.

Cumulative Effects/Determination of Effects

Except where watershed restoration projects occur in the future, the implementation of the District Travel Plan would have little impact upon the Coeur d'Alene salamander. Past road building, primarily those roads that encroach upon streams have already altered habitat for the Coeur d'Alene salamander across the district. There would be no effects from planned precommercial thinning projects on the Coeur d'Alene salamander. Some habitat for the salamander is altered by watershed restoration projects associated with the Douglas-fir Beetle EIS. However, this is a short-term alteration of habitat. Over the long term, where watershed restoration projects occur, habitat for the salamander would be improved.

None of the alternatives would alter habitat in Lewelling Creek, where known populations of Coeur d'Alene salamanders exist, and potential habitat in the Little North Fork Coeur d'Alene River, Tom Lavin Creek and Rablens Creek would remain unchanged. Slight changes in stream flows could alter habitat in Iron Creek under Alternatives 2, 5, 6, 7, and 8. Stream restoration projects could also alter currently unidentified habitat for the Coeur d'Alene salamander, however stream restoration would improve habitat for the salamander over the long term. Because of slight changes in peak flows in Iron Creek, risk of currently unidentified populations destroyed during stream restoration projects and potential of unidentified habitat in other streams the implementation of any of the alternatives **may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species**. Since known populations would not be affected by any of the alternatives and restoration trends habitat towards an improved condition the alternatives should maintain or enhance viability over the long term for the Coeur d'Alene salamander.

3.6.5 Big-Game Management Indicator Species

A. Existing Conditions

White-tailed deer, moose and elk inhabit the analysis area. The Iron Honey Resource Area has portions of two Elk Habitat Units (EHUs) within its boundary. The Iron Honey Resource Area comprises about 20% of **Elk Habitat Unit 2**. Elk Habitat Unit 2 covers approximately 52,987 acres. **Elk Habitat Unit 10** covers about 33,152 acres. Approximately 30% of EHU 10 lies within the Iron Honey Resource Area. Each EHU has a habitat goal developed in the forest planning process. Elk habitat values are also calculated for each compartment. However, the Forest Plan does not identify elk habitat potential goals at the compartment level. It is believed that the model is most accurate at the compartment level of analysis (communication with Idaho Fish and Game).

Elk Habitat Unit 2: The current elk habitat potential for EHU 2 is 63%, below the Forest plan goal of 65% (Forest Plan Appendix B, Summer Range Elk Management Plan). Compartments 304 and 305, in EHU2, have elk habitat potentials of 26% and 34%, respectively.

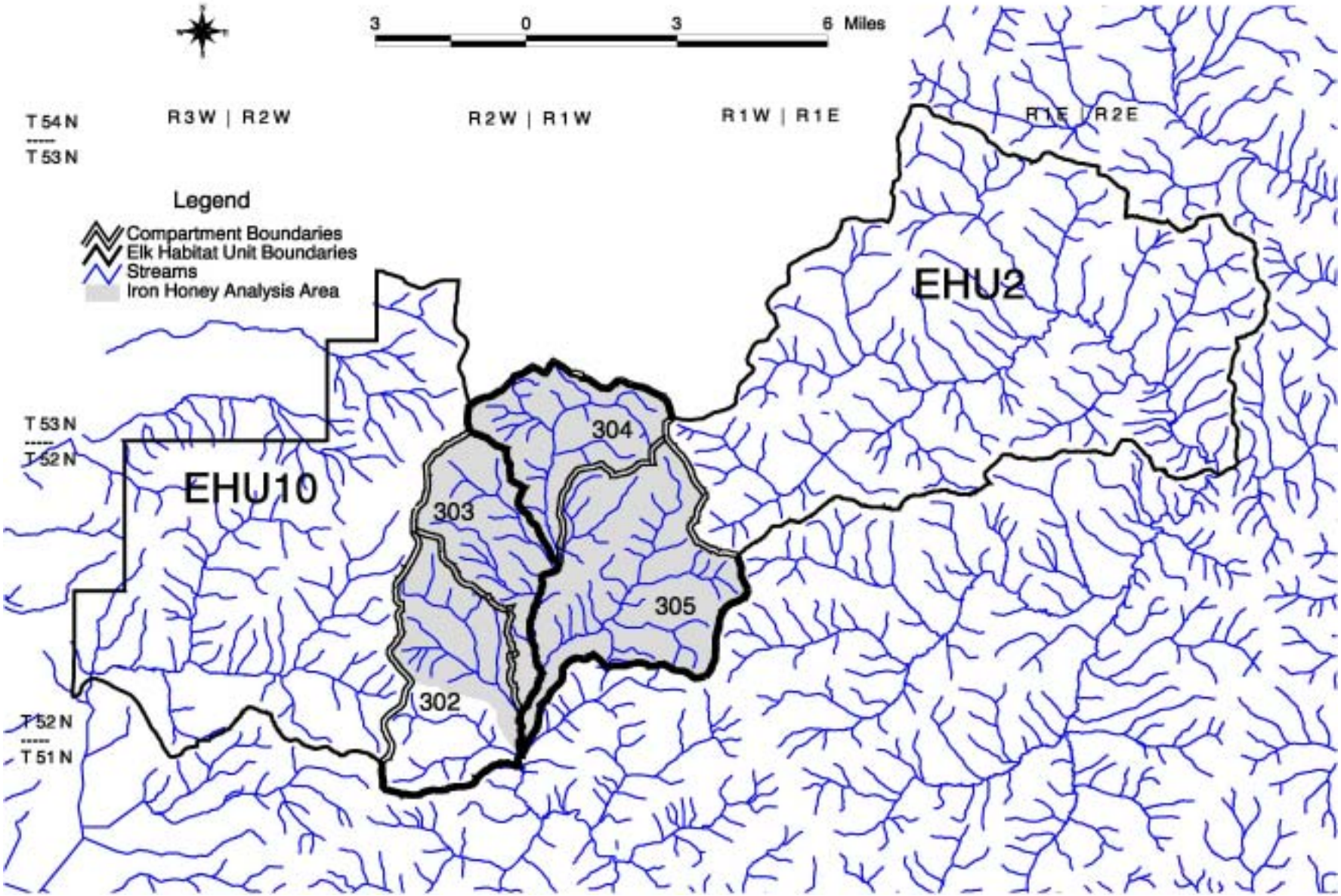
Elk Habitat Unit 10: The current elk habitat potential for EHU 10 is 44%, which meets the Forest Plan goal (44%). Compartments 303 and 302 have elk habitat potential of 48% and 33%, respectively (there is no goal identified at the compartment level). Harvest activities were recently completed under the Savant Sage Timber Sale located within Elk Habitat Unit 10. However, post-sale activities (such as site-preparation burning and planting) are not completed. Because of this some level of activity will continue to occur within the Savant Sage area during the next 5 years. It is anticipated that once the activities for the Savant Sage project are completed, the elk habitat potential will increase to 48%. This represents the existing condition, and does not include the effects of activities under the Iron Honey proposal, which are disclosed under Environmental Consequences discussion later in this chapter.

The existing average elk habitat potential for the western half of the Coeur d'Alene River Ranger District (formerly known as the Fernan Ranger District) is currently 52% (USDA Forest Service, 1999, Douglas-fir Beetle EIS), which is above the Forest Plan goal (48%) for this area on the western half of the District. No winter range is found within the project area. There is some important elk summer range on the western edge of the analysis area, along Chilco Mountain (Forest Plan, management area map).

Security: Large secure areas are important for big game. These secure areas are used for calving and fawning and rearing of young. In addition, they provide places for elk to escape from hunting pressure. The recommended security minimum is 20% in an area the size of Iron Honey. The Iron Honey analysis area has security blocks on 16% of the analysis area. However, ATV use bisects some of these security areas. Roading and motorized use is the biggest impact to elk security within the Iron Honey Resource area. There are several large security areas, including 950 acres in the Chilco Mountain area, 2,350 acres in the Solitaire Creek area, and 190 acres in the Cataract Creek drainage. Currently there are 2.1 miles of roads per square mile that are drivable with standard-sized vehicles. These areas have limited access due to road closures or brushed-in roads. However, ATV use occurs within all three areas, reducing the effectiveness of the security (the reduced effectiveness was accounted for in the elk model by using a lower value for security).

Cover: Cover is not a limiting factor within the area. Most harvest units from the 1960s are now of sufficient age to provide cover. Cover values are incorporated into the elk habitat effectiveness model.

Figure III-18. Iron Honey Analysis Area Elk Habitat Units



B. Environmental Consequences

Direct and Indirect Effects

Alternative 1: The Coeur d'Alene River Ranger District Travel Plan will be implemented, resulting in special changes in security. No short-term vegetative effects or changes would result from the implementation of Alternative 1. There would be a loss of forage habitat over time, as existing sapling stands move towards mature forest structure. Watershed restoration and road obliteration would not occur therefore, habitat for big game and other species dependent upon security and riparian corridors would not trend towards an improved condition.

Alternatives 2, 5, 7 and 8: Large openings, increased distance from forage to cover, and reductions in cover reduce the elk habitat potentials in some of the compartments during sale activities. The largest opening would be created under Alternative 5, with a 384-acre group-shelterwood unit. Alternatives 2, 7, and 8 have a large opening of 266 acres (Appendix E – Specific Unit Information). Roads that need to remain in place for stand-tending purposes also reduce post-sale security within the resource area.

Disturbance associated with sale activities can displace elk. In some cases this may mean that elk just move over the ridge to an area with no activities. When activities are widespread elk may need to displace to an adjacent watershed. There is a concern when elk continue to be disturbed that they may use more energy and go into the winter season in poorer condition. Females with young are more vulnerable to disturbance.

Under Alternative 2, elk would be displaced from the Iron Creek drainage. The west side of the Resource Area would provide a displacement area during sale activities with the implementation of Alternative 2. Alternatives 5 and 7 have the potential to displace elk across the entire Iron Honey Resource Area. However, implementing subdivisions (described in Chapter II, 2.6.10 Mitigation, (D) Mitigation to Reduce Effects to Wildlife) would result in approximately one-third of the sale area providing some security at any point in time during the sale duration. During sale activities security would also be provided in the Goose Creek and Independence Creek drainages, where there have been some road closures and is also the location of unroaded habitat

Alternative 8 would displace elk from the Iron, Solitaire, Honey and Sob Creek drainages. The most likely area for elk to disperse to would be the Goose Creek and Independence Creek drainages, where there have been some road closures and is also the location of unroaded habitat. Because of additional units proposed for instream wood source under Alternative 8, the displacement area for big-game during sale activities would be further reduced from what would be available under Alternative 2. Within the sale area (during sale activities), the displacement area for big game under Alternative 8 would be the 950-acre security area in the upper reaches of Lewelling Creek. Under Alternatives 2, 5, 7, and 8, this displacement could last for about 5 to 8 years. Post-sale and restoration activities could result in displacement for a period longer than 10 years.

Due to the length of disturbance and lack of adjacent security, Alternative 5 would result in the most negative impacts to elk habitat of all the alternatives. Under Alternatives 2, 5, 7 and 8, road obliteration that occurs after sale activities are complete would provide increased security over the long term. All alternatives, except for Alternative 8, would meet the Forest Plan goal for EHU 2. In EHU 10 the elk habitat potential under these alternatives would result in slight increases over the long term. This is consistent with the Forest Plan (Forest Plan Appendix B, Elk Management).

Alternative 3: Despite the low number of acres that would be harvested under Alternative 3, roads required for stand-tending activities would result in reductions in elk security (Table III-45). Displacement of elk would occur across the entire Iron Honey Resource Area. The duration of disturbance associated with sale activities would probably be 5 to 7 years (shorter than under Alternatives 2, 5, 7 and 8). Elk habitat potentials

are slightly lower, post sale, under Alternative 3 than under Alternatives 2, 5, 7 and 8, this is due to fewer road obliterations and watershed restoration work than under the other alternatives. Although they would be managed as closed roads, more roads would be required for the purpose of stand tending.

Alternative 6: There would be a slight reduction in cover because of proposed instream wood structure source units. There would be minimal change in distance from forage to cover under Alternative 6. There would be positive impacts to elk due to road obliteration that occurs with stream restoration activities. Increases in security over the long term are similar to Alternatives 2, 5, 7 and 8.

All Alternatives: All alternatives would maintain a weighted elk habitat potential for the west side of the zone (Fernan) of 52%; this is above the Forest Plan standard for Fernan of 48%.

Modeling of the existing condition for elk habitat potential does not incorporate the new District Travel Plan. Post-sale effects are modeled based on "travel on designated routes only." Roads that are re-opened for stand-tending activities would be more secure when closed (due to the better enforcement possible under the new Travel Plan) thereby providing more security for big game.

Table III-44. Percent elk habitat potential during and after project activities.

Analysis Area	Alt. 1 Existing	Alt. 2 During Sale	Alt. 2 Post Sale	Alt. 3 During Sale	Alt. 3 Post Sale	Alt. 5 During Sale	Alt. 5 Post Sale	Alt. 6 During Sale	Alt. 6 Post Activities	Alt. 7 During Sale	Alt. 7 Post Sale	Alt. 8 During Sale	Alt. 8 Post Sale
Elk Habitat Unit 2	63	62	65	62	71	62	65	66	69	61	65	53	57
Compartment 304	26	36	46	26	47	26	48	40	54	32	48	32	48
Compartment 305	34	21	34	25	39	25	37	34	45	20	36	17	37
Elk Habitat Unit 10	44	43	46	41	46	39	47	45	47	41	47	44	47
Compartment 302	33	37	37	28	46	23	48	41	44	31	48	37	44
Compartment 303	48	36	49	35	49	31	49	49	54	36	49	47	54

** The Forest Plan goal for elk habitat potential in EHU 2 is 65%.*
*** The Forest Plan goal for elk habitat potential in EHU 10 is 44%.*

Table III-45. Acres of elk security during and after project activities.

Analysis Area	Alt. 1 Existing	Alt. 2 During Sale	Alt. 2 Post Sale	Alt. 3 During Sale	Alt. 3 Post Sale	Alt. 5 During Sale	Alt. 5 Post Sale	Alt. 6 Post Activities	Alt. 7 During Sale	Alt. 7 Post Sale	Alt. 8 During Sale	Alt. 8 Post Sale
Compartment 304	750	250	750	250	0	250	750	750	250	750	1,500	750
Compartment 305	1,200	1,000	2,000	1,000	1,000	1,000	2,100	1,200	1,000	2,000	3,500	2,000
Compartment 302 *	400	400	900	400	450	400	1,200	1,200	400	1,200	600	1,200
Compartment 303	950	650	1,550	0	650	550	1,800	750	550	1,800	450	750
Total analysis area**	3,300	2,300	5,200	590	2,350	2,200	5,850	3,900	2,200	5,750	6,050	4,700

** Security in Compartment 302 lies outside the Iron Honey Resource Area.*
*** Recommended security is 20%, which would be approximately 4,200 total acres in the analysis area.*

Cumulative Effects

The District has developed a new Travel Plan that will restrict motorized use (ATVs and motorcycles) to designated trails across the District (Chapter II, 2.4 Ongoing and Reasonably Foreseeable Activities). This management will improve the effectiveness and size of the elk security areas within the Iron Honey Resource Area by reducing ATV access into portions of the analysis area where there currently are no restrictions. To provide recreationists with opportunities for motorized recreation, areas within the Iron Honey area will be added to the motorized trail system. The change in access management will not have any effect upon the Chilco security area, since the motorcycle trail along the ridge will continue to be managed as a motorized trail. The security area in Solitaire Creek will be reduced in size due to the presence of a designated ATV trail. The security area found in Rablens creek vicinity will increase in size due to road closures in Cataract Creek and Iron Creek (increases from 1,200 acres to 1,500 acres). In addition, the travel on designated routes only policy should move the district towards more effective security. However, this will require time to inform the public and gain full compliance through the necessary law enforcement.

Many of the ATV users begin their rides at the private land known as Horse Haven. accessing National Forest System land from this drop off point. Because the Forest Service has no jurisdiction over management of this private parcel, for modeling and analysis purposes it is not considered habitat for wildlife. However, the area may provide some values for wildlife.

The new Travel Plan has been approved, but actual implementation will occur over the next several years (Chapter II, 2.4 Ongoing and Reasonably Foreseeable Activities). Therefore, the existing situation does not incorporate the new Travel Plan. The effects of the Travel Plan implementation are incorporated into post sale elk habitat effectiveness values modeling.

Implementation of any alternative, including the no action alternative, would result in the same road densities because the District Travel Plan would be implemented under all alternatives. Since the model is primarily sensitive to changes in roads densities, the implementation of the Travel Plan would result in similar post-sale Elk Habitat Potential values for all alternatives. Slight differences between alternatives in Elk Habitat Potential Values, post sale, can primarily be attributed to the methods of road closures used in each alternative. Some alternatives result in more miles of road obliteration. For example, the elk model gives a higher security value to an obliterated road and a lower security value to a gated road.

The elk habitat model used is a cumulative effects model that includes past, current and proposed activities. Elk habitat potential was calculated for both Elk Habitat Units 2 and 10 and the Iron Honey Resource Area (Compartments 304, 305, 302 and 303). The tables display the percent elk habitat potential prior to, during, and after post-sale activities (including road closures) are completed, and the acres of elk security prior to, during and after sale activities. With the exception of Alternative 6, all alternatives would result in an increase in big-game forage. However, forage is not considered a limiting factor for elk in the Coeur d'Alene Mountains at this time. There will be ATV trails added that would bisect some existing security areas, which would eliminate or reduce security in those areas.

As described in Chapter II (2.6.10 Mitigation), the project area would be divided into at least 3 subdivisions under Alternatives 2, 3, 5, 7 and 8. Activities would occur in no more than two subdivisions at any time, to allow the remaining subdivision(s) to provide security for big game and other wildlife species during project implementation.

3.6.6 Old-Growth Management Indicator Species

A. Pine Marten

Existing Conditions

The marten ranges throughout most of northern North America's late successional stage forests (Patton and Escano in Warren 1990). Marten are found throughout the forested regions of Idaho. Patton and Escano (1990) recommend that suitable pine marten home ranges be provided every 1-2 square miles in order to maintain viable populations.

Pine marten inhabit late successional coniferous forests, preferring old-growth fir or spruce-fir stands (Koehler and Hornocker 1977, Spencer 1981) and are used by the Idaho Panhandle National Forests as management indicators of these habitats (IPNF Forest Plan 1987). An important component for marten is dead trees including snags, stumps, and down logs. These are used for regulating temperature in the winter, resting, hiding from predators and reproducing (Simon 1980, Spencer 1981). Marten prefer stands with greater than 30 percent canopy closure and are usually within close proximity to cover. In north Idaho, pine marten habitat usually exists above 4,000 feet in elevation, although they are also found in lower elevations, especially along drainages. They prefer spruce-subalpine fir stands with large overstory trees (greater than 19 inches in diameter), and many down logs (more than 20 per acre) (Warren 1989). Marten will also use openings for foraging in the summer and winter (Koehler and Hornocker 1977, Spencer 1981). They prey upon small mammals, especially voles, but including squirrels, snowshoe hares, etc. They will also occasionally eat insects, berries, and songbirds (Weckwerth and Hawley 1962). Pine marten are very susceptible to trapping; high road densities probably increase vulnerability. They prefer areas with road densities of less than 1 mile per square mile (Warren, 1989). Marten rarely venture greater than 150 feet from forest cover, especially in winter (Warren, 1989).

Pine marten are present in the ecosystem. A marten was sighted in the analysis area, near Cascade Saddle in 1993. Low snag and downed log densities have resulted in low habitat capability for the marten. Although old growth is a low percent of the resource area, mature stands within Iron Honey have the potential to provide suitable habitat, especially if allowed to trend towards old age. There are approximately 7, 195 acres in the Iron Honey Resource Area that provide pine marten habitat, as described above.

To ensure that a viable population of marten is maintained across its range, suitable habitat for individual martens should be distributed geographically in a manner that allows interchange of individuals between habitat patches (Warren 1990).

Direct and Indirect Effects

Alternative 1 and 6 would not reduce marten habitat quality directly, so there would be no change to the existing HSI in the short term. These alternatives would result in gradual improvement of the existing moderate quality marten habitat into the future as shade-tolerant conifers continue to age. This would increase marten HSI and the area's carrying capacity for marten. We recognize there is ongoing mortality due to root disease in the Iron Honey Analysis Area that has the potential to alter habitat. However, based on on-ground inspections, aerial photo interpretation and conversations with Forest insect and disease experts, these holes in the canopy resulting from root disease would not fragment habitat. Dead trees and logs from the disease, under story trees and brush would provide sufficient structure to allow for the movement of marten.

There would be no impact to pine marten under Alternative 1, since there would be no reduction in old forest or old growth habitat in the area. In Alternative 1 the area would continue to provide forested movement

corridors connecting good marten habitat within and adjacent to the analysis area. Existing high open road densities would continue to cause human disturbance or trapping pressure on marten. Unlike the action alternatives no physical closures or road obliterations would occur under this alternative. Therefore, compliance with the District Travel Plan will probably proceed at a slower rate than with the implementation of alternatives that generate funds for physical closures.

Under Alternative 6, forested movement corridors would continue to connect marten habitat. However, human disturbance and trapping pressure would be decreased because of watershed restoration activities, which would reduce road densities.

Alternative 2: Three subwatersheds would have HSI values reduced and would no longer support a marten. The three subwatersheds with reduced values are Iron Creek below Rablens, Iron Creek-Cataract Creek and Iron Creek-Rablens Fork.

Alternative 3: One subwatershed would have HSI value reduced and would no longer support a marten. This sub-watershed is Tom Lavin.

Alternative 5: With the implementation of this alternative, five subwatersheds would no longer support a marten. These are Coeur d'Alene River Face, Iron Creek below Rablens, Iron Creek-Cataract Creek, Iron Creek-Rablens Fork and Sob Creek. The loss of marten habitat in Sob Creek is considered significant since this provides the best habitat for marten within the Iron Honey Analysis area.

Alternative 7: This alternative would result in the loss of four marten territories: Iron Creek below Rablens, Iron Creek-Cataract Creek, Iron Creek-Rablens Fork and Tom Lavin.

Alternative 8: The implementation of this alternative would result in the loss of four marten territories: Coeur d'Alene River Face, Iron Creek below Rablens, Iron Creek-Cataract Creek and Iron Creek-Rablens Fork.

The loss of territories described above would be for approximately 50 years. At that time approximately 5,000 acres of forest now 100 years of age would begin to provide habitat for the marten. Increasing recruitment old growth would help to provide habitat for pine marten over the long term. Alternatives 2, 6 and 8 would increase recruitment old growth within the resource area by 800 acres. Alternatives 5 and 7 would increase recruitment old growth by 704 acres. This recruitment old growth would be added to the old growth database for tracking. No additional recruitment old growth would be added under Alternative 3.

Road closures implemented to varying degrees with the action alternatives would reduce threat of trapping to the marten. Reserves in shelterwood units would provide a component of large diameter trees, snags and downed logs for the future. These reserve trees would provide some stand structure and diversity as the stand matures. The surrounding stand would take 50 years or more to reach an age where the reserved trees serve as a habitat component for the pine marten.

The marten habitat rating for the Iron Honey analysis area is .29, which is considered poor to fair marten habitat. Currently, the subwatersheds of Coeur d'Alene River Face, Iron Creek below Rablens, Iron Creek-Cataract Creek, Iron Creek-Rablens Fork, Lewelling, Sob Creek and Tom Lavin provide sufficient habitat to each support a marten.

The pine marten habitat suitability index (HIS) ratings include:

0 = Non-habitat for marten
.25 = Poor to fair marten habitat
.50 = Moderate marten habitat
.80 = Good marten habitat
1.00 = Optimal marten habitat

Acres rated at 1.00 are 100% of optimum. Acres rated at .25 are 25% of optimum. It would take 4 acres of habitat rated at .25 to be the equivalent 1 acre rated at 1.00 (Allen 1984 in Bitterroot National Forest 1996).

Table III-46. Habitat suitability index values for pine marten cover in the Iron Honey Resource Area.

Subwatershed	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Coeur d'Alene River Face	.34	.34	.34	.23	.33	.34	.27
Hudlow Creek – East Fork	.00	.00	.00	.00	.00	.00	.00
Honey Creek	.39	.39	.38	.23	.38	.38	.39
Iron Creek - above Rablens	.20	.14	.19	.14	.18	.14	.14
Iron Creek - below Rablens	.37	.30	.37	.28	.36	.30	.30
Iron Creek - Cataract Creek	.47	.35	.47	.35	.44	.35	.35
Iron Creek - Rablens Fork	.42	.32	.42	.32	.42	.32	.32
Lewelling Creek	.32	.32	.31	.32	.32	.32	.32
Lower Hudlow Creek	.01	.01	.01	.01	.01	.01	.01
Hudlow – Middle Fork	.07	.07	.07	.05	.07	.07	.07
Sob Creek	.52	.52	.51	.29	.52	.51	.52
Solitaire	.20	.20	.20	.12	.20	.20	.13
Tom Lavin	.35	.35	.31	.31	.35	.31	.35
Upper Coeur d'Alene River	.25	.25	.25	.25	.25	.25	.23
Hudlow – West Fork	.00	.00	.00	.00	.00	.00	.00
Total HSI for project area	.29	.26	.28	.21	.28	.26	.25

Table III-47. Habitat Suitability Values for Forage for Marten in the Iron Honey Resource Area.

Subwatershed	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Coeur d'Alene River Face	.56	.56	.56	.43	.55	.56	.47
Hudlow Creek – East Fork	.11	.11	.11	.11	.11	.11	.11
Honey Creek	.49	.49	.49	.30	.48	.49	.49
Iron Creek above Rablens	.32	.22	.31	.22	.30	.22	.22
Iron Creek below Rablens	.56	.39	.54	.37	.55	.39	.40
Iron Creek - Cataract Creek	.60	.44	.60	.44	.57	.44	.50
Iron Creek - Rablens Fork	.53	.40	.53	.40	.53	.40	.40
Lewelling Creek	.60	.60	.58	.59	.59	.59	.60
Lower Hudlow Creek	.00	.00	.00	.00	.00	.00	.00
Hudlow – Middle Fork	.04	.04	.04	.01	.04	.04	.04
Sob Creek	.71	.71	.69	.42	.71	.70	.71
Solitaire Creek	.35	.35	.35	.21	.35	.35	.21
Tom Lavin Creek	.60	.60	.55	.60	.60	.56	.60
Upper Coeur d'Alene River	.30	.30	.29	.22	.30	.30	.22
Hudlow Creek – West Fork	.00	.00	.00	.00	.00	.00	.00
Total HSI for project area	.43	.39	.42	.33	.43	.39	.37

For complete habitat suitability index model runs, please refer to the Project Files, Wildlife.

Cumulative Effects/ Determination of Effects

Cumulatively, the Coeur d'Alene River Ranger District is implementing a "travel on designated routes only" policy. In the long term, this plan will increase wildlife security (including security for marten). However, it is anticipated that full compliance with the plan will be a gradual process and full results from implementation of the plan will not be realized for 5 to 10 years.

Foreseeable thinning in past harvest units should trend the area in all alternatives towards higher quality marten habitat. Because these thinned stands will, over the long term, provide larger diameter trees that will better meet the denning needs of the marten.

Private lands in the Horse Haven area within the Iron Honey Analysis area were not analyzed as habitat for the marten.

The HSI calculations for each territory incorporate past activities since the TSMRS database is used to determine values. Each action alternative would reduce the marten HSI to some extent over the short term. The HSI rating for marten is generally directly related to the amount of coarse woody material on the ground and the crown closure percentage. For analysis purposes the HSI values for cover and forage were averaged for each alternative in each subwatershed. A territory with a HSI value at or near a value of .50 or greater is considered to have sufficient habitat to support a marten.

Currently, moderate to optimal marten habitat (HSI of .51 or greater) occurs in seven subwatersheds within the Iron Honey Analysis Area. Harvest under the various alternatives changes HSI. Recruitment old growth would trend towards more optimal marten habitat. Approximately 489 acres of recruitment old growth currently qualify as old growth; 310 acres of recruitment old growth will qualify in 10-20 years.

Road-use restrictions in all alternatives would reduce the potential for human disturbance and trapping of marten in the Iron Honey Analysis area. The area would continue to provide various amounts of forested movement corridors connecting marten habitat within and adjacent to the analysis area in all alternatives. The combination of these factors should ensure that the area would continue to contribute to maintenance of population viability for marten at local and larger scales under alternatives 1, 2, 3, 6, 7 and 8. However, a 50-year loss of marten habitat in Sob Creek, considered the most optimal habitat within Iron Honey Resource area, with alternative 5, could threaten the viability of marten in the Little North Fork drainage.

B. Pileated Woodpecker

Existing Conditions

The pileated woodpecker is found in the Pacific Northwest and into the northern Rockies, including Idaho and Montana. Its range does not extend further south than the Snake River Plain (Warren 1990). Aney and McClelland (1985) recommend that pileated woodpecker habitat be managed to support at least one pair per 2,500 acres.

Pileated woodpeckers nest in mature to old-growth stands of about 50 to 100 acres that are found within their home ranges, with relatively closed canopies (greater than 65% closed) and large (greater than 20 inch diameter) trees (Bull 1980, McClelland 1977 and 1979). They prefer stands with high snag densities (greater than 12 per acre) for feeding (Warren 1989). Nest trees are large snags, usually averaging 30 inches in diameter and 90 feet tall (Aney and McClelland 1985). However, pileated woodpeckers can excavate a nest in a live ponderosa pine if heart rot is present (Bull 1975, 1980). Both larch and ponderosa pine are preferred

nest trees (Bull 1975). They feed mostly on carpenter ants (McClelland 1977, Bull 1980), but also eat other insects and fruits and berries. They usually avoid openings for foraging, and prefer dense canopies with many snags and down logs. Shelterwood cuts and small group selection cuts are suitable, but not preferred, feeding areas (McClelland 1979). Pileated home ranges are usually about 1,000 acres. Large, continuous habitat blocks are more desirable than more fragmented patches. Often, old growth habitats will be found along stream courses in linear patterns. To provide suitable pileated woodpecker habitat, strips should be at least 300 feet in width (McClelland 1979).

Pileated woodpeckers are found throughout the IPNF; there is evidence of pileated use in the Iron Honey Resource area. Reconnaissance has shown pileated foraging activity throughout the area, and particularly in areas with large (greater than 20 inches diameter) live and dead grand fir. The most likely habitat for pileated woodpeckers is along Honey Creek and Sob Creek, where snag densities are high and old growth can also be found. Because of overall low snag densities, the remainder of the Iron Honey Resource Area is probably low on forage habitat for the pileated.

Direct and Indirect Effects

There is sufficient habitat to support a breeding pair of pileated woodpeckers in each of the following sub-watersheds: Coeur d'Alene River Face, Iron Creek-below Rablens, Iron Creek-Cataract Creek, Lewelling Creek, Sob Creek and Tom Lavin.

Alternatives 1 and 6: No short term effects or changes would result from the implementation of Alternative 1 and minimal changes in habitat would occur with the implementation of Alternative 6. Over the long term natural mortality would result in snag and downed log recruitment. Mature stands would move towards old growth. However, the white pine and larch components would continue to be absent from this watershed, therefore an important nesting tree (larch) would remain absent in the Iron Honey Analysis area. Both alternatives would maintain sufficient habitat to support 6 pairs of pileated woodpeckers.

Alternative 5 would have the greatest impacts on habitat delineated as pileated woodpecker habitat. Harvest would occur on approximately 205 acres of pileated woodpecker habitat. Habitat values (HSI) for the Coeur d'Alene River face, Honey Creek, Sob Creek, Iron Creek below Rablens and Iron Creek-Rablens Fork would all have pileated habitat reduced from moderate to poor with the implementation of Alternative 5. Analysis area wide, this alternative reduces habitat value for the pileated woodpecker from moderate/fair to poor. This would most likely result in the reduction in the number of breeding pairs the analysis area can support. Based on the HSI values this would likely be a reduction of 3 breeding pairs of pileated woodpeckers.

Alternatives 2, 7 and 8 would have similar impacts to pileated habitat, with harvest occurring on approximately 200 acres of pileated habitat. In the subwatersheds Iron Creek below Rablens and Iron Creek-Rablens Fork habitat for the pileated woodpecker would be reduced from moderate to fair. Based on the HSI values the implementation of Alternative 8 would likely result in a reduction of 3 breeding pairs, Alternatives 2 or 7 would result in the loss of 2 breeding pairs.

Slight reduction in pileated woodpecker habitat occurs with the implementation of Alternative 3. However, the capability to support 6 pairs of pileated woodpeckers would be maintained.

Snags that provide forage and nesting habitat across the landscape within the Iron Honey Resource Area would also be reduced. The greatest impact would result under Alternative 5, with the most snag loss.

There would be long term benefits to the pileated woodpecker as a result of increasing the amount of recruitment old growth under Alternatives 2, 5, 6, 7 and 8. Most of this recruitment old growth is associated with riparian areas. Riparian old growth is an important component of pileated woodpecker habitat.

The pileated woodpecker habitat suitability index (HIS) ratings include:

0 = Non-habitat for pileated woodpeckers
.25 = Poor to fair pileated woodpecker
.50 = Moderate pileated woodpecker habitat
.80 = Good pileated woodpecker habitat
1.00 = Optimal pileated woodpecker habitat

Acres rated at 1.00 are 100% of optimum. Acres rated at .25 are 25% of optimum. It would take 4 acres of habitat rated at .25 to be the equivalent of 1 acre rated at 1.0.

Table III-48. Habitat Suitability Values for the Pileated Woodpecker (Post Sale).

Subwatershed	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Coeur d'Alene River Face	.47	.47	.47	.36	.47	.47	.40
Hudlow Creek – East Fork	.01	.01	.01	.01	.01	.01	.01
Honey Creek	.41	.42	.42	.26	.40	.42	.42
Iron Creek above Rablens	.28	.19	.26	.19	.26	.19	.19
Iron Creek below Rablens	.47	.33	.46	.33	.46	.33	.33
Iron Creek-Cataract Creek	.52	.38	.52	.38	.50	.38	.38
Iron Creek-Rablens Fork	.40	.29	.40	.29	.40	.29	.29
Lewelling Creek	.50	.50	.49	.49	.49	.49	.50
Lower Hudlow Creek	.00	.00	.00	.00	.00	.00	.00
Hudlow - Middle Fork	.10	.10	.10	.10	.10	.10	.10
Sob Creek	.55	.55	.54	.33	.55	.55	.55
Solitaire Creek	.30	.27	.29	.19	.30	.27	.14
Tom Lavin Creek	.56	.56	.51	.52	.56	.52	.56
Upper Coeur d'Alene River	.37	.37	.36	.29	.36	.37	.29
Hudlow Creek – West Fork	.00	.00	.00	.00	.00	.00	.00
Total HSI for project area	.38	.34	.37	.29	.37	.33	.31

For complete habitat suitability index model runs, please refer to the Project Files, Wildlife.

Cumulative Effects/Determination of Effects

The implementation of the District's new Travel Plan will have no direct effects upon the pileated woodpecker. However, over the long term the implementation of the Travel Plan would result in snags being protected from firewood harvest which would indirectly benefit the pileated woodpecker and it's habitat. Snags that provide forage and nesting habitat across the landscape within the Iron Honey Resource Area would also be reduced. The greatest impact would result under Alternative 5, with the most snag loss. There would be long term benefits to the pileated woodpecker as a result of increasing the amount of recruitment old growth under Alternatives 2, 5, 6, 7 and 8.

Adjacent private lands (Horse Haven) were not considered as habitat for the pileated woodpecker in this analysis, although these lands may provide some low quality habitat for the pileated woodpecker.

3.6.7 Non-game habitat

A. Existing Conditions

There is a large body of information on the condition of wildlife habitats in the Vegetation Section of this EIS. In summary, the Resource Area's vegetation, and the non-game habitat it provides have been changed over the last 100 years by man's activities in the area. Due to past harvest patterns and selective removal of white pine that was driven by the widespread mortality caused by blister rust, approximately 70% of timber stands in the Iron Honey Resource Area are less than 100 years old. White pine and western larch are now at levels far below historic levels (Geographic Assessment, p. 36-37).

The highly productive forest lands in this area have the ability to grow big trees, fairly rapidly, especially those species like white pine and western larch that out-compete other species when growing in full sunlight. Historically, much of the harvest focused on cutting the large white pine and larch, leaving large hemlock, grand fir and Douglas-fir on the landscape, because they were less desirable. For these reasons, large diameter trees (greater than 20 inches diameter) are found across the landscape within the Iron Honey analysis area, but these large old trees are no longer the dominant white pine and larch that created forests and wildlife habitats of a different character than the present shade tolerant firs and hemlock (TSMRS data base queries). Shade tolerant tree species tend to regenerate under themselves, and the resultant forest is one of thick canopy from the ground up. Mature white pine forests tended to be a heavy overstory canopy a hundred feet overhead and very little live growth in the understory. These forests generally had very large rotting logs on the forest floor, providing that component of non-game habitat.

The historic harvests left small isolated patches of old growth, which comprise about 5% of the area. Most of these old growth areas are fragmented by roads or interspersed among older harvest units, have had individual trees removed by past harvest, and have lost snags because of firewood gatherers. Another 18% of the area is classified as mature forest, and in 50 years or less would have characteristics suitable to be considered old growth. Generally one would expect to find large downed wood in old-growth stands. However, field review of the allocated old growth stands in Iron Honey found a limited amount of large downed wood. This lack of down wood is probably due to past selective harvest of large trees and, to some extent, firewood harvest.

Root diseases are common throughout the analysis area. The mortality from this disease provides an abundance of snags, although they are primarily grand fir, hemlock and Douglas-fir, and are progressively smaller in size as the disease pockets continually kill these species as they regenerate on site. Root disease also results in recruitment of downed logs in the analysis area. Large white pine, larch and western red cedar are underrepresented as a snag component, because the dead trees, and even the merchantable down logs were salvaged during the early timber entries. In addition, on the earlier regeneration harvest units, snags or large live residual trees were not retained, further reducing this component of non-game habitat.

Riparian areas are another important habitat for non-game species, generally providing large trees in the overstory, at times including hardwoods. These are also areas of abundant herbaceous vegetation on the forest floor, and very complex habitat structures including the bed and banks of the stream, and interspersed wetlands. The old growth discussed above is generally found along these riparian corridors in the Iron Honey Resource Area. Many of the riparian areas are no longer providing wetlands created by flooding. Past road construction in the flood plains filled and isolated these low areas, reducing their abundance. Roads, along with the trapping access they provided, probably led to a reduction of beaver activity. Evidence of old beaver dams shows that the area once held good beaver populations. Beaver populations are currently low and ponds created by their presence are relatively rare on the Little North Fork of the Coeur d'Alene River. However,

there seems to be a trend toward beaver populations increasing in the upper Little North Fork, probably due to depressed fur prices and increased costs of transportation for the trappers.

B. Direct and Indirect Effects

Alternative 1: Taking no action at this time would allow the naturally occurring vegetation changes to continue. White pine and western larch forests, and the wildlife species associated with them, would remain far below historic levels for the long term. Root diseases would continue to kill the susceptible firs and hemlock, over the long term continually adding to snags and downed log recruitment. Mature stands would move towards climax species (hemlock, cedar and grandfir) old growth. Approximately 600 acres of stands that were previously planted to white pine, larch and ponderosa pine would continue to be cultured to provide mature stands of these species. As these stands mature to old growth characteristics, they could be added to the old growth allocation, or they could be harvested to again move the area toward stands of vigorously growing conifers. Harvesting these stands would not provide habitat for old growth dependent species. If the stands are not harvested in the future, they would over time provide much needed habitat for white pine old-growth dependent species, including non-game species like rodents, amphibians, and songbirds, although on a very small proportion (600 acres, or less than 3%) of the analysis area.

Alternative 2: The openings created with the harvest proposed under this alternative (1,100 acres of shelterwood harvest, which is 5% of the Iron Honey Resource Area) would reduce non-game habitat for those species dependent upon older interior forests. This effect would last at least 30 years until these regeneration harvest again function as young conifer forests instead of created openings. Reserve trees within the shelterwood harvest units would provide some stand structure diversity in the future and provide for future legacies (old, large trees) as long as these trees are not harvested at a future date. Non-game bird species that were adapted to the white pine forests are now at reduced numbers or extirpated (Upper Columbia River Basin Draft EIS, Chap.2 pg.66). Over the long term, non-game species could benefit from the regeneration of white pine forests in the drainage. A long-term increase in old, early seral forest could be assured if additional stands of this maturing white pine are managed as old growth (wildlife project files: Late Successional Forests). Over time the area would trend towards improved non-game habitat and historical condition. It is likely that these species would increase in numbers and re-inhabit the renewed white pine forests.

Alternative 3: This alternative includes 141 acres of thinning in Units 30, 31 and 32 (please refer to the map of Alternative 3, enclosed). These units lie within an area containing enough suitable characteristics that they were proposed as old growth in the other alternatives. This investment in thinning indicates these stands are being managed for maximum growth and yield, and would be regeneration harvested when they mature. In addition to the 141 acres of thinning, there would be 183 acres of small openings created throughout the resource area. These small openings would create edge and diversity in the short term. However, because they are small and not large blocks, and are unlikely to be successfully regenerated to white pine or larch, they would not contribute to interior forest habitat for species such as the marten and goshawk (Witmer, G. et al., Forest Carnivore Conservation and Management in the Interior Columbia Basin 1998, and Idaho Department of Fish and Game, Habitat Conservation Assessment, 1995). The Iron Honey Analysis area would not trend towards historical conditions for non-game species under this alternative.

Alternative 5: Alternative 5 proposes over 4,000 acres of shelterwood and clearcut harvest, which would result in a loss of snags and downed logs. The alternative would have significant short-term impacts on non-game species because of loss of mature forests, interior habitat and loss of snags. Over the long-term, the regeneration of healthy long-lived seral species like white pine and larch could benefit non-game species if no further disturbances occurred for at least 50 years (to grow to at least pole-size). Additionally, riparian restoration work would improve non-game wetland habitat and proposed recruitment old growth as part of

this alternative would provide large diameter trees, snags and downed logs over time. Creating large harvest units would provide interior forest habitat in 80 to 100 years.

As under Alternative 3, Alternative 5 includes 141 acres of thinning in Units 30, 31 and 32 (please refer to the map of Alternative 5, enclosed). These units lie within an area containing enough suitable characteristics that they were proposed as old growth in the other alternatives. This investment in thinning indicates these stands are being managed for maximum growth and yield, and would be regeneration harvested when they mature.

Alternative 6: This alternative would have very slight short-term impacts on non-game species, primarily from harvesting for the in-stream wood necessary for the in-stream rehabilitation, and the short-term disturbance to riparian habitats effected by the rehab. The project would benefit non-game species over the long-term by reducing roads that traverse through wetland systems and natural processes leading to increasing large diameter trees, snags and downed logs. However, it is likely that as the watershed condition improves, disturbance from additional timber harvests would continue because vegetative rehabilitation would remain a high priority in this highly productive area.

Alternative 7: This alternative would impact non-game species similar to Alternative 2, above. In addition to the activities proposed under Alternative 2, three small units would be thinned (42 acres), and 40 acres more would be harvested in small openings. The additional small openings would create more edge and diversity in the short term, but lead to a more fragmented forest than is desirable for species such as the marten (and their prey), which depend on interior habitat not influenced by wind and sunlight. Thinning Unit 31 is located within an area that is proposed as recruitment old growth under Alternatives 2, 6 and 8. Thinning this unit would have the same effects as those discussed under Alternative 3; that is, the investment in thinning indicates these stands are being managed for maximum growth and yield, and would be regeneration harvested when they mature, and not retained as old growth habitat for non-game species.

Alternative 8: Impacts would be similar to Alternatives 2 and 7; a short term decline in non-game habitat, except there would be more extensive shelterwood harvest in Solitaire Creek, Sob Creek, Honey Creek and near the head of the Little North Fork. Over the long-term, this type of harvest in large blocks could benefit non-game species, similar to the effects described in Alternative 5. The included riparian restoration work would improve non-game wetland habitat, as discussed in Alternative 6, and proposed recruitment old growth would provide large diameter trees, snags and downed logs on larger areas over time.

C. Cumulative Effects

Several activities could have effects that accumulate with this project. The District Travel Plan would benefit non-game habitat under all alternatives as a result of pulling roads from riparian areas and increasing the long-term value of these wetlands (additional discussion is provided in the “Aquatic Resources” section of this Chapter). Managing additional mature stands as future (recruitment) old growth would also benefit these species. Over time these stands would provide snags, large-diameter trees, and downed logs, all of which are now in short supply within the resource area. Under all alternatives there are opportunities for creating wetland habitat as part of stream restoration projects. Small potholes and ponds could be created in the flood plain, which would enhance non-game riparian habitat, and in turn increasing the prey base for carnivores such as fisher, marten, and lynx. These wetland habitats are currently limited in the Coeur d'Alene Mountains. The wetland enhancement projects would be accomplished with KV funds, so funding could be limited, depending on the alternative selected and current market value of logs.

Private lands in the Horse Haven area, and near the divide with Lake Pend Oreille are not considered of much value for non-game species. The Horse Haven area is mostly an extremely disturbed riparian area containing a grass airstrip and numerous 4X4 trails and mud bogs. The patented mining claim near the divide has been logged and allowed to revert to a natural recovery regime. Very little overstory canopy remains. Since the

Forest Service has no authority over management of private lands, the conservative approach for analysis purposes was to not include these lands as habitat, even though they may provide some habitat value for non-game species, especially riparian ones dependent upon standing water. The habitat values for this private land are also discussed in the analysis for the goshawk, marten, pileated woodpecker, fisher and black-backed woodpecker.

3.6.8 Neotropical (Land) Birds

A. Existing Conditions

Neotropical birds are those that breed and nest in one area and migrate to another area to winter. These birds are impacted in a variety of ways including loss of habitat due to agriculture, logging, and urbanization. Many of their wintering grounds are outside the United States and it is difficult to monitor habitat components of these. The Upper Columbia Basin Draft EIS (USDA Forest Service et.al.) states that breeding bird surveys on National Forests found an increase of 10 species of neotropical birds and a decrease of 5 species. Vaux's swift, pileated woodpecker, Hammond's flycatcher, pygmy nuthatch, and Swainson's thrush are thought to have decreased (USDA, Upper Columbia River Basin Draft EIS Chap 2, pp. 66-67). Often the increases in populations are less desirable species such as the brown-headed cowbird (Collopy and Smith 1995 in Upper Columbia River Basin Draft EIS). Neotropical birds are generally on the decline throughout most of their habitat (Richie 1994).

Another threat to these land birds is nest parasitism by cowbirds. The brown-headed cowbird was historically rare or nonexistent in many parts of the West (Rothstein 1994 in Young and Hutto). The sudden presence of this species may have a serious impact on hosts that are not adapted to its presence (Young and Hutto). Generally, this is a bigger threat when forested areas lie adjacent to developed or agricultural lands. Cattle grazing is also attributed to the expansion of cowbird habitat (Young and Hutto). Iron Honey is surrounded by primarily non-agricultural Forest Service land and should be at a lower risk for cowbird parasitism. However, cattle grazing does occur. Once present, cowbirds become parasites of the nests of other birds. Holes created in forest canopies create habitat for cowbirds. Surveys indicate that cowbird populations may actually be on the decline in Idaho (per. comm. Ritter, S.). The concern is management activities in forested lands could result in expansion of cowbird habitat, which could threaten more desirable neotropical birds. The potential of cowbird parasitism also reflects potential for other nest predators, including crows, grackles, skunks etc. (Samson, Interim Direction-Habitat Fragmentation).

B. Direct and Indirect

Because there would be no new activities that would create openings in the area under Alternatives 1 or 6, there would be no change to habitat of neotropical land birds under either of these alternatives. Root rot would continue to create small holes in the canopy. However, these tend to be uneven with an abundance of brush and snags and would function as contiguous forest habitat. Under the remaining alternatives, newly created openings would impact nesting and foraging habitat for land birds. Alternative 5 would create the greatest acreage of openings (4,191 acres of openings) of all alternatives and would result in the greatest loss of nesting and foraging habitat for land birds, such as the pileated woodpecker and the pygmy nuthatch, that require interior forest or non-fragmented habitats. This is followed by Alternatives 8 (2,254 acres), 7 (1,144 acres), 2 (1,099 acres) and 3 (324 acres), respectively. (Please refer to the Project Files, Wildlife: Unit Tables pp. 1-10) Edge dependent species, such as the northern flicker and tree swallow, would gain habitat under these alternatives.

A complicating factor is the concern for nest parasitism by cowbirds. Since cowbirds are present in the Coeur d'Alene Mountains, increases in openings create more cowbird habitat, increasing the chance for nest

parasitism. In general, a low ratio of edge to interior habitat is preferred. Therefore, a large noncomplex opening with little edge is preferred over many small complex openings with a lot of edge. Perimeter ratios for each alternative were calculated (Refer to wildlife project files: Perimeter calculations for cowbirds p 1-3). The alternatives most likely to increase cowbird nest parasitism and reduce land bird populations are Alternatives 5, 7, 2, and 3, respectively. Of the action alternatives, Alternative 8 has the lowest perimeter ratio and therefore, the lowest risk of cowbird parasitism (Refer to wildlife project files: Alt. 8 perimeter calculations). Alternative 6 would not increase the risk of cowbird parasitism, because no openings are created.

Looking into the future (80-100 years), the larger unit alternatives (Alternatives 2, 5, 7 and 8) would provide more interior habitat over the long term once the large harvest in these alternatives grow into mature forest. These large blocks of interior forest would enhance land bird habitat over time.

Because of loss of interior forest habitat and risk for cowbird nest parasitism and the impacts of these upon declining land bird populations, Alternative 5 would be a risk to viability of these species for the short term. Over the long term however, large blocks of interior habitat created by alternative 5 would trend the area towards the historical situation.

The remaining alternatives maintain more interior forest habitat and have a lower risk of cowbird parasitism. Over the long term these alternatives would trend towards historical levels of interior habitat.

C. Cumulative Effects

There are ongoing and foreseeable actions adjacent to the Iron Honey Resource Area that were considered in the analysis for neotropical land birds. The West Gold Creek Timber on the Sandpoint Ranger District is in the latter stages of planning. This sale will most likely have some impact on neotropical migrants due to the creation of holes in the canopy. In addition, Douglas-fir beetle activity has resulted in both an increase in snags and harvest associated with the beetle outbreak. The harvest of beetle killed trees does not occur near or within this analysis area. Precommercial thinning of previously harvested stands within the analysis area should trend these areas towards more desirable habitat for neo-tropical species dependent upon large diameter trees (for example, goshawks), since one of the objectives of thinning is to attain a large diameter tree over time.

3.6.9 Cumulative Effects to Wildlife

Historically, white pine was probably the dominant tree species on over 50% of the Iron Honey Analysis area (Project Files, Alternative Development, FGWA Report of the Iron Honey Analysis Area). Historically, old growth was found on approximately 10 to 25% of the landscape, and included a white pine component. Species such as the red crossbill, which are dependent upon pine and larch seeds, were more abundant. The average patch size (continuous forest stand of similar age and species) was twice as large in the 1930s as it is today (Geographic Assessment, p. 42). These large patch sizes favored species that are intolerant of edge such as the goshawk, pileated woodpecker, and fisher.

Past management of the project area has included harvesting timber, constructing and maintaining roads and trails, road removal, and maintenance of recreational facilities. Approximately 54% of the Iron Honey Resource area has been set back to a younger age class as a result of past timber harvest; 14% of this is less than 35 years old. There are no timber harvest activities currently active within the Iron Honey Resource Area.

If left alone, the Iron Honey Analysis area would not trend towards a more historical condition. Patch sizes would remain approximately half the size they were found historically. Western white pine would continue to

decrease rather than trend towards historic levels. It is unlikely that white pine would provide a old growth component in the future like it once had. Species dependent upon white pine and interior forest habitat would further decline in numbers. However, if left alone, trees would continue to age and old growth forest would eventually increase within the analysis area.

Currently, there are ongoing and foreseeable actions adjacent to the Iron Honey Resource Area that were considered in the analysis. The West Gold Creek Timber Sale on the Sandpoint Ranger District is in the latter stages of planning. If an action alternative is selected for implementation in the Iron Honey Resource Area, the West Gold Creek Timber Sale would likely be active at the same time as activities associated with the Iron Honey project. Because of this adjacent sale, big game would probably not displace to the north. West Gold Creek will not provide a displacement area for big game and other large-ranging species during the Iron Honey Timber Sale.

In addition, Douglas-fir beetle activity has occurred throughout much of the Coeur d'Alene River Ranger District, as described in the Douglas-fir Beetle EIS (USDA Forest Service, 1999). This has resulted in the removal of diseased trees across the landscape. The removal of these diseased trees required that approximately 50 miles of previously closed and/or brushed in roads outside the Iron Honey Analysis Area were reopened (Douglas-fir Beetle EIS 1999). None of the Douglas-fir beetle harvest occurred within the Iron Honey Resource Area. However, displacement of big game and other wildlife occurred in these other activity areas. Most of the Douglas-fir beetle harvest will be completed prior to implementation of proposed Iron Honey timber sale activities. However, post sale activities associated with Douglas-fir beetle would be occurring simultaneously with the Iron Honey project further reducing displacement areas for wildlife.

Other ongoing activities incorporated into the effects analysis are grazing and precommercial thinning. The preferred alternative for the Coeur d'Alene River Draft Grazing Allotments Environmental Assessment shows no impacts to Threatened, Endangered or most Sensitive wildlife species. There are slight impacts Coeur d'Alene salamander, boreal toad, Northern leopard frog and harlequin duck resulting from grazing. To ensure protection of adequate big game forage, riparian stubble height surveys and standards would be implemented (Coeur d'Alene River Draft Grazing Allotments Environmental Assessment, USDA Forest Service, 2001). Precommercial thinning could impact hiding cover for big game in the short term. However, since cover is not limiting in the Iron Honey Resource Area thinning was considered to have a negligible effect on big game. Since the Iron Honey Resource Area lies outside of a lynx analysis unit, precommercial thinning is not a concern for lynx forage habitat.

<u>Alternatives 2 and 7:</u> Old growth and older age classes are the least represented in the Iron Honey Resource Area. No stands currently identified as old growth would be affected by these two alternatives. Either alternative would increase the young age class from 14% to 25% of the Iron Honey Resource Area. This would improve the age-class distribution for younger age classes. Age classes 80 years and older would be reduced by 5%. Over the long term, larger security blocks of interior forest habitat would be provided. Alternatives 2 and 7 would reduce habitat suitability for wildlife in the short term; however, habitat suitability would increase in the long term (50 years or more).

<u>Alternatives 3 and 6:</u> Alternative 3 would increase the young age class from 14% to 15%. Age classes 80 years and older would be reduced by 1%. There is no change in age classes with the implementation of alternative 6. Neither of these alternatives would significantly reduce habitat suitability for wildlife in the short term. Over the long term and short term, Alternative 6 would increase habitat suitability for wildlife. There would be no improvement of habitat suitability for wildlife, over the long term, with the implementation of Alternative 3.

Alternative 5: This alternative would increase the young age class from 14% to 30%. Age classes 80 years and older would be reduced by 16%. Over the long term, larger security blocks of interior forest habitat would be provided with the implementation of this alternative. This alternative would have significant short-term impacts to wildlife. Habitat suitability for wildlife would increase after 50 to 80 years.

Alternative 8: This alternative would increase the young age class from 14% to 23%. Age classes 80 years and older would be reduced by 9%. Large security blocks of interior habitat would be provided under this alternative over the long term. This alternative would result in significant short-term impacts to wildlife. Habitat suitability for wildlife would increase after 50 to 80 years (Refer to discussions on goshawk, marten and pileated woodpecker). Snag standards in compliance with recommendations in the Upper Columbia River Basin Draft EIS and companion report by Bull (1997) would be implemented under all alternatives, ensuring viability of snag dependent species. Road densities are reduced which will maintain viable populations of furbearers. Watershed restoration projects that would trend watersheds towards historical conditions would maintain viability for amphibians over the long term.

3.6.10 Consistency With the Forest Plan and Other Applicable Regulatory Direction

All alternatives would be consistent with Forest Plan management direction, goals, objectives, standards and guidelines for the management and protection of wildlife and species, as described below.

A. Elk

1. (a) Coordinate with the Idaho Fish and Game Department to allocate the distribution of habitat potential.

Idaho Fish and Game participated in the allocation of Elk Habitat Units and goals during the Forest Planning process.

1. (b) Identify and delineate existing and potential winter range for each elk habitat unit and establish goals for forage production suitable to support desired population levels, including such tools as designation of permanent forage areas, scheduling of timber harvest, and habitat movement.

Winter range was delineated during the Forest Planning process as a Management Area. Forage goals were delineated during the development of the Elk Habitat Suitability Model. Permanent forage areas, scheduling of timber harvest and habitat shifts are analyzed with each proposed project.

1. (c) Utilize the "Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho" (Wildlife Bulletin No. 11, 1984, Idaho Department of Fish and Game) for evaluation of effects of proposed activities on elk habitat (Appendix Y, Idaho Panhandle National Forests Plan).

These guidelines are incorporated into the elk suitability model.

1. (d) Include lands of all cooperators for habitat analysis where mixed ownership is within Elk Habitat Units.

These are incorporated into the database for modeling purposes.

B. Threatened and Endangered Species

2. (a) Management of habitat and security needs for threatened and endangered (T&E) species will be given priority in identified habitat. Results of research regarding habitat of T & E species will be incorporated into management direction as it becomes available.

Habitat conservation strategies for Threatened and Endangered species include the habitat and security needs for these species. These are identified and analyzed in the Biological Assessment. Current and ongoing research information is used in the Biological Assessment.

2. (b) Biological evaluations will be done on any project likely to have an adverse effect on identified habitats or threatened or endangered animals.

Biological Assessment and Biological Evaluations have been completed for all Threatened, Endangered and Sensitive species.

2. (c) Current direction for management of T & E species will be amended or revised to ensure conformance with Species Recovery Plans.

All current management direction for Threatened and Endangered species, including recovery plans and strategies, have been incorporated into the Biological Assessment.

3. (d) Actively initiate and participate in an information/education program to promote a better understanding of endangered species conservation and recovery both within and outside the Forest Service.

This is outside the scope of this EIS. However, the District Biologist does promote a better understanding of endangered species conservation through school programs.

C. Bald Eagle

5. (a) Nesting, feeding and roost areas will be protected in accordance with the Pacific States Bald Eagle Recovery Plan (Appendix W, Idaho Panhandle National Forests Plan).

All known nest, roost areas, and feeding areas are identified and protected from disturbance in compliance with the Pacific States Bald Eagle Recovery Plan. No known nest, roost or feeding areas are found within the analysis area.

5. (b) Develop site specific bald eagle nest management plan for each located eagle nest on National Forest land as outlined in the Montana Bald Eagle Management Plan (Appendix II, Idaho Panhandle National Forests Plan).

There are no known nest sites on National Forest Land of the Coeur d'Alene River District. However, measures are implemented to provide protection when forest management activities could impact an active nest on adjacent lands under other ownership. There are no known nest sites near or adjacent to the project area. The closest known nest site is located on private lands near Hayden Lake.

5. (c) Cooperate in research and surveys involving bald eagles on the Forest.

District biologists participate in annual winter surveys for bald eagles.

D. Gray Wolf

6. (a) In areas of reported occurrence, consider maintenance of a high number of prey species (deer, elk) and maintenance of security through road management.

The analysis of the gray wolf was based on maintenance of prey and security. Please refer to the Biological Assessment for further information.

6. (b) Forward information on reported sightings to the Wolf Recovery Team.

All information regarding possible wolf sightings are forwarded immediately to the Wolf Recovery Team.

6. (c) Cooperate in research and data collection involving wolf and wolf habitat.

District biologists cooperate with all wolf relocation efforts and report all possible sightings.

E. Other Wildlife

7. (a) Maintain at least minimum viable populations of management indicator species distributed throughout the Forest.

Viability analysis has been done for these species. Viability thresholds have yet to be developed at the Regional Level. For additional discussion, please refer to the analysis of management indicator species in this chapter.

7. (b) Maintain habitat for cavity nesting species and foraging substrates by implementation of the IPNF Snag and Woody Down Timber Guidelines (Appendix X, Idaho Panhandle National Forests Plan).

Snag requirements for the Iron Honey analysis area are described in Chapter II, 2.6.9 Features Common to All Action Alternatives, (F) Features Designed to Protect Wildlife Habitat. Based on these features, snag management would meet or exceed the requirements identified in the Forest Plan (Appendix X).

F. Sensitive Species

9. (a) Manage the habitat of species listed in the Region 1 Sensitive Species List to prevent further declines in populations, which could lead to Federal listing under the Endangered Species Act.

All alternatives would comply with the Endangered Species Act of 1973 as amended (ESA). Forest Plan standards (Forest Plan, Chapter II, pages II-26 through II-29; Project Files, "Wildlife"), in compliance with NFMA (219.20 Ecological sustainability), were incorporated into all alternatives. These standards addressed elk and elk goals, threatened and endangered species, sensitive species and old growth management. All alternatives are consistent with Forest Plan standards regarding allocated old growth. No harvest is proposed in allocated old growth or recruitment old growth areas under any alternative. Additional acres of allocated recruitment old growth are proposed under all action alternatives except Alternative 3. For additional discussion, please refer to analysis for sensitive species within this chapter.

3.7 RECREATION ACCESS

3.7.1 Regulatory Framework and Methodology

Recreation goals and objectives identified in the Forest Plan (Forest Plan, Chapter II) are to provide for the projected use of developed recreation areas with development of new sites as budget becomes available, to provide for a variety of dispersed recreation opportunities (both motorized and non-motorized), to pursue opportunities to increase and improve the recreation trail system, and to continue to increase cooperative trail programs with organizations, clubs and other public agencies.

Determination of the existing conditions for recreation activities, facilities and opportunities is derived from facility inventories, facility maintenance work, observation by recreation specialists and technical personnel, and contact with recreation user groups and individuals. Guidance for management of recreation resources is provided in various National Forest manuals and handbooks, as well as professional publications and documents.

3.7.2 Existing Conditions

The Recreation Opportunity Spectrum (ROS) classification system has identified the lands within the Iron Honey Resource Area as a "roaded natural setting." The main attraction to visitors is the water corridor formed by the Little North Fork of the Coeur d' Alene River. In 1982, segments of the Coeur d'Alene River and North Fork Coeur d'Alene River were identified as potential "Recreational" river segments under the Wild and Scenic Rivers Act of 1968. The Wild and Scenic Rivers Interagency Guidelines (Federal Register, Vol. 47, No. 173, September 7, 1982) define "recreational river areas" as those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past (for additional information, please refer to the National Park Service's website: *www.nps.gov/rivers/guidelines.html*). Ten management principles have been identified for Wild and Scenic rivers (including those with the "recreational" designation). These principles address carrying capacity, public use and access, basic facilities, major facilities, motorized travel, agricultural and forestry practices, other resource management practices, water quality, land use controls, and rights-of-way. For further information, please refer to the Project Files, Recreation.

Throughout the Coeur d' Alene River Ranger District, water corridors see the greatest visitation for recreation purposes. There are over 20 undeveloped, (dispersed), camping sites located along the River and near the mouth of tributary streams, Hudlow Creek and Iron Creek. Many of these sites are large enough to accommodate groups of campers including trailers and recreation camping vehicles. During the period from mid May to early September, there is a great use of these locations for camping, primarily on weekends. In October, hunting camps prevail in the same sites. Approximately 10% of the area is important for recreation camping, all located in the river corridors. The Forest Service maintains a toilet facility at the confluence of the River and Iron Creek to improve the sanitary conditions in the area.

Along with camping, a major recreation use of the area is seasonal operation of over-snow vehicles and all-terrain vehicles, primarily motorcycles.

Since the early 1970's, snowmobiles have converged on the old Horse Heaven airstrip with the aid of a quality system of groomed trails. This location is central to the groomed system and has the attraction of a long flat open run formed by the old airstrip where vehicles can race. This strip is privately owned. Owners have never attempted to exclude public use of the site; however this could change if there were a change in ownership, which could dramatically alter use patterns of oversnow and ATV uses in the area.

There are over 40 miles of frequently groomed snowmobile trails within or fringing the analysis area. Horse Heaven airstrip is the hub of this local system and a destination for snowmobile riders. Even if the public were excluded from use of the airstrip, trails in the area would remain at the heart of the total snowmobile trail system of over 500 miles on the District.

The popularity of snowmobiling in the area spawned the growth of ATV use in the area in the summer season. Use of ATV's began booming in the mid 1980's. Motorcycles were first on the scene and recently four-wheel all terrain vehicles have appeared in great numbers. Along with these vehicles, jeeps and other types of ATV's are appearing in the area. Trails in Barney Creek, Nicholas Creek and along Chilco Mountain are suitable for and frequently used by motorcycles. Motorcyclists have also constructed trails without authorization in several places in the area mainly around Colt Mountain and on the east flanks of Chilco Mountain. The wide all-terrain type vehicles are not suited to the single tread trails used by motorbikes and instead make use of the many old road systems that abound in the head waters of the River. ATV's also frequently use Forest system roads although unless they are "street legal", which few are, it is illegal for them to do so. Four-wheel drive jeeps and trucks have created some eroded climbs up slopes in the Iron Creek drainage and at times attempt to drive along the bottom of the river.

The District has attempted to manage motorized uses in the area by working with cooperating groups of motorcycle riders to create a logical trail system and cut down the amount of trails built without authorization. The District has enforced laws protecting lands and waters through issuing citations to violators. Physical barriers to inhibit access to the River by ATV's have been installed and have been partly successful. Laws governing ATV use of public roadways are enforced as well. Unfortunately growth of ATV use in the area far exceeds the resources available to the Forest Service to manage it. This problem is complicated by the private landholdings at Horse Heaven where the Forest Service has no legal jurisdiction. Exclusive of the Iron Honey project, the Ranger District will continue to work on strategies to manage ATV use in the area.

There is one outfitter-guide permit issued for the area. Hidden Creek Ranch (Harrison, Idaho) holds a permit to guide snowmobile tours and big-game hunting.

The above-described activities are the focus of recreation in the area. There is some hiking and horseback riding along the Chilco Mountain Trail. Other trails in the area are not often used by this group of trail users. There is also some activity in recreational gathering of forest products primarily berry picking along the upper slopes of Crooked Ridge, which forms the eastern boundary of the area. Hunting in season occurs on a moderately heavy frequency. There is also some limited fishing along the River in the spring-summer period. The old flume system in Sob Creek provides the opportunity for interpretive signing, which is dependent upon available funding.

Relatively close proximity to urban areas in the Coeur d' Alene-Spokane metropolitan region means this area will continue to be important for recreation. However, the area is dominated by motorized recreation, which will limit use of the area by many other groups that are more interested in natural sites and sounds of the environment.

3.7.3 Environmental Consequences

The overall effects of timber harvest activities on recreation are mainly to the scenic environment that the recreation activity takes place in. Harvest activities can temporarily disrupt recreation by precluding entry into a particular area or in producing dust, noise and smoke. Proposed stream rehabilitation activities may change the nature of access to an area. For instance a conventional road may be eliminated whereby only people afoot or on certain types of ATV's may be able to follow the former route.

It is possible that large harvest areas where much of the timber is removed and other vegetation burned off may become play areas for ORV's, especially snowmobiles in higher elevation units where the snow is deeper. Post timber harvest access will need to be managed in order to inhibit potential soil and vegetative impacts due to ORV travel. There may also be an opportunity to create snowmobile play areas as a goal for recreation management in the area.

The long-term recreation access goals for the area encompassing the Iron Honey project are to manage for a high degree of motorized vehicle use along designated routes. Under Alternative 1, current recreation management would continue.

Under Alternatives 2, 3, 5 and 7, snowmobile routes in Iron Creek would be affected by shifting the existing trail up Iron Creek to the reconstructed Road 1560 (as described in Chapter II, 2.6 Alternative Descriptions).. This alternate route is comparable to the original route that traveled up Road 794. In fact, the proposed new route would probably be superior in that it would have fewer curves and be easier to groom for snowmobile use. Another change would be to abandon Road 1532 that connects the Horse Heaven area to trails in Cascade Creek and replace it with a reconstructed segment and a newly constructed segment of Road 2346 that would connect the east end of the Horse Heaven airstrip with the trail that goes on to Walker Saddle and Cascade Creek. This is considered to be of no impact to the quality of the snowmobile trail system.

The implementation of Alternatives 2, 5, 7, or 8 would open at least temporarily large areas that may be attractive to off road vehicles drivers. An extra effort would be made to sign and monitor extensively harvested areas to prevent undesirable effects of unauthorized ORV travel. Numerous large openings in the timber would be an invitation for snowmobile snow play opportunities. It is not possible at this time to predict which sites would be the best for this activity, although the highest elevation units with north faces would likely be favored. While oversnow travel is fairly non-impactive to soils it can, if heavy, suppress vegetation growth. It can also affect tree plantations by potentially impacting tree leader branches. This is not occurring at this time, but could occur with increased use.

Camping in undeveloped sites in the area would be unimpacted for the most part, except for the short-term disturbances by logging activities. Several campsites in Iron Creek east of the airstrip would no longer be accessible by automobile due to stream rehabilitation work in Iron Creek. At this time and for the foreseeable future there are enough sites in the vicinity to compensate for the loss. The affected site would still be accessible by hiking or possibly trail bikes.

At this time, none of the existing trailheads in the area warrant expansion. It is expected this will change over time under any alternative, due to the trend of increasing ATV use. Trailhead improvement and interpretive signing would occur as necessary to protect natural resources.

Other than short term disruptions due to logging there would negligible effects to motorized recreation in the area. Several units, particularly those just north of the airstrip might be attractive to ORV users for off-road hill climbs, a situation that would require monitoring and management.

Under the Wild and Scenic Rivers Act, management principles related to agricultural and forestry practices state, “Row crop production and timber harvest may be practiced in recreational and scenic river areas. Recreational river areas may contain an even larger range of agricultural and forestry uses. Timber harvest in any river area will be conducted so as to avoid adverse impacts on the river area values,” (Wild and Scenic Rivers Interagency Guidelines, p.15). None of the alternatives would modify the North Fork Coeur d'Alene River or Coeur d'Alene River to the degree that eligibility or classification would be affected. For additional information, please refer to the Project Files (Recreation).

3.7.4 Consistency With Forest Plan and Other Legal Mandates

The Forest Plan identifies specific goals and objectives related to providing a variety of recreation opportunities and settings (Forest Plan, pages II-1 and II-3). The following standards apply to recreation management:

1. The Forest will continue to provide a share of recreation opportunities and diversity in relation to other public and private entities; recreation planning and operations will be coordinated with other federal, state, local and private recreational managers.

All alternatives would continue to provide a diversity of recreation opportunities. Coordination with other recreation managers is done on an ongoing basis throughout the Coeur d'Alene River Ranger District. Based on this information, all alternatives would meet this standard.

2. Forest Service recreational programs will be complementary with other public and private programs where possible.

Recreational programs on the Coeur d'Alene River Ranger District are complementary with other recreational programs provided by county, state, and private facilities. The activities proposed under the action alternatives would not change this situation; therefore all alternatives would meet this standard.

3. Consult with recreational users and other recreational suppliers to coordinate public needs.

Consultation occurs with recreational organizations on an ongoing basis, and with the recreating public at large through project scoping. Recreation needs in the Iron Honey Resource Area have been considered and will be provided under all alternatives. Based on this information, all alternatives would meet this standard.

4. Evaluate and authorize service by the private sector on National Forest lands that complement National Forest objectives.

This standard applies to outfitters, guides, and concessionaires. As described under "Existing Conditions," there is currently one permittee authorized in the area; this is consistent with Forest Plan objectives.

5. Continue existing private recreation uses of National Forest lands only on lands that are not suitable or not needed for public use, providing that long-term public interest is protected.

There are no existing private recreation uses (such as a leased cabin or resort) provided in the Iron Honey Resource Area, therefore this standard does not apply.

6. Additional recreational sites will not be permitted.

There would be no additional recreation sites permitted under any alternative; therefore all alternatives would meet this standard.

7. Provide a broad spectrum of dispersed and developed recreation opportunities in accord with identified needs and demands. Enhance user experience by on and off-site interpretation.

A broad spectrum of dispersed and developed recreation opportunities are provided in the Iron Honey Resource Area in response to public needs and demands. The Recreation Opportunity Spectrum (ROS) classification system has identified the area as having a "roaded natural setting." The old flume system in Sob

Creek provides the opportunity for interpretive signing, pending availability of funding. None of the alternatives would change the classification for the area, nor the opportunity for interpretive signing; therefore, this standard would be met under all alternatives.

8. On proposed developed sties treat and maintain timber stands in a manner compatible with recreation objectives prior to development.

Current recreation objectives would be maintained under all alternatives, and potential for future recreation developments would be unaffected. Based on this information, all alternatives would meet this standard.

9. Trailhead facilities in dispersed areas will be minor and limited to resource protection. Off-site interpretation is encouraged.

At this time, none of the existing trailheads in the area warrant expansion. It is expected that this will change over time due to the trend of increasing ATV use. At that time, trailheads would be improved to protect natural resources. Improvements normally include informational signing. This trend and the resulting improvements would occur under any alternative; all alternatives would be consistent with this standard.

10. Trails will be managed in accordance with management area requirements as identified in a more site-specific analysis of needs.

The No-Action Alternative would not have any affect on area trails. Under all action alternatives, standards for trails would be met.

11. Cooperate with the State of Idaho in developing a joint management agreement on the Lower Priest River.

The Lower Priest River is not located in the Coeur d'Alene River Ranger District; therefore this standards is not applicable to the Iron Honey Resource Area.

12. Maintain the free flowing characteristics of rivers identified as eligible for consideration as part of the National Wild and Scenic Rivers System pending suitability. Identified rivers will not be modified to the degree that eligibility or classification would be affected.

In 1982, segments of the Coeur d'Alene River and North Fork Coeur d'Alene River were identified as potential recreational river segments under the Wild and Scenic Rivers Act. Based on alternative design features and mitigation measures to protect aquatic resources (Chapter II, 2.6.9 Features Common to All Alternatives, (A) Features Designed to Protect Aquatic Resources; and 2.6.10 Mitigation, (A) Mitigation to Reduce Effects to Aquatic Resources), implementation of any alternative would not modify these river segments to the degree that eligibility or classification would be affected. For additional discussion, please refer to Chapter II (2.2.3 Wild and Scenic Rivers Act of 1968), the recreation effects discussion in this chapter (3.7.3 Environmental Consequences), and the Project Files (Recreation).

13. Maintain free flowing and related characteristics of the Lower Priest River and Moyie River until prescribed guidelines in cooperative agreements or ordinances have been approved per River Study recommendations.

The Lower Priest and Moyie Rivers are not located in the Coeur d'Alene River Ranger District; therefore this standards is not applicable to the Iron Honey Resource Area.

3.8 SCENIC RESOURCES

3.8.1 Regulatory Framework and Methodology

Scenery management direction is provided by the Forest Plan and is described in terms of Visual Quality Objectives. The objectives are based on the area seen from sensitive travel corridors and on other features that result in a high visual sensitivity level. The visual management system was revised in 1995, and is now known as the Scenery Management System. The revised guidelines are provided in "Landscape Aesthetics: A Handbook for Scenery Management," (USDA Forest Service, 1995).

3.8.2 Existing Conditions

The analysis area is typical of the Coeur d'Alene Mountain range, being steep and highly dissected by drainages. Typically the vegetation cover is coniferous which completely covers the slopes and hill tops with a dense dark green cover of trees. With the exception of the high ridge tops of the twin Chilco Peaks, trees cover all ridges and mountaintops. Unnatural-appearing openings have been created in the forest cover in the form of geometrically shaped timber harvest units. These units are in various stages of regenerating a cover of trees. In many units the harsh lines of the harvest units are being softened by regrowth. Many roads cut across the slopes in the area but many of the cuts and fill of these roads are revegetated, thus reducing the visual impact of color contrast between exposed mineral soils and vegetated slopes.

The primary travelway and location of the greatest scenic concern is the forest road that follows the course of the Little North Fork of the Coeur d'Alene River. This road is located in the lower part of the River valley and offers little in the way of panoramic views. For the most part a traveler on this road enjoys foreground views of the Little North Fork and tree-clad slopes adjacent to it. There are only occasional views up into the higher terrain in the valley. The scenic condition along the River is of high concern to summer visitors as there are at least 20 undeveloped campsites along the River and several tributary streams such as Hudlow Creek and Iron Creek.

Another travelway with important scenic attributes is the Chilco Mountain National Recreation Trail. This trail borders the analysis area on the west and offers views mostly to the west. From the Chilco summits there are 360-degree views; numerous old timber harvest units are visible within the area. Views to the north and west are more visually pleasing.

Other roads in the area are secondary travelways where the public is traveling through rather than actually touring the area itself. In the winter there is heavy snowmobile use of the upper slope roads.

3.8.3 Environmental Consequences

Alternative 1

With no harvest action there would be no short-term effects to the scenic condition of the area. Old harvest units would continue to recover tree growth slowly muting the visual effects of tree lines and unnaturally shaped openings. Long term, the increasing vulnerability to wildfire of the area may bring change to the scenic conditions.

Alternative 2

None of the harvest units proposed under this alternative would be visible from key visual points along Road 209 or from the Chilco Mountain summits or Hudlow Creek. They would also not be visible from one mile up from the mouth of Iron Creek. The proposed harvest units would be visible from less sensitive viewpoints along the 794 road and parts of Crooked Ridge Road 258. Although the units would be substantial in size,

they would actually be far less visually impactive than equal acreages of smaller-size openings. Fewer unnatural-appearing geometric shapes and tree lines are created with a "broad brush" approach to units.

Alternative 3

This alternative features small regeneration units that form openings in the timber cover. None of the units would be visible from the key viewpoints along Road 209. None of the harvest units would be visible from the Chilco Mountain summits.

Alternative 5

This alternative would have substantial impact to the visual condition of the area. The numerous large regeneration units would be easily visible from many points and form a substantial contrast with the present visual condition of the area. This alternative would attempt to mimic the effects large-scale fires would have on the land. There is no doubt that fire-influenced landscapes are natural looking and have been accepted culturally as part of the western landscape. The difficulty in this management regimen is how to use mechanical means to simulate a major fire event in the area. The after-effects of logging are characterized by many stumps, skid trails and roads used for timber haul and stand tending.

The visual effects of timber harvest are most obvious when viewed from close range or from foreground viewpoints. The proposed harvest units would viewed from the foreground from North Fork Coeur d'Alene River Road 209 at several points along the way. This effect on the desired natural-appearing visual quality can be muted by leaving and preserving screens of trees along the roadway and in campsites to eliminate the foreground views of the units. The visible parts of these units as seen from Road 209 would be more in the middle ground or background from the key viewpoints and easier to accept as natural openings similar to those that might occur in a major fire. When viewed from the Chilco Mountain summits, the openings would be numerous and become the dominant feature of the scenery. The widespread and large openings would probably mimic fire-burned openings fairly well as they are viewed from a long distance away.

Fire-influenced vegetative landscapes are normal in the Coeur d' Alene and Bitterroot Mountain ranges. The great 1910 fire burned at least one-third of the District and major fires occurred in the next three decades after. The influence of these fires on the scenic condition is less apparent now than it obviously was in the years following the fires. Modern fire fighting techniques have subsequently influenced the scenery by suppression of fire. This activity in itself amounts to an artificial impact to the scenic condition of the Coeur d' Alene Mountains. However, most people accustomed to the unbroken forested landscapes produced by 50 years of fire control will have difficulty accepting the mechanical simulation of fire effects.

Implementation of this alternative would require some mitigation techniques to bring it in to a marginally acceptable range in relation to Forest Plan objectives for visual quality. New units should incorporate old clear-cut tree lines as much as possible to reduce the "hedge" effects that tree line unit boundaries have on the scenery. Foreground views from key visual platforms on Road 209 need to be protected with tree screens or unit boundary setbacks. The main objective would be that most of these units not be seen from the road or campsites along the North Fork. Retained seed trees in the units should be western larch or western white pine to help diversify the color and texture of the future forest in the area.

Alternative 7

This alternative would include the same harvest units as under Alternative 2, except that all units would be harvested using shelterwood harvests. The residual shelterwood trees would have a minor effect in reducing the contrast between harvest units and the surrounding lands; this effect would be lessened as one views them as background or from long distances. The need for screening trees along Road 209 would remain important.

This alternative would add five small clearcut units and some commercial thinning units in the same locations as under Alternative 5. These units would not be observable from the key viewpoints and are of very small scale when compared to the shelterwood units.

Alternative 8

The effects to the visual condition of the area would be similar to that under Alternative 5, although not to the same extent. The large regeneration units would be easily visible from many points and form a substantial contrast with the present visual condition of the area. This alternative would attempt to mimic the effects large-scale fires would have on the land. There is no doubt that fire-influenced landscapes are natural looking and have been accepted culturally as part of the western landscape. The difficulty in this management regimen is how to use mechanical means to simulate a major fire event in the area. The after-effects of logging are characterized by many stumps, skid trails and roads used for timber haul and stand tending.

The visual effects of timber harvest are most obvious when viewed from close range or from foreground viewpoints. The proposed harvest units would be viewed in the foreground from several points along the Little North Fork Coeur d'Alene River Road 209. This effect on the desired natural-appearing visual quality can be muted by leaving and preserving screens of trees along the roadway and in campsites to eliminate the foreground views of the units. The visible parts of these units as seen from Road 209 would be more in the middle ground or background from the key viewpoints and easier to accept as natural openings similar to those that might occur in a major fire.

When viewed from the Chilco Mountain summits, the openings would be numerous and become the dominant feature of the scenery. The widespread and large openings would probably mimic fire-burned openings fairly well as they are viewed from a long distance away. Fire-influenced vegetative landscapes are normal in the Coeur d' Alene and Bitterroot Mountain ranges. The great 1910 fire burned at least one-third of the District and major fires occurred in the next three decades after. The influence of these fires on the scenic condition is less apparent now than it obviously was in the years following the fires. Modern fire fighting techniques have subsequently influenced the scenery by suppression of fire. This activity in itself amounts to an artificial impact to the scenic condition of the Coeur d' Alene Mountains. However, most people accustomed to the unbroken forested landscapes produced by 50 years of fire control will have difficulty accepting the mechanical simulation of fire effects.

Implementation of this alternative would require some mitigation techniques to bring it in to a marginally acceptable range in relation to Forest Plan objectives for visual quality. New units would incorporate old clear-cut tree lines as much as possible to reduce the "hedge" effects that tree line unit boundaries have on the scenery. Foreground views from key visual platforms on Road 209 would be protected with tree screens or unit boundary setbacks. The main objective would be that most of these units not be seen from the road or campsites along the North Fork. Retained seed trees in the units would be western larch or western white pine where available to help diversify the color and texture of the future forest in the area.

3.8.4 Consistency With the Forest Plan and Other Legal Mandates

The Forest Plan identifies specific goals and objectives related to protection of visual (scenic) quality (Forest Plan, pages II-1 and II-4). The following standards (Forest Plan, pages II-25 and II-26) apply to visual management:

1. Meet adopted visual quality objectives (VQO's). Exceptions may occur in unusual situations; these will be identified through the project planning process involving an interdisciplinary team…Mitigation measures should be developed for areas when VQO's are not met.

All alternatives would be consistent with this standard. Alternative 1 would have no short-term visual effects because no openings would be created by timber harvest. Under Alternatives 2, 3 and 7, none of the harvest

units would be visible from the two primary travelways, although some may be visible from less sensitive viewpoints. Alternative 5 and (to a lesser extent) Alternative 8 would have substantial impact to the visual condition of the area, with large regeneration harvest units that would be visible from both primary travelways, as well as several other less sensitive viewpoints. However, implementation of mitigation measures (described in Chapter II, 2.6.9 Mitigation, Mitigation to Reduce Effects to Scenic Resources) would bring these alternatives into compliance with this standard.

2. The visual resource has been evaluated based on visual sensitivity levels assigned to travel routes, use areas, and water bodies in and adjacent to the IPNF. Adjustments in VQO boundaries based on project level analysis will conform to principles in FSM 2380.

There would be no adjustments to VQO boundaries under any alternative; therefore all alternatives would be consistent with this standard.

3.9 FINANCES

3.9.1 Regulatory Framework

Forest Service policy sets a minimum level of financial analysis for timber sale planning (Forest Service Handbook 2409.18, section 32). The level of timber harvest is important not only in providing jobs in the timber industry, but also through indirect and induced impacts on other business sectors as well (Forest Plan, page IV-47). One of the seven major issues for the Forest Plan was community stability (Forest Plan, pages 1-8).

3.9.2 Methodology

This analysis deals only with project-level financial attributes (predicted costs and revenues) of each alternative; and approached the analysis as though each alternative that proposed timber harvesting was a timber sale (or in the case of Alternative 5, three concurrent timber sales). An appraisal was then performed as though each alternative was actually being offered for sale at this time. The analysis was used to ascertain the probability of a timber sale (and therefore the alternative) being financially viable, as well as a tool that compares the alternatives against each other. A summary of that work is contained in the tables under "Financial Consequences." Non-commodity values were not included in this analysis (no economic efficiency analysis was conducted) because effects to the resources that give rise to the non-commodity values are evaluated under the specific resource section. In complying with NEPA, the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are qualitative considerations (40 CFR 1502.23).

Revenues and costs vary by action alternatives due to the level of management activities proposed. A computer program was used to calculate an expected stumpage (i.e. gross bid value) of timber harvested, on a sale-by-sale basis. The program runs the same regression equation that is contained in the Transactions Evidence (TE) appraisal model that is used for appraising actual timber sales. Since the model is based on several independent variables collected from actual bidding on recent similar sales within Region 1 of the Forest Service (northern Idaho and western Montana) production costs for logging and milling are reflected in the predicted rates. The 1999 second-quarter TE version was used for the Iron Honey EIS action alternatives that contain a harvesting feature. The TE appraisal model works in combination with factors unique to the proposed harvest units. The table below displays some of those factors, by alternative. Volume-by-species is another factor used in the TE model; this data is contained in the Project Files (Finances). Typically higher bids are received if there are larger diameter trees, larger sale volumes, no helicopter yarding, shorter distance between mills and harvest units, and higher amounts of desired tree species (such as white pine and cedar).

Table III-49. Site-specific Factors Affecting Expected Stumpage Values

Feature	Alt. 2	Alt. 3	Alt. 5	Alt. 7	Alt. 8
Net Volume (million board feet)	14.8	3.4	45.7	16.2	27.2
Yarding Systems (percent of volume)					
Tractor	18	15	9	17	11
Skyline	82	59	89	78	89
Helicopter	0	26	2	5	0
Average Diameter of Harvested Trees Inches)	14	12	11	13	13

Since the completion of the Iron Honey Draft EIS, in which the financial analysis used the 1999 TE model, the net IPNF average stumpage values rose 30 percent and dropped back to be approximately 20 percent above the 1999-2 TE model average, and presently is rising again. Thus, due to the current uncertainty of the national economy (discussed under section 3.9.3 Existing Conditions, below) and the recent fluctuation in local timber prices, a conservative approach was taken in financial modeling for the FEIS: figures generated by the 1999-2 TE model were used for the predicted stumpage values, but were applied against recent costs, overhead rates, and inflation factors.

Costs (such as road maintenance, fuels reduction and site preparation burning, and planting) were developed based on actual District costs. Road construction and reconstruction costs were also developed and updated based on current costs. Cost estimates are summarized in the tables below; the Project Files (Finances) contain detailed documentation of cost estimates. Net predicted stumpages were calculated by subtracting costs for road construction and reconstruction, reforestation, mitigation and other direct costs from the expected gross stumpage value. The costs of upgrading existing arterial roads (main travel/haul routes), to further reduce long-term risks to the watersheds, are included in the reconstruction costs.

Under the harvesting alternatives, watershed improvement work that sale purchasers could perform was identified, such as upgrading culverts, and/or removing culverts and closing roads. Much of this type of work was made part of the contractual costs because a purchaser can accomplish work more economically, in many cases, than the government can due to lower overhead costs. The necessity of all proposed sale activity work (such as type and extent of fuel treatments, road work, etc) that would be required of the purchaser was continually reviewed during the development and analysis of the alternatives.

Please refer to the Project Files (Finances) to view printouts displaying purchaser costs. A summary of the analysis results are displayed in Table III-51, which also reflects the sensitivity of the alternatives to a timber market turndown. The financial efficiency analysis does not include purchaser costs, which is consistent with Forest Service Handbook 2409.18 (section 32.5).

Quick-Silver (Version 5) software was used to calculate Benefit/Cost ratios and Present Net Values for Table III-52. A 4% discount rate was used, consistent with Forest Service Handbook 2409.18, section 32.25. *Quick-Silver* was developed by J. Michael Vasievich, North Central Research Station, USDA Forest Service. Printouts that resulted from the use of this program are included in the Project Files (Finances).

Non-commodity values were not included in this analysis (i.e., an Economic Efficiency Analysis was not conducted) because effects to the resources that give rise to the non-commodity values are evaluated under the specific resource section. In complying with NEPA, the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are qualitative considerations (40 CFR 1502.23). Analysis of monetary and social impacts on the human population, which in-turn has effects on the greater environment well outside of the analysis area, are appropriate at the Forest Plan level of analysis. What is important in maximizing net public benefits, which cannot be calculated nor assigned monetary values, is " the agency's public involvement and collaborative processes, not its analytical procedures…," (Bartuska, 2000). For additional discussion, please refer to 3.9.5 Consistency With Forest Policy and Legal Mandates.

Table III-50. Cost Estimates for Proposed Activities.

Project Activity	Cost*	Per Unit
Roads: Timber Sale		
Maintenance (during sale)	$0.54	/mile/mbf
Maintenance (presale) (blading roads, brushing cut-slope)	$1,050	/mile
Reconstruction		
a) Brush roadway and cutslope, remove stumps, etc.	$5,000	/mile
b) Upgrade Existing Culverts	$3,100	/each
c) Install & Remove Culverts in Closed Roads	$3,000 - $4,500	/each
d) Install Gates	$500	/each
e) Vent and armor Iron Creek crossing at Horse Haven	$3,000	/each
New permanent road construction	$ 30,000	/mile
New temporary road construction	$ 5,700	/mile
Culvert removal/road storage	$1,300 - $3,500	/each
Fuel Treatment: Purchaser		
Helicopter yarding tops	$40.00	/MBF
Skyline yarding tops	$5.04	/MBF
Slash unmerchantable and brush/prep. for under burning	$100.00	/Acre
Grapple pile slash with a machine (excavator)	$250.00	/Acre
Pile slash at landings:	$667.00	/Acre
Fire line constructed by hand	$101.00	/Chain
Fire line constructed by machine	$55.00	/Chain
Fuel Treatment: Forest Service		
Burn slash at landings:	$100.00	/Acre
Under burn in units for slash reduction and site preparation	$480.00	/Acre
Erosion Control		
Seed skid trails and landings (purchaser)	$59.00	/Acre
Seed and water bar roads	$200.00	/mile
Noxious Weeds Control (Purchaser)	$280.00	/Acre
Essential Regeneration		
Plant (8x8 ft spacing)	$433.00	/Acre
Stocking surveys (3 each per acre planted)	$39.00	/Acre
Watershed Recovery Projects (Road Obliteration and Storage)**		
Full recontouring	$6,000-$11,040	/mile
Partial re-contouring	$4,000-$5,560	/mile
Riparian road r-contouring	$12,000-$27,280	/mile
Removing crossings (cost depends on depth of fill)	$1,500 - $5,000	each
Purchase shrubs	$600	/1000 shrubs
Plant shrubs	$1,500	/acre
Obtaining, delivering and placing logs	$2,000	/ load
Seeding	$300	acre
Installing road closures	$200	each
Watershed Recovery Projects (Stream Stabilization)**		
B Channel	$35	/Ft.
C Channel	$75	/Ft.

** Please refer to the Project Files (Finances) for a discussion of values used for these two factors (without overhead or inflation) and how they were applied.*
*** A site-by-site estimate of costs for road obliteration and storage is provided in the Project Files (Finances).*

3.9.3 Existing Conditions

Within northern Idaho, the Forest Service has been offering for sale 11 to 12 percent of the timber that was on the market the last few years. This figure is down from approximately 33 percent of the timber harvested during the late 1980s to early 1990s; which matched a trend throughout the western U.S. (Keegan III, et al, Page 9). Keegan co-authored Idaho's Forest Products Industry: A descriptive Analysis 1979-1996 (see project files) that provides a detailed look at the causes of the timber market fluctuations, and the effects on both the local and national economy, over the past 20 years. The report also notes that the "net growth of timber on national forests exceeds harvest by several fold…"

Based on recent information at the Forest level (Timber Sale Planning and Analysis System (TSPAS), USDA Forest Service, 1998), each million board feet of timber harvested on the Idaho Panhandle National Forests annually results in a total of approximately 39 jobs and $1,158,000 income for that year. These figures include the impacts associated with harvesting and processing timber, as well as the impacts of Forest Service salaries and investment and the 25% fund expenditures.

Stumpage prices were noticeably down across the United States starting over two years ago, largely due to financial problems in the Asian nations (personal communication with Fred Steward (Keegan et al, 1997, p. 10), USFS Northern Region Economist, and John Carlson, IPNF Timber Sales Contracting Officer, 1999). However, timber markets in the northwest did not seem to have been depressed as much as those in the rest of the United States. This is probably due to the growth that the region experienced; which, for the Idaho Panhandle counties, ranged from approximately 2 to 4 times the national average between 1990 and 1998 (Project Files, Finances). Based on the net IPNF average stumpage values estimated by the R1 TE Appraisal Model(s), this trend seems to have continued through 1999. Local sales of Douglas-fir timber by the Forest Service brought bids averaging $180 per thousand board feet for the Douglas-fir beetle-killed timber. This figure is for sales that contained a high amount of helicopter yarding, and was almost twice the average appraised or advertised rate. However, bidding data from the first portion of 2000 indicated a downturn in local prices.

Several factors affect the timber market throughout a year and from year to year, including interest rate adjustments, trade negotiations with Canada, a recent tax cut, plus the ongoing rate of growth for the local and regional area (Project Files, Finances), a large drop in the timber market is not expected within the next year.

3.9.4 Financial Consequences

Timber Management Financial Viability: Implementing stand-management treatments would depend on having financially viable timber sales that the local forest products industry is willing to purchase. Generating funds to help finance watershed and wildlife projects while having sales that are not below cost is also desirable. For such an analysis, all identifiable costs associated with timber sales (including administration, mitigation, sale preparation, and sale execution) were included.

The following tables provide a summary of the financial appraisal and financial efficiency analysis of each alternative. In Table III-51, the "Difference Between Predicted and Minimum Bid per CCF" values indicate how far the timber market could fall before the funding of the other projects (such as contracted road obliteration, watershed restoration, and road closures for wildlife security) are in jeopardy of not being funded by sale generated monies. Modeling indicates that stumpage for Alternative 3 should not be expected to fund most of the regeneration costs, much less the watershed restoration and wildlife security projects. In the same vein, the market would have to fall twice as far to adversely effect the funding of other projects that are part of Alternatives 2, 7 and 8 than those that are part of Alternative 5. Alternative 8 would have the greatest probability of withstanding a major downturn in the local timber market and still generating funding to achieve the watershed improvements.

Alternatives 2, 7, and 8 resulted in a Benefit/Cost ratio greater than 1, with Alternative 8 having the greatest Benefit/Cost (discounted) ratio of all the alternatives (Table III-52). Alternatives 2 and 7 achieved ratios greater than 1 by not having in-stream work featured in the alternatives (where Alternative 8 does). Stumpage values for Alternatives 2 and 7 were depressed in-part due the amount of helicopter yarding that is feature of the two alternatives. It was expected that Alternative 5 would also have had a benefit/cost (discounted) ratio greater than 1 because of the amount of volume in that proposal. However, this alternative had the smallest average harvested tree diameter (Table III-49), which, when coupled with helicopter yarding requirements and a considerable amount of purchaser contractual watershed work, resulted in a low predicted stumpage. Alternative 8 does not require helicopter yarding and does not require the use (and upgrade) of as many roads as Alternative 5 does. The low stumpage value for Alternative 3 stems from the combination of widely scattered small units that required considerable road work, a high percentage of helicopter yarding, while harvesting the next to the smallest average diameter trees.

No commercial harvesting of trees are associated with Alternatives 1 and 6, thus the benefit/cost ratio of 0.0 is shown for these two alternatives. These alternatives are shown in Table III-52 because there is a planning cost associated with them; and Alternative 6 carries restoration costs (Table III-55). Non-commodity values were not included, nor required (40 CFR 1502.23), in the analysis, or for any of the alternatives, because effects to these resources are evaluated under the specific resource sections.

Below Cost Sales: When viewed as individual potential sales, Alternative 3 would be a below-cost sale (where projected costs for reforestation, planning, field preparation, and sale administration would not be fully covered by projected stumpage). Two of the major reasons why Alternative 3 would result in a below-cost figure are the low total harvest volume and costs associated with upgrading a large number of road miles needed to access widely-scattered small harvest units.

Historically, 25 percent of the gross timber receipts generated by the Coeur d'Alene River Ranger District would go directly to local counties for public schools and roads. Under Public Law 106-393 (Secure Rural Schools and Community Self-Determination Act of 2000), eligible counties have the option continuing to receive their share of the State's payments under the 25 Percent Fund Act (15 USC 500), or electing to receive their share of the average of the three highest 25 percent payments to the State during the period of fiscal year 1986 through 1999.

Definitions

The **stumpage value** reflects the size of timber harvested (average diameter), volume per acre, species composition, planned yarding method (helicopter, skyline, cable or tractor) and hauling distance (on paved and unpaved roads).

Timber sale contractual costs are those costs that are considered in the timber purchaser's bid, which includes contractual requirements. The timber purchaser is billed for Forest Service slash treatment to be completed after the sale. Normally, a timber sale would not have as much road obliteration or reconstruction that is planned for watershed restoration in many of these alternatives. The other contractual items are generally indicative of the type and amount of contractual work required in a timber sale.

The **predicted bid** is the stumpage price, minus the total of the other contractual costs. The estimated bid per hundred cubic feet is calculated by dividing the predicted bid by the estimated volume.

The **Difference Between Predicted and Minimum Bid** was determined by adding the costs of all the contractual items *plus* the cost of stand regeneration and other featured KV projects then subtracting that sum from the predicted net stumpage. The resulting number indicates how much "cushion" is available in the predicted net bid-up before some of the projects would not be funded. In other words, it shows how much the price of a bid could fall, due to market forces, and still cover featured KV work. On a sale-by-sale basis, this number was also used to determine below cost sales; which is when the costs of timber sale contractual items, plus featured projects, are higher than the predicted bid.

Table III-51. Summary of purchaser contractual costs and sensitivity of featured KV project funding to market fluctuations.

	Alt's 1 and 6	Alt. 2	Alt. 3	Alt. 5	Alt. 7	Alt. 8
Total of stumpage (gross predicted high bid) /ccf	0	$5,298,000	$850,000	$17,272,000	$6,082,000	$13,030,000
Total sale contractual costs	0	$2,315,000	$733,000	$9,554,000	$2,525,000	$3,732,000
Total of stumpage minus contractual costs	0	$2,984,000	$77,000	$7,718,000	$3,557,000	$9,298,000
Predicted (net) bid/ccf	0	$101	$10	$78	$106	$162
Total other featured costs (KV, including planting)	0	$1,224,000	$150,000	$3,842,000	$1,248,000	$3,598,000
Stumpage minus contractual and other featured costs	0	$1,760,000	-$73,000	$3,877,000	$2,308,000	$5,700,000
Minimum bid to cover all featured kv projects (/ccf)	0	$41	$19	$39	$37	$63
Difference between predicted and minimum bid (/ccf)	0	$59	-$9	$39	$69	$99

Table III-52. Financial efficiency analysis.

Benefit/Cost Category (unadjusted for inflation)	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Revenue							
Stumpage value (predicted net bid)	NA	$2,984,000	$77,000	$7,718,000	$0	$3,557,000	$9,298,000
Total Present Net Value Revenues	$0	$2,904,000	$76,000	$7,479,000	$0	$3,460,000	$9,033,000
Financial Costs							
Planning	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000
Sale Preparation	$0	$406,000	$93,000	$1,253,000	$0	$445,000	$746,000
Harvest Administration	$0	$52,000	$12,000	$161,000	$0	$57,000	$96,000
Engineering Administration	$0	$24,000	$33,000	$64,000	$0	$41,000	$33,000
Slash disposal/site prep (FS)	$0	$797,000	$137,000	$3,045,000	$0	$832,000	$1,391,000
Reforestation (FS)	$0	$772,000	$130,000	$2,947,000	$0	$804,000	$1,349,000
Road closures for wildlife security (FS)	$0	$16,000	$20,000	$22,000	$0	$22,000	$22,000
Road storage and obliteration for watershed restoration (FS)	$0	$436,000	$0	$177,000	$1,260,000	$422,000	$640,000
In-stream channel work for watershed and fisheries restoration (FS)	$0	$0	$0	$695,000	$1,333,000	$0	$1,586,000
$0.50/MBF to US Treasury	$0	$7,000	$2,000	$23,000	$0	$8,000	$14,000
Total Present Net Value Financial Costs	-$250,000	-$2,847,000	-$722,000	-$9,092,000	-$3,230,000	$2,968,000	-$7,220,000
Present Net Value (Discounted)	-$250,000	$57,000	-$647,000	-$1,613,000	-$3,230,000	$492,000	$1,813,000
Benefit/Cost Ratios	0.00	1.02	0.11	0.82	0.00	1.17	1.25

Direct, Indirect and Cumulative Effects at the Coeur d'Alene River Ranger District Project Area Scale

Alternatives 2, 3, 5, 7 and 8 would produce forest products over both the short and long term; traditional employment opportunities in the woods product industry would be similarly affected. Employment opportunities would also occur from planned restoration under all action alternatives, including Alternative 6.

Alternative 6 does not propose timber sale activities. Trees harvested under this alternative would go

directly to watershed improvement projects located within the analysis area, and would not be offered for bid on the public market. Costs for the removal and transport of the trees, roadwork, and site regeneration would all be carried by appropriated funds and/or grants.

Through the design of the alternatives, a portion of the total watershed recovery work identified in the analysis area (which is best demonstrated by Alternative 6) can be achieved by a sale purchaser (Table III-53) and/or contracts let by the Coeur d'Alene River Ranger District that are funded by expected stumpage revenues (Alternatives 2, 3, 5, 7 and 8). Tables III-53 and III-54 summarize that work by alternative. Due to lower overhead costs, a timber sale purchaser can accomplish the work more economically in many cases than the government can, especially when compared to the overhead collections required in the KV program. Historically, very little appropriated and/or grant monies, which Alternative 6 is entirely dependent upon, have been available for watershed restoration work; especially in the amount necessary to complete the full spectrum of inventoried work. Over the past 10 years (1992-2001), an average of approximately $110,000 of appropriate funds has been available each year to accomplish watershed restoration work across the entire Coeur d'Alene River Ranger District (including administrative costs). As can be seen by the estimated cost of the proposed watershed restoration work (displayed in the tables below), that amount would not come close to the cost of watershed restoration that could be accomplished by the sale purchaser and through the sale of timber (generating KV funds). Despite requests for additional funding, an increase in appropriated funding to accomplish watershed restoration is not expected in the foreseeable future.

Table III-53. Accomplishment of Watershed Restoration Work by Sale Purchaser*

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Cost of culvert upgrades	$0	$21,000	$135,000	$153,000	$0	$90,000	$63,000
Number of culvert upgrades.	0	7	45	51	0	30	21
Cost of stream crossings removed	$0	$11,000	$13,000	$64,000	$0	$12,000	$42,000
Number of stream crossings removed.	0	9	10	49	0	10	30
Total costs	$0	$32,000	$148,000	$217,000	$0	$102,000	$105,000

** The costs listed in the table do not include inflation or overhead. The effects of inflation and overhead factors are demonstrated in Table III-52).*

Table III-54. Accomplishment of Watershed Restoration Work through KV (Other) Contracts Funded by Sale Stumpage

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Cost of road restoration	$0	$145,000	$0	$84,000	$0	$143,000	$228,000
Miles of road restoration	none	44	none	14	none	42	61
Cost of stream crossings removed	$0	$195,000	$0	$60,000	$0	$187,000	$276,000
Number of stream crossings removed	none	108	none	27	none	103	146
Cost of in-stream channel work	$0	$0	$0	$583,000	$0	$0	$1,333,000
Total costs	$0	$340,000	$0	$727,000	$0	$330,000	$1,837,215000

** The costs listed in the table do not include inflation or overhead. The effect of inflation and overhead factors are demonstrated in Table III-52.*

As displayed in the following table, special funding and/or grant monies would be sought for work not accomplished with the funding identified above. Watershed restoration work funded by these monies was not included in the risk reduction analyses because the funding cannot be guaranteed.

Table III-55. Accomplishment of Watershed Restoration Work Through Special Funding and/or Grants*

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Cost of culvert upgrades	$0	$207,00	$0	$0	$228,000	$138,000	$165,000
Number of culvert upgrades	0	31	0	0	38	8	17
Cost of road restoration	$0	$48,000	$219,000	$195,000	$322,000	$48,000	$94,000
Miles of road restoration	0	103	147	133	147	105	86
Cost of stream crossings removed	$0	$410,000	$603,000	$492,000	$616,000	$417,000	$289,000
Number of stream crossings removed	0	217	324	258	334	211	158
Cost of in-stream channel work	$0	$1,333,000	$1,333,000	$750,000	$1,333,000	$1,333,000	$0
Total costs	$0	$2,127,000	$2,258,000	$1,480,000	$2,499,000	$2,067,000	$557,000

Timber harvest from the action alternatives would contribute to continuing operation of local mills, thus, directly and indirectly enhancing the local and state economy through employment and tax revenues. These features would also be enhanced through employment created through the planned restoration activity work outside of the timber sale contracts. Additionally, it is likely that 25 percent of gross timber receipts will go directly to Kootenai and Bonner Counties, Idaho, for public schools and roads (as described in the footnote to Table III-52). It is anticipated that the sale of timber, from National Forest Lands, will have very little effect on the price that private land owners will receive for their timber because the timber in this proposal will be part of the IPNF's normal timber program.

Cumulative Effects

Timber sale(s) offered under Alternatives 2, 3, 5, 7 and 8 would be part of the volume normally offered for sale by the IPNF (described under 3.9.3 Existing Conditions); and would therefore not generate additional timber volume that could adversely affect the regional timber market or private landowners with timber to sell.

Not managing the timber resource in this area (as under Alternatives 1 and 6) would result in a loss of mature timber (of commercial size) to disease and insects and would result in the loss of productivity over the long term. This directly relates to expected future revenues.

The amount of watershed and fishery improvement work accomplished would vary by alternative, with no in-stream work proposed under Alternatives 1, 2, 3 and 7. However, all action alternatives would lower risks to the watersheds through a combination of culvert upgrading or removal, and storage or obliteration of roads. The amount of aquatic improvement work that can be accomplished varies greatly by alternative based on funding availability.

Funding of the Identified Opportunities

Historically, very little appropriated and/or grant monies, which Alternative 6 is entirely dependent upon (Table III-55), have been available for watershed restoration work; especially in the amount necessary to complete the full spectrum of inventoried work. (Please refer to the discussion under “Direct, Indirect and Cumulative Effects at the Coeur d'Alene River Ranger District Project Area Scale”). A change in that funding trend is not expected in the foreseeable future. This observation can be also applied to the probability of funding the other watershed

projects identified in this document as opportunities. The foregoing discussions involving the probabilities of the predicted stumpage bid-ups being realized can be also applied to the funding of the watershed opportunity work that is identified by alternative.

3.9.5 Consistency With Forest Policy and Legal Mandates

Forest-wide goals, objectives, and standards for finances are not specifically addressed in the Forest Plan. This issue is addressed indirectly in the discussion of community stability. Chapter II of the Forest Plan states, "Management activities will continue to contribute to local employment, income, and life-styles. The Forest will be managed to contribute to the increasing demand for recreation and resource protection while at the same time continuing to provide traditional employment opportunities in the woods product industry," (Forest Plan, page II-11). All the action alternatives would meet this Forest Plan direction to varying extents. Even Alternative 6, because of the need for people skilled in the removal, transport, and placement of trees for in-stream work, plus those skilled in road rehabilitation and obliteration work.

3.10 OTHER REQUIRED DISCLOSURES

3.10.1 Potential Conflicts With Plans and Policies of Other Jurisdictions

The following statements are provided to help define the areas of potential differences between the policies, management and enforcement responsibilities of the Forest Service and other agencies.

A. Aquatic Resources

Section 313 of the Clean Water Act requires federal agencies to comply with all federal, state, interstate, and local requirements, administrative authority, process and sanctions with respect to the control and abatement of water pollution. Several state and federal agencies were contacted during scoping, public involvement, and analysis phases of this project (including the U.S. Fish and Wildlife Service, Environmental Protection Agency, Idaho Fish and Game, and Idaho Division of Environmental Quality). There are no major conflicts with other agencies related to this project. The concerns of the above agencies have been considered, and appropriate changes incorporated into the alternative development and analysis process. Please refer to Appendix A for a copy of their comments and information on how their comments were used in the process.

B. Wildlife

The Forest Service and Idaho Fish and Game work together to manage wildlife, but the missions of the two agencies are difference. The Forest Service manages the land and affects wildlife by adjusting cover, forage relationships, or through travel management. The State of Idaho manages the animals, and they affect wildlife by adjusting hunting seasons, bag limits, and enforcing other rules that affect the populations of fish and wildlife. Concerns identified by Idaho Fish and Game have been incorporated into alternative development and analysis, and used to modify alternatives. Their comments and how they were used are displayed in Appendix A.

The Forest Service works with the U.S. Fish and Wildlife Service for the recovery of Threatened and Endangered species. The Fish and Wildlife Service coordinates and oversees all activities relating to Threatened and Endangered species. The Forest Service consults with the Fish and Wildlife Service when Threatened and Endangered species may be affected by a proposed project. The U.S. Fish and Wildlife Service has identified the current list of Threatened and Endangered (and candidate) species that could be present. Based on their list, a Biological Assessment has been prepared and submitted to the US Fish and wildlife Service for their concurrence.

C. Air Quality

The prescribed burning proposed in harvest units and for wildlife habitat enhancement has the potential to affect local air quality. These activities will be conducted in accordance with the State Air Quality guidelines administered by the Idaho Department of Health and Welfare, Division of Environmental Quality. Because prevailing winds in North Idaho affect air quality in Montana, burning is coordinated with the Montana Airshed Committee, a group made up of industry, state and federal agencies, and local health departments.

Diane Riley (Idaho Department of Environmental Quality – Air Quality Division) expressed concern that the issue of air quality was inadequately addressed in the Draft Environmental Impact Statement. NEPA provides for identification and elimination from detailed study those issues which are not significant or which have been covered by prior environmental review. Because use of prescribed fire would be based on smoke management guidelines, current air quality standards would not be exceeded under any alternative (please refer to Appendix A -Public Comments During Review of the Draft EIS, Comment Letter #03). Potential conflicts occasionally exist between National Forest System land management goals and the commitments of State Agencies to clean air. However, there are no conflicts related to this project at this time. For additional information, please refer to the Project Files, Air Quality.

D. Heritage Resources

The laws and policies that govern cultural resource protection on Federal lands are coordinated with the State Historic Preservation Office of Idaho. The policies of the Forest Service and State Historic Preservation Office are consistent. The Coeur d'Alene Tribe was included in scoping and public involvement efforts (no concerns were identified by the Tribe). The Forest Service will continue consultation with the State Historic Preservation Office and Coeur d'Alene Tribe as necessary throughout the project.

3.10.2 Probable Adverse Environmental Effects Which Cannot Be Avoided

Implementation of any of the alternatives would inevitably result in some adverse environmental effects. The severity of the effects can be minimized by adhering to the design features of the alternatives (2.6.9 Features Common to All Alternatives) and mitigation measures (2.6.10 Mitigation).

A. Wildlife

The opening of previously-closed roads would increase the opportunities for foot traffic and potentially ATV use, thereby increasing the vulnerability of some species to hunting and trapping. This would last until such time that the roads are closed and become revegetated. Some wildlife species would be disturbed or displaced during periods of human activity under all action alternatives. The harvesting of some trees would result in a direct loss of reproduction of some nesting birds.

B. Fuels and Fire Behavior

Under the Alternatives 1 and 6, the prolonged buildup of fuel may lead to fires more catastrophic and destructive to the site than typically occurred in the native forest. The combination of new understory trees serving as ladder fuels, continuing accumulation of heavy fuels from down logs and snags all contribute to changes in fuels and towards more severe fire behavior, which in turn threaten future fire control and place neighboring forest ecosystems at risk. The fuel conditions that enable a fast moving wildfire of higher than normal intensity would persist for several decades. Another negative impact from Alternatives 1 and 6 is there would be no reduction in the amount of snags created and their inherent danger to firefighters. Further discussion of these risks is provided in the Chapter III, 3.5 Fire/Fuels discussion.

C. Air Quality

Effects to air quality cannot be avoided. All of the alternatives, including No-Action, have the potential to temporarily impact air quality. There would be potential impact from wildfire smoke under any alternative, and potential impact from prescribed burning under Alternatives 2, 3, 5, 7, and 8. Every effort would be made to limit the impacts of both wildfire and prescribed fire. All prescribed burning operations would be conducted in accordance with Idaho air quality laws and guidelines, as described in Chapter II (2.6.9 Features Common to All Alternatives, (E) Features Designed to Protect Air Quality.

The potential for air quality degradation and reduced visibility increases with Alternative 1 (No Action) and Alternative 6. Existing and increased tree mortality increases the intensity of wildfire. A wildfire under normal summer conditions could prove difficult to control. Consumption of increased fuel loads and understory biomass would increase the amount of smoke emissions under summer conditions. These emissions may remain in the local and surrounding airsheds for a period of a few days to several weeks depending on a wildfire's size and intensity.

Under Action Alternatives 2, 3, 5, 7 and 8, the Forest Service would voluntarily cease prescribed burning activities to avoid violations of State standards. Burning of fuels under prescription would occur primarily in early spring when demand for airspace has been historically low. Activities such as agricultural field burning, other forest residue burning on private lands, residential wood stove use, motor vehicle exhaust, and dust input from the Palouse and Columbia basin are competing uses of the monitored airspace.

D. Recreation and Scenery

There would be a short-term visual impact under Alternatives 2, 3, 5, 7 and 8. Road construction, reconstruction, and closure activities would temporarily affect aesthetics, erosion, wildlife, and public uses of the activity area.

E. Noxious Weeds

Any activity has a risk of introducing and spreading weeds. Vehicle use and travel associated with timber harvesting, road construction and other activities would increase the risk of spread. Design features of the alternatives (Chapter II, 2.6.9 Features Common to All Alternatives, (H) Features Designed to Reduce the Spread of Noxious Weeds) would help reduce but not eliminate the risk of weed spread due to proposed activities under any alternative.

3.10.3 Short-Term Uses And Long-Term Productivity

Short-term uses are generally those that determine the present quality of life for the public. Current activities must not significantly impair the long-term productivity, which refers to the capability of the land to provide resources such as forage, timber products and high quality water.

A. Aquatic Resources

As a result of watershed improvement activities, there would be a short-term increase of sediment during the period of activity, but the long-term benefits of the watershed improvement work would reduce the total potential volumes of sediment entering the stream channels and provide for better channel morphology and floodplain connectivity. Removal of culverts and roads in riparian areas would have the short-term effect of removing streamside vegetation associated with the road fill, but the long-term benefit would be a more natural channel condition and better fish habitat elements (including habitat complexity and large wood recruitment).

B. Forest Vegetation

Long-term, the capability of the land to produce forage, timber and high quality water would not be significantly impaired under any action alternative. Soil productivity would not be compromised beyond Forest Plan soil quality standards under any alternative due to the specific features designed to protect soils (described in Chapter II). Under Alternatives 2, 3, 5, 7, and 8 the diversity of the vegetation would trend toward the historical level because all regeneration areas would be regenerated with site adapted species/seed source and will be dominated by long lived seral species" (2.6.9 Features Common to All Action Alternatives, (B) Features Designed to Improve Vegetation Management). Thus the vegetative resilience to disturbances (such as fire, insects and diseases) would be increased. Also, there would be no change in timber resource land suitability. Use of various regeneration and intermediate treatments to trend species compositions to species with increased resistance to pests and diseases is a major component of all action alternatives except Alternative 3.

In the case of the Idaho Panhandle National Forests, the lack of an adequate seral species seed source in many of the current, altered timber stands would assure long-term failure of vegetative restoration efforts without artificial regeneration of seral species. The present vegetation composition in the analysis area presents long-term fire and fuels consequences. Significant accumulations of additional fuel and increased mortality from forest pest agents result in an increase in snag density. With the pest induced thinning in the overstory, regeneration of species tolerant to insects and disease will begin to occur. This provides the fine fuels necessary for a fast moving fire and the heavy down fuel loadings, contributing to higher than normal fire intensities. These conditions could persist for several decades; combined they present serious safety hazards to firefighters when suppressing fires in affected stands.

C. Recreation

Camping in undeveloped sites in the area would be un-impacted for the most part, except for the short-term disturbances by logging activities due to noise and logging related traffic. Several campsites in Iron Creek east of the airstrip would no longer be accessible by automobile due to stream rehabilitation work in Iron Creek. At this time and for the foreseeable future there are enough sites in the vicinity to compensate for the loss. The affected sites would still be accessible by hiking or possibly trail bikes.

Recreational snowmobile use of harvest openings may take place with Alternatives 2, 5, 7, and 8; however, because of the usual high snows depths and anticipated minimal level of use, this activity may effect individual trees but have minimal effect on vegetation overall. There may also be an opportunity to create snowmobile play areas as a goal for recreation management in the area.

The long-term recreation access goals for the area encompassing the Iron Honey project are to manage for a high degree of motorized vehicle use along designated routes. Several units, particularly those just north of the airstrip might be attractive to ORV users for off-road hill climbs, a situation that would require monitoring and management; and it is possible that large harvest areas, where much of the timber is removed and other vegetation burned off, may become play areas for ORV's. Post timber harvest access will need to be managed in order to inhibit potential soil and vegetative impacts due to ORV travel.

Other than short term disruptions due to logging there would negligible effects to motorized recreation in the area.

D. Scenery

The proposed openings, in conjunction with previously regenerated areas, would create openings on the landscape of the scale and pattern that are more appropriate relative to the historic disturbance regimes for this analysis area. Under Alternatives 2, 3 and 7, none of the harvest units would be visible from the two primary travelways, although some may be visible from less sensitive viewpoints. Alternative 5 and (to a lesser

extent) Alternative 8 would have substantial impact to the visual condition of the area, with large regeneration harvest units that would be visible from both primary travelways, as well as several other less sensitive viewpoints. However, implementation of mitigation measures (described in Chapter II, 2.6.10 Mitigation, Mitigation to Reduce Effects to Scenic Resources) would bring these alternatives into compliance with this standard. The impacts will be most evident in the short term, lessening over time as the grass, brush, and new trees become established and grow taller

E. Wildlife

Disturbance to wildlife and loss of security related to road openings would be minor and short term.

F. Fuels and Fire Behavior

Timber harvest under Action Alternatives 2, 3, 5, 7 and 8 can significantly affect both short and long-term fuel loading. Timber harvest moves unavailable aerial fuels (tops, stems, limbs, needles) into available surface fuels. Thus the risk of crown fire may be reduced while the risk of a surface fire can be increased by moving fuel to the ground. A short term increased fire hazard and risk of ignition from ground activities such as recreation camping, vehicles, recreational hiking, and machinery used in timber harvest may result. Treatments outlined in the mitigation measures such as lopping and scattering of fuels, piling and burning, and underburning in the created fuels can reduce some ignition risk and improve our ability to control wildfire.

3.10.4 Irreversible And Irretrievable Commitment of Resources

Irreversible effects describe the loss of future options and apply primarily to effects of using nonrenewable resources such as minerals or cultural resources, or to those factors that are renewable only over long periods of time (such as soil productivity). Irretrievable effects apply to loss of production, harvest, or use of natural resources. The production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume production (Forest Service Handbook 1909.15-92-1 (05), Definitions).

Fuels and Fire Behavior

Without fuels treatment on sites and restoration of seral species, the chances increase that in appropriate weather, when wildland fires do occur, their intensities and severity could be higher than historic fires. These large and hot fires could result in soil damage through loss of stored nutrients, loss of organics, and reduction of infiltration; with an accompanying loss in potential soil productivity.

3.10.5 Specifically-required Disclosures

A. Effects on Social Groups and Compliance With The Environmental Justice Act

In February 1994, President Clinton signed an Executive Order on environmental justice, requiring federal agencies to conduct activities related to human health and the environment in a manner that does not discriminate or have the effect of discriminating against low-income and minority populations (Project Files, “Environmental Justice”). The Idaho Panhandle National Forests deal with a relatively homogeneous population. In both Kootenai and Shoshone Counties, approximately 96% of the population is white, with 1.5% or less American Indian (“Race in Northern Idaho,” Northern Idaho Socio-Economic Newsletter, April 27, 2001). Other races accounted for less than 1% each. Per capita personal income was approximately $20,698 in Kootenai County, and $17,871 in Shoshone County (“Personal Income in Northern Idaho,” Northern Idaho Socio-Economic Newsletter, October 25, 2000).

Although low-income and minority populations live in the vicinity, activities under the Iron Honey project would not discriminate against these groups. Based on the composition of the affected communities and the cultural and economic factors, the activities that are proposed would have no disproportionately adverse effects to human health and safety or environmental effects to minority, low-income, or any other segments of the population. Please refer to the Project Files (Environmental Justice) for demographic (social and economic) information related to Kootenai and Shoshone Counties and northern Idaho.

B. Effects of Alternatives on Floodplains and Wetlands

Specific riparian goals and objectives have been developed under the Inland Native Fish Strategy (Chapter II, 2.6.9 Features Common to All Alternatives, (A) Features Designed to Protect Aquatic Resources). Standard widths for defining interim Riparian Habitat Conservation Areas were utilized without modification. Categories 3 and 4 both include protective measures for wetlands. Activities would meet or exceed rules and regulations of the Idaho Forest Practices Act and Best Management Practices.

C. Effects of Alternatives on Threatened and Endangered Species

The Coeur d'Alene River Ranger District Wildlife Biologist, Fisheries Scientist, and Botanist evaluated the activities proposed in the Iron Honey Resource Area in regard to Threatened, Endangered and Sensitive wildlife, fish and plant species. Findings are disclosed for each of these resources in Chapter III (3.2 Aquatic Resources, 3.6 Wildlife), Appendix B (Threatened, Endangered and Sensitive Plants) and the Project Files (Aquatic Resources, Wildlife, and TES Plants). Findings are also disclosed in the Biological Assessment and Biological Evaluations (Project Files, Biological Assessments and Evaluations). Threatened species include bull trout, gray wolves, water howellia and Ute ladies' tresses. Spalding's catchfly is identified as a proposed Threatened species. Endangered species include grizzly bear, bald eagle, and Canada lynx. Westslope cutthroat trout are identified as a "species of concern" with respect to section7(c) of the Endangered Species Act.

Based on existing conditions, design features of the alternatives, and mitigation measures, the proposed activities would have no impact or a beneficial impact to bull trout and westslope cutthroat trout at the cumulative effects area scale. The proposed activities may affect but would not likely adversely affect gray wolves. There would be no effect to water howellia, Ute ladies' tresses or Spaldings catchfly. There would be no effect to bald eagles or grizzly bears. The proposed activities may affect but would not likely adversely affect lynx.

D. Energy Requirements and Conservation Potential of Alternatives

The energy required to implement any of the alternatives in terms of petroleum products would be insignificant when viewed in light of production costs and the effect on the regional and national petroleum reserves.

E. Effects of Alternatives on Prime Rangeland, Forest Land and Farm Land

There are no identified prime range, forest or farmlands that would be affected by any of the alternatives. In all alternatives, federal lands would be managed with the appropriate consideration of adjacent lands.

LIST TO WHOM COPIES OF THE DOCUMENT HAVE BEEN SENT

The following is a list of agencies, organizations and individuals to whom this Final EIS has been sent, either on CD or printed copy...This list is based on those people who have provided comments or otherwise indicated an interest in the project, and other agencies as necessary. It is likely that additional copies will be distributed to the public upon request.

Agencies

U.S. Environmental Protection Agency - Richard Parkin
USDI Fish and Wildlife Service, Boise and Spokane Offices
Bonneville Power Administration – Tom Murphy
Idaho Department of Environmental Quality – June Bergquist
Idaho Department of Environmental Quality – Diane Riley
Idaho Department of Environmental Quality – Jack Skille
Idaho Department of Environmental Quality – Dave Stasney
Idaho Fish and Game – Greg Tourtlotte/Chip Corsi

Elected Officials

U.S. Senator Larry E. Craig
U.S. Senator Michael Crapo
U.S. Representative C.L. Otter

Kootenai County Commissioners
Shoshone County Commissioners

Organizations

Alliance for the Wild Rockies – Jennifer Ferenstein/Brian Bishop
American Wildlands – Deborah Kmon
Audubon Society
Brush Bunch
Coeur d'Alene Press – Eric Flowers
Coeur d'Alene Snowmobile Club – Del Kerr
Colorado State Universities Libraries – Judy Smith
Forest Conservation Council
Idaho Forest Industries Association – Stefany Bales, Greg Schildwachter
Idaho Rivers United – Sarah Denniston
Idaho Sporting Congress – Ron Mitchell
Kootenai Environmental Alliance – John Bentley, Mike Mihelich
North Idaho Fly Casters – Earl Frizzell, Ed Hoy
Northwest Machines – Dick Weatherly
Northwest University – H. Paul Friesema
Panhandle Trail Riders Association – Esther Rollis, Michael White
Spokesman-Review – Benjamin Shors
The Ecology Center – Jeff Juel
The Lands Council – Rein Attemann
Trout Unlimited – Charlie Elliot, Troy Trvdy

Individuals

Gil Bate
Al Beauchene
John Bentley
Shireene Hale
Dave Hayes
Ken Matney
Barry Rosenberg
Eric Schubert
Tammy Ulvan

For the convenience of our interested public and in an effort to reduce costs associated with printing and mailing, the Iron Honey Final EIS is also available to the public on the Idaho Panhandle National Forests' internet web page:

http://www/fs/fed/us/ipnf/eco/manage/nepa

LIST OF PREPARERS

There have been many people involved in this project, which has taken several years to near completion. The project was initiated in 1996, but was at times derailed by more pressing concerns, such as responding to the ice storm of 1996 and the Douglas-fir beetle infestation of 1998. Some people have been with the team from the very beginning, while others have only recently become part of the effort. The following are primary members of the project team. There are several more people who contributed to the project in the course of their work – for example, the aquatics crew that gathered stream data and who will implement any watershed restoration projects, the timber crew who gathered site-specific unit information and who will layout any harvest units, and the people who provided similar support during sensitive plant surveys, wildlife surveys, road reconnaissance, and so forth.

Glenn Truscott has been the Team Leader for the project since it began. His education includes a Bachelor of Science degree in Forestry (majoring in Range Management) and another in Wildlife Biology. Glenn has been with the Forest Service since 1972, working in Idaho and Montana as a forestry technician and forester, planning and preparing timber sales, and in fire control. Prior to that, Glenn served in the U.S. Army Corps of Engineers for 10 years as a Commissioned Reserve Officer Small Combat Unit Leader and Biologist.

There are several "resource specialists" on the team, each focusing on a particular aspect or value of the area. We have had two silviculturists on the team, providing information and analyses related to the forests. **Steve Zieroth** started with the team, providing the silvicultural analysis and initial harvest prescriptions. His education includes a Bachelor of Science degree in Forestry. Steve began his career with the Forest Service in 1974, working in California, Colorado, Washington, and Idaho. In 2000, Steve left Idaho for a position as Assistant Fire Manager on a National Forest in Utah.

When Steve left, his replacement on the team was **Joyce Stock**. A certified silviculturist, her education includes a Bachelor of Science degree in Forest Resources. Her career with the Forest Service also began in 1974, working as a forestry technician and forester in Minnesota and Idaho. Prior to that, she worked in private industry as an interpretive naturalist.

There have been three key people addressing the aquatic concerns of the Iron Honey Resource Area. **Ted Geier** has been the lead hydrologist for the team. His education includes a Bachelor of Science degree in Forest Management, a Master's degree in Public and Environmental Policy, and a Doctor of Philosophy Degree (Ph.D.) in Forest Hydrology and Water Quality. He began his career with the Forest Service in 1993 as a hydrologist in Alaska before coming to Idaho. Prior to that, he worked for 3 years as a consultant in private research in northern Minnesota. Ted has recently accepted a job as hydrologist in the Regional Office for the Forest Service's Eastern Region in Milwaukee, Wisconsin.

Throughout the project, Ted has had the support of hydrology technician **John Ruebke**. John has an Associate's Degree in Forest Technology. He began his career with the Forest Service in 1981, working in the fields of planning, timber operations, and hydrology.

An issue closely related to the water resource is protection of fisheries habitat. **Edward Lider** is a certified Fisheries Scientist, and has been a fisheries biologist on the Idaho Panhandle National Forests for several years. His education includes both a Bachelor of Science and Master's degree in Fisheries Management and Limnology (the scientific study of lakes, ponds and streams). His career with the Forest Service began in 1981. In addition to fisheries, he has worked in the fields of hydrology and wildlife in Idaho. Prior to that, he worked for 3 years with the Desert Research Institute as a Research Associate in aquatic ecology in Nevada, Oregon, and California. He also worked in private industry for 3 years as a fisheries biologist and limnologist in Nevada.

The other biologist on the team is **Gail Worden**, who assessed the wildlife species and habitat in the Iron Honey Resource Area. Gail has a Bachelor of Science degree in Wildlife Management. She

began her career with the Forest Service in 1978, and has served her entire tenure in Idaho.

Val Goodnow is the Team's botanist. Val has a Bachelor of Science degree in biology. She began her career with the Forest Service in 1983, and has worked in Idaho in the field of silviculture as well as botany. In addition to addressing Threatened, Endangered and Sensitive plants and their habitat, Val is the Noxious Weed Treatment Coordinator for the District. She identified the sites and methods for noxious weed treatment in the Iron Honey Resource Area.

Jack Dorrell addressed the issues of recreation and scenic resources in the Iron Honey Resources Area. Jack has a Bachelor of Science degree in Recreation Management. He began his career with the Forest Service in 1984, and has worked in Idaho in the fields of recreation, minerals, range, land uses, and watershed resources. Prior to that, he worked in the recreation field for 3 years for the City of Burbank (California), and for 3 years for the State of California. Jack's work in scenery management has been based on training received through the Forest Service.

Dave Brown has conducted the fire and fuels management for the Iron Honey Resource Area project. Dave has a Bachelor of Science degree in Forest Resource Management. He began his career with the Forest Service in 1978, working in the field of Forest Management in Idaho and Oregon. Prior to that, Dave worked for private industry for 5 years in Oregon.

Carl Ritchie has served a dual role on the team, addressing both soils and heritage resources (buildings, sites or other areas or objects that have scientific, historic or social values). Carl has a Bachelor of Arts degree in Anthropology and Archaeology. He began his career with the Forest Service in 1980, working with both heritage resources and soil science in Idaho. Prior to that, he worked for 8 years as a field archaeologist for private industry in California, Nevada, Colorado, and Wyoming.

The issues related to the transportation system in the Iron Honey Resource Area have been addressed by two people. **Dennis Adams** was the engineer first assigned to the team. Dennis has a Bachelor of Science degree in Engineering. He began his career with the Forest Service in 1973, working in engineering and logging systems in both Idaho and Montana. After Dennis retired in 1999, **Dwight Clift** took on the engineering responsibilities for the Iron Honey Resource Area project. Dwight began his Forest Service career in 1970, working as an engineer in both Idaho and Oregon.

Ralph Shepard provided technical support to the team, developing a variety of maps using the Geographic Information System (GIS) and related computer software programs. Ralph has a Bachelor of Science degree in Forest Resource Management. He began his career with the Forest Service in 1977, and has served his entire career in Idaho.

Kerry Arneson is the Writer-Editor for the Iron Honey Resource Area project team, helping to coordinate the analysis and documentation process, as well as the public involvement efforts associated with the project. Kerry began her career with the Forest Service in 1980, working in public information and planning in Idaho, Oregon and Washington. She also worked for the U.S. Army Corps of Engineers for 2 years in their Public Affairs Office in Vicksburg, Mississippi.

The Iron Honey Resource Area project has had a number of people provide guidance and supervision. **Steve Bateman** is the Ecosystems Staff Officer at the Coeur d'Alene River Ranger District. As such, he has provided guidance through the analysis process. Steve has a Bachelor of Science degree in Forestry. He began his career with the Forest Service in 1972. He has worked in forestry and silviculture, fire management, and forest planning in Idaho, Montana, Oregon, California, South Dakota and Minnesota.

The District Ranger is responsible for steering the direction of the team and coordinating the project with the many interested publics. There have been three people in this role since the project began. **Susan Jeheber-Matthews** was the District Ranger at the time the project was initiated. When she transferred, Deputy (and Acting) District Ranger **Jose Castro** stepped into the role. Last spring, **Joe Stringer** accepted the District Ranger position for the Coeur d'Alene River Ranger District, and has since steered the course for the team and the project. Prior to becoming District Ranger, he served as an attorney for the Department of Agriculture's Office of General Counsel, making his home in Ogden, Utah.

LIST OF REFERENCES

The list of references is organized by the following categories:

I. Aquatics
II. Fire, Fuels and Air Quality
III. Finances
IV. Forest Vegetation
V. Noxious Weeds
VI. Recreation, Scenery
VII. TES Plants
VIII. Wildlife

I. Aquatics

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ACRONYMS/GLOSSARY

Acronyms

ATV	All-terrain vehicle
BA	Basal Area
BACT	Best Available Control Technology
BEHAVE	Fire Behavior Model
BF	Board foot*
BMP	Best Management Practices*
CCF	Cunit (hundred cubic feet)*
CDA	Coeur d'Alene
CFR	Code of Federal Regulations*
CNF	Colville National Forest
cfsm	Cubic feet per second per square mile (referring to water flow)
COR	Contractor's Officer Representative
dbh	Diameter at breast height
DEIS	Draft Environmental Impact Statement
DEQ	Department of Environmental Quality
DF	Douglas-fir
EAWS	Environmental Assessment at the Watershed Scale
ECA	Equivalent Clearcut Acres
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAR	Functioning at risk (referring to watersheds)
FEIS	Final Environmental Impact Statement
FFE	Fire and Fuels Extension
FOFEM	First Order Fire Effects Model
FPA	Forest Practices Act
FSH	Forest Service Handbook
FSM	Forest Service Manual
FVS	Forest Vegetation Simulator
GA	Geographic Assessment
GAO	Government Accounting Office
ICBEMP	Interior Columbia Basin Ecosystem Management Project
IDL	Idaho Department of Lands
IDT	Interdisciplinary Team*
IFPA	Idaho Forest Practices Act
IFTNP	Intermountain Forest Tree Nutrition Cooperative
INFS	Inland Native Fish Strategy
IPNF	Idaho Panhandle National Forests
KV	Knutson-Vandenburg Act of 1924
LP	Lodgepole pine
MA	Management Area*
MBF	Thousand Board Foot
MMBF	Million Board Foot
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act*
NFMA	National Forest Management Act
NFS	National Forest System
NPFC	Not properly functioning condition (referring to watersheds)
PFC	Properly functioning condition (referring to watersheds)
PM	Particulate Matter
PP	Ponderosa pine
PWC	Public works contract
Q2	level of instantaneous discharge expected to occur on average of every 2 years (referring to watershed conditions)
Q50	level of instantaneous discharge expected to occur on average of every 50 years (referring to watershed conditions)
R1	Region 1--the Northern Region of the Forest Service
R6	Region 6--the Pacific Northwest Region of the Forest Service
RD	Ranger Distrcit
RHCA	Riparian Habitat Conservation Area*
RMO	Riparian Management Objective
ROD	Record of Decision
RPA	(Forest and Rangeland) Renewable Resources Planning Act
SAF	Subalpine fir
SAM	Sale area map
SCA	Stream Channel Alteration (Act)
SMU	Streamside Management Unit
SMZ	Streamside management Zone*
SPCC	Spill Prevention Control and Countermeasure
SPS	Special project specifications
SWCP	Soil and Water Conservation Practices
TES	Threatened, Endangered and Sensitive
TMDL	Total Maximum Daily Load
TML	Timber Marginal Lands
TSA	Timber Sale Administrator
TSC	Timber Sale Contract
TSI	Timber Stand Inventory
TSP	Total Suspended Particulate
WBP	White-bark pine
WDNR	Washington State Department of Natural Resources
WH	Western hemlock
WL	Western larch
WP	White pine
WQLS	Water Quality Limited Stream
WRC	Western redcedar
WSDFW	Washington State Department of Fish and Wildlife
WSDOE	Washington State Department of Ecology

** These terms are defined in the Glossary below.*

Glossary

A

Activity Fuels. The residue left on the ground after human-caused disturbances.

Aesthetics. Generally, the study, science, or philosophy dealing with beauty and with judgments concerning beauty. In scenery management, it describes landscapes that give visual and sensory pleasure.

Affected Environment. The natural, physical, and human-related environment that exists at the time of the analysis.

Age Class (Scenery/Visual definition). An age grouping of trees according to an interval of years, usually 20 years. A single age class would have trees that are within 20 years of the same age, such as 1 - 20 years or 21 - 40 years.

Air Quality. Refers to standards for various classes of land as designated by the Clean Air Act, P.L. 88-206: Jan. 1978

Airshed. A geographical area that, because of topography, meteorology, and climate, shares the same air.

Alluvial. Materials transported and deposited by water.

Area Transportation Plan. A plan that identifies the transportation facilities needed to manage the lands and resources for a given area.

Armoring. Protective coverings or structures used to displace the erosive force of water. Rip-rapping is a type of armoring.

Aspect. The direction a slope faces. For example, a hillside facing east has an eastern aspect.

B

Background (Visual Distance Zone). That part of a scene, landscape, etc., which is furthest from the viewer; The distant part of a landscape. The IPNF defines background as the landscape area located from three miles to infinity from the observer. The Newport Ranger District defines background as the landscape area located from 4 miles to infinity from the viewer.

Basal Area. Area of the cross section of a tree stem near the base, generally at breast height and inclusive of bark.

Baseline Data. Data representative of a particular base period or concurrent control sample. Normally representative of the undisturbed, undeveloped state.

Best Management Practices (BMP). Practices determined by the State to be the most effective and practicable means of preventing or reducing the amount of water pollution generated by non-point sources, to meet water quality goals.

Big Game. Those species of large mammals normally managed as a sport-hunting resource.

Biodiversity or Diversity. The relative distribution and abundance of different plant and animal communities and species within an area.

Biomass. Total weight or quantity of organic material on a given area over a defined period.

Biophysical Settings. The Newport Ranger District defines biophysical settings as areas with similar vegetation characteristics, fire frequencies, moisture regimes and geological and topographical characteristics. The Newport Analysis Area has five biophysical settings: BS #3 - Douglas-fir/grand fir with tall shrubs; BS #5 - Douglas-fir/grand fir with huckleberry; BS #7 - subalpine fir with forbs and shrubs; BS #11 - western redcedar/western hemlock with forbs and shrubs; and BS #12 - western redcedar/western hemlock on moist bottomlands.

Board Foot (BF). A unit of measurement equal to an unfinished board one foot square by one inch thick.

Broadcast Burn. See Prescribed Burning.

C

Canopy. More or less continuous cover of branches and foliage formed collectively by the crown of adjacent trees and other woody growth. In terms of scenery or visuals, it refers to the part of any stand of trees represented by the tree crowns, usually the uppermost layer of foliage, but it can be used to describe lower layers in a multi-storied forest.

Canopy Closure. The amount of ground surface shaded by tree canopies, as seen from above. Used to describe how open or dense a stand of trees is, often expressed in percent.

Capable Habitat. Wildlife habitat that has the fixed attributes that enable it to produce the habitat requirements for a given species currently or in the future. These fixed attributes are usually soils (or parent material, or landtype), slope, aspect, elevation, and habitat type. The vegetation on the site may not be currently suitable for a given species because of variable stand attributes such as inappropriate seral stage, cover type or stand density. See also Suitable Habitat.

Cavity Habitat. Snags, broken-topped live trees and down logs used by wildlife species that excavate and/or occupy cavities in these trees.

Characteristic. When used in terms of scenery or visuals, this refers to the qualities that constitute a character, that characterize a landscape; a distinguishing trait, feature, or quality; uniqueness; or attribute.

Clearcut Harvest. A stand in which essentially all of the trees have been removed in one operation. Depending on management objectives, a clearcut may or may not have reserve trees left to attain goals other than regeneration.

Climax Vegetation. The culminating stage in plant succession for a given habitat, that develops and perpetuates itself in the absence of disturbance, natural or otherwise (in temperate ecosystems this rarely occupies large portions of the natural landscape because of the frequency of natural disturbances).

Code of Federal Regulations (CFR). The listing of various regulations pertaining to management and administration of the National Forests.

Color. The property of reflecting light of a particular wavelength that enables the eye to differentiate otherwise indistinguishable objects. A hue (red, green, blue, yellow, and so on), as contrasted with a value (black, white, or gray).

Commodity. Commercial item that can be bought, sold, and transported, such as mineral, agricultural, timber or other forest products.

Compaction. Making soil hard and dense, decreasing its ability to support vegetation because the soil can hold less water and air and because roots have trouble penetrating the soil.

Composition (species). The mix of difference species that make up a plant or animal community, and their relative abundance.

Conifer. Any of a group of needle and cone-bearing evergreen trees.

Connectivity. The arrangement of habitats that allows organisms and ecological processes to move across the landscape; patches of similar habitats are either close together or linked by corridors of appropriate vegetation. The opposite of fragmentation.

Contract Provisions. Controls constraints, and/or general direction included in Contracts offered by the Forest Service.

Contrast. A term used in regard to scenery or visuals, referring to the diversity or distinction of adjacent parts, or the effect of striking differences in form, line, color, or texture of a landscape.

Contour map feature. A term used in regard to scenery or visuals, referring to a line drawn on a map that connects points of the same elevation.

Corridor (landscape). Landscape elements that connect similar patches of habitat through an area with different characteristics. For example, streamside vegetation may create a corridor of willows and hardwoods between meadows or through a forest.

Council on Environmental Quality (CEQ). An advisory council to the President, established by NEPA. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

Cover. Vegetation used by wildlife for protection from predators, adverse weather conditions, or in which to reproduce. The different types are identified as hiding cover, thermal cover, and security areas.

Cover/Forage Ratio. The ratio, in percent, of the amount of area in cover conditions to that in forage conditions.

Created Opening. A term used in regard to scenery or visuals, referring to an opening in the forest cover created by the application of even-aged silvicultural practices.

Cross Drain/Ditch. A man made ditch or channel constructed to intercept surface water runoff and divert it before the runoff concentrates to erosive volumes and velocities.

Crown. The part of a tree containing live foliage; treetops.

Crowning. Forming a convex road surface which allows runoff to drain from the running surface to both sides of the road prism.

Cultural or Heritage Resources. The physical remains of human activity (artifacts, ruins, burial mounds, pertroglyphs, etc.) having scientific, prehistoric, or social values.

Cultural Landscape. A term used in regard to scenery or visuals, referring to human-altered landscapes, especially those slowly evolving landscapes with scenic vegetation patterns or scenic structures. Addition of these elements creates a visually pleasing complement to the natural character of a landscape.

Cumulative Effect. The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or nonFederal) or person undertakes such other actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time.

Cunit (CCF). One hundred cubic feet. A measurement for timber volume.

D

Decommissioning. Refers to road obliteration. Partial obliteration includes removal and recontouring of all stream crossings and, as needed, recontouring of unstable fill slopes, cutslope stabilization, ripping the road tread, installation of no-maintenance cross ditches, and revegetation. Full obliteration includes removal of all stream crossings and full recontouring of the entire road prism, introduction of woody debris, and revegetation as needed.

Degraded Watershed. A basin which has suffered environmental damage, resulting in accelerated soil or vegetative loss or chemical contamination to the quantifiable detriment of other resources.

Designated Streams. A stream or portion of a stream identified as warranting special consideration in management decisions and project activities. See also Stream or Streamcourse.

Desired Future Condition. The combination of desirable attributes to be attained in the future through management of the national forest. For scenery management, desired future condition is comprised of interrelated components, including desired travelways, desired use areas, desired landscape character and desired scenic condition.

Desired Landscape Character. A term used in regard to scenery or visuals, referring to the appearance of the landscape to be retained or created over time, recognizing that a landscape is a dynamic and constantly changing community of plants and animals. Combination of landscape design attributes and opportunities, as well as biological opportunities and constraints.

Developed Recreation. Recreation dependent on facilities provided to enhance recreation opportunities in concentrated use areas. Examples are ski areas, resorts and campgrounds.

Dispersed Recreation. Recreation that occurs outside of developed recreation sites; requiring few, if any, facilities or other improvements. Includes such activities as hunting, hiking, viewing scenery and cross-country skiing.

Distance Zones. Landscape areas denoted by specified distances from the observer. Used as a frame of reference in which to discuss landscape attributes or the scenic effect of human activities in a landscape (Immediate Foreground, Foreground, Middleground, and Background).

Distinctive. Refers to extraordinary and special landscapes. These landscapes are attractive, and they stand out from common landscapes.

Disturbance. An event, either natural or human induced, that causes a change in the existing condition of an ecological system.

Dominance Elements. In scenery management, the dominance elements are form, line, color, and texture. They are the attributes that make up the landscape character.

Dominant Human Alterations. In scenery management, dominant human alterations override the natural character of the landscape and are very noticeable.

Down or Downed Wood. A tree or part of a tree that is dead or dying and is laying on the ground.

E

Ecosystem. The organisms of a particular habitat together with the physical environment in which they live; a dynamic complex of plant and animal communities and their associated environment.

Ecosystem/Wildlife Burning. This is the application of prescribed fire to fire-dependent ecosystems in order to meet multi-resource objectives (for example, to improve forage habitat for wildlife).

Ecological integrity. In general, ecological integrity refers to the degree to which the elements of biodiversity and the functions that link them together and sustain the entire system are complete and capable of performing desired functions; the quality of being complete; a sense of wholeness. Absolute measures of integrity do not exist. Proxies provide useful measures to estimate the integrity of major ecosystem components (forestland, rangeland, aquatic, and hydrologic). Estimating these integrity components in a relative sense across the project area helps to explain current conditions and to prioritize future management. Thus, areas of high integrity would represent areas where ecological functions and processes are better represented and functioning than areas rated as low integrity.

Ecosystem management. Using an ecological approach to achieve the multiple-use management of national forests and grasslands by blending the needs of people and environmental values in such a way that national forests and grasslands represent diverse, healthy, productive and sustainable ecosystems.

Edge. The line where an object or area begins or ends. Edge serves to define borders, limits or boundaries. In this analysis, edge often refers to where plant communities meet or where successional stage or vegetation conditions within the plant community come together.

Effects (or impacts). Environmental consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action. Effects may be either direct, which are caused by the action and occur at the same time and place; indirect, which are caused by the action and are later in time or farther removed in distance; but are still reasonably foreseeable, or cumulative.

Endangered Species. Any plant or animal species which is in danger of extinction throughout all or a significant portion of its range. (Endangered Species Act of 1973).

Endemic. The population of plants, animals, or diseases that are at their normal, balanced level, in contrast to epidemic.

Ephemeral Streams. Streams that flow only as a direct response to rainfall or snowmelt events. They have no baseflow.

Epidemic. The population of plants, animals, or diseases that are widely prevalent, and exceed their normal, balanced level, in contrast to endemic levels.

Erosion. Detachment or movement of soil or rock fragments by water, wind, ice, or gravity. Accelerated erosion is much more rapid than normal, natural, or geologic erosion, primarily as a result of the influence of activities of people, animals, or natural catastrophes.

Evident. That which is noticeable, apparent, conspicuous, or obvious.

Existing Scenic Integrity. Current state of the landscape, considering previous human alterations; existing visual condition.

Expected Image. A term used in regard to scenery or visuals, referring to a mental picture of what a person expects to see in a national forest.

F

Feature. A visually distinct or outstanding part, quality, or characteristic of a landscape.

Fines (sediment). Sediment particles smaller than 0.2 inch. Excessive fines can trap newly hatched fish and decrease the amount of water percolating through spawning gravels. High fine sediment loads slow plant growth and reduce available food, oxygen and light.

Floodplain. The lowland and relatively flat areas during adjoining inland waters that are covered by its waters during flooding.

Forage. Vegetation used for food by wildlife, particularly big game wildlife and domestic livestock.

Forage Areas. Vegetated areas with less than 60 percent combined canopy closure of tree and tall shrubs (greater than seven feet in height).

Foreground (Visual Distance Zone). That part of a scene, landscape, etc., which is nearest to the viewer, and in which detail is evident. The IPNF defines foreground as the landscape area located from one-quarter to one-half mile from the observer. The Newport Ranger District defines foreground as the landscape area located from the observer to one-half mile away.

Forest Cover Type. A category of forest usually defined by its dominant vegetation, based on percentage cover of trees (see Timber Type).

Form. Structure, mass, or shape of a landscape or of an object. Landscape form is often defined by edges or outlines of landforms, rockforms, vegetation patterns, or waterforms, or the enclosed spaces created by these attributes.

Fragmentation (habitat). The break-up of a large land area (such as a forest) into smaller patches isolated by area converted to a different land type. The opposite of connectivity.

Frame of Reference. An area or framework against which various parts can be judged or measured.

Fry. Recently hatched fish.

Fuel (fire). Combustible materials present in the forest (dry dead parts of trees, shrubs and other vegetation) which contribute to the intensity of a fire.

Fuel ladder. Vegetative structures or conditions such as low-growing tree branches, shrubs, and other vegetation that can burn readily.

Fuel load. The dry weight of combustible materials per unit area; usually expressed as tons per acre.

Fuelbreak. A strategically-located strip or block of land where the fuel is modified to reduce fire intensity potential. Fuelbreaks are designed to interrupt the continuity of heavy, hazardous fuel so fires burning to them can be readily controlled. They are pre-attack installations that provide safer, easier, and faster control efforts for fighting fire. Generally, this treatment provides holding area and accessibility for fire-suppression forces and reduces potential fire damage to adjacent resources.

Fuels Management. Manipulation or reduction of fuels to meet Forest protection and management objectives while preserving and enhancing environmental quality.

G

Geographic Information System (GIS). An information processing technology to input, store, analyze and display data; a system of computer maps with corresponding site-specific information that can be combined electronically to provide reports and maps.

Gradient. A rate of vertical elevation change per unit of horizontal distance; also called slope.

Group Selection. A method of regenerating uneven-aged stands in which trees are removed and new age classes are established, in small groups.

H

Habitat Type. (Vegetation). An aggregation of all land areas potentially capable of producing similar plant communities at climax.

Hardwoods. A conventional term for the wood of broadleaf trees.

Hazardous Substance. Materials which by their nature are toxic or dangerous to handle or dispose of, such as radioactive materials, petroleum products, pesticides, chemicals and biological wastes.

Hiding Cover. Vegetation capable of hiding 90 percent of a standing adult deer or elk at 200 feet or less. Includes some shrub stands and all forested stand conditions with adequate tree stem density or shrub layer to hide animals. In some cases, topographic features also can provide hiding cover.

High Integrity Area. Those areas within the drainage which are functioning the best in terms of providing security, late successional forests, current carnivore sightings, and key habitats. See also Secondary Integrity Area.

High Scenic Integrity Level. A scenic integrity level meaning human activities are not visually evident. In high scenic integrity areas, activities may only repeat attributes of form, line, color, and texture found in the existing landscape character.

Historical Variation. A term used in regard to scenery or visuals, referring to the range of the spatial, structural, compositional, and temporal characteristics of ecosystem elements during a period specified to represent "natural" conditions.

Human Impact or Influence. A term used in regard to scenery or visuals, referring to a disturbance or change in ecosystem composition, structure, or function caused by humans.

I

Immediate Foreground (Visual Distance Zone). That part of the foreground which is extremely critical for visual detail. The IPNF defines immediate foreground as the landscape area located usually within 400 feet of the observer. The Newport Ranger District defines immediate foreground as the landscape area within the first few hundred feet of the observer, usually within 300 feet of the observer. Distance zones are normally used in project-level planning rather than broad-scale planning.

Improvement Cutting. The removal of less desirable trees of any species in a stand of poles or larger trees, primarily to improve composition and quality.

In-Service. Pertains to activities, actions or personnel within the USDA Forest Service.

Indicator Species. Species of fish, wildlife, or plants adapted to a particular kind of environment, which reflect ecological changes caused by land management activities.

Indirect Effects. Secondary effects which occur in locations other than the initial action or significantly later in time.

Inland Native Fish Strategy (INFS). A decision amending Regional Guides for the Forest Service's Intermountain, Northern, and Pacific Northwest Regions, and Forest Plans for 22 National Forests. The strategy provides interim direction to protect habitat and populations of resident native fish, through riparian management objectives, standards and guidelines, and monitoring requirements.

Instream (flow). Flow of water in its natural setting (as opposed to waters diverted for “offstream” uses such as industry or agriculture. Instream flow levels provided for environmental reasons enhance or maintain the habitat for riparian and aquatic life, with timing and quantities of flow characteristic of the natural setting.

Intactness. A term used in regard to scenery or visuals, referring to something untouched or unaltered, especially by anything that harms or diminishes its character.

Interdisciplinary Approach. Use of one or more individuals representing areas of knowledge and skills focusing on the same task, problem, or subject. Team member interaction provides needed insight to all stages of the process.

Interdisciplinary Team (IDT). A group of two or more individuals, with different training or skills, assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. The members of the team proceed to solution with frequent interaction, so that each discipline may provide insights to any stage of the problem and disciplines may combine to provide new solutions. This is different form a multidisciplinary team, where each specialist is assigned a portion of the problem and their partial solutions are linked together at the end to provide the final solution. The forming of the team, the data collection and analysis, team discussions, interactive evaluation, and joint resolution of the problem in the Interdisciplinary Process.

Intermittent Stream. A stream that flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow.

Irretrievable. Applies to losses of production, harvest, or a commitment of renewable natural resources. For example, some or all of the timber production from an area is irretrievably lost during the time an area is used as a winter sports (recreation) site. If the use is changed, timber production can be resumed. The production lost is irretrievable, but the action is not irreversible.

Irreversible. Applies primarily to the use of nonrenewable resources, such as minerals, or cultural resources, or to those factors that are renewable only over long time spans, such as soil productivity. Irreversible also includes loss of future options.

Issue. A point, matter, or question of public discussion or interest, to be addressed or resolved through the planning process.

Issue Indicator. A specific, measurable element which expresses some feature or attribute relative to an issue.

J

Jackpot Burning. A modified method of broadcast burning used primarily to burn concentrations of fuels where the fuelbed is not continuous.

L

Land Allocation. The assignment of a management emphasis to particular land areas with the purpose of achieving goals and objectives. Land allocation decisions are documented in environmental analysis documents, such as the Forest Plan for the Idaho Panhandle National Forests.

Landform. One of the attributes or features that make up the Earth's surface, such as a plain, mountain, or valley.

Landscape. An area composed of interacting ecosystems that are repeated because of geology, land form, soils, climate, biota, and human influences throughout the area. Landscapes are generally of a size, shape, and pattern which is determined by interacting ecosystems.

Landscape Character. Particular attributes, qualities, and traits of a landscape that make it identifiable or unique.

Landscape Character Goal. A management prescription designed to maintain or modify the existing landscape character to a desired future state. (See Desired Landscape Character.)

Landscape Setting. The context and environment in which a landscape is set; a landscape backdrop.

Landscape Visibility. Accessibility of the landscape to viewers, referring to one's ability to see and perceive landscapes.

Landtype. A unit of land with similar designated soil, vegetation, geology, topography, climate and drainage. The basis for mapping units in the land systems inventory.

Large Woody Debris (LWD). Pieces of woody material derived from tree limbs, boles, and roots in various stages of decay, generally having a diameter of at least three inches and a length greater than three feet.

Lethal fires. Fires that kill 90% or more of the dominant tree canopy. These are often called "stand-replacing" fires. They are commonly crown fires, burning with high severity. In general, lethal fires have long return intervals (140 to 250 years or more apart), but affect large areas when they occur. Local examples of these types of fires would be the Sundance and Trapper Peak Fires of 1967 that burned over 80,000 acres in a relatively short time period during late summer drought conditions. Refer to mixed severity fires and nonlethal fires.

Line. An intersection of two planes; a point that has been extended; a silhouette of form. In terms of landscapes, features such as ridges, skylines, structures, changes in vegetation, or individual trees and branches may be perceived as line.

Line Officer. Management personnel within the Forest Service Organization consisting of: Secretary of Agriculture, Chief of Forest Service, Regional Foresters, Forest Supervisors, and District Rangers. Refers to the line of authority and responsibility.

Log Landing. An area where logs are skidded or yarded prior to loading and transportation to a mill.

Lop and Scatter. Branches are cut from felled trees to a predetermined height then scattered to reduce fuel concentrations. The objective is to re-arrange the fuel so as to eliminate concentrations and break up vertical and horizontal continuity. Generally, this treatment hastens natural decomposition and improves esthetic qualities of the treated area.

Low Scenic Integrity. A scenic integrity level meaning human activities must remain visually subordinate to the attributes of the existing landscape character. Activities may repeat form, line, color, or texture common to these landscape characters, but changes in quality of size, number, intensity, direction, pattern, and so on, must remain visually subordinate to these landscape characters.

M

Maintenance. See Road Maintenance.

Management Area (MA). Geographic areas, not necessarily contiguous, which have common management direction, consistent with the Forest Plan allocations.

Management Direction. A statement of multiple use and other goals and objectives, along with the associated management prescriptions and standards and guidelines to direct resource management.

Management Prescription. A set of land and resource management policies that, as expressed through Standards and Guidelines, trends toward a Desired Future Condition over time.

Management Activity. An activity humans impose on a landscape for the purpose of managing natural resources.

Mature Timber. Trees or an even-aged stand that is capable of reproduction, has attained most of its potential height growth, or has reached merchantability standards. In the context of wildlife, mature forests are those with the characteristics needed to provide habitat for species such as pine marten and pileated woodpecker (generally when the stand is around age 100).

Merchantable timber. Timber that can be bought or sold.

Metapopulation. Clustered, non-contiguous populations that interact at times through geneflow and dispersal.

Middleground. (Visual Distance Zone). The IPNF defines middleground as that part of a scene or landscape which hits between the foreground and background zones. The Newport Ranger District defines middleground as the zone between the foreground and the background in a landscape, usually located from one-half mile to four miles from the observer.

Mitigate. To offset or lessen real or potential impacts of effects through the application of additional controls or actions. Counter measures are employed to reduce or eliminate undesirable or unwanted results.

Mixed Conifer. See Timber Types.

Mixed severity fires. Fires that kill more than 10% but less than 90% of the dominant tree canopy. These fires are commonly patchy, irregular burns, producing a mosaic of different burn severities. Return intervals on mixed severity fires may be quite variable. Refer to nonlethal and lethal fires.

Monitoring and Evaluation. The evaluation, on a sample basis, of Forest Plan management practices to determine how well objectives are being met, as well as the effects of those management practices on the land and environment.

N

National Environmental Policy Act (NEPA) Process. An interdisciplinary process, which concentrates decisionmaking around issues, concerns, alternatives and the effects of alternatives on the environment.

National Forest Management Act (NFMA). Law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring preparation of Regional Guides and Forest Plans, and the preparation of regulations to guide that development.

Natural Disturbance. Periodic impact or natural events such as fire, severe drought, insect or disease attack or wind.

Natural Landscape Character. Landscape character that originated from natural disturbances such as wildfires, glaciation, succession of plants from pioneer to climax species, or indirect activities of humans, such as inadvertent plant succession through fire prevention.

Natural-Appearing Landscape Character. Landscape character that has resulted from human activities, yet appear natural, such as historic conversion of native forests into farmlands, pastures, and hedgerows that have reverted back to forests through reforestation activities or natural regeneration.

Natural Regeneration. Renewal of a tree crop by natural means using natural seed fall.

No-Action Alternative. The No-Action Alternative is required by regulations of the National Environmental Policy Act (NEPA) (40 CFR 1502.14). The No-Action Alternative provides a baseline for estimating the effects of other alternatives. Where a project activity is being evaluated, the No-Action Alternative is defined as one where current management direction would continue unchanged.

Nongame Species. All wild animals not subject to sport-hunting and fishing regulations.

Nonlethal fires. Fires that kill 10% or less of the dominant tree canopy. A much larger percentage of small understory trees, shrubs and forbs may be burned back to the ground line. These are commonly low-severity surface and understory fires, often with short-return intervals (a few decades). Refer to mixed severity and lethal fires.

Nonpoint Source (NPS) Pollution. Diffuse sources of water pollution that originate from many indefinable sources and normally include agricultural and urban runoff, run-off from construction activities, etc. In practical terms, nonpoint sources do not discharge at a specific, single location (such as a single pipe). Nonpoint source pollutants are generally carried over or through the soil and ground cover via stormflow processes. Unlike point sources of pollution (such as industrial and municipal effluent discharge pipes), nonpoint sources are diffuse and can come from any land area. It must be kept in mind that this definition is necessarily general: legal and regulatory decisions have sometimes resulted in certain sources being assigned to either the point or nonpoint source categories because of consideration other than their manner of discharge (for example, irrigation return flows are designated as "nonpoint sources" by law, even though the discharge is through a discrete conveyance).

Normal Operating Season. A portions of a year when normal timber harvesting operations are expected to take place uninterrupted by adverse weather conditions.

Noxious Weeds. Rapidly spreading plants which can cause a variety of major ecological impacts to both agriculture and wild lands.

O

Obliteration. See Road Obliteration.

Observer Position. Specific geographic position in the landscape where the viewer is located. Also known as viewer platform.

Old-growth Forest. Old-growth forests are considered ecosystems that are distinguished by old trees and related structural attributes. They encompass the later stages of stand development that typically differ from earlier stages in characteristics such as tree age, tree size, number of large trees per acre and basal area. Attributes such as decadence, dead trees, the number of canopy layers and canopy gaps are also important, but are more difficult to describe because of high variability. (See also Potential or Recruitment Old Growth.)

Older Capable Habitat. Stands that are nearing the age at which they would provide "suitable" wildlife habitat. Canopy closures in older capable habitat may not currently meet the needs of flammulated owls.

Open Park-Like Stand. A single stratum of large trees is present. Large trees are common. Young trees are absent or few in the understory. Park-like conditions may exist. (Applies to Newport Ranger District Only)

Open Road Density. A measure of the roads accessible to motorized use which affects wildlife, expressed as miles of road per square mile of area.

Outputs. The goods and services produced from and offered on National Forest lands.

Outsloping. Shaping a road to cause drainage to flow toward the outside shoulder (generally the fill slope), as opposed to insloping which encourages drainage to flow to the inside shoulder (generally the cut slope). Emphasis is on avoiding concentrated water flow.

Overstory. The portion of trees in a forest which forms the uppermost layer of foliage.

P

Park-like Structure. Stands with large scattered trees and open growing conditions, usually maintained by ground fires.

Partial Retention. A visual quality objective which, in general, means man's activities may be evident but must remain subordinate to the characteristic landscape.

Pattern. An arrangement of parts, elements, or details that suggests a design or somewhat orderly distribution

Payments to Counties. The portion of receipts derived from Forest Service resource management that is distributed to State and county governments, such as the Forest Service's 25 percent fund payments.

Perennial Streams. Streams that flow continuously throughout the year.

Permittee. Individual or entity that has received a grazing or Special Use Permit from the Forest Service.

Pesticide. A general term applied to a variety of chemical materials including insecticides, herbicides, fungicides and rodenticides.

Pile Burning. Employing top-attached yarding methods, woody debris is removed from a site to a roadside landing or hand-piled on site, where the woody debris can be burned safely and inexpensively. Pile burning is conducted in late fall.

Point Source. Originating from a discrete identifiable source or conveyance.

Pool. Portion of a stream where the current is slow, often with deeper water than surrounding areas and with a smooth surface texture. Often occurs above and below riffles and generally is formed around stream bends or obstructions such as logs, root wads, or boulders. Pools provide important feeding and resting areas for fish.

Population. Spatially-discreet groups of individuals that can freely interbreed.

Potential or Recruitment Old Growth. Stands that do not yet have the characteristics of old growth (as defined under "Old Growth Forests," above), but are being managed to develop those characteristics over time.

Preferred Alternative. The alternative recommended for implementation in an EIS (40 CFR 1502.14).

Prescribed Burning. The intentional application of fire to wildland fuels in either their natural or modified state under such conditions as to allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to further certain planned objectives (i.e., silviculture, wildlife management, reduction of fuel hazard, etc.).

Prescribed Fire. Any fire ignited by management actions to meet specific objectives. Prescribed fire can rejuvenate forage for livestock and wildlife or prepare sites for natural regeneration of trees.

Prescription. Management practices selected and scheduled for application on a designated area to attain specific land and resource management goals and objectives.

Productivity (soil). The capacity of soil to produce plant growth, due to the soil’s chemical, physical and biological properties (such as depth, temperature, water-holding capacity, and mineral, nutrient and organic matter content).

Programmatic Document. An environmental document that establishes a broad management direction for an area by establishing a goal, objective, standard, management prescription and monitoring and evaluation requirements for different types of activities which are permitted. It also can establish what activities are not permitted within the specific area(s). This type of document does not mandate or authorize the permitted activities to proceed.

Project Area. The geographic area defining the scope of this document and the alternatives proposed by it.

Purchaser. The entity which is awarded a USDA Forest Service contract after bidding, usually with competition. As used in timber, the entity which has purchased timber as identified in a timber sale contract.

R

Rain-on-Snow Event. A winter storm that is characterized by precipitation falling as rain, rather than snow, and melting of existing snowpack.

Range of Alternatives. An alternative is one way of managing the National Forest, expressed as management emphasis leading to a unique set of goods and services being available to the public. A range of alternatives is several different ways of managing the Forest, offering many different levels of goods and services.

Range of Variability. The spectrum of conditions possible in ecosystem composition, structure, and function considering both temporal and spatial factors.

Reconstruction. See Road Reconstruction.

Reforestation. The natural or artificial restocking of an area with forest trees; includes measures to obtain natural regeneration, as well as tree planting and seeding.

Regeneration. The renewal of a forest, whether by natural or artificial means. This term may also refer to the young trees themselves.

Residual Stand. Trees remaining standing after some disturbance event, such as fire or logging.

Resilience. The ability of an ecosystem to maintain diversity, integrity, and ecological processes following a disturbance.

Restoration. Actions taken to modify an ecosystem to achieve desired, healthy and functioning conditions and processes. Restoration management activities can be either active (such as control of noxious weeds, thinning of over-dense stands of trees, or redistributing roads) or more passive (more restrictive, hands-off management direction that is primarily conservation oriented).

Restricted Road. A National Forest road or segment which is restricted from a certain type of use or all uses during certain seasons of the year or yearlong. The use being restricted and the time period must be specified. The closure is legal when the Forest Supervisor has issued and posted an order in accordance with 36 CFR 261.

Revegetation. The replacement of vegetative cover which has been harvested or lost due to natural occurrences. Accomplished either through planting or nursery stock or seeding, or through natural processes.

Riffle. Relatively shallow section of a stream or river with rapid current and a surface broken by gravel, rubble, or boulders.

Riparian Areas/Habitats. Areas of land that are directly affected by water, usually having visible vegetation or physical characteristics reflecting this water influence. Streamsides, lake edges, or marches are typical riparian areas.

Riparian Habitat Conservation Areas (RHCAs). Portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems.

Rip Rapping. The use of a large rock, boulders, concrete chunks or similar non-erosive, heavy objects as an armoring device.

Road Maintenance. The upkeep of the entire Forest Development Transportation Facility including surface and shoulders, parking and side areas, structures, and such traffic-control devices as are necessary for its safe and efficient utilization. Maintenance includes needed brushing, blading, and shaping of the road tread, cleaning ditch lines and culvert inlets, drivable waterbars or rolling dips and revegetation.

Road Maintenance Plan. A document schedule and program for upkeep of roads to provide a level of service for the user and protection of resources. There are five levels of maintenance; Level I being the least intense and Level V being the most intensive.

Road Obliteration. There are varying degrees of road obliteration. **Level 1 Obliteration** includes removal and recontour of all stream crossings and, as needed, recontour of unstable fill slopes, cutslope stabilization, ripping the road tread, installation of no-maintenance cross ditches, and revegetation. Obliteration also includes some kind of road closure method such as with a guard rail barrier, gate, an earthen berm, or a short section of full recontour, called "front end" obliteration. Front End Obliteration includes recontouring of the first site distance, or about 250 feet of the road, to stop motorized traffic from entering onto the road. Culverts that pose a high risk of failure because of lack of maintenance would be removed and recontoured concurrently with the closure of the road. **Level 2 Obliteration** includes removal of all stream crossings and full recontour of the entire road prism, introduction of woody debris, and revegetation as needed.

Road Reconstruction. There are varying degrees of road reconstruction. **Light Road Reconstruction** includes, as needed, installation of rolling dips, installation of relief culverts, rolling the road grade for increased drainage, armoring of culvert catch basins and outlets, and adding gravel surfacing. **Heavy Road Reconstruction** includes, as needed, changing the road design, replacing existing stream crossings, cut and fill slope stabilization using gabions or other means, subgrade reinforcements, road prism realignment, and removal of encroaching road fills.

Road Stabilization. Stabilization includes the use of vegetation and geotextiles to control or reduce surface erosion.

Rocking. The application of aggregate to a roadbed to provide strength and a more stable erosion resistant surface.

Runoff. Fresh water from precipitation and melting ice that flows on the earth's surface into nearby streams, lakes, wetlands and reservoirs.

S

Sale Area Map. A map of suitable scale and detail to be legible which part of a timber sale contract. The map identifies sale area boundaries and contract requirements specific to the sale.

Salvage Harvest. The removal of dead trees or trees damaged or dying because of injurious agents other than competition, for the purpose of recovering economic value that would otherwise be lost.

Sanitation Harvest. Removal of dead, damaged or susceptible trees to prevent the spread of pests or pathogens.

Scale. The degree of resolution at which ecological processes, structures, and changes across space and time are observed and measured.

Scenery. General appearance of a place, general appearance of a landscape, or features of a landscape.

Scenery Management. The art and science of arranging, planning, and designing landscape attributes relative to the appearance of places and expanses in outdoor settings.

Scenic. Of or relating to landscape scenery; pertaining to natural or natural appearing scenery; constituting or affording pleasant views of natural landscape attributes or positive cultural elements.

Scenic Attractiveness. The scenic importance of a landscape based on human perceptions of the intrinsic beauty of land form, rockform, waterform, and vegetation pattern. Reflects varying visual perception attributes of variety, unity, vividness, intactness, coherence, mystery, uniqueness, harmony, balance, and pattern. It is classified as a), distinctive; b) typical or common; or c) undistinguished.

Scenic Class. A system of classification describing the importance or value of a particular landscape or portions of that landscape.

Scenic Integrity. State of naturalness or, conversely, the state of disturbance created by human activities or alteration. Integrity is stated in degrees of deviation from the existing landscape character in a national forest. "**Very High**" (unaltered) refers to landscapes where the valued landscape character is intact with only minute, if any, deviations. The existing landscape character and sense of place is at the highest possible level. "**High**" (appears unaltered) refers to landscapes where the valued landscape character appears intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident. "**Moderate**" (slightly altered) refers to landscapes where the valued landscape character "appears slightly altered". Noticeable deviations must remain visually subordinate to the landscape character being viewed. "**Low**" (moderately altered) refers to landscapes where the valued landscape character "appears moderately altered". Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. "**Very Low**" (heavily altered) refers to landscapes where the valued landscape character "appears heavily altered". Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside the landscape being viewed. "**Unacceptably Low**" (extremely altered) refers to landscapes where the valued landscape character being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern or scale from the landscape character.

Scenic Quality. The essential attributes of landscape that when viewed by people, elicit psychological and physiological benefits to individuals and therefore, to society in general.

Scenic Resource. Attributes, characteristics, and features of landscapes that provide varying responses from, and varying degrees of benefits to humans.

Scoping. The procedures by which the Forest Service determines the extent of analysis necessary for a proposed action, i.e., the range of actions, alternatives, and impacts to be addressed, identification of significant issues related to a proposed action, and establishing the depth of environmental analysis, data, and task assignments needed.

Secondary Integrity Area. Those areas which contain slightly higher amounts of mature or old forest when compared to other areas in the drainage, yet are highly fragmented and typically have high total road and open road and/or motorized trail densities.

Security. The inherent protection that provides minimal human disturbance and minimal threat of mortality for species that either avoid human disturbance or are directly threatened by trapping, hunting, and/or other forms of mortality.

Sediment. Any material carried in suspension by water, which will ultimately settle to the bottom. Sediment has two main sources: from the channel area itself and from disturbed sites.

Seed Tree Harvest. The cutting of all trees except for a small number of widely-dispersed trees retained for seed production and to produce a new age class in a fully-exposed microenvironment. Some or all of the shelter trees may be retained after regeneration has become established to attain goals other than regeneration.

Seed Trees With Reserves. Harvest where some or all of the shelter trees are retained after regeneration has become established to attain goals other than regeneration.

Seedlings and Saplings. Non-commercial size young trees, generally occurring in plantations.

Seen Area. The total landscape area observed based upon land-form screening. Seen areas may be divided into zones of immediate foreground, foreground, middleground, and background. Some landscapes are seldom seen by the public.

Sense of Place. A concept that focuses on the subjective and often shared experience or attachment to the landscape emotionally or symbolically. It refers to the perception people have for a physical area with which they interact, whether for a few minutes or a lifetime, that gives that area special meaning to them, to their community, or to their culture.

Sensitivity Level. Measure of people's concerns for the scenic quality of the National Forest. Sensitivity levels are determined for land areas viewed by people who are: traveling through the forest on developed roads and trails; using areas such as campgrounds and visitor centers; or recreating at lakes, streams and other water bodies. There are three sensitivity levels for identifying the different levels of concern a visitor/user has for the visual scenic quality they experience. They are classified as: Level I - Highest Sensitivity, Level II - Average/Moderate Sensitivity, and Level III - Lowest Sensitivity.

Sensitive Species. Those species identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trends in (a) population numbers or density, or (b) habitat capability that would reduce a species' existing distribution.

Seral Stage. The successional developmental phase of a forest stand with characteristic structure and plant species composition.

Shade Intolerant. Tree species which grow best in direct sunlight.

Shade Tolerant. Tree species which can tolerate a shaded environment.

Shape. Contour, spatial form, or configuration of a figure. Shape is similar to form, but shape is usually considered to be two-dimensional.

Shelterwood Harvest. The cutting of most trees in an area, leaving those needed to produce sufficient shade to produce a new age class in a moderated microenvironment.

Shelterwood with Reserves. Harvest unit where some or all of the shelter trees in a shelterwood harvest unit are retained after regeneration has become established to attain goals other than regeneration.

Significant Disturbance. Disturbance of surface resources, including soil, water and vegetation, which has the potential to degrade water quality to a level requiring corrective action.

Site Preparation. A general term for a variety of activities that remove or treat competing vegetation, slash, and other debris that may inhibit the establishment of regeneration.

Site Specific. Pertains to a discernible, definable area of point on the ground where a project or activity would (or is proposed) to occur.

Slash. The residue left on the ground after natural or human-caused disturbance.

Snag. A standing dead tree, usually greater than five feet tall and six inches in diameter at breast height. Snags are important as habitat for a variety of wildlife species.

Soil and Water Conservation Practice (SWCP). The set of practices which, when applied during implementation of a project, ensures that soil productivity is maintained, soil loss and water quality impacts are minimized, and water related beneficial uses are protected. These practices can take several forms. Some are defined by state regulation or Memoranda of Understanding between the Forest Service and the States and thus are recognized as Best Management Practices (BMPs). Others are defined by the Forest Service interdisciplinary teams or described in Forest Service Handbooks for application Forest-wide. Both kinds of SWCP are included in the Forest Plan as Forest-wide standards or are referenced in the plans. A third kind of SWCP is identified by the interdisciplinary team for application to specific management areas; these are included as Management Area Standards in the appropriate management areas in the Forest Plan. A fourth kind, project level SWCPs, are based on site specific evaluations and represent the most effective and practical means of accomplishing the soil and water resource goals of the specific area involved in the project. These project level conservation practices can either supplement or replace the Forest Plan for specific projects. This handbook would aid in the development of the fourth kind of SWCP.

Soil Productivity. The capacity of the soil to produce a specific crop such as fiber and forage, under defined levels of management. It is generally dependent on available soil moisture and nutrients and length of growing season.

Space. A limited extension in one, two or three dimensions or a volume. Expanse of a landscape, such as the floor, walls, and ceiling of an "outdoor room."

Special Use Permit. A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest land for some special purpose.

Specified Road. A forest development transportation system road that is identified in and to be constructed or reconstructed under a Forest Service contract.

Stand. A contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality to be a distinguishable unit.

Stand Composition. The proportion of each tree species in a stand expressed as a percentage of either the total number, basal area, or volume of all tree species in the stand.

Stand Conversions. Application of silvicultural practices that change the species composition of trees in a stand, including planting a variety of species, discrimination against undesirable species during thinning, and other practices that naturally discriminate against undesirable species, such as specific site preparation and harvest methods.

Stand Structure. The horizontal and vertical distribution of components of a forest stand, including the height, diameter, crown layers, and stems of trees, shrubs, herbaceous understory, snags, and down woody debris.

Stocking. The degree to which trees occupy the land, measured by basal area and/or number of trees by size and spacing, compared with a stocking standard; that is, the basal area and/or number of trees required to fully utilize the land's growth potential.

Stream order. It is often convenient to classify streams within a drainage basin by systematically defining the network of branches. Each nonbranching channel segment (smallest size) is designated a first-order stream. A stream which receives only first-order segments is termed a second-order stream, and so on. The order of a particular drainage basin is determined by the order of the principle or largest segment.

Stream morphology. The study of the form and structure of streams.

Streamside Management Zone (SMZ). A designated zone that consists of the steam and an adjacent area of varying width where management practices that might affect water quality, fish, or other aquatic resources are modified. The SMZ is not a zone of exclusion, but a zone of closely managed activity. It is a zone which acts as an effective filter and absorptive sone for sediment, maintains shade, projects aquatic and terrestrial riparian habitats, protects channel and streambanks, and promotes floodplain stability. The SMZ may be wider than the riparian area.

Structural Stages. Category of successional stage based on stand age and tree size class. Three structural stages are used in this analysis. The shrub/seedling/sapling stage includes forest stands that are less than 35 years old; the pole/small to medium stage stands are 36 to 100 years old and the mature/large timber stage stands are over 100 years old.

Structure. How the parts of ecosystems are arranged, both horizontally and vertically. Structure might reveal a pattern, or mosaic, or total randomness of vegetation.

Subordinate. A term used in regard to scenery or visuals, referring to landscape features that are inferior to, or placed below, another in size, importance, brightness and so on. Features that are secondary in visual impact or importance.

Successional Stage. A stage or recognizable condition of a plant community which occurs during its development from bare ground to climax.

Suitable Forest Land. Forest land (as defined in CFR 219.3, 219.14) for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions; for which there is reasonable assurance that such lands can be adequately restocked (as provided in CFR 219.4); and for which there is management direction that indicates that timber production is an appropriate use of that area.

Suitable Habitat. Wildlife habitat that currently has both the fixed and variable stand attributes that enable it to produce the habitat requirements for a given species. Fixed attributes of a stand do not change over time, and may include elevation, aspect, landtype, slope, and habitat type. Variable attributes change over time and may include seral stage, cover type, stand density, tree size, stand age, or stand condition. See also Capable Habitat.

Sustainability. The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

Sustainable. The yield of a natural resource that can be produced continually at a given intensity of management is said to be sustainable.

T

Terrestrial. Pertaining to the land.

Texture. Visual interplay of light and shadow created by variations in the surface of an object. Grain or nap of a landscape or a repetitive pattern of tiny forms. Visual texture can range from smooth to coarse.

Thermal Cover. Vegetation used by animals to modify the adverse effects of weather. A forest stand that is at least 40 feet in height with tree canopy cover of at least 70 percent provides thermal cover. These stand conditions are achieved in closed sapling-pole stands and by all older stands unless the canopy cover is reduced below 70 percent. Deciduous stands may serve as thermal cover in summer, but not in winter.

Thinning. A cultural treatment to reduce the density of trees in a stand, primarily to improve growth and enhance forest health, or to recover potential mortality.

Threatened Species. Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range, and which has been designated in the Federal Register as such. In addition, some States have also declared certain species as Threatened in their regulations or statutes.

Tiering. Refers to the coverage of general matters in broader Environmental Impact Statements or Environmental Assessments with subsequent other related statements in Environmental Assessments incorporated, by reference, the discussions contained in the previous document, solely on the issues specific to the statement subsequently prepared.

Timber Types. A descriptive classification of forestland based on present occupancy of an area by tree species (i.e., lodgepole, mixed conifer). More appropriately called forest cover types, this category is further defined by the composition of its vegetation and/or environmental factors that influence its locality.

Tractor. Any logging system which uses ground-based machines.

Trampling. Fuel is treated by crushing it. Trampling is utilized in areas where fuels are relatively light and the area is limited by slope (usually areas that are harvested with a machine). The objective is to mix fuel with soil to hasten decomposition and provide for nutrient cycling.

Typical or Common Landscape. A term used in regard to scenery or visuals, referring to prevalent, usual, or widespread landscapes within a landscape province. It also refers to landscapes with ordinary and routine scenic attractiveness.

Travel Corridor. The habitat pathway that allows an animal to move from one place to another.

U

Underburning. A prescribed fire method designed to meet various resource objectives where a tree canopy is present and is to be preserved. The treatment reduces woody debris, provides site-preparation for natural or artificially-planted regeneration and eliminates unwanted vegetation. Underburning can also improve wildlife habitat.

Understory. Vegetation (trees or shrubs) growing under the canopy formed by taller trees.

Uneven-age Management. The application of a combination of actions needed to simultaneously maintain continuous high-forest cover. Cutting methods that develop and maintain uneven-aged stands are individual-tree and group selection.

Unique. Unequalled, very rare, or uncommon.

Unplanned Ignition. A fire started at random by either natural or human causes or a deliberate incendiary fire.

Unroaded. Area characterized by its lack of existing roads, but not designated as a Roadless Area or Wilderness.

Unsuitable Forest Land. The IPNF defines unsuitable forest land as lands not selected for timber production in Step II and III of the suitability analysis during the development of the Forest Plan due to: (1) the multiple-use objectives for the alternative precludes *scheduled* timber production; (2) other management objectives for the alternative limit timber production activities to the point where management requirements set forth in 36 CFR 219.27 cannot be met; and (3) the lands are not cost-efficient over the planning horizon in meeting forest objectives that include timber production. Land not appropriate for timber production shall be designated as unsuitable in the Forest Plan.

V

Variety. An intermixture, diversity, or succession of different things, forms, or qualities in the landscape.

Variety Class. A term from the Visual Management System. See "Scenic Attractiveness."

Very High Scenic Integrity Level. A scenic integrity level that generally provides for ecological change only.

Very Low Scenic Integrity Level. A scenic integrity level meaning human activities of vegetative and landform alterations may dominate the original, natural landscape character but should appear as natural occurrences when viewed at background distances.

Viability. In general, the ability of a population of plant or animal species to persist for some specific time into the future. For planning purposes, a viable population is one that has the estimated numbers and distribution of reproductive individuals to ensure that its continued existence will be well distributed in the planning area.

Viewshed. Subunits of the landscape where the visitor's view is contained by topography similar to a watershed.

Visual. A mental image attained by sight.

Visual Absorption Capability. A classification system used to denote relative ability of a landscape to accept human alterations without loss of character of scenic quality.

Visual Quality Objective (VQO). The IPNF defines Visual Quality Objective as a system of indicating the potential expectations of the visual resource by considering the frequency an area is viewed and the type of landscape. The Newport Ranger District defines Visual Quality Objective as a desired level of scenic quality and diversity of natural features based on physical and sociological characteristics of an area, referring to the degree of acceptable alterations of the characteristic landscape. Under the Newport definition, all VQO's except "Preservation" imply that there will be management activities: "**Preservation**": In general, human activities are not detectable to the visitor; usually provides for ecological change only. "**Retention**:" Human activities are not evident to the casual Forest visitor. "**Partial Retention**": Human activities may be evident, but must remain subordinate to the characteristic landscape. "**Modification**": Human activity may dominate the characteristic landscape but must, at the same time, utilize naturally

established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground. "**Maximum Modification**": Human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background. "**Rehabilitation**": A short-term management alternative used to return existing visual impacts that are undesirable or do not meet adopted VQO's to a desired visual quality. "**Enhancement**": A short-term management alternative which is done with the express purpose of increasing positive visual variety where little variety now exists.

Visual Resource. The IPNF defines visual resource as the composite of landforms, water features, vegetative patterns and cultural features which create the visual environment. The Newport Ranger District defines visual resource as the composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

W

Watershed. Entire area that contributes water to a drainage system or stream.

Wetlands. Those areas that are inundated by surface or groundwater with a frequency sufficient, under normal circumstances, to support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated solid conditions for growth and reproduction. Wetlands included marshes, bogs, sloughs, potholes, wet meadows, river overflows, mud flats, seeps and springs.

Windrowing. To pile slash or debris is a row along the contour of the slope.

Wildland Fire. Any non-structure fire, other than prescribed fire, that occurs in the wildland. This term encompasses fires previously called both wildfires and prescribed natural fires.

Wildlife Burning. See Ecosystem/Wildlife Burning.

Wildlife Diversity. The relative degree of abundance of wildlife species, plant species, communities, habitats or habitat features per unit area.

Windthrow. Trees blown over by the wind.

Y

Yarding. A method of bringing logs in to a roadside area or landing, for truck transport. Methods may include forms of skyline cable logging systems, ground-based skidding, balloon, helicopter, etc.

Yield. Measured output; for example, timber yield or water yield.

APPENDIX A
PUBLIC INVOLVEMENT IN ISSUE IDENTIFICATION AND ALTERNATIVE DEVELOPMENT AND MODIFICATION

INTRODUCTION

This appendix provides an overview of public involvement activities, how public comments were analyzed and used in the issue identification and alternative development process. Distribution and review of the EIS is addressed, providing responses to specific comments and displaying copies of all comments received during review of the Draft EIS.

SCOPING AND ISSUE IDENTIFICATION

Public Notices and Outreach

Scoping is an early process for identifying the issues related to the proposed action, and the extent of those issues. The scoping process and comments received during scoping were addressed in the Draft EIS (Appendix A).

Issues Addressed in Detail in This EIS

There are several issues considered as factors in the decision to be made. Some are those that are of sufficient concern to drive development of alternatives to the extent feasible within the physical, biological, and legal limits of forest management. Others were not key in developing alternative concepts, but are important for their value in assessing specific protective measures. These protective measures become features of the alternatives and/or specific mitigation measures. They have been addressed in detail either because the effects will have a bearing on the decision to be made, or because these resources are of interest or concern to the public. These include:

- *Improvement of aquatic resources*
- *Improvement of vegetative resources (including reduced old-growth fragmentation)*
- *Protection of soil productivity*
- *Reduction in risk of wildfire*
- *Protection of wildlife habitat*
- *Recreation opportunities*
- *Protection of scenic values*
- *Financial considerations*

Issues Not Addressed in Detail in This EIS

During the course of this analysis, the public and project resource specialists identified other issues that could be relevant to the proposed project. Each issue was considered by the appropriate team member to determine if/how it is related to the proposal and the level of potential impact. As a result a decision was made either to address the issue in detail in this EIS, or not to address the issue in detail. There were three situations in which an issue was not addressed in detail: 1) the issue is beyond the scope of this project; 2) there will be little or no effect to the issue of concern; or 3) the issue has been effectively addressed through specific alternative features and/or mitigation measures. These include:

- *Threatened, Endangered and Sensitive Plant Species*
- *Noxious weeds*
- *Air quality*
- *Specific Threatened, Endangered and Sensitive wildlife species (grizzly bear, peregrine falcon, boreal toad, Northern leopard frog, Townsend's big-eared bat, and harlequin duck)*
- *Heritage resources*
- *Grazing allotments*
- *Public safety*

For each of these, a brief overview of the issue and the reason for not providing further documentation in the EIS is provided below.

Threatened, Endangered and Sensitive Plant Species

There would be no effect to either of the two Threatened plant species under any alternative. There would be no effect to the proposed Threatened plant species. There are no Endangered plants identified for the Idaho Panhandle National Forests.

While some Sensitive plant individuals may be impacted by implementation of projects on National Forest System lands, cumulatively, these effects constitute insignificant impacts to Sensitive plant populations or suitable habitat. Refer to Appendix B and the Project Files (TES Plants) for supporting information.

Noxious Weeds

The cumulative effects to noxious weeds would be low to moderate under Alternative 5, based on the amount of proposed regeneration harvest, road work, watershed restoration, and prescribed fire. Based on these same factors, the remaining alternatives (including No-Action) would have a low level of cumulative effects. While existing infestations of certain weed species may continue to increase on Federal lands and adjacent private lands, features of the action alternatives would serve to minimize (but not eliminate) the risk of weed spread. Please refer to the "Features Common to All Action Alternatives" discussion in this chapter and the Project Files (Noxious Weeds) for supporting information.

The following table lists roads within the Resource Area that would be treated under contract clause CT 6.27 or equivalent to reduce the risk of weed spread. Weed treatment sites were identified and assigned an identification number in the Coeur d'Alene River Ranger District Noxious Weed Environmental Impact Statement (USDA Forest Service, 2000) as weed infested, with a high priority for treatment.

Table A-1. Noxious weed treatment sites in the Iron Honey Resource Area.

Site	Road #/Location Description	Miles of Proposed Treatment
20	Hayden Creek Road # 437	9.9 mi.
26	Bunco High Drive Road #332	2.9 mi.
28	North Fork Coeur d'Alene River Road #209	1.1 mi.
33	Iron Creek Road # 794	7.4 mi.
	Total	**21.3 mi.**

Air Quality

The Environmental Protection Agency and Idaho Department of Environmental Quality both identified concerns related to protection of air quality. Because the use of prescribed fire would be based on smoke management guidelines, current air quality standards would not be exceeded under any alternative. Over the long term, prescribed fire may reduce total particulates by reducing the risk of large wildfires that cannot be managed for emissions. Supporting information is provided in the Project Files (Air Quality).

Specific Threatened, Endangered and Sensitive Wildlife Species

Grizzly Bear: The grizzly bear is not likely to occur on the district, and the district is not within a recovery area (USFWS 1997, MacCracken and Goble 1994). Grizzly bears were more abundant within the Coeur d'Alene River District historically than they are today. Hudson Bay trapping records show grizzly bears were harvested by early fur trappers in the Coeur d'Alene Mountains, primarily in the northern portion of the Coeur d'Alene Mountains (Geographical Assessment, page 41). Today the basin is influenced by human presence and development through timber harvesting and associated road building, mining, recreation, and urbanization. These changes have influenced the distribution of wildlife species, including the grizzly bear (Coeur d'Alene Geographical Assessment).

Grizzly bears are occasionally sighted in the Coeur d'Alene River Basin, especially in the Upper North Fork area. The most recent sightings occurred in 1995. Both sightings were in the Upper North Fork. No high quality grizzly bear habitat has been identified in the Coeur d'Alene Mountains. The Iron Honey Area does not lie within a recovery area and there have been no sightings of grizzly bears in the area within the last 10 years. The project would not result in the long-term degradation of grizzly bear habitat, nor would any expansion of human settlement occur. In addition, there

would be no increase in unnatural food sources as a result of this project. The implementation of any of the action alternatives would result in a decrease in total road densities after all activities are completed. Based on these conditions, there would be no effect to grizzlies.

Peregrine Falcon: A decline in American peregrine falcon populations began in the 1950s leaving western populations severely depressed (Levine and Melquist, 1996). The Idaho population was essentially extirpated by 1974 (Bechard et al. 1987). In 1982, work to restore this population was begun through the release of captive-produced young using a process referred to as "hacking." Reintroductions of peregrine falcons have occurred in North Idaho. The peregrine falcon was taken off the threatened and endangered species list during the summer of 1999.

Peregrine falcons are known to exist in North Idaho. These birds prefer steep rocky outcrops and cliffs for nesting. They are often associated with water because of the abundant prey base that can be found in wetlands. Besides waterfowl, these birds prey upon a variety of songbirds.

Reintroduction of peregrine falcons has occurred in North Idaho. Surveys along the Clark Fork River in 1996 found an adult pair of peregrines re-occupying a historic cliff near a release site. No successful nesting attempt was observed; however, the pair was observed engaging in courtship activities (Levine, 1996). Another historic but currently unoccupied eyrie lies 3 miles north of the project area in the Bernard Peak area. A peregrine was sighted within the Iron Honey Analysis area in 1993 in the vicinity of Hudlow Saddle. Since there is no known active or historic eyrie within the Iron Honey Analysis Area no further analysis of this species will be done.

Boreal Toad: Boreal toads require shallow water in ponds, lakes or slow-moving streams for breeding sites. This species does not require much aquatic or emergent vegetation in its breeding habitat. After the brief spring breeding season, adult toads leave aquatic habitats and travel to a variety of upland habitats. Radio telemetry research on boreal toads in southern Idaho found that toads can travel up to 2 kilometers (about 1 mile) from their natal ponds; it also showed that toads avoided crossing openings (Bartelt, 1994). Boreal toads in Colorado have been documented traveling up to 2.5 miles away (Loeffler, 1998).

Boreal toads hibernate in the winter in habitats with a high humidity and above-freezing temperatures. Areas that provide shelter for hibernating toads include rodent burrows, beaver dams and slash piles. It is important that toads be able to move among their seasonal habitats. According to Nussbaum et al., optimal habitat probably has moderate to dense undergrowth in more humid regions. The biggest potential barrier to their movements is roads. Steep road cuts can be a barrier to toads moving between seasonal habitats. Juvenile toads are vulnerable to being killed by motorized vehicles when they are dispersing from their natal ponds.

Preliminary analysis shows that inland Native Fish Strategy guidelines concerning riparian habitat conservation areas within 150 feet of the edge of wetlands would prevent sedimentation of toad breeding habitat. Road removal or improvement would benefit toads by eliminating a potential sediment and mortality source near the wetlands. It was determined that there were adequate design criteria to protect boreal toads and their habitat.

Northern Leopard Frog: This species occupies marshes, wet meadows, riparian areas and moist, open woods. Leopard frogs apparently require moderately high ground cover for concealment (Nussbaum et al., 1983, p. 128). Because this species attaches its eggs to aquatic vegetation, it prefers ponds or lakes shores that have fairly dense aquatic and emergent vegetation during the spring egg-laying season. This species probably hibernates in ponds and lakes.

Preliminary analysis shows that Inland Native Fish Strategy guidelines concerning riparian habitat conservation areas within 150 feet of the edge of wetlands would prevent sedimentation of frog breeding habitat. Road removal or improvement would benefit frogs by eliminating a potential sediment and mortality source near the wetland. It was determined that there were adequate design criteria to protect northern leopard frogs and their habitat. Therefore, no further analysis or discussion is needed.

Townsend's Big-eared Bat: These sensitive mammals are found in a variety of habitats, from arid juniper/pine forests to high-elevation mixed conifer forests. Big-eared bats winter in large groups in caves or old mines. They are thought to be very sensitive to human disturbance (USDA Forest Service, 1989). During 1997 surveys on the Sandpoint Ranger District, a maternity site for big-eared bats was found in a mine, indicating that these bats are present on the Idaho Panhandle National Forest. There is an adit within the Iron Honey Resource Area that could provide potential habitat. There would be no impact to the Townsend's big-eared bat under any of the alternatives. No activities would occur in the vicinity of the old mine, nor would the mine be altered.

Common Loon: Loons are totally dependent upon lakes. They prefer large lakes at low elevation. Studies in Montana show that loon nests are always within 5 feet of the water's edge (Skaar, 1990). There is no suitable loon habitat within the Iron Honey Resource Area. There would be no impact to the common loon under any of the alternatives.

Harlequin Duck: Harlequin ducks were sighted on the Coeur d'Alene River and the North Fork of the Coeur d'Alene in 1991. No harlequin ducks were found on the Coeur d'Alene River District during two years of surveys. Most recently a pair of harlequin ducks were spotted in Fern Creek during the summer of 1999. In 1982, harlequin ducks were seen in Tepee Creek. In 1987, there was a pair seen on the east end of the district, northeast of Cathedral Peak in the Coeur d'Alene River. The Idaho Conservation Data Base Center has no record of harlequin sightings in the Little North Fork.

A 1989 study of harlequin duck habitat in North Idaho concluded that one missing element in the Coeur d'Alene Mountains may be boulders and log jams providing mid-stream loafing sites (Groves and Wallen 1988). More recent studies have indicated that stone fly populations may be more important than stream structure in indicating suitability for the harlequin. In this case, sedimentation would have a direct impact upon a stream's suitability for the harlequin. District field personnel have noted that stone fly populations appear to be low in the Little North Fork.

There would be no impact to the harlequin duck or its habitat under any alternative. Implementation of Inland Native Fish Strategy guidelines would insure that harlequin duck habitat would be maintained. The transportation plan to be implemented under all alternatives would have positive impacts upon harlequin habitat since roads would be removed from the bottom allowing for increased long term woody debris recruitment into the stream.

Heritage Resources

In the late 1930's and early 1940's a logging railroad extended up the Little North Fork of the Coeur d'Alene River to Iron and Honey Creeks to facilitate the removal of logs. Flumes were used to transport logs to the rail head, once a common practice across the Coeur d'Alene River Ranger District. Remnants of the flumes can still be found in many drainages in the analysis area, along with sections of the old railroad bed.

The application of streamside buffers to protect riparian zones and fish habitat in and along harvest units will also protect the remnants of the flumes and railroad bed. Over the years much of the railroad bed has been converted to roads and the hillside streams crossed with roads. All instream work sites will be inspected by a certified cultural resource officer before earth-moving work occurs. Sites containing important cultural resources will be assessed for their historical value and be protected as appropriate. A map is provided in the Project Files (Heritage Resources) displaying sites that would need checked after identification of new road locations, should an alternative be selected that includes new road construction.

Any future discovery of cultural resource sites would be inventoried, and protected if found to be of cultural significence. Decisions to avoid, protect, or mitigate inpacts to these sites is in accordance with the National Historic Preservation Act of 1966.

Grazing Allotments

The Iron Honey Analysis Area makes up about 44% of the 48,700-acre Iron-Mokins-North Fork cattle allotment. Forty-five cow/calf pairs are allowed on the allotment from June 1 to September 30. It is anticipated that the alternatives will have very little, if any, effect on the movement nor management of the cattle because there are so few cows using the area and most of their use follows the riparian areas.

The Coeur d'Alene River Grazing Allotments Environmental Assessment is currently in progress, and will address management of the Iron-Mokins-North Fork cattle allotment. The environmental assessment is expected to be completed in 2001. Under the preferred alternative, no additional riparian exclosure fencing needs were identified at this time, though some may be called for in the future pending future surveys for Threatened, Endangered and Sensitive plant species by the District's botanist. Also, no change in stocking levels nor grazing seasons was called for under the preferred alternative; however, utilization standards, in riparian areas especially, would be established by Riparian Management Objectives under the Inland Native Fish Strategy.

Public Safety

Proposed activities would be accomplished utilizing safety standards based on the Forest Service's Health and Safety Code Handbook (FSH 6709.11). Should the selected alternative include road construction and/or reconstruction, the standards and objectives for these activities emphasize safety (please refer to Appendix F and the Transportation Plan in the Project Files). Any timber sale contract would contain safety provisions C6.33 – Safety and C6.332 – Safety (Timber Hauling). These provisions require development and implementation of a traffic control plan and other safety requirements.

ALTERNATIVE DEVELOPMENT AND MODIFICATION

Alternatives Considered in Detail

The project team used the 6-step process outlined in the "Federal Guide to Watershed Analysis - Environmental Analysis at the Watershed Scale" (USDA Forest Service, August 1995) to focus on proposed activity areas, describe current conditions, and identify possible treatment alternatives. Documentation related to the process is provided in the project files ("Alternative Development"). In addition to the No-Action Alternative, five action alternatives were initially developed, with one additional alternative (Alternative 8) developed based on public review and comment on the Draft EIS. These alternatives are discussed in detail in Chapter II.

Alternatives Considered But Eliminated

Three alternative concepts were developed by the project interdisciplinary team and considered during early scoping and project development, but dismissed from further study as explained briefly below.

1. Extensive use of only prescribed fire (Alternative 4)

This alternative would use prescribed fire (without timber harvesting) on a large scale to mimic the large stand-replacing fires that occurred naturally in the ecosystem. Trees that were damaged but still had salvage/economic value would not be harvested. Priority for treatment would be those drainages which have been highly fragmented by past harvests and those drainages dominated by 60 to 100-year old grand fir and Douglas-fir that are showing signs of increased root disease.

This alternative was eliminated from further consideration because it would not meet the purpose and need identified for the area, would result in unacceptable environmental impacts to area resources, and is not economically feasible at this time. The large-scale application of fire would like result in a substantial increase in water yields and would consume commercially valuable timber. Also, disease-resistant white pine would not be restored unless planted in the area. These activities would require a considerable amount of funding, while the financial value of commercial timber in the burned areas would be lost.

2. Extensive use of even-aged harvest units not exceeding 40 acres

An alternative concept was considered that would utilize even-age harvest methods (such as shelterwood, seed tree, and clearcut) and would limit the size of regeneration harvest units to no larger than 40 acres, which is the maximum size allowed unless approved by the Regional Forester (Forest Service Manual 2471.1).

Although extensive use of units 40 acres and less in size would help meet the objective of restoring white pine to the area, it would also lead to more stand fragmentation and would require an extensive road system to allow stand tending in the years to come. One of the objectives stated in the purpose and need is to reduce stand fragmentation (which was largely caused by extensive use of small regeneration units) and at the same time help trend the watershed toward improvement over the long term. Extensive use of a road system for stand tending would not help trend the watershed toward improvement over the long term. Further development of this alternative was halted because additional fragmentation is counter to the purpose and need for the Iron Honey Resource Area.

3. Extensive use of uneven-age management tools

An alternative was considered that would utilize uneven-age harvest methods (those that result in a multiple-storied stand of trees, such as group selection, single-tree selection, and salvage).

One of the objectives stated in the purpose and need is to reduce stand fragmentation and at the same time help trend the watershed toward improvement over the long term. Uneven-age management would help to reduce stand fragmentation. However, this alternative would not help trend the watershed toward improvement over the long term because an extensive road system would be required for stand tending, as entries would occur every 20 years or so; nor would the alternative meet the objective of restoring white pine to the area. Larch and white pine do not survive in the partial shade conditions that result from the use of selection and salvage harvest prescriptions. This alternative was not developed further because it would not meet the purpose and need for the Iron Honey Resource Area.

Public Comments During Review of the Draft EIS

The Draft EIS was released for public review in April 2000. Copies of the Draft EIS were initially mailed to 35 individuals, organizations, and agencies, with additional copies provided upon request. Another 36 copies were distributed to federal agencies as required. A Notice of Availability of the Draft EIS was published in the Federal Register on April 21, 2000. The 45-day public comment period ended on June 5, 2000; however, in order to be as responsive to public concerns as possible, comments received after the end of the comment period were considered and are addressed in this appendix if they were received before final preparation of the document for publication.

A total of 10 letters provided comments based on review of the Draft EIS. Identification numbers were assigned to each:

Organizations:
- #01 John Bentley, Kootenai Environmental Alliance
- #02 Mike Mihelich, Kootenai Environmental Alliance
- #04 Sara Denniston, Idaho Rivers United and Idaho Conservation League
- #07 Jeff Juel, Ecology Center and Alliance for the Wild Rockies
- #10 Troy Tvrdy, Idaho Panhandle Chapter Trout Unlimited

Other agencies:
- #03 Diane Riley, Idaho Department of Environmental Quality
- #05 June Bergquist, Idaho Department of Environmental Quality
- #06 Greg Tourtlotte, Idaho Fish and Game
- #08 Richard Parkin, U.S. Environmental Protection Agency

A letter was also received from Preston Sleeger, USDI Office of Environmental Policy and Compliance (#09), stating that they do not have any comments to offer. There were no comments or concerns identified by adjacent landowners or other individuals.

Although the public identified no new issues, they provided comments that helped to further define the analysis of effects and proposed treatments. Representatives from Trout Unlimited and Idaho Fish and Game provided recommendations that led to the development of a new alternative (Alternative 8).

The team has considered concerns identified by the public and incorporated their recommendations whenever possible. The following briefly identifies the issues of concern and how each was incorporated into or addressed by the alternatives or analyses. In some instances comments have been paraphrased in order to get to the key concerns in the letters. The page number of the comment letter where the specific comment can be found is identified in parenthesis (). All comment letters received during the Draft EIS review period are displayed in their entirety at the end of this appendix.

Concerns identified by John Bentley, Kootenai Environmental Alliance (#01)

Mr. Bentley expressed concerns related to aquatic resources in the Iron Honey Resource Area, especially related to Alternative 5. He recommends implementation of Alternative 6 to maximize watershed recovery.

1 (a). Utilization of the pulse technique as a forest management tool must surely assume it is applied only where the existing watershed is in a proper functioning condition. (Comment letter page 1.) We cannot see how the district can seriously suggest utilizing the pulse approach in the Iron Honey area knowing that this entire stretch of the Coeur d'Alene River is in poor condition and clearly not meeting the goals outlined in the Forest Plan nor meeting NFMA requirements as far as fisheries is concerned. (Comment letter page 4.)

Landscapes within the analysis area and most of the Upper Little North Fork of the Coeur d'Alene River contain a heavily roaded, fragmented matrix that provide neither large blocks of mature/old forest or large areas with potentially long-lived early seral tree species (EIS, page III-112). The Geographic Assessment for the Coeur d'Alene River Basin identified these landscapes as the highest priority for aggressive vegetation restoration. It was recommended that watershed-sized blocks should be regenerated to potentially long-lived early seral tree species (such as rust-resistant white pine, western larch, and ponderosa pine), road densities should be reduced and watersheds restored through timber-related activities (EIS, page III-112).

Alternatives 2, 5, 7 and 8 all include some level of a "pulse" approach. Alternatives 2, 7 and 8, focus on those watersheds that are identified as non-functioning. Implementation of any of these alternatives would result in better conditions that we currently have in those particular watersheds. Alternative 5 represents a more intensive "pulse" approach. The objective of Alternative 5 is to restore vegetation composition and structure to more closely resemble historical patterns within the entire analysis area (EIS, pages II-15, III-112). In response to this and similar comments, the Interdisciplinary Team formulated alternatives that lessened the degree of "pulse" in particular watersheds.

NEPA requires that we examine a reasonable range of alternatives. Given the recommendations of the Geographic Assessment, which is consistent with the findings of the Upper Columbia River Basin assessment, it was reasonable to analyze a "pulse" approach alternative.

1 (b). The FS fails to quantify "viable" fish populations. (Comment letter page 1.) It appears that the IPNF has intentionally avoided or fails to have quantitative data regarding fisheries and their habitat in this Resource Area. (Comment letter page 2.)

"Viable population" is defined in the Glossary as the minimal population level needed to maintain the genetic diversity of a species. The existing fish presence is discussed in Chapter III, section 3.2.3 (D); fish abundance and composition is discussed in section 3.2.3 (E). The analysis of effects to fisheries did not and is not required to quantify number of fish, but focused on potential changes to fish population levels as a result of changing habitat components believed to be influencing the productive potential of the Management Indicator fish species (Westslope cutthroat trout and bull trout) within the planning areas (EIS, Assessment of Environmental Consequences to Fisheries, pages III-11 through III-13). The analysis of direct effects considered changes in stream temperature, habitat diversity, cover complexity, and channel stability. Indirect effects were based on the amount of riparian harvest, sediment delivery risk, increased fish passage, and reduced length of encroaching roads.

1 (c). The EIS avoids disclosing that the upper reaches of the Little North Fork of the Coeur d'Alene River are in very poor condition. There is little site specific or quantifiable data to suggest the true condition of the upper reaches of this river. It is not clear what are the major contributors to water quality and habitat degradation. This DEIS puts major emphasis on roads and stream crossings, but waffles on just how significant canopy openings are in causing watershed problems. (Comment letter page 2.) It is beyond us how Alternative 5 only rates a "negatively impacted" rating in terms of watershed effects (pages 75-76). It is difficult to imagine how major canopy removal can have little cumulative effect on the constant problem in this region of bedload movement. (Comment letter page 3.)

Contrary to this comment, the Purpose and Need for this project is based on the poor conditions in the Little North Fork. Specific conditions in the upper reaches of the Little North Fork Coeur d'Alene River are discussed in the Aquatics section in Chapter III (including Figures III-4 and III-5, which are photographs depicting current conditions) and in Appendix D. These discussions disclose the features of the stream channels and fish habitat, including the following concerns: 1) The catastrophic delivery of sediment to the main channel from repeated failures of the streamside road and infringement of the road in the riparian area; 2) delivery of sediment associated with high densities of road channel crossings; and 3) disturbance of runoff patterns in the headwater areas from timber harvest and road building, resulting in increased water yields and peak flows.

One of the environmental factors considered for each watershed was the level of past harvest (EIS, Environmental Factors Considered for Each Watershed, pages III-10 and III-11). Indicator variables used to measure changes included percent sediment yield and percent peak flow, based in part on proposed timber harvest units. The analysis of direct effects considered changes in stream temperature and habitat diversity (both of which included removal of riparian vegetation through timber harvest), cover complexity, and channel stability. Indirect effects were based on the amount of riparian harvest (affecting canopy), sediment delivery risk, increased fish passage, and reduced length of encroaching roads. Analyses of proposed harvest units included both harvest unit size and method (which provides an estimate of canopy opening). Appendix D discusses at length the effects to aquatic resources as a result of timber harvest-related activities. Additional site-specific information is provided in the Project Files (Aquatics).

The disclosure of effects referred to on pages 75-76 of the Draft EIS relates to the direct and indirect effects at the watershed scale for Iron Creek. The alternative discussions provide an interpretation of the analysis results displayed in Table III-3. The statement, "Iron Creek would be negatively impacted by activities under Alternative 5," is a conclusion, not a rating. Please refer also to Table III-19, "Effects to Management Indicator Species, Alternative 5" and its' associated discussion on page III-66 and III-67.

1 (d). The USFS claims, in behalf of Alternatives 3, 5, and 7 that "The cumulative effects from management activities over the No-Action Alternative would not be measurable at the tributary scale for peak flows or sediment," (Draft EIS, page 82). We presume that this claim is made because of the promised watershed mitigation work that is typically included in these aggressive harvest alternatives. However, it is mystifying how Alternative 5 will produce no measurable increase in peak flows or sediment, regardless of the fact that they confine this benign prediction to the tributary scale. (Comment letter page 4.)

The analysis of effects to aquatic resources evaluated the Upper Little North Fork of the Coeur d'Alene River and its tributaries at three scales:

1) *The local site or tributary;*
2) *the cumulative effects scale of the project area (from the headwaters of the Little North Fork to just below its confluence with Hudlow Creek), and*
3) *an extended cumulative effects area (from the headwaters of the Little North Fork to its confluence with Skookum Creek).*

The information on page 82of the Draft EIS applied to the local site or tributary scale, specifically the 1,408-acre Lewelling Creek watershed. Under Alternative 5, only 18 acres of thinning would occur in the Lewelling Creek watershed (approximately 2% of the watershed acres); no clearcutting or shelterwood harvests are proposed there (page III-37).

Elsewhere in the Iron Honey Resource Area, clearcutting with reserves would occur on approximately 34% of the acres (a total of 675 acres) in the Hudlow watershed (page III-34)) and thinning would occur on approximately 6% of the acres (123 acres) in the Tom Lavin watershed (page III-36). The remainder of the harvest proposed under this alternative (3,519 acres) would be shelterwood, distributed throughout several drainages.

At the tributary scale, both percent sediment yield and peak flow would increase under Alternative 5 in all of the watersheds except Lewelling (as discussed above) and the Face Drainages of the Little North Fork Coeur d'Alene River (both percent sediment yield and peak flow would decrease). Refer to the disclosure of effects in the EIS (3.2.4 (B) Effects to Aquatic Resources at the Watershed Scale") for a discussion of these effects at the tributary scale.

At the Iron Honey project area cumulative effects scale (Hudlow Creek and above) as well as at the extended cumulative effects scale (Skookum Creek and above), sediment yields and peak flows would both increase under Alternative 5 (EIS, page III-66 through III-68).

1 (e). There is a disparity in the ECA figures in the Draft EIS versus Barney Rubble's Cabin EA (specifically in the Lewelling, Hudlow, Iron and Tom Lavin watersheds). (Comment letter page 4.)

There is a difference in figures because there were different ongoing and reasonably foreseeable activities included in the cumulative effects analyses for the two documents. For example, the Barney Rubble's Cabin Environmental Assessment included a proposed timber sale (Tom Jessie) in the cumulative effects watershed analysis, which would have been located in the Lewelling and Tom Lavin watersheds (Barney Rubble's Cabin EA, page III-19). The Iron Honey analysis did not include this sale, because it was dropped several years ago and is no longer reasonably foreseeable. The Iron Honey Draft EIS included in its cumulative effects analysis several timber sales and other activities that are either active or reasonably foreseeable, but which were not foreseeable at the time the Barney Rubble's Cabin Environmental Assessment was completed in 1992. Please refer to the discussion of Reasonably Foreseeable Activities in Chapter II (2.4 Ongoing and Reasonably Foreseeable Activities).

1(f). The EIS contains no fish population inventories, pool frequencies and volumes, width/depth ratios, water temperatures or any other quantitative information that was so liberally offered in older EA's of this general area. Has any monitoring data been collected regarding fish populations? (Comment letter page 6.)

The Project Files(Aquatics) contain specific data regarding fish population inventories, pool frequencies and volumes, width/depth ratios, and other survey data. The data was used to provide the watershed descriptions in the EIS (Chapter III). The more detailed information was not included in the EIS because there would be a voluminous amount of data associated with the number of watersheds covered by this analysis. All project file information is available for review by the public upon request (EIS, page I-6).

Fish population data has been collected in conjunction with Idaho Fish and Game, University of Idaho, and the USDA Forest Service Intermountain Research Station. The primary focus on these surveys has been Westslope cutthroat trout and bull trout. Idaho Fish and Game has snorkel survey transects located in the Little North Fork Coeur d'Alene from Laverne Creek to Deception Creek. Results of fisheries-related monitoring and surveys are published in the Forest's annual "Forest Plan Monitoring and Evaluation Report." Please refer to Chapter III, "3.2.3 (E) Fish Abundance and Composition."

1 (g). The 1987 Forest Plan makes a number of commitments to maintain good fishery habitat and native fish in quantities appropriate for this size and type of stream. However, very little reference is made in the EIS to the goals stated in the current Forest Plan. Federal regulations and Forest Plan goals are not being met or remotely adhered to. The record fails to indicate any meaningful or significant mitigation work since prior EA's were published (1992) and would appear that the subject watershed has continued to decline in terms of habitat. (Comment letter page 6.)

Forest Plan goals (as well as other Forest policy and legal mandates) for aquatic resources are discussed in Chapter II under "2.2 Policy Direction and Legal Guidance" and in Chapter III (3.2.1 Regulatory Framework). Consistency with the Forest Plan as amended by the Inland Native Fish Strategyand other legal requirements are disclosed under "3.2.5 Consistency With Forest Policy and Other Legal Mandates." The ongoing activities that have been completed since distribution of the Draft EIS are briefly described in Chapter II (2.4 Ongoing and Reasonably Foreseeable Activities). Activities completed prior to analysis were addressed by the existing condition. The Project Files (Aquatics) contain a map displaying watershed restoration projects that have occurred in the area in the past.

1 (h). Every effort should be directed toward mitigating the sources of peak flow problems. (Comment letter page 7.)

All action alternatives incorporated specific design features to protect aquatic resources and help to minimize impacts ("2.6.9 Features Common to All Action Alternatives, (A) Features Designed to Protect Aquatic Resources). These include measures to minimize increases in percent peak flow. A comparison of peak flow under each alternative is provided in Chapter II (Figure II-7). The methodology used to determine percent peak flow is described in Chapter III (Aquatics, 3.2.2 Methodology).

Water yield and peak flow are projected to increase anywhere from 1 to 3% under the action alternatives, as displayed in the "Projected Watershed Response" tables in Chapter III, Aquatics, and in the tables displaying cumulative effects (Tables III-22 and III-23). The modeled increases would peak immediately following harvest and progressively decline to pretreatment levels, representing an interruption in the current recovery of peak flows of approximately 5 to 9 years. It is promoted by some people that peak flows are the root of the stream degradation in this area. Although peak flows are an important analysis indicator, both the Geographic Assessment and this analysis point to bedload and in-stream sediment as the major chronic problem in the Iron Honey streams. Therefore, the watershed restoration efforts deal primarily with removal of crossings, and encroaching road segments, which will reduce flow velocities and peak flows at local sites, as well as providing other long-term benefits. The benefits of restoration considerably outweigh the risks associated with management activities and would compensate for any delay in recovery (Chapter III, Aquatics,Effects by Watershed).

Concerns identified by Mike Mihelich, Kootenai Environmental Alliance (#02)

Mr. Mihelich expressed concerns primarily related to methodology, and recommends selection of Alternative 6.

2 (a). The Final EIS must supply an in-depth discussion of how the "Net Associated Sediment Risk" model works, describe the features of the model that show this model is scientifically superior to rain-on-snow and RASI analysis, and state the date, year and month, of the most recent calibration of, and validation of the WATSED model. (Comment letter page 1.)

A resport of the Risk Analysis model with references and sample calculations is found in the Project Files. The Risk Analysis is based on 1) field data from road inventories, 2) a hydrologic model developed from IPNF gauge data, and 3) standard engineering calculations for estimating the probability of culvert failure (page 180 of the report).

The Risk Analysis model is superior to the Rain-on-Snow (ROS) model for effects analysis. The write-up consists of three pages on how to run the model, but no documented scientific basis. The coefficients in the model were "based on best professional judgment, and are subject to revision as more field data becomes available (page 2 of the report)." ROS was never field-validated nor calibrated. It used arbitrary weights to produce multipliers for adjusting water yield estimates from models such as WATSED (page 2 of the report). The coefficients appear to be based on research conducted in the western Cascades of Oregon, but the link between the model and the research was not documented. The Risk Analysis is based on measured sediment sources, is specific to hydrologic data from the IPNF, and uses stochastic methods to estimate effects.

The Riffle Stability Index (RASI) model evaluates channel stability by comparing the particle size distribution of riffles to the substrate composition of point bars. The model was designed for evaluating stream condition. It is not applicable to effects analysis because there is no connection between upstream sediment sources and downstream effects. The Risk Analysis evaluates specific sediment sources and the probability that these sources will impact the stream system.

WATSED was calibrated for the IPNF in 1991. In 1999, WATSED results were compared with IPNF gauge data (IPNF 1999 Forest Monitoring Report). The need to re-calibrate the model was not demonstrated on the Coeur d'Alene River Ranger District. WATSED was fairly accurate in predicting flow, but overestimated sediment (Project Files, Aquatics, WATSED reports. pages 4-6). WATSED is sufficient for its intended use: it provides a consistent method for comparing management alternatives. It is not designed to exactly predict flow and sediment yield. WATSED is one of several analysis tools used to formulate and support professional judgment.

2 (b). Due to the failure of the WATSED model to accurately account for the delivery of coarse material to stream channels, the estimates given for Annual Sediment and Current Sediment Load Modification (percent) for each watershed described in Appendix D are not accurate. The Final EIS needs to supply accurate data for the true amount of annual sediment being delivered to each stream in each watershed. (Comment letter page 2.)

Sediment yield (sediment load modification) and peak flow serve as relative indicators of potential hydrologic responses in the watershed with a specified series of events (Appendix D, page D-2). The estimates given for annual sediment and current sediment load modification are just that, estimates. No empirical data is available for true annual sediment delivery. The results from WATSED are intended to be used in the context of all of the information that is available, and with the support of knowledge of the model and its limitations, other models, data, analyses, experience, and judgment (Appendix D, page D-3). In this analysis, sediment risk reduction analysis was used to further enhance the prediction of effects from the WATSED model (Appendix D, page D-4). WATSED in fact does account for the delivery of coarse material (bedload) to the stream channel based on the mass movement potential of landtypes (landtypes are the basis in the model for sediment yield) (WATSED Manual, page PC-98). To supplement WATSED information, the Iron Honey EIS also uses a risk analysis which evaluates the potential of individual stream crossings to contribute coarse sediment to the stream system.

2 (c). The Final EIS needs to have a concise description of how Watbal and WATSED are used to calculate peak flows. If one model was used to perform the majority of the calculations, the Final EIS needs to indicate which model was used. (Comment letter page 2.)

The WATSED model is discussed in the Aquatics section of Chapter III (3.2.2 Methodology) and in Appendix D (pages D-2 through D-4). WATBAL is mentioned on page D-2 under the paragraph explaining the methodology used to describe the hydrologic regime for each watershed: "The anticipated runoff modification and equivalent clearcut area for a watershed or watershed area were derived from methods documented in the R1/R4 Sediment Guides 2 and the Watbal Technical User Guide 3, and calibrated on the Idaho Panhandle National Forests." WATSED is a re-design of the WATBAL model. It is important to note that while the use of these models is refered to numerous times in Mr. Mihelich's comments, the effects analysis is based on more than simply modeling. The estimated responses are combined with other sources of information and analyses to determine the findings of probable effects (Appendix D, page D-4, and the Project File documents referenced therein).

2 (d). The Final EIS needs to supply scientific analysis with data that will indicate how increases in peak flows and water yield associated with each action alternatives will not increase bedload movement in the streams within the project area and the entire LNF River System. There should be specific analysis in the Final EIS regarding estimated peak flows and water yields in each of the watersheds where proposed new canopy openings would be directly adjacent to current canopy openings. The final EIS should have extensive analysis regarding proposed canopy openings and the potential increase in bedload movement for Iron Creek, which is listed as non-functioning, and for each of the streams listed as functioning-at-risk. (Comment letter page 3.)

Anticipated changes in peak flow and water yield are addressed throughout the Aquatics section of the Final EIS, specifically in each tributary section (Iron Creek begins on page III-29) and then at the cumulative effects scale (3.2.4 (D) Effects to Fisheries at the Cumulative Effects Scale, Hudlow Creek and Above; 3.2.4 (E) Cumulative Effects Beyond the Project Area, to the Coeur d'Alene River Above Skookum Creek). Analysis of fish habitat diversity, complexity, and channel stability are used to show effects of bedload movement and stability. Channel stability is highly dependent upon bedload movement, which is connected to changes in water yield and timing. The link between proposed canopy openings and increases in peak flows/water yields are discussed extensively in Appendix D of the FEIS. Increases in peak flow and water yield would not be measurable under any alternative, and therefore would not contribute to a level of instream bedload movement that could be partitioned from natural causes. The potential to increase the <u>amount</u> of bedload in the already-overloaded stream segments is the subject of the Sediment Risk Analysis.

Analyses of proposed harvest units includes both harvest unit size and method, which provides an estimate of canopy opening. Please refer to Chapter III (3.2.2 Methodology, page III-10 and 3.3.15 Consistency With Forest Policy and Legal Mandates, Timber Standard 7) and Appendix G (Proposed Harvest Openings).

The classification of "functionality" of watersheds, and recommendations for improvement are products of the Geographic Assessment, which is included in the project files as reference material. The information in the Geographic

Assessment was used extensively in devising the proposed action and alternatives to that proposal. The reduction of the potential sources of sediment and bed load is a prominent recommendation in the Geographic Assessment. The estimated effects of peak flows, water yields and sediment risk drove development of several alternatives, and the existing conditions of the watersheds in the analysis area was a large part of the need for this project (Chapter I, 1.1 Purpose and Need).

2 (e). The final EIS needs to supply analysis with data that will indicate whether any new logging will meet State temperature requirements for cold water, salmonid spawning waters, bull trout waters, and seasonal cold water. (Comment letter pages 2-3.)The Final EIS should indicate the date of the most recent examination for Dissolved Oxygen Concentrations and Intergravel Dissolved Oxygen in the LNF River System. (Comment letter page 5.)

The relevance of stream temperature as a habitat component that could have a direct effect on fisheries is discussed in Chapter III (Aquatics, 3.2.2 Methodology, pages III-10 and III-11). Effects of harvest-related activities on stream temperatures is discussed in Appendix D (pages D-19 and D-20). There would be no effect to streamside canopy as a result of proposed activities under any action alternative due to the use of buffers as directed by the Inland Native Fish Strategy standards and guidelines. The importance of dissolved oxygen to the analysis of effects of this project is discussed in Chapter III, 3.2.2 (B)(3)Assessment of Environmental Consequences to Fisheries. With no anticipated change in canopy, there would be no change in stream temperature. Dissolved oxygen is directly related to stream temperature change; with no anticipated change in stream temperature, there would be no change to dissolved oxygen levels.

2 (f). The Final EIS should indicate that the US Fish and Wildlife Service has established a Bull Trout Recovery Unit Team for the Coeur d'Alene Lake Basin Recovery Unit. This area includes the Iron Honey Project Area. (Comment letter page 5.)

A Bull Trout Recovery Unit Team has been established for the Coeur d'Alene Lake Basin. The Fisheries Biologist from the Coeur d'Alene River Ranger District is a member of this Recovery Team. Establishment of such a team does not affect the analysis of effects nor is it key to the decision. Should the U.S. Fish and Wildlife Service develop new policies or recommendations based on findings of the team, the new information will be assessed as described in Forest Service Handbook 1909.15 (Chapter 10, Section 18).

2 (g). The degraded fisheries in the Project Area currently do not comply with the Clean Water Act (CWA). The biological integrity of the LNF River System, including the Iron Honey Area, has not been restored or maintained. The requirement for protection and propagation of bull trout and Westslope cutthroat trout in the LNF River System, including Iron Honey, also has not been met. There is no analysis in Chapter III that explains why the fisheries conditions in the LNF River System are in such dismal condition. The action alternatives proposed will not meet the biological integrity requirements of CWA. (Comment letter page 5.)

Under authority of the Clean Water Act, the Environmental Protection Agency and the States must develop plans and objectives that will eventually restore identified stream segments of concern. In lieu of those plans, the Forest Service will demonstrate or find that our actions will not result in a net substantial increase in the pollutant of concern or prohibit or delay potential recovery (Idaho Department of Health and Welfare, 1997; USDA Forest Service, 1995). The Forest Service has agreements with the States to implement Best Management Practices or Soil and Water Conservation Practices for all management activities. Proposed activities are in compliance with the guidelines in the Soil and Water Conservation Handbook (Forest Service Manual 2509.22) which outlines Best Management Practices that meet the intent of the water quality protection elements of the Idaho Forest Practices Act (Chapter III, Aquatics, 3.2.1 Regulatory Framework). Additional discussion of Best Management Practices is provided in Appendix C.

Fisheries habitat conditions are described in Chapter III, including a discussion of the past activities and events that led to the current conditions (3.2.3 (C) Effects of Past Land Management Activities on Aquatic Resources). These existing conditions where a major part of the need for this project (Chapter I, 1.1 Purpose and Need)

In addition, an Aquatic Resources Monitoring and Evaluation Plan has been developed for the Iron Honey project to track the transition from implementation of this project into compliance with the Clean Water Act and other mandates (1.1 Purpose and Need).

2 (h). The Final EIS needs to indicate if there have been any fisheries and/or watershed evaluations associated with monitoring data related to timber sales within or adjacent to the project area, or associated with monitoring performed in any 1st, 2nd or 3rd-order drainages within or adjacent to the project area. (*Comment letter page 6.*)

Monitoring and evaluation occurs in conjunction with every timber sale. As described in Chapter II (2.6.11 Monitoring), all alternatives would comply with specific monitoring requirements identified by the Forest Plan. Monitoring results are reported annually, and a summary of the major findings from Forest Plan monitoring is made available to the public.

Stream surveys are conducted at both the project and Forest level (USDA Forest Service, Forest Plan Monitoring and Evaluation Report, 1998, page 79). Surveys are conducted to provide baseline information for monitoring trends of habitat composition, quality, and complexity. Some of these surveys are conducted only once, while others have been surveyed multiple years at the same location. Findings of surveys related to fisheries are described in Chapter III (3.2.3 (D) Fish Presence and 3.2.3 (E) Fish Abundance and Composition). Additional survey findings are described in each appropriate watershed discussion in Chapter III (Aquatics).

2 (i). The Final EIS needs to supply data that will indicate how many miles of new roads were constructed and how many miles of roads have been reconstructed in the project area during the period 1957-1971, and since 1972. (Comment letter page 6.)

Effects of past activities, including road construction and reconstruction, have been considered in the analyses of effects to watershed resources, wildlife and fisheries under the Iron Honey proposal, as described in Chapter III (Aquatics, 3.2.2 Methodology and Wildlife, 3.6.2 Methodology, and Appendix D). An encyclopedic listing of road construction or reconstruction during any historic period was not considered germane to the analysis, and would serve no purpose. However, the chronology and recovery rates of the road system is inherently a driver used in several of the models, including the Elk model, and WATSED. The road data used in these models can be found in Appendix D, and the Project Files (Aquatics and Wildlife).

2 (j). It is not clear how many acres that contain old trees would be logged by each action alternative. The Final EIS should indicate how many acres of old trees, not classified as old growth and replacement old growth, exist in each watershed within the project area. The final EIS should also supply data that would indicate how many acres of old trees classified as old growth and replacement old growth exist in each watershed within the project area. (Comment letter page 6.)

*Terminology is key to this issue. Mr. Mihelich does not define what he considers an "**old tree**", or how many "old trees" need to be on an acre of land to count that acre as containing old trees; therefore we cannot respond to his request for information on the existance of acres of old trees. However, the IPNF uses several methods of assessing changes to old trees and old forests.*

*The terms **"mature and old growth**" are defined in the Silviculture Methodology portion of Chapter III, and are used to analyze changes to a general type of stand. These definitions are used by the Forest Plan and are generally accepted in silvicultural texts. Currently 5% of the Resource Area stands are considered to be "allocated old growth". This would not drop below 5% under any alternative and increases to 12% in alternatives 2, 6 and 8. The amount of **allocated old growth** remaining under each alternative is displayed in Table III-33 (Approximate acres and percent of structural stages in the Iron Honey Resource Area) and discussed for each alternative under "Forest Vegetation," by watershed and for the cumulative effects analysis area (Forest Vegetation, sections 3.34 through 3.3.14). This may be the information Mr. Mehelich is interested in when he uses the term "old trees."*

*The term "**old growth forest"** is used in the Forest Plan, in relationship to numbers of acres that must be reserved as **allocated,** and **potential or recuitment** old growth to meet standards. The Forest Plan, along with the Forest Supervisors June 22, 1993 clarification letter, contains standards, goals, objectives, and implementation guidance for managing **allocated,** and **potential or recruitment old growth**. The information Mr. Mihelich reguests on classified (allocated) and potential (recruitment) old growth is provided for each watershed in Chapter III (Forest Vegetation and the project files referenced therein).*

Concerns identified by Diane Riley, Idaho Department of Environmental Quality (#03)

Ms. Riley's comments focused upon air quality. She pointed out that "without the project file, it is difficult to evaluate whether air quality was adequately addressed…There should be a summary of the air quality analysis from the project file included in the DEIS." She states that the DEIS should disclose such information as: maximum number of acres to be burned in a day; PM10 and PM2.5 emission estimates; smoke sensitive areas; emission reduction techniques; public notification process; mitigation actions during smoke intrusion episodes; alternatives to burning considered and used; and coordination with other burn activity.

NEPA provides for identification and elimination from detailed study those issues which are not significant or which have been covered by prior environmental review, thereby narrowing the discussion of those issues to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere (40 CFR 1501.7(3)). The discussion of "Issues Not Addressed in Detail" in this Appendix includes the issue of air quality as one not addressed in detail in this environmental impact statement. However, air quality was used to develop features of the alternatives. Because use of prescribed fire would be based on smoke management guidelines, current air quality standards would not be exceeded under any alternative. Supporting information is provided in the Project Files (Air Quality); all Project Files are available for review by contacting the Project Team Leader or NEPA Coordinator (Chapter I, page I-6).

Concerns identified by Sara Denniston, Idaho Rivers United and Idaho Conservation League (#04)

Ms. Denniston supports implementation of Alternative 6.

4 (a). The selected alternative must not include any clearcuts or so-called regeneration harvests.

Ms. Dennistons opinion on the use of clearcuts parallels a national sentiment on this evenaged silvicultural system. The identification of vegetative treatment begins with an assessment of the existing conditions. Proposed treatment methods are based on environmental, transportation, economic, and social considerations in compliance with National Forest Management Act requirements related to vegetation manipulation [36 CFR 219.27(b)], silvicultural practices [36 CFR 219.27(c)], and even-aged management [36 CFR 219.27(c)]. Under these laws and regulations, use of even-aged management systems (such as clearcut and regeneration harvests) must be appropriate to meet the objectives and requirements of the Forest Plan.

Under the Iron Honey project, clearcutting is proposed in lodgepole pine stands under some alternatives(Alternatives 3, 5 and 7) because lodgepole pine growing in dense stands is likely to have poor root development (Chapter III, "Forest Vegetation," page III-113 through III-115). Using other even-aged regeneration methods such as shelterwood or seed tree harvests would likely lead to windthrow of reserve trees. Uneven-aged management would not lead to adequate regeneration of early seral species. Under other alternatives, clearcutting is proposed in regeneration units that are less than 10 acres in size. Early seral species require adequate light for establishment and growth. In these small units, adjacent uncut trees provide adequate site protection, while the openings provide adequate light. Retention of too many trees in these small units could create conditions unsuited to the establishment of seral species, especially western larch. Clearcutting in these situations is the most suitable harvest method. Please refer to the "Forest Vegetation" discussion in Chapter III for additional information (3.3.15 Consistency With Forest Policy and Legal Mandates).

4 (b). The selected alternative must include sufficient riparian buffer zones for logging and road building activities that do occur. It is not enough to rely on the INFISH buffers, which are merely a minimum standard. In order to sufficiently protect water quality, fish habitat, and riparian areas, no logging or road building should occur within ¼ mile of any stream. The selected alternative should not involve any stream-disturbing activities. The FS should not conduct any in-stream activities except those intended strictly and solely to improve fish habitat and/or water quality.

The opinion that larger buffer widths are necessary to sufficiently protect resources is unfounded and unsupported. The Inland Native Fish Strategy (INFS) states "Widths of interim Riparian Habitat Conservation Areas that are adequate to protect streams from non-channelized sediment inputs should be sufficient to provide other riparian functions, including delivery of organic matter and woody debris, stream shading and bank stability" (INFS, page E-5). In development of

the action alternatives, standards and guidelines of the Inland Native Fish Strategy (which is an amendment to the Forest Plan) were used specifically to protect water and aquatic biota during implementation of the activities under the Iron Honey EIS project (Chapter II, 2.6.9 Features Common to All Action Alternatives, (A) Features Designed to Protect Aquatic Resources). Standard widths for defining interim Riparian Habitat Conservation Areas were used without modification (INFS, pages E-5 and E-6). Streamside buffers would be applied along regeneration harvest units under all action alternatives.

4 (c). New roads proposed for construction, regardless of location, must be properly engineered and constructed to withstand anticipated uses and weather conditions. Roads must also be carefully monitored and maintained.

Approximately two-tenths of a mile of new system road construction is proposed under all action alternatives except Alternative 3 (which proposed no new system road construction). Temporary road construction would occur under all action alternatives. The Forest Service employs standard engineering design and contract specification processes which result in properly engineered and constructed roads built by timber purchasers.

Road management objectives have been identified for each system road in the analysis area based on ten considerations, including environmental constraints, safety, physical features, traffic volume, traffic service level, maintenance, and others (Appendix, page F-4; Project Files, "Transportation"). Maintenance is regularly performed on all roads with a Maintenance Level 4 and 5. All other roads are maintained on a less regular basis, such as in conjunction with a timber sale or if erosion problems are occurring. The Forest Plan requires monitoring of road construction in association with timber harvest (Monitoring Item B-5, Forest Plan, page IV-10). Additional monitoring related to roads is described in Chapter II (2.6.10 Monitoring) and in Appendix C (Aquatic Resources Monitoring and Evaluation Plan).

4 (d). Before taking action, the FS must study all streams impacted by the project and/or within the project area for eligibility for Wild and Scenic River designation.

The Forest Plan identified portions of rivers as part of the National Wild and Scenic Rivers System (National Wild and Scenic Rivers Act 16 USC 1271-1287) as Management Area 12 (Forest Plan, page III-52); there were no waterways identified on the Coeur d'Alene River Ranger District for such classification. However, the North Fork and Little North Fork of the Coeur d'Alene River were identified as eligible for consideration as part of the Wild and Scenic Rivers System. Forest Plan objective B(1)(f) requires that the present wild and scenic river potential of these segments be maintained (Forest Plan, page II-5; Project Files, "Aquatics").

The National Park Service has compiled and maintains a Nationwide Rivers Inventory, a register of river segments that potentially qualify as national wild, scenic or recreational river areas. Each federal agency is required to take care to avoid or mitigate adverse effects on rivers identified in the Nationwide Rivers Inventory. Segments of the North Fork and Little North Fork of the Coeur d'Alene River are included in this inventory.

The cumulative effects analysis area for aquatics encompassed the Iron Honey project area (referred to as the sixth-code scale) and extends from the headwaters of the Little North Fork to just below its confluence with Hudlow Creek. The extended cumulative effects area was delineated from the headwaters of the Little North Fork to its confluence with Skookum Creek. Based on alternative design features and mitigation measures to protect aquatic resources (Chapter II, 2.6.9 Features Common to All Alternatives, (A) Features Designed to Protect Aquatic Resources; and 2.6.10 Mitigation, (A) Mitigation to Reduce Effects to Aquatic Resources) the wild and scenic river potential of the North Fork and Little North Fork of the Coeur d'Alene River would be maintained (Chapter III, Recreation, 3.7.4 Consistency With Forest Policy and Other Legal Mandates, Recreation Standard 12).

Concerns identified by June Bergquist, Idaho Division of Environmental Quality (#05)

Ms. Bergquist indicates the Divison of Environmental Quality supports Alternative 6. She states, "We are currently developing a TMDL for the Little North Fork of the CDA River from the headwaters to Laverne Creek. The pollutant of concern is sediment. Prior to approval of the TMDL, interim rules prohibit further impairment of beneficial uses…"

Section 303(d) of the Clean Water Act requires the States to list water bodies (streams and lakes) that do not support beneficial uses. These are identified as Water Quality Limited. The 1998 Idaho Administrative Code (IDAPA 16.01.02)

charges the State Department of Environmental Quality with the responsibility for gathering information for listing under Section 303(d). The Forest Service responsibility under the law is to participate in the planning of TMDL implementation through the Watershed Advisory Groups. While the main stem of the Little North Fork (above Lavern Cr.) is 303(d) listed, none of the tributaries of this river in the Iron Honey Resource Area are currently designated as Water Quality Limited (Appendix D, Watershed Characteristics, Condition Indicators and Dominant Watershed Disturbances). TMDLs are currently being researched and written by the Idaho DEQ, for the North Fork of the Couer d'Alene, and a TMDL has been issued for Lake Coeur d'Alene, including the Wolf Lodge drainage. However, these are currently unrelated to the Little North Fork, and the TMDL for the Little North Fork is not yet published.

Until the Total Maximum Daily Limit (TMDL) is approved, the Forest Service will demonstrate that our actions will not result in a net substantial increase in the pollutant of concern (in this case, sediment) or prohibit or delay potential recovery. This is discussed in Chapter III, "Aquatics," page III-5. The Forest Service has agreements with the States to implement Best Management Practices or Soil and Water Conservation Practices for all management activities. Proposed activities will be in compliance with the guidelines in the Soil and Water Conservation Handbook (Forest Service manual 2509.22), which outlines Best Management Practices that meet the intent of the water quality protection elements of Idaho Forest Practices Act (Chapter II, 2.6.9 Features Common to All Action Alternatives, (A) Features Designed to Protect Aquatic Resources).

Concerns identified by Greg Tourtlotte, Idaho Fish and Game (#06)

Mr. Tourtlotte provides comments on each of the proposed alternatives (including the No-Action Alternative). He supports Alternative 6 for implementation, but believes that some opportunities exist to burn or otherwise treat areas of existing brush fields and overstocked stands of young trees, and then to restock the areas with desired species.

6 (a). While conceptually we believe the approach has merit, we have significant concerns about the ability of the Forest Service to follow through with the project over the time frame necessary for the project to prove beneficial. While we recognize some stand-tending activities may be needed over the long term, it seems unlikely that the Forest Service would be able to commit to a long-term policy of not pursuing more significant timber harvest in the analysis area. (Comment letter page 2.)

The Idaho Panhandle National Forests are entering into a Forest Plan revision period. Part of that revision process will be to revise the Management Area (MA) delineations and definitions. There is need to devise a Management Area designation geared toward areas where restoration has taken place and are now in need of a period of rest to allow recovery. It is anticipated that such an MA would apply to portions of the Iron Honey analysis area where large scale restoration takes place under the alternatives, and a natural recovery period is necessary to garner the full benefits of this restoration.

The amount of time that would pass before additional management activities would occur in the area would depend on which alternative is selected for implementation, and the amount of time needed for recovery. For example, under Alternatives 3 and 6, timber harvest would likely occur in the area within approximately 10 years. This is because Alternative 3 would treat a relatively small portion of the area, but the treatments would be repeated at regular, short intervals (page II-15) and Alternative 6 would not accomplish any of the vegetative restoration in the area that is so much a part of the need described in Chapter I (1.1 Purpose and Need). Alternative 5 would accomplish a high proportion of vegetation and aquatic restortation, and thus may lead to the longest desirable rest period after the work is accomplished.

Under Alternative 5, it could be several decades before vegetative management is needed in the area, barring any damage that would warrant salvage of timber in the area (for example, large-scale wildfire, insect epidemic, or major windstorm damage). The type and extent of vegetative treatment proposed under Alternative 5 would not require additional repeated entry (page II-15 and II-16). Alternatives 2 and 8 would have a limited "pulse" of regeneration harvest in specific drainages, where intensive harvest treatments would occur over a large area within a short period of time, but would not be repeated in that watershed for extended periods of time (pages II-14, II-17 and II-18).

Under Alternative 7, there would be also be the same type of intensive harvest treatments over a large area within a short period of time as under Alternative 2, but with additional commercial thinning. Because such a small portion (5%) of the analysis area would be treated; loss of trees to pathogens would continue at a high rate. This would increase the

likelihood that further vegetative treatment (including timber harvest) would occur in the area within the next several years (pages III-114 and III-115).

Under Alternative 1, there would be no activities to restore forest vegetation in the Iron Honey Resource Area. The short-term effects of this alternative would be continued loss of shade-tolerant species to root disease, decay and associated insect attacks. Over the long-term, western larch and white pine would continue to decline as components in the analysis area. (For further discussion of effects to vegetation, please refer to Chapter III, Forest Vegetation, 3.3.13 Direct and Indirect Effects at the Resource Area Scale.)

6 (b). We are concerned about the ability of the Forest Service to fund all of the needed watershed restoration work. It is our understanding the intent is to guarantee the identified work would be done under action alternatives that include timber harvest. For those alternatives that do not include timber harvest (Alternatives 1 and 6), funding would not likely be available to accomplish necessary work. (Comment letter page 2.)

If an alternative proposing commercial timber harvest is selected, a portion of the proposed watershed restoration activities would be accomplished by the timber sale purchaser, with additional funding through Forest Service contracts and/or special funding or grants (EIS, page III-200). Should Alternative 6 be selected, the watershed restoration activities would not depend upon timber harvest; funding would come solely from special funding and/or grants (EIS, page III-205). Since there are no guarantees that this funding would be available, any watershed restoration activities funded by these monies (under any alternative) were not included in the risk reduction analyses (EIS, page III-200). For further information, please refer to Chapter III, 3.9 Finances.

6 (c). Additional concerns include the short- and long-term negative impacts to elk and other wildlife which would occur from the implementation of all of the action alternatives except Alternative 6. Concerns for elk and other big game are heightened due to the apparent emphasis by the District on providing an extensive trail network and access for motorized vehicles in the area. (Comment letter page 2.)

The Forest Plan directs that the District provide for a variety of recreation opportunities, including motorized (Chapter III, Recreation (3.7.1 Regulatory Framework and Methodology); Forest Plan, "Objectives," pages II-3, II-24 and II-25 of the Forest Plan). In addition, an intense public involvement process took place to assess the access needs on the Coeur d'Alene River Ranger district. Iron Honey access tiers to that analysis (USDA Forest Service, 2000, "Access Management Environmental Assessment")

A detailed analysis of direct, indirect and cumulative effects to wildlife habitat is provided in Chapter III (3.6 Wildlife) and a comparison of effects to wildlife provided in Chapter II (2.7.6 Wildlife Habitat). Each of the action alternatives except Alternative 6 would result in temporary displacement of elk during sale activities. Under any alternative, there would be no more than two-tenths of one mile of permanent road construction in the Iron Honey Resource Area. Once post-sale activities and/or road obliteration activities are complete, both open and total road density would be substantially reduced through road closures (Appendix F, Tables F-2 and F-3).

Under any of the action alternatives, a number of roads that are not open to all motorized vehicles may be used by vehicles of ATV size and smaller; this ranges from 2 miles under Alternative 6 to 23 miles under Alternative 3 (Appendix F, Table F-4). All of the action alternatives were designed with features to protect wildlife habitat (Chapter II, 2.6.9 Features Common to All Action Alternatives, (F) Features Designed to Protect Wildlife Habitat). Any road currently closed that would be opened to accomplish project activities would be closed with gates to meet wildlife security needs during activities. Following completion of the project, most of these roads would be closed using physical barriers (such as earth berms).

6 (d). Attempting a project designed to mimic a large, pulse disturbance is a relatively new concept. We believe it is critical that it be approached from an experimental standpoint, with thorough monitoring to include controls. The monitoring plan in Appendix C has some good aspects to it, but we do not believe that monitoring in years 1, 5 and 10 only will be adequate to understand all of the parameters being monitored. For instance, meaningful trend data for fish population abundance is best obtained with annual sampling, and in most cases ten years is a minimum time period for detecting actual trends. *(Comment letter page 2.)*

Given the recommendations of the Geographic Assessment (Chapter III, 3.3.2 Methodology, pages III-81 and 82), which is consistent with the findings of the Upper Columbia River Basin assessment, it was reasonable to analyze the effects of implementing a "pulse" alternative.

The length of time monitoring is needed will be determined by the results and evaluation of what is being monitored (Chapter II, 2.6.10 Monitoring). When it is certain that regulations and standards are being met, monitoring of a particular element will cease. If monitoring evaluations show that regulations or standards are not being achieved at the desired level, management intervention will occur. Initially, sampling for fish abundance would occur in years 1, 3 and 5 after watershed restoration work is completed. Out-year sampling would depend on the reoccurance of streamflow events (that is, 5-, 10- and 20-year floods). This is what is meant by the term "variable" opposite "fish abundance" in Appendix C, Table C-2.

6 (e). Based on discussions with District personnel, the primary obstacle to implementation of Alternative 6 is lack of funds. For this reason, we recommend the District consider combining Alternative 6 with aspects of one of the other action alternatives as a possible means of creating adequate funding. If this approach is taken, we recommend thorough examination of the risks to watershed condition and making every effort to minimize those risks. (Comment letter page 2.) If a suitable compromise between Alternatives 2 or 7 and Alternative 6 can be found (i.e. reduced risk with greater watershed restoration than found in either 2 or 7 as currently presented), we believe the approach has potential. (Comment letter page 5.)

In response to this suggestion, the project interdisciplinary team developed an alternative that combines watershed restoration activities (less than proposed under Alternative 6 but more than proposed under Alternatives 2 or 7) with a limited "pulse" of regeneration harvest in the Iron Creek and Solitaire drainages (more than proposed under Alternatives 2 or 7 but less than proposed under Alternative5). The combined alternative is identified as Alternative 8. Alternatives are described in detail in Chapter II (2.6 Alternative Descriptions), with a summary comparison of effects (2.7 Comparison of Alternatives).

6 (f). The DEIS notes that projects could be completed with less risk if watershed restoration activities are completed prior to timber harvest and road reconstruction, yet the schedule for the project actions indicates at least a significant portion of the watershed restoration will begin after timber harvest is initiated. Initiating restoration actions prior to timber harvest would not only reduce watershed risks, but would make a clear statement about the District's commitment to watershed restoration. (Comment letter page 4.)

Historically, very little appropriated and/or grant monies have been available for watershed restoration work (Chapter III, "Finances," page III-205). A change in that funding trend is not expected in the foreseeable future. Also, a timber sale purchaser can often accomplish the watershed restoration work more economically than the government, due to lower overhead costs. The more funding that is available early in implementation, the more watershed restoration work can occur prior to timber harvest. Without creative manipulation of funding sources, very little watershed restoration work will occur prior to timber harvest reciepts being deposited into Trust Fund accounts. For further information, please refer to Chapter III, 3.9 Finances.

6 (g). A correction is needed on page 119 where the EIS states that increased fishing pressure is likely to result in greater losses to fish populations due to hooking mortality. The entire analysis area is within the Little North Fork Coeur d'Alene drainage catch-and-release area, where artificial flies and lures are required. Hooking mortality in similar situations has been demonstrated to be very low, with no significant impacts on fish populations. (Comment letter page 4.)

The correction has been made to the FEIS (page III-74). Although hooking mortality from catch and release using artificial flies has been demonstrated to be very low, the anticipated increase in fishing pressure (as a result of increased recreational use) would most assuredly result in additional mortality simply because more fish may be injured in the process of being caught.

6 (h). Given the high road densities and substantial motorized use in adjacent parts of the Forest, and the District's apparent management direction to manage for motorized use in the Little North Fork drainage, we question whether elk will be displaced or carrying capacity reduced to the point where the area can support fewer elk. Elk and elk hunting are, we believe, critical resources and outputs on the IPNF. We recommend the Final EIS clarify whether elk and other wildlife will simply be displaced, or whether habitat and elk will actually be lost. (Comment letter page 5.)

The analysis of effects to wildlife discusses potential displacement of each wildlife species (Chapter III, Wildlife, 3.6.5 Big Game Management Indicator Species). As stated earlier, the Forest Plan directs that the District provide for a variety of recreation opportunities, including motorized (Chapter III, "Recreation,3.7.1 Regulatory Framework and Metholdogy; Forest Plan, "Objectives," pages II-3, II-24 and II-25 of the Forest Plan).

6 (i). The large amount of road reconstruction with the timber harvest alternatives creates a significant concern for both water quality and particularly big-game security. Reconstructed roads will be much more usable to motorized recreationists than brushed in roads. We recognize the need to deal with brushed in roads that still have culverts and other drainage structures which are not being maintained. A gated road provides less security than a brushed-in road, and we believe the EIS should recognize and account for this discrepancy. (Comment letter page 5.)

Roads and motorized use have the most impact to elk security within the analysis area (Chapter III, Wildlife, 3.6.5 Big Game Management Indicator Species, page III-171). Three large security areas in the Iron Honey Resource Area have limited access due to road closures or brushed-in roads. However, ATV use occurs within all three areas, reducing the effectiveness of the security. This has been accounted for in the elk habitat model by using a lower value for security.

The amount of proposed road reconstruction ranges from 10 miles under Alternative 8 to 51 miles under Alternative 5 (Table II-2). The wildlife analysis took into consideration all activities proposed under the action alternatives. The effects analysis discloses the effects to security before, during, and after project activities are completed (Chapter III, 3.6 Wildlife). Actions necessary to limit the impacts of roads and road use were incorporated into the project design for all action alternatives (2.6.10 Mitigation, (D) Mitigation to Reduce Effects to Wildlife).

Concerns identified by Jeff Juel, Ecology Center/Alliance for the Wild Rockies (#07)

7 (a). The maps supplied with the EIS show the vast network of roads, but fail to display all the past logging, making it difficult to understand cumulative effects (Comment letter page 1). The DEIS does not provide an adequate cumulative effects analysis for the Little North Fork Coeur d'Alene River, nor the North Fork as a whole. The analysis of the cumulative effects of ongoing timber sales is inadequate. (Comment letter page 2.)

Proposed activities are described in detail in Chapter II (2.6 Alternative Descriptions). A map of past harvest in the area is provided in the Project Files (Vegetation).

Ongoing activities and reasonably foreseeable activities associated with specific projects are also identified in Chapter II (2.4 Ongoing and Reasonably Foresseable Activities). Routine ongoing activities, such as recreation use, fuelwood gathering and other activities are considered as part of the existing condition for each resource. Direct, indirect and cumulative effects are disclosed for each of the resource issues discussed in Chapter III of the EIS. The EIS considered

direct, indirect, and cumulative effects that could occur as a result of the proposed, ongoing, and reasonably foreseeable activities. Effects of past activities have been analyzed and are reflected in the existing condition.

7 (b). The logging alternatives all propose some degree of removal of what is already scarce – larger, older trees. (Comment letter page 1.)

The alternatives harvest varying numbers of trees, some will be old and large. As displayed in Appendix E (Specific Unit Information), average diameter of trees to be harvested ranges from 11 to 13 inches. Both the Geographic Assessment for the Coeur d'Alene River Basin and the Integrated Scientific Assessment in the Interior Columbia Basin describe conditions for this area as lacking late and old forest structures and forest compositions susceptible to insects disease and fire. It should be noted that these scientific assessments address forest structure and composition, not just individual old trees (Integrated Scientific Assessment in the Interior Columbia Basin Table 23, Pg 113; and Geographic Assessment, "Condition 2" on page 63).

The intent of this proposal is to "Trend the vegetative species composition toward historical levels, which included species more resistant to insects and disease;" and "Increase age-class diversity, and reduce old-growth fragmentation" (1.1.4 Objectives of the Iron Honey Resource Area Proposal). The proposed changes to mature/large timber would range from 3 to 8% between alternatives, with no change in allocated old growth and an increase of 4-7% in potential or recruitment old growth under Alternatives 2, 5, 6, 7 and 8. These changes are proposed to facilitate a reduction of the fragmentation of old forest areas, while increasing the areas of forests containing long-lived seral species, which are the most desirable and most scarce forests referred to in the scientific assessments, and to which Mr.Juel's "scarce-larger, older trees" seems to be referring (pages I-3, III-82).

7 (c). The EIS is confusing about the scale of road treatments proposed. Apparently, roads would be decommissioned with all of the road channel crossings proposed for removal. Yet this is unclear from the document and maps. (Comment letter page 1.)

Table II-2 has been modified to display the miles of road obliteration, number of channel crossings to be removed, miles of roadbed to be recontoured, and number of culverts to be upgraded under each alternative. A brief description of what would occur under the two types of obliteration is provided on page II-19 and in the Acronyms/Glossary section (page AG-12). The environmental effect of both methods is essentially the same, they are just two different techniques that are used depending upon specific site conditions and closure needs. The alternative maps have been improved to display the individual types of road work associated with watershed rehabilitation.

7 (d). The DEIS doesn't disclose the frequency of recurrent of storm events resulting in fill failures. The Transportation plan doesn't propose to obliterate nearly enough roads in the project area. (Comment letter page 2.)

The recurrence interval of an event that exceeds culvert capacitiy is explicitly modelled in the Risk Analysis project files, Risk Analysis Discussion, pg 180) Mr. Juel also expresses an opinion about the amount of road obliteration that is appropriate for this area. It is unclear by his reference to the "Transportation plan" whether he has reviewed the information on road obliteration which is contained in Chapters II (also addressed in response to 7c above) and III of the EIS, particularly in the Aquatics Section and Appendix F.

7 (e). The DEIS fails to provide a sound financial analysis which displays, by alternative, the short- and long-term costs of maintaining all the roads and the costs of repairing foreseeable flooding and other storm events. (Comment letter page 2.)

A detailed financial analysis is provided in Chapter III, with supporting information in the Project Files (Financial). Yearly District expenditures of appropriated monies for road maintenance of specific roads is outside the scope of this document, and more germane to analysis at the Forest Plan level. However, predicted revenue (stumpage) for each alternative is needed to perform a Financial Efficiency Analysis (Forest Service Handbook 2409.18, section 32) for timber sale planning. One of the factors used in calculating the expected stumpage was the short-term cost of maintaining the roads that a timber sale purchaser would be using.as haul routes. These figures are displayed by

alternative in the Project Files (Financial, "Financial Analysis – Comparison of Alternatives"). The results of these calculations (expected stumpage) are displayed in Chapter III, Table III-53. If a purchaser maintains the roads, the District would not need to maintain them during the years that the purchaser is using them.

Performing a benefit/cost analysis for the long-term maintenance of all roads, including the costs of repairs needed after flooding or other storm events, is germane to planning at the forest Plan level, under the category of non-commodity values. Effects to the resources that give rise to the noncommodity values are evaluated under each specific resource section in Chapter III. Therefore, the effects that each alternative would have on the miles of road constructed, made inert and/or removed and the culverts removed or upgraded is best reflected in the Risk Analysis that is provided in the Chapter III, 3.2.4 (Aquatics) Environmental Consequences. Also, in complying with the NEPA process, the weighing of the alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are qualitative considerations (40 CFR 1502.23).

7 (f). The DEIS treats the "Long Term Transportation Plan" as if some sort of Decision has been made, however we are not aware of past public involvement opportunities for this Plan. The DEIS assumes that certain aspects of access, such as with snowmobiles and ORVs, is needed. The DEIS does not provide enough information to substantiate these assumed needs of motorized recreationalists to be proposing even more access. (Comment letter page 2.)

In 7(g) below, Mr. Juel quotes from the "Access Management Environmental Assessment" which may be the "Long Term Transportation Plan" that he contends he was "not aware of past public involvement opportunities." In fact, Mr. Juel made use of the public involvement opportunities by providing comment on this plan in a three-page letter dated December 5, 1997. The Access Management Environmental Assessment used the NEPA planning process to ensure widespread public involvement in the review and modification of the District's Travel Plan. The Travel Plan identifies those roads available to the public for motorized use across the entire Coeur d'Alene River Ranger District. The new Travel Plan is identified as ongoing in Chapter II (2.4 Onoging and Reasonably Foreseeable Activities).

The Forest Plan directs that the District provide for a variety of recreation opportunities, including motorized (Chapter III, Recreation,3.7.1 Regulatory Framework and Methodology; Forest Plan, "Objectives," pages II-3, II-24 and II-25 of the Forest Plan). Analysis of access is occuring at varying levels of detail, from the programmatic (national, regional and forest-wide) to the site-specific (on an area-by-area basis through the NEPA planning process). For each site-specific NEPA proposal, a long-term transportation plan is developed to identify the road access needs for that specific area over the next several decades (2.6.9 Features Common to All Action Alternatives, (I) Long-term Transportation Plan Common to All Alternatives). A recently-released protocol: Roads Analysis: Informing Decisions about Managing the National Forest Transportation System has been utilized to incorporate the various levels of information that have been used to assess access needs (Project Files, Transportation, Roads Analysis).

7 (g). The DEIS fails to disclose the impacts of ongoing and increased motorized access in the project area. The Access Management Environmental Assessment states: "Wildlife that is unable to move great distances [will] either become accustomed to the disturbance or their population numbers [will] be reduced…Those species that require large undisturbed areas for their habitat will either be displaced or will not be able to survive." Based upon the current high level of motorized access in the Iron Honey project area, the Access Management EA's disclosure surely applies to this area as well as any in the District. (Comment letter page 2.)

The general statements from the Access Management Environmental Assessment are further refined in the detailed analysis of direct, indirect and cumulative effects to wildlife habitat provided in Chapter III of the Iron Honey FEIS (sections 3.6.3 through 3.6.9). A comparison of effects to wildlife is provided in Chapter II (2.7.5 Wildlife Habitat). Each of the action alternatives except Alternative 6 would result in temporary displacement of elk during sale activities. Under any alternative, there would be no more than two-tenths of one mile of permanent road construction in the Iron Honey Resource Area. Once post-sale activities and/or road obliteration activities are complete, both open and total road density would be substantially reduced through road closures (Appendix F, Tables F-2 and F-3).

Under any of the action alternatives, a number of roads that are not open to all motorized vehicles may be used by vehicles of ATV size and smaller; this ranges from 2 miles under Alternative 6 to 23 miles under Alternative 3 (Appendix F, Table F-4). All of the action alternatives were designed with features to protect wildlife habitat (Chapter II, 2.6.9 Features Common to All Action Alternatives, (F) Features Designed to Protect Wildlife Habitat). Any road currently

closed that would be opened to accomplish project activities would be closed with gates to meet wildlife security needs during activities. Following completion of the project, most of these roads would be closed using physical barriers (such as earth berms and partial obliterations). The long term results of these projects is a substantial decrease in motorized access and a connected increase in wildlife security.

7 (h). The DEIS does not adequately discuss the impacts of cattle grazing on the streams, riparian areas, and values of Riparian Management Objectives as a whole. ***(Comment letter page 2.)***

Grazing is included as a reasonably foreseeable activity (Chapter II, Table II-1). Additional information is provided in the discussion of issues not addressed in detail (in this Appendix, page A-4). The herd of 45 cow/calf pairs ranging over almost 50,000 acres in the Iron-Mokins-North Fork allotment for four monthsout of each year is not an impact that would have cumulative effects on the riparian areas or retard attainment of the Riparian Management Objectives. This determination is based on the effects analysis in the (Draft) Environmental Assessment for Grazing, which is incorporated by reference on page A-4 of this appendix. This lack of impact is also being born out by ongoing monitoring of the allottment (Range review field trip notes, 7/25/2001)

7 (i). We believe that evidence exists for placing most or all of these streams (not functioning or functioning at risk) on the list of Water Quality Limited Segments. We strongly urge the FS to provide this information to the State of Idaho so that the streams may be properly listed and so that pollution abatement plans (TMDLs) can be developed forthwith. (Comment letter page 2.)

Section 303(d) of the Clean Water Act requires the States to list water bodies (streams and lakes) that do not support beneficial uses, even though BMP's are employed. These are identified as Water Quality Limited. The 1998 Idaho Administrative Code (IDAPA 16.01.02) charges the State Department of Environmental Quality with the responsibility for gathering information for listing under Section 303(d). The Forest Service responsibility under the law is to participate in the planning of TMDL implementation through the Watershed Advisory Groups. It is not the charge of the Forest Service to petition the state for listing under Section 303d. None of the streams in the Iron Honey Resource Area are currently designated as Water Quality Limited (Appendix D, Watershed Characteristics, Condition Indicators and Dominant Watershed Disturbances). TMDLs are currently being researched and written by the Idaho DEQ, for the North Fork of the Couer d'Alene, and a TMDL has been issued for Lake Coeur d'Alene, including the Wolf Lodge drainage. However, these are currently unrelated to the Little North Fork and thus outside the scope of this project.

7 (j). The DEIS does not indicate if all old mass wasting sites and other landslide-prone areas have been designated as Riparian Habitat Conservation Areas, as the Forest Plan requires. (Comment letter page 2.)

The Inland Native Fish Strategy (INFS) designates as Riparian Habitat Conservation Areas "the extent of landslides and landslide-prone areas" (Category 4 a, page E-6, Inland Native Fish Strategy EA, 1995). It is unclear from Mr. Juel's comment what the expectations are for being "designated" beyond the quotation above. It appears that Mr. Juel contends that all old mass wasting sites and other landslide–prone areas need to be delineated on the ground, and that this is required by the Forest Plan. This is not the intent of the Inland Native Fish Strategy. The intent is to designate this type of area as an RHCA and apply the standards and guidelines of the Inland Native Fish Strategy to these areas as they are discovered on the ground, or in planning a project. Although it is not required by the Forest plan, a map depicting the Category 1, 2 and 4 designations is provided in the Project Files (Aquatics).

7 (k). Please disclose the Equivalent Clearcut Acres for each subwatershed, by alternative. The EIS would also be more information by disclosing total road mileage and road density plus the number of stream crossings for each tributary. The DEIS should also disclose how many acres of logging are proposed for each of the tributary watersheds. The EIS should disclose such information as sediment elevations above natural, stream stability and data representing values of Riparian Management Objectives for all streams in the project area. (Comment letter pages 2 and 3.)

Specific conditions in each watershed are displayed in tables in Appendix D (Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances), and discussed throughout Chapter III, 3.2 Aquatics (specifically by tributary). Proposed timber harvest is identified for each watershed (by alternative). The information includes:

- *physical characteristics (drainage area, sensitive landtypes, and sensitive snowpack)*
- *qualifications (Water Quality Limited Streams, apparent watershed status (properly functioning, functioning at risk, or not properly functioning), and which watersheds were used in the analysis for that drainage*
- *hydrologic regime (estimated peak flow, current runoff modification, and equivalent clearcut area)*
- *erosion and sediment information (annual sediment, current sediment load modification, road density and including road density on sensitive soils)*
- *stream crossings information (inventoried crossings, risk of failure, stream crossing frequency, and fish migration barriers.*

Attainment of Riparian Management Objectives (INFS, RMOs, page E-4) is judged on four parameters: Stream Temperature, Habitat Diversity, Cover Complexity, and Channel Stability (FEIS, pages III-11 and III-12). These directly relate to the applicable RMOs defined in the Inland Native Fish Strategy. The analysis of this information is disclosed by tributary beginning on page III-29 of the FEIS.

7 (l). The DEIS does not discuss the old growth situation in terms of meeting Forest Plan standards for old growth, specifically standards 10(b), 10(c) and 10(f). The DEIS does not disclose how much of the allocated old growth in the project area meets the accepted (Thomas 1979) criteria. Nor does it state whether or not all areas, whether planned for logging or not, have been compared to old growth criteria. (Comment letter page 3.)

Forest Plan standard 10a for old growth habitat management directs the use of an old growth definition developed by a Regional Task Force (Forest Plan, page II-29) At that time, Thomas (1979) was to be used as an interim guide. Subsequently, the forest has issued clarification letters dated May 7, 1991 and June 22, 1993. The 1993 letter references and adopts Draft Minimum Criteria from the Regional Guides and Report issued May 14, 1992 by the Regional Task Force.. This FEIS relies upon the definitions and followup implementation clarification presented in the Forest Plan and those letters, rather than Thomas.

There are currently an estimated 56,295 acres of allocated existing old growth on the Coeur d'Alene River Ranger District, with 3,827 allocated potential old growth. There is no additional field verified old growth on the district. (USDA Forest Service, 2001. Forest Plan Monitoring and Evaluation Report – 1999, page 58). .

There are currently 1,144 acres of allocated and potential old growth within the Iron Honey Resource Area (Table III-33). There would be no change to allocated old growth under any alternative. There are 689 acres of potential or recruitment old growth in the analysis area. The amount of potential old growth would increase by 800 acres under Alternatives 5 and 7, or by 1,380 acres under Alternatives 2, 6, and 8. None of the proposed units, of any alternative, harvest allocated old growth or potential/recruitment old growth identified as a portion of the district old growth allocation.

Old growth is discussed for each analysis area in Chapter III (3.3 Forest Vegetation, 3.3.15 Consistency With Forest Policy and Legal Mandates).

7 (m). The DEIS does not adequately discuss the impacts of removing these important components (snags at least 30 inches in diameter for nesting and at least 20 inches in diameter for foraging) from the MIS pileated woodpecker's habitat. (Comment letter page 3.)

Effects to snag habitat were considered in this analysis. Habitat suitability index values for the pileated woodpecker were calculated for the existing condition and all alternatives. Habitat suitability values factor in nesting and foraging trees greater than 20 inches diameter (live or dead); feeding trees per acre greater than 30 inches diameter (live or dead); and nesting trees with an average size greater than 26 inches diameter (live or dead). Each value is individually determined based on timber stand data base (TSMRS), then an average is calculated. Table III-48 displays the changes in habitat suitability values by alternative. This change is due in part to the changes in the quantity of large-diameter trees (live or dead) per acre. In addition to the wildlife discussion in Chapter III, please refer to the Project Files, Wildlife: "Pileated woodpecker Habitat Suitability Index (HSI)" for a more detailed explanation of how the TSMRS database information was used to assign values to each stand.

7 (n). The IPNF has failed to monitor population trends of old growth management indicator species as required by the Forest Plan (monitoring item F-1). The EIS must disclose the District's methodology for maintaining viable populations of old growth species in the project area and forest-wide. (Comment letter page 3.)

The analysis for Management Indicator species, in particular those that are dependent upon old growth forests are addressed in the Wildlife section of the FEIS. The condition of MIS habitat is also analyzed in the Vegetation Section, and tiered to in the wildlife analysis. The Ninth Circuit Court has held that quantitative population data is not requited by 36 CFR 219.19, and clearly sanctions the use of habitat analysis for those species for which population data could not be obtained. Plaintiffs in a recent case (Indiana Forest Alliance, Inc vs US Forest Service, Civ. No. 99-214-C, S.D. Indianna) alleged "the NFMA and its regulations, the Plan, and the Forest Service Manual required the Forest Service to inventory all MIS and sensitive species before making a final decision". The court ruled that none of these sources require such information. The Court adopted the findings in Sierra Club v. Marita, and Inland Empire, and stated the FS is entitled to use its own methodology in assessing population viability. The FEIS discloses the methodologies used to assess changes to old growth and related populations (Chapter III, Wildlife, 2.6.2 Methodology, (F) Old Growth Management Indicator Species). A forest-wide assessment of populations is outside the scope of this project.

7 (o). The DEIS does not disclose whether or not the previously logged areas meet standards and guidelines for snag and snag recruitment habitat. (Comment letter page 3.)

Snags and snag recruitment habitat were not identified as factors that would be affected by this project (2.3.2 Issues), primarily because of design criteria for retention of existing and recruitment snags (2.6.9 Features Common to All Action Alternatives, (F) Features Designed to Protect Wildlife Habitat). The EIS did not specifically identify the existing condition of this component as an issue. However, snag habitat was considered as part of the effects analysis for specific wildlife species (black-backed and pileated woodpeckers, fisher, marten, and goshawk). In particular, the lack of snags due to previous harvest is described for goshawk (page III-158) and black-backed woodpecker (page III-167). As described in Chapter II (2.6.9 Features Common to All Action Alternatives, (F) Features Designed to Protect Wildlife Habitat), leave trees in regeneration and rehabilitation areas would be reserved from harvest and Forest Plan snag guidelines will be met under any action alternative. Habitat for cavity nesting species and foraging substrates is maintained through implementation of the Forests' Snag and Woody Down Timber Guidelines (Forest Plan Appendix X).

7 (p). The "Likely to adversely affect" lynx determination in the "Biological Assessment of the Effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada Lynx" makes Section 7 formal consultation mandatory, before actions such as the Small Sales project are approved. The IPNF must amend its Forest Plan before allowing the project activities in lynx habitat, because implementation of the present Plan is a factor that has led to the necessity for listing lynx under the ESA. The concept of Lynx Analysis Units vastly oversimplify lynx habitat relationships, which results in the DEIS not presenting a sufficient analysis for lynx. (Comment letter page 4.)

Based on conferencing with the U.S. Fish and Wildlife Service, this project is following recommendations found in the Canada Lynx Conservation Assessment and Strategy (USDA Forest Service, 2000). The strategy identified lynx analysis units (LAU's) to be managed for lynx. The Iron Honey Resource Area is not considered to provide habitat for lynx, is not located within an LAU, and lynx are probably an infrequent visitor to the area. None of the proposed harvest units are within any of the lynx analysis units (EIS, page III-156). A map is provided in the Project Files ("Wildlife") displaying the location of the proposed harvest units in relation to the identified lynx analysis units and travel corridors; this map is available for review upon request. Upon further review of aerial photography and based on the type and location of past harvest activities, these additional units would not reduce lynx travel habitat and this project would have no effect on lynx populations. The effects analysis and determination of effects in the biological assessment specific to this project will require concurrence from the U.S. Fish and Wildlife Service; concurrence means that the USF&WS agrees with a more project-specific determination of effects to this species. This determination will be documented in the Record of Decision.

7 (q). The DEIS does not adequately disclose the significance of the impacts from past logging and roadbuilding on populations of MIS and TES species. The DEIS does not adequately consider the cumulative impacts of developments in adjacent and nearby watersheds. The DEIS's definition of cumulative effects is rather narrow. (Comment letter page 5.)

The analysis for wildlife and fish considers direct, indirect and cumulative effects. The existing condition of the habitat for these species is a disclosure of the impacts of past logging and road building. Some examples of this disclosure are in Chapter III, Introduction (3.1.2 Past Activities), Aquatics (3.2.3 (C) Effects of Past Land Management Activities on Aquatic Resources), Vegetation (3.3.3 (C) Disturbance and Successional Patterns), Wildlife (3.6.2 Methodology, (A) Introduction).

A map of past harvest in the area is provided in the Project Files (Vegetation). Proposed activities are described in detail in Chapter II of the EIS (2.6 Alternative Descriptions). Ongoing activities and reasonably foreseeable activities associated with specific projects are identified in Chapter II (2.4 Ongoing and Reasonably Foreseeable Activities). Routine ongoing activities, such as recreation use, fuelwood gathering and other activities are considered as part of the existing condition for each resource. In addition, the cumulative effects section discloses the additive impacts of past, present and reasonably forseeable actions that may be affecting species and their habitat..

Effects analysis areas are discussed in the wildlife and fisheries sections, and each speciesis analyzed based on life histories and home ranges, dependant upon a number of variables. The effects areas are delineated commensurate with the scope and magnitude of the impact, the risk associated with the project, the species involved, and the level of knowledge at hand (3.6.2 Methodology, (A) Introduction). When the analysis showed that the impact was minimal at one scale, the next larger scale; for instance, the adjacent watershed, became unnecessary to analyze. The criteria for deciding to analyze individual wildlife species in detail are explained in the "Species Relevancy Screen" discussion in Chapter III (3.6.2 Methodology, (B) Species Relevancy Screen). Some habitat and species may occur within the Coeur d'Alene River drainage but may not be applicable to any or all analysis areas. No further discussion or analysis is necessary for those species or suitable habitat that are not found within the assessment area. Additional rationale is provided in the Project File ("Wildlife") for those species dismissed from further consideration.

7 (r). It is not apparent that the DEIS identifies the FS's preferred alternative. NEPA regulations at 40 CFR 1502.14(e) requires the FS to: "Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement…" (Comment letter page 3.)

The key wording here is "if one or more exists…" As stated on page I-6 (Changes Made Between the Draft and Final EIS), there was no preferred alternative at the time the Draft EIS was published. The Final EIS identifies Alternative 8 as the preferred alternative (Abstract; page I-6; page II-17).

7 (s). The Forest Service should review Tiedemann et al. (2000) in order to improve the analyses of the proposed prescribed fire.

As a result of this request, the project fuels specialist reviewed and considered the information provided in the reference "Solution of forest health problems with prescribed fire: are forest productivity and wildlife at risk?" (Tiedemann, Arthur R., James O. Klemmedson, Evelyn L. Bull, 2000). The reference examines large-scale conversion of forests in Oregon, Washington and the Intermountain area to seral conditions that emulate those assumed to exist before European settlement. This 13 page article urges caution in "implementing prescribed fire widely," the use of "large scale prescribed fire," and "frequent" burning of the forest floor. The authors question how well presettlement forest conditions are understood and the feasibility and desirability of conversion to a seral state that represents those conditions. They focus on the potential effects of prescribed fire on forest productivity and wildlife. Two types of fuels treatment are proposed in the Iron Honey Resource Area: underburning and top-attached yarding (Table II-2). These are minimal treatments, not "wide implementation," "large scale," or "frequent" prescribed fire use;which are the types of prescribed fire activities questioned in this article.

7 (t). The DEIS omits site-specific information which would confirm or validate the assumptions made about overly dense tree stands and the desired future conditions concept. There is little site-specific data on the historical range of vegetative conditions in the project area to show it does not sufficiently meet desired future conditions.

The information used in the description of existing vegetative conditions came from a variety of sources. Information on stand density came from the district Timber Stand Management Record System (TSMRS), stand exam information, historical records, aerial photo interpretation and field reconnaisance.

7 (u). The Ecology Center's January 25, 2000 letter to the Forest Supervisor should be incorporated as comments on this DEIS. "Please place a copy of that letter in the Project File as responsive to your request for comments on the DEIS. The contents of the letter are based upon many years of experience in the public involvement process on the Coeur d'Alene River Ranger District, the IPNF and the national forests of the region as a whole."

In the past two years, Mr. Juel has made similar requests to incorporate letters he had written to Forest Supervisor David Wright regarding his desires for management of the National Forest. The Forest Supervisor has consistently responded that such an approach to public comment is insufficient, and does not meet the requirements for commenting on Forest Service proposals, which requires "specific facts or comments along with supporting reasons that the person believes the Responsible Official should consider in reaching a decision" (36 CFR 215.6(b)). Most recently, Mr. Juel was advised that many of the concerns he raised in his January 25, 2000 letter are more appropriately addressed at the Forest Plan scale or at even a more broad scale (letter to Jeff Juel from Forest Supervisor David Wright dated February 11, 2000). Mr. Juel was asked to respond as specifically as possible to project level proposals.

Concerns Identified by Richard Parkin, Environmental Protection Agency (#08)

Mr. Parkin based his overall rating of the EIS on Alternative 5, although he also provided a rating for each of the other alternatives as well. He provided specific comments on Alternatives 3, 5 and 6, objecting to Alternative 5.

8 (a). The EIS should define in the glossary what is meant by obliteration if that is how the 11 miles of roads will be closed.

This information is provided in Chapter II (page II-19), and in the Acronyms/Glossary section (page AG-12).

8 (b). If what the Ecology Center states is true, that 1/3 of the area has already been clearcut (we are not certain how this figure reconciles with your discussion of past activities on page 43) and the road density is 8.6 miles per square mile, then Alternative 5 appears to be out of line to what the area can sustainably handle.

The numbers in the FEIS reflect that about 3,900 acres (approximately 18% of the analysis area) has been clearcut (3.3.3 Overview, (E) Existing Conditions in the Iron Honey Resource Area, page III-88). About 3,050 acres of the analysis area (14%) is less than 35 years old, primarily in stands that were clearcut in the '60's. These stands are inclusive in the total of 3900 acres (18%). The Ecology Center's statement appears to be incorrect. Stands that are 35 years old have recovered to about 80% of their original evapo-transporation rates (WATSED manual, PC-107). The FEIS (3.3.3 Overview, (E) Existing Conditions in the Iron Honey Resource Area, page III-84-85) states that the analysis area "historically…probably burned in a variable pattern" but "high wind events, high intensity fires (covering) ten's of thousands and hundreds of thousands of acres…created large blocks of younger forests with smaller areas of mature and old age classes... 1910 alone burned approximately 24% of the Coeur d"Alene National Forest. From 1889 through 1934 (45 year period) a series of large fires...burned almost 50% of the Coeur d'Alene National Forest ... (and) between 1810 and 1862...a similar or larger" area burned in the Coeur d'Alene National Forest.

As stated in the EIS, the existing total road density is 8.6 miles of road per square mile of land (Figure II-9). Open road density is currently 2.5 miles per square mile. Because this is an improvement project geared toward removing roads and rehabilitating the watershed, implementation of any of the action alternatives (including Alternative 5) would result in substantial decreases in both open and total road density, and would still not even come close to approaching the high end of the range of disturbance. Chapter III (3.3 Forest Vegetation) discusses the proposed activities and how they relate to historic disturbances, by alternative.

8 (c). We stated in our scoping comments that if the purpose of this project is ecosystem restoration and forest health the EIS should present a convincing discussion that active intervention is the best alternative. In response, the EIS states that this is not an ecosystem restoration project, but is active intervention to address the four specific areas of concern identified in the purpose and need. This may be an issue of semantics, but the four objectives do seem to point to ecosystem restoration and improving forest health. We still believe the EIS should present a discussion on the relative merits of passive and active restoration to meet project objectives.

As stated in response to comment 7(r) above, there was no preferred alternative at the time the Draft EIS was published. This indicates that the No Action alternative, where a passive stance was taken, is a viable alternative. The effects of no action are portrayed throughout Chapter III of the FEIS, and are used as comparison points for the action alternatives, throughout Chapter II. This analysis examined the merits of taking no action and of actively intervening in the trends that are occurring in the resource area. The FEIS does not provide a vehicle for making a choice on what alternative is best, except for the potential selection of a Preferred Alternative. The relative merits of passive and active restoration are the heart of the effects analysis. The Deciding Official will make the choicein the ROD, based on this information, on what is the best approach to meet the need of restoring the resources addressed in the Purpose and Need in Chapter I (1.6 Decisions to be Made).

8 (d). The EIS should explain the significance and reliability of the sediment yield and peak flow numbers. How does this relate to water quality standards?

Appendix D discusses in detail the significance and reliability of the modelling used in the Aquatics section, and the section was updated with further discussions on how these numbers relate to water quality.

8 (e). The EIS should explain what is meant by the term "hydrologic recovery." It is unclear how hydrologic recovery would be accelerated under Alternatives 2 and 7 because these alternatives involve so much clearcutting.

Several scales of hydrologic recovery are used in the analysis. At the stand level, WATSED uses vegetation recovery curves (WATSED manual, page PC-107) to model evapotranspiration recovery. This is one of the factors in the model that influences the water yield outputs.

A more qualitative discussion of hydrologic recovery for each watershed in the Aquatics section of Chapter III expresses the concept that as trees grow to maturity in openings, evapotranspiration rates increase, which directly reduces water yields and thus indirectly influences the recovery of bank stability, woody debris recruitment and sediment production. Accelerated hydrologic recovery, as detailed in the Iron Honey tributary section of the effects analysis (Chapter III, 3.2.4(B) Effects to Aquatic Resources at the Watershed Scale) speaks to the effects of the entire project, and bases this recovery trend on the removal of sediment and bedload sources (both existing and potential) from the watershed. It also reflects that peak flows from proposed timber removal is not projected to be a significant long term detriment to watershed recovery (5-9 years, in Iron Creek, for example - Chapter II, 3.2.4 (B)(1) Effects to the Iron Creek Watershed).

8 (f). With regard to the 20 years for the hydrologic system of the watershed to recover, the EIS should give the baseline for recovery. If baseline is the current condition, are current conditions good or bad for the hydrologic system?

In the Draft EIS, the statement regarding a 20-year hydrologic recovery period was a generalized estimate of how long it would take for the evapotranspiration rate of the vegetation in harvest units to recover to the pre-harvest rate. The baseline for recovery in this context was the current conditions. However, these sections have been rewritten in the Final EIS and the 20 year estimate was omitted.

8 (g). The pulse approach should be discussed further in terms of advantages and disadvantages in meeting the different objectives. How long has this approach been used and how successful has it been?

To the best of our knowledge, there is very limited long-term information of the success of the pulse approach. However, natural processes in these ecosystems ran in pulse-types of disturbances over very large areas (Coeur d' Alene Geographic Assessment, and Landscape Dynamics Chapter (1996) of the Component Assessment for Interior Columbia Basin Ecosystems Management Project). Therefore, it was assumed that a pulse that emulated the effects of a natural disturbance, such as a large, stand replacing fire, would keep the effects of a project within the natural range of variability of this ecosystem. This is discussed further in Chapter II (page II-14) and Appendix D (page D-15).

Although the pulse approach was used to formulate Alternative 5, the Interdisciplinary Team rapidly discovered during their analysis of effects that a pulse to the entire watershed might lead to degradation of other resources, such as wildlife, and watershed. The team also had concerns that to implement a pulse meant also to implement a long rest period after the pulse, and the regulations and policies on the Idaho Panhandle National Forests did not contain a vehicle for administering a long-term rest of an area this size. Therefore, alternatives to the pulse approach were

devised and analyzed to reflect the advantages and disadvantages of the different methods of meeting the objectives stated in the Purpose and Need in Chapter I (1.1 Purpose and Need).

8 (h). It appears that while a clearcut can mimic a fire by creating an opening, clearcuts do not provide the large influx of wood associated with fires. Are there other differences? Why is the FS preemptively creating these openings rather than waiting for the natural fire?

It is recognized that clearcuts, in their purest form, do not provide for the retention of large amounts of wood associated with the majority of stand-replacing fires. In fact, the analysis for snag habitat points to a severe lack of wood in the area, particularly standing and down in the older clearcuts. That is the reason that alternatives were designed to employ silvicultural practices like irregular group shelterwoods that more closely emmulate the aftermath of such a fire in these landscapes. The intent of these systems is to leave both standing and down wood, along with remnant large green trees, similar to the landscapes described in much of the historic literature, while still creating the openings necessary to regenerate the desired early seral conifer species.

Some other differences (reflected in the analyis) are that stand-replacing fires did not stop at designated boundaries, and usually contributed to extremely high erosion rates for several years, along with more intensive flood events that moved the sediment through the aquatic system. Much has changed since the time of those disturbance events. Dams have been built that result in deposition of that sediment in very controlled portions of the downstream river systems. People and their valued assets now are interspersed on a landscape where widespread stand-replacing fires are no longer tolerated. Atmospheric pollution in the form of smoke is no longer tolerated in areas downwind of forests that historically burned. All of these changes have resulted in a tightening of the regulations governing acceptable practices on the National Forests. Based on these changes, the Forest Service now believes the public would find it unacceptable to burn the forest to the extent needed to create these openings. The vegetative treatments and objectives are descibed in the Environmental Consequences portions of sections 3.3.4 to 3.3.12 with addtional information in section 3.3.13.

8 (i). Explain the concept of "recruitment old growth allocation" and how this works. This is not adequately explained nor is it defined in the glossary.

A definition for potential or recruitment old growth has been added to the glossary (page AG-11). Potential old growth stands are those that do not yet have all the characteristics of old growth (old trees and related structural attributes such as tree size, number of large trees per acre, basal area, decadence, dead trees, number of canopy layers, canopy gaps), but are being managed and allocated to develop those characteristics over time. The characteristics for old growth are described by the Forest Plan and Forest Supervisors June 22, 1993 clarification letter (found in the project file).

Concerns Identified by Troy Trvdy, Idaho Panhandle Chapter Trout Unlimited (#10)

Mr. Tvrdy supports Alternative 2, but recommends combining features of the alternatives as described in Comment 10 (b).

10 (a). The monitoring program should be extended beyond the 10 years stated in the DEIS (Appendix C).

The length of time monitoring is needed will be determined by the results and evaluation of what is being monitored (Chapter II, 2.6.11 Monitoring). When it is certain that regulations and standards are being met, monitoring of a particular element will cease. If monitoring evaluations show that regulations or standards are not being achieved at the desired level, management intervention will occur.

10 (b). Alternative 6 has merit, but there would be difficulty in obtaining funding to accomplish the watershed restoration activities. We would like to see some of the proposed methods to meet the objectives in Alternative 6 used also. A combination of Alternatives 2 and 6 if you will.

In response to this suggestion, which is similar to comment 6 (d), the project interdisciplinary team developed an alternative that combines some of the watershed restoration activities of Alternative 6 with the limited "pulse" of regeneration harvest in the Iron Creek and Solitaire drainages proposed under Alternative 5. The combined alternative is identified as Alternative 8. Alternative 8 would remove more channel crossings, recontour more miles of roadbed, and upgrade more culverts than Alternative 2, but less than Alternative 6. For additional information on Alternative 8, please refer to Chapter II (2.6.8 Alternative 8).

01

Kootenai Environmental Alliance

P.O. Box 1598 Coeur d'Alene, ID 83816-1598

June 1, 2000,

Coeur d'Alene River Ranger District
Attn: Iron Honey Resource Area Project
2502 East Sherman Ave.
Coeur d'Alene, ID 83814

Re: Public comments on the Iron Honey Draft Environmental Impact Statement in behalf of the Kootenai Environmental Alliance

The concept of utilizing a forest land management technique that tends to emulate some of the effects of stand replacement fire appears to be interesting on the surface. The so-called "pulse" approach to timber harvest tempts serious consideration for it's promise of infrequent incursions within a given watershed or Resource Area. However, the utilization of the pulse technique as a forest management tool must surely assume it is applied only where the existing watershed is in a proper functioning condition.

Nothing could be further from this fact in the upper Coeur d'Alene watershed system!

The Iron Honey Draft Environmental Impact Statement is inconsistent in addressing this critical issue of watershed condition. This inconsistency is particularly and glaringly apparent when one reviews older Environmental Assessments prepared in 1992 for the Barney Rubble's Cabin and Skookum resource areas, located just south of the subject Iron Honey RA.

As an example, in the Iron Honey DEIS section "Aquatics", the author(s) quote the NFMA that states the US Forest Service must "*manage for a diversity of fish habitat to support viable fish populations* (36 CFR 219.9)" (underline added for emphasis). The DEIS goes on to say, on page 56,

> *"The quality of fish habitat conditions in the cumulative effects area have generally been compromised but are adequate to support viable populations of some cold water biota, especially resident fishes."*

This simple, single quote typifies the bland generalization utilized when the USFS does not want to deal with specifics. They fail to quantify what the term "viable" populations are. The fact is that the subject area, the upper reaches of the Little North Fork of the Coeur d'Alene River (LNF Cd'A) have been on a catch and release regime for years and yet the fish population of West Slope Cutthroat continues to decline. This DEIS avoids disclosing that this section of the Cd'A River system is in very poor condition.

A fish population study conducted by Joel Hunt (1991, University of Idaho) found **19 to 23 fish per Kilometer of the Little North Fork below Skookum Creek**. **The fish count above Deception Creek was even lower, averaging 11 fish per Kilometer of river.** This section of river can be, and is, compared to the upper sections of the **St. Joe River which contained an average of 200 to 300 fish per Kilometer of river.**

It appears that the IPNF has intentionally avoided or fails to have quantitative data regarding fisheries and their habitat in this Resource Area. Instead, there are a great deal of broad statements as to the current status of the subject Resource Area and the effects to the resources covered in each alternative. NFMA at 36 CFR 219.12 (g) (1) states the USFS must identify for each EIS alternative *"The expected outputs for the planning periods, including appropriate marketable goods and services, as well as nonmarket items, such as recreation and wilderness use, wildlife and fish, protection and enhancement of soil, water, and air, and preservation of aesthetic and cultural resource values:"*

The Iron Honey DEIS continues to perpetrate inconsistencies when reporting watershed conditions, what causes these conditions and what are the resulting populations of native fish.

As an example, the DEIS seems to vacillate as to whether the upper LNF Cd'A is in very poor condition or something less in terms of degradation. On page 58 of the DEIS, they say *"The Little North Fork of the Coeur d'Alene River system appears to be one of the few larger watersheds in the Coeur d'Alene basin that is not capable of fully supporting native fish or other biotic beneficial uses of the water."*

Yet there is little site specific or quantifiable data to suggest the true condition of the upper reaches of this river. The DEIS leaves the reader with little substance to draw his/her own conclusions of watershed condition with any hope of accuracy. When one utilizes older analysis data available, only then does one now become aware of just how devastated this river system is in terms of fisheries habitat.

Again, it is not volunteered nor clear what are the major contributors to water quality and habitat degradation. This particular DEIS puts major emphasis on roads and stream crossings. That is understandable and, in our opinion, one of the proper focuses of degradation. However, again the USFS waffles on just how significant canopy openings are in causing watershed problems. On page 69, the DEIS states:

" The hydrologic regime in all these tributaries (Honey, Sob, Solitaire and Upper Little North Fork*) has been altered as a result of timber harvest and road building in the same four respects as Iron and Hudlow Creeks. Peak flows are longer in duration, peak flows generated by rain-on-snow events increase in magnitude with tree canopy removal, the effective gradient of some of the channels has been increased, and subsurface flows intercepted by road cuts can be rapidly routed on compacted road surfaces to stream channels."*

"The monthly peak flows and rain-on-snow risk represent both elevated monthly peak flows and rain-on-snow risk within all these sub-watersheds (Appendix D). Though slowly recovering, these streams will be influenced for a long period of time by the hydrologic alterations described above.)

On page 74 through 76, the DEIS flatly states that peak flows would be *"greatly increased"* for Alternatives 2 and 7. Alternatives 2 and 7 call for similar harvest plans of about 1,000 to 1,200 acres cut, primarily Shelterwood harvests. The waffling that we earlier referred to is demonstrated by the DEIS Environmental Consequences analysis of Alternative 5 on pages 75 and 76. This Alternative proposes to cut nearly 300 percent more acres (4,335) than either Alternative 2 or 7, but after going through a convoluted attempt to say what Alternative 5 would do to the watershed, it finishes with the weak summary *"Iron Creek would be negatively impacted by activities under Alternative 5."* This, we contend, is the understatement of the year. Again, it appears, and we repeat, it appears that the authors of this DEIS tend to avoid very frank negative analysis of alternatives that produce maximum timber. It is beyond us how Alternative 5 only rates a *"negatively impacted"* rating in terms of watershed effects.

The IPNF concedes that vegetative recovery (canopy restoral) will bring a gradual decrease in the elevated peak flows. On page 99 of the DEIS they state, *"The risk of rain-on-snow generated peak flows would also be reduced with vegetative recovery"*. This peak flow reduction is attributed to the much down played Alternative 1. This statement seems to be one of the few places in the DEIS where the IPNF admits or suggests that large scale canopy removal is one of the major contributors to significantly increased peak flows. It is difficult to imagine then how major canopy removal can have little cumulative effect on the constant problem in this region of bedload movement.

The Coeur d'Alene River Ranger Dist. has and still is failing to meet some of its stated Goals in the Forest Plan.

There is ample information that clearly demonstrates the critical effects canopy openings have on watershed health. One example it the USFS frequent reference to past Forest Service Hydrologist work by Gary Kappesser. As a general rule, the USFS warns that drainages having Equivalent Clearcut Areas (ECA) above 20 to 25 percent *"are considered to be at high risk for channel damage."* Other indexes such as Peak Flows and Rain on Snow absolutely support the fact that the huge inventory of roads, large canopy openings and the majority of the subject area being within the Rain on Snow zone are the primary contributors to the present watershed functioning at risk in many areas. Since there is such an emphasis on promised watershed restoration work, which is used as a carrot and stick game, the DEIS discusses the road issue with considerable emphasis and with regularity. Not so when the question of canopy openings is raised since to give big clearcut or near clearcut activity a black eye would be counter productive to the USFS latest game, the pulse technique or, ie: big clearcuts.

KEA is convinced that this forest has a serious fuel load problem and is ever mindful of the risks caused by past fire suppression and certain past land management policies. However, the USFS has managed this forest for decades at the expense of declining fish habit health. There is no distinction or law that we are aware of that allows or suggests

that the beneficial uses of recreation and fishing holds a lower priority or is to play second fiddle to timber extraction. The IPNF can no longer ignore or deny this imbalance in priorities simply because the public is becoming increasingly more intolerant of this activity.

The classical denial is shown in the Environmental Consequences section on page 82 where the USFS claims, in behalf of Alternatives 3,5 and 7 that *"The cumulative effects from management activities over the No-Action Alternative would not be measurable at the tributary scale for peak flows or sediment."* We presume that this claim is made because of the promised watershed mitigation work that is typically included in these aggressive harvest alternatives. However, it is mystifying how Alternative 5, which holds only limited watershed work but does propose to harvest a staggering 4,335 acres of timber (45.7 million board feet) will produce no measurable increase in peak flows or sediment, regardless of the fact that they confine this benign prediction to the "tributary scale". That contention will have to be proven before proper authorities before it is accepted at the public level.

The DEIS has an interesting disparity in its reported Equivalent Clearcut Area (ECA) figures versus what was reported for the same area in 1992. As an example, in Appendix D of the Iron Honey DEIS it is stated that Lewelling Creek has an ECA of only 4 % but the 1992 Barney Rubble's Cabin EA shows this same area having an ECA of 19%. Similarly, Hudlow Creek currently shows it has 13 % vs. 17% eight years ago; Iron Creek now is 15% vs. 25.3% before; Tom Lavin Creek is supposedly a mere 7% but was 18% just eight years ago. Some of these disparities may be attributed to some degree to canopy recovery during the past eight years but certainly some of these differences defy what we would have expected. These differences beg an explanation. In any event the past summations of the condition of the LNF Cd'A River below the Iron Honey RA is replete with testimony that this watershed is in big trouble. Much of this blame is laid, in the past by the IPNF, upon excessive canopy openings or clearcuts. The descriptions of how large canopy openings contribute significantly to peak runoff conditions explains, in part, why this river has suffered huge bedload movement. Yet the Iron Honey DEIS seems strangely silent on this subject with only fleeting mention of the effects of "vegetative recovery".

We cannot see how the Cd'A River Ranger Dist. can seriously suggest utilizing the pulse approach in the Iron Honey RA knowing that this entire stretch of the Cd'A river is in poor condition and clearly not meeting the goals outlined in the Forest Plan nor meeting NFMA requirements as far as fisheries is concerned. Applying the pulse philosophy on land having healthy watersheds warrants serious considerations, in our opinion, but not on land that the USFS readily admits has produced fishery habitat that is terribly substandard. Compare the analysis of stream conditions and fish populations of the LNF Cd'A River with the upper reaches of the St. Joe and one must surely conclude that watershed restoration in the Cd'A system must precede any further harvest activities of significance until this system can recover to a reasonable extent.

KEA is not alone in being extremely concerned about the neglect of this particular watershed. In a letter to Mr. David Wright on Jan. 14, 1993, the Idaho Fish and Game

Dept. points these IPNF 1987 Forest Plan Goals and Objectives failures out in reference to both the 1992 Environmental Assessments for Skookum Creek and the Barney Rubble's Cabin RA.

The IDF&G says,

- *Forest Wide Goal #2 – Provide for dispersed recreation. The collapse of the Little North Fork fishery, despite our* (IDF&G) *best attempts through regulations to improve it, has essentially eliminated the opportunity for anglers to fish a high quality trout stream in close proximity to the urban center of Coeur d'Alene. Our options for providing more consumptive stream fisheries are also greatly reduced by the loss of carrying capacity in the Little North Fork.*

- *Forest Wide Goal #9 – Manage vertebrate wildlife to maintain viable populations. As stated earlier, we believe the Little North Fork cutthroat fishery is already at risk. Even if the Biological Evaluation (BE) is correct with a "no effect" call, the populations will continue to be at risk for maintaining viability. Maintaining viability is also a requirement of NFMA and Forest Service policy.*

- *Forest Wide Goal #13 – Manage fisheries habitat to provide a carrying capacity that will allow an increase in the Forest's trout populations. As long as water yields continue to be pushed to the limit (or beyond) by continued timber harvest, it is not likely the watershed will heal. Again, we cite the "no effect" findings of the BE's in making the point that even under optimistic performance by the mitigation projects, no positive effect is concluded. Beyond that, we seriously question whether the proposed mitigation can handle the additional water yields and delays in recovery expected as a result of the considerable timber harvest program.*

- *Forest Wide Goal #18 – Maintain high quality water to protect fish habitat. This goal is not being met in the Little North Fork now, nor will it be in the future unless management activities are designed to create net benefits to the watershed.*

- *Forest Wide Goal #19 – Manage resource developments to protect the integrity of the stream channel system. In its existing condition, the integrity of the Little North Fork and its tributaries is not being protected. High water yields continue to shift bedload annually. Some of the proposed mitigation should help to control bedload in the tributaries, but continued high flows will not allow for stabilization of the stream system.*

These same failures still exist today and will be significantly exacerbated if major canopy removal is undertaken in this Resource Area before major vegetative recovery is allowed to occur.

Regarding the generalizations utilized in this DEIS, NEPA states *"Statements shall be concise, clear and to the point, and shall be supported by evidence that the agency has made the necessary environmental analyses."* (40 CFR 1502.1) This DEIS contains no fish population inventories (viable populations?), pool frequencies and volumes, width/depth ratios, water temperatures or any other quantitative information that was so liberally offered in older Environmental Assessments of this general area. On page 101 of the DEIS, they say, *"The population trend of the cutthroat was in rapid decline but now appears to be stabilizing."* This statement typifies a glaring oversimplification of the current state of this fishery. What is meant by "appears to be stabilizing."? What scientific data is this statement based upon? What are the current densities of cutthroat fish in the upper sections of the river? Has any monitoring data been collected regarding fish populations? Again, this generalization, suggesting that the rapid decline of cutthroat numbers has stabilized is in violation of both NEPA and NFMA because it completely lacks specificity. However, on Page D-25 of the DEIS there again appears an oblique contradiction to the assessment that fish populations are stabilizing by saying *"Existing fish habitat conditions are generally below desired levels and the trend is not favorable in all these watersheds with this area, except Lewelling Creek"*. In fact, the entire section of Appendix D from page D-18 through page D-27 reads more like a first grade primer course addressing General Effects of Activities, Watershed Processes and Effects of Past Activities on Fish Habitat Connectivity with virtually no specific quantitative information directed towards the subject river section. We failed to see one figure regarding fisheries or any comparative data that would assess the habitat condition of this watershed compared to a similar un-entered watershed.

The 1987 Forest Plan covering this Resource Area makes a number of commitments to maintain good fishery habitat and native fish in quantities appropriate for this size and type of stream. However, very little reference is made in the Iron Honey DEIS to the goals stated in the current Forest Plan. Federal Regulations clearly state, *"Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area."* What is equally clear is this Federal Regulation and Forest Plan Goal is not being met or remotely adhered to. Furthermore, prior descriptions of the upper reaches of the Little North Fork of the Cd'A River and its tributary streams in prior EA's was a grim admission of how past land administration activities had reduced this watershed to a mere shadow of its expected carrying capacity. In spite of this negative assessment, the record fails to indicate any meaningful or significant mitigation work since these EA's were published (1992) and, in fact, it would appear that the subject watershed has continued to decline in terms of habitat. Recently, a section of Burnt Cabin Creek, just down stream from the Iron Honey RA, washed out during a comparatively moderate precipitation event confirming the claim that this entire section of the Cd'A River system has very little capacity to absorb peak flows.

A great deal of fault finding has been going on for several decades concerning what and who is the cause of this watershed degradation. However, there are two very simple and clear points that must be made regarding this problem.

First, the IPNF readily admits in some of it's own documentation that the upper reaches of the Coeur d'Alene River system is not meeting it's beneficial uses in terms of water quality, fisheries and fishery habitat.

Second, in spite of the loud debate on what and who has caused this watershed problem, it obviously has occurred during the USFS's watch; no other group of people, corporation or agency has been given the authority and responsibility that has been handed to the US Forest Service for the last 100 plus years. Regardless of who the culprit(s) is, or are, this failure must surely rest on the shoulders of the USFS. If this is factual, then we cannot see how the Coeur d'Alene River Ranger Dist. can justify continuing to exacerbate the continued worsening problem of fishery habitat decline.

In summary, every effort should be directed towards mitigating the sources of peak flow problems. The Coeur d'Alene River area is particularly vulnerable to this type of event. Page 101 of the DEIS, in general, tends to sum up what should be done. This document states *"Watershed conditions are not likely to improve until sediment sources are removed and natural hillslope processes are restored."* The only conscionable decision would be to implement Alternative 6 to maximize watershed recovery. Once those measures are taken to significantly reduce these hazards, and sufficient vegetative recovery is attained, then and only then should the Cd'A River Ranger Dist. consider applying the pulse technique within the Cd'A River area. In fact, a long term, aggressive restoration program, free of the counter productive harvest gimmicks, is probably the only way the US Forest Service is ever going to eventually restore the Coeur d'Alene River Ranger District back to a timber production region.

To continue to ignore the simple fact that excessive harvest activity and road construction has rendered this river to a mere shadow of what its potential should be is no longer acceptable. If the USFS wants the public to discontinue interjecting themselves into the daily administration of the public forest, the USFS must take credible action to reverse the current trend of denying they have created a serious problem.

We strongly support the USFS continuing to be the agency of choice to administer these public lands. However, it remains to be seen whether this agency is willing to step up to the plate and assume the full responsibility it is charged with. We are concerned that if the USFS continues to deny some of their legal responsibilities, pressure will continue to be perpetrated to change who has the assigned task of administering these lands.
The possibility of changing of the guard of federal lands administration is not going to make this problem go away. Therefore, KEA feels that reassigning this responsibility to some other agency is risky and self-deceiving.

The ball is in your court.

Respectfully,

02

Kootenai Environmental Alliance

P.O. Box 1598 Coeur d'Alene, ID 83816-1598

Coeur d'Alene River Ranger District
Attn: Iron Honey Resource Area Project
2502 East Sherman Avenue
Coeur d'Alene, ID 83814

June 2, 3000

I am submitting the following supplemental comments for KEA regarding the Iron Honey Draft EIS.

1A. WATSED model:
Page 1 of Chapter 1 has the following sentence "Water yields have significantly changed over historic levels within the Upper Little North Fork Coeur d'Alene River, primarily due to extensive vegetative changes from logging and through the extension of channel networks associated with roading."

In our Nov 22, 1997 letter to the District regarding Iron Honey, we requested that watershed analysis should include rain-on-snow(r-o-s) analysis and analysis of RASI data. The DEIS indicates that the requested analysis was not performed. Page A-7 of Appendix A of the DEIS indicates that a "Net Associated Sediment Risk" model was used in conjunction with the WATSED model. There is no further mention in the DEIS of the "Net Associated Sediment Risk" model, and there is no explanation or analysis with data of how the "Net Associated Sediment Risk" model works in conjunction with the WATSED model. NEPA at 40 CFR 1500.1(b) requires that information be made available to the public before decisions are made and before actions are taken.

The Final EIS must: supply an indepth discussion of how the "Net Associated Sediment Risk" model works; describe the features of the model that show this model is scientifically superior to r-o-s and RASI analysis; and state the date, year and month, of the most recent calibration of, and validation of the WATSED model.

The Final EIS must also list the page number(s) of the WATSED manual that describe the relationship of the "Net Associated Sediment Risk" model to calculating water yields, peak flows, and bedload movement. If the "Net Associated Sediment Risk" model cannot calculate water yields, peak flows, and bedload movement, this information needs to be stated in the Final EIS.

There is also the following water issue related to the WATSED model. Page 29 of Chapter III of the Barney's Rubble Cabin E.A., Fernan Ranger District, 1992, has the following sentences

concerning the model "The program estimates fine sediment delivery using several variables including bedrock geology, slope percent, and slope position (ridge, streamside, etc). It is very important to recognize that these figures do not include the delivery of coarse (larger than sand size) material to the stream and thus greatly underestimate the actual volume of material delivered to the channel. This is likely to be especially important in watersheds such as Burnt Cabin where road densities are high (especially unmaintained non-system roads) and culvert failures are an important component of the total sediment delivery."
Page 1 of Appendix F of the DEIS indicates that there is a very high road density, 8.6 miles of road per square mile in the Project Area. It is also clear that there are significant number of miles of non-system roads in the Project Area that are not maintained, out of the 122 miles of non-system roads in the Project Area.

Due to the failure of the WATSED model to accurately account for the delivery of coarse material to stream channels, the estimates given for Annual Sediment and Current Sediment Load Modification(percent) for each watershed described in Appendix D are not accurate. The Final EIS needs to supply accurate data for the true amount of Annual Sediment being delivered to each stream in each watershed.

If the PC version of WATSED was used for any water or sediment calculations, the Final EIS needs to indicate the date of the most recent calibration and validation of this version of the model, year and month. The Final EIS also needs to state whether the PC version of WATSED cannot perform certain modeling procedures that are run on the mainframe version of WATSED.

1B: WATBAL model:
Page 2 of Appendix D under Hydrological Regime discusses R1/R4 Sediment Guides 2 and the Watbal Technical User Guide 3. It is also indicated that anticipated runoff modification were derived from the Watbal Technical User Guide along with WATSED. It is not clear from the discussion on page 2 of D as to why both Watbal and WATSED are used to calculate peak flow (runoff modification).

The Final EIS needs to have a concise description of how Watbal and WATSED are used to calculate peak flows. If one Model was used to perform the majority of the calculations, the Final EIS needs to indicate which Model was used.

2. Water:
The DEIS on pages 47, 48, 49, 50, and 51 do not mention bedload movement. Page 62 mentions increased bedload supply. There are no Tables in Chapter III that list the current degree of bedload movement in each of the streams within and below the Project Area.

Accurate scientific analysis and high quality information, as required by NEPA, is lacking in the DEIS regarding the water quality/water quantity issues relating to bedload movement in each of the streams within the Project Area.

There are also no expert agency comment in Chapter III of the DEIS that informs the public as to whether nearly 100% of the LNF River System still continues to move on a annual basis. The expected increases in peak flows for each of the Action Alternatives in each of the Watersheds, as described in the Environmental Consequences section of Chapter III, will significantly impact bedload movement in the streams in the Project Area. The increases in peak flows will also impact bedload movement below the Project Area.

The Final EIS needs to supply scientific analysis with data that will indicate how increases in peak flows and water yield associated with each Action Alternatives will not increase bedload movement in the streams within the Project Area and the entire LNF River System.

The Final EIS also needs to supply scientific analysis and data regarding the expected cumulative effects to the LNF River System and bedload movement, due to past timber sales, ongoing beetle timber sales, and planned timber sales in the Project Area.

There also should be specific analysis in the Final EIS regarding estimated peak flows and water yields in each of the Watersheds where proposed new canopy openings would be directly adjacent to current canopy openings.

The Final EIS should have extensive analysis regarding proposed canopy openings and the potential increase in bedload movement for Iron Creek which is listed as Non-Functioning, page 48 of Chapter III, and each of the streams listed as Functioning-at-Risk.

3. Fisheries:
Page 52 of the DEIS mentions stream temperatures in relation to aquatic habitat conditions in the Project Area. There are no charts or Tables in Chapter III of the DEIS that indicate stream temperature data exists for the streams in the Project Area. The State of Idaho has specific requirements regarding streams temperatures for Aquatic Life. There is no data in the DEIS that indicates the current requirements are being met or will be met with any of the Action Alternatives.
Pages 19 and 20 of Appendix D state that the proposed project activities will not impact existing stream temperatures, but no historical data is supplied in Appendix D that indicates there will be no changes to water temperatures.

The Final EIS needs to supply analysis with data that will

indicate whether any new logging will meet the following State temperature requirements for: Cold Water, Salmonid spawning waters, Bull Trout waters, and Seasonal Cold Water.

3a. Cold Water: Waters designated for cold water aquatic life are to exhibit the following characteristics: b. water temperatures of twenty-two (22) degrees C or less with a maximum daily average of no greater than nineteen (19) degrees C. [Page 101 of Sec 250, IDAPA 16.01.02]

3b. Salmonid spawning: waters designated for salmonid spawning are to exhibit the following characteristics during the spawning period and incubation for the particular species inhabiting those waters:
ii. Water temperatures of thirteen (13) degrees C or less with a maximum daily average no greater than nine degrees (9) degrees C. [Page 102 of Sec 250, IDAPA 16.01.02]

3c. Regarding Bull Trout temperature requirements: these water temperatures shall not exceed (12) degrees C daily average during June, July and August for juvenile bull trout rearing, and nine degrees (9) C daily average during September and October for bull trout spawning. For the purpose of measuring these criteria, the daily average shall be generated from a recording device with a minimum of 6 evenly spaced measurements in a twenty-four hour period. [Page 102 of Sec 250, IDAPA 16.01.02]

3d. Seasonal Cold Water : "Water temperatures of twenty-seven (27) degrees C or less as a daily maximum with a daily average of no greater than twenty-four (24) degrees C." [Page 103 of Sec 250, IDAPA 16.01.02]

3e. Dissolved Oxygen Concentrations:
There are also the following State requirements regarding Dissolved Oxygen Concentrations for cold water aquatic life. On page 101 of Sec 250 "Dissolved Oxygen Concentrations exceeding six (6) mg/L at all times." [Page 101 of Sec 250, IDAPA 16.01.01]

3f. Concerning Dissolved Oxygen and Intergravel Dissolved Oxygen requirements for Salmonid spawning waters, they include "One (1) day minimum of not less than five point zero (5.0) mg/L" and Seven (7) day average mean of not less than six point zero (6.0) mg/L." [Page 102 of Sec 250, IDAPA 16.01.02]

3g. For Seasonal Cold Water, the following characteristics apply, "Dissolved Oxygen Concentrations exceeding six (6) mg/L at all times." [Page 103 of Sec 250, IDAPA 16.01.02]

The Final EIS needs to indicate which streams within the Project Area currently meet State requirements concerning Dissolved Oxygen and Intergravel Dissolved Oxygen concentrations.

If any new logging will impact any streams and Dissolved Oxygen and Intergravel Dissolved Concentrations in these streams, these impacts need to be fully described in the Final EIS.

The State of Idaho requirements concerning Temperature and Dissolved Oxygen Concentrations and Intergravel Dissolved Oxygen are particularly important for Bull Trout that may exist in the LNF above Iron Creek, Tom Lavin Creek, and Lewelling Creek. The Final EIS should indicate the date of the most recent examination for Dissolved Oxygen Concentrations and Intergravel Dissolved Oxygen in the LNF River System, including above Iron Creek, Tom Lavin Creek and Lewelling Creek.

The Final EIS should indicate that the U.S. Fish and Wildlife Service has established a Bull Trout Recovery Unit Team for the Coeur d'Alene Lake Basin Recovery Unit. This area includes the Iron Honey Project Area.

The degraded fisheries in the Project Area currently are not in compliance with the Clean Water Act(CWA). The goal of the Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. An interim goal of the Act is the protection and propagation of fish, shellfish, and wildlife.

The biological integrity of the LNF River System, including the Iron Honey area, has not been restored or maintained. The requirement for protection and propagation of Bull Trout and Westslope Cutthroat Trout in the LNF River System, including the Iron Honey, also has not been meet. The continued fisheries habitat degradation described on page 58 of Chapter III is a clear indication that the requirements of the CWA have not been met. It is also clear from page 101 of Chapter III that the fisheries requirements of the CWA will not be met until natural hillslope processes are restored. There is no analysis in Chapter III that explains why, more than 25 years after the CWA became Federal law that directly applied to the Forest Service, the fisheries conditions in the LNF River System are in such dismal condition. Any short term increase in sediment and/or bedload movement in the streams within the Project Area will continue the fisheries degradation in the Project Area. The Action Alternatives proposed will not meet the biological integrity requirements of CWA.

4. Monitoring:
Appendix C concerns a Aquatic Resources Monitoring and Evaluation Plan. Appendix C does not include a discussion of the results from the Monitoring of previous timber sales within and/or adjacent to the Project Area. There is also no mention of written Evaluations that were to accompany the Monitoring data, as is required by the IPNF Forest Plan, NFMA, and CWA.

The Final EIS needs to answer the following Monitoring and

Evaluation questions.
Are there any written fisheries and/or watershed Evaluations associated with Monitoring data gathered as a result of the Hudlow II timber sale? If there is a written fisheries and/or watershed Evaluation report, the Final EIS needs to describe the findings of the Evaluation report as it relates to fisheries and watershed conditions following the timber sale.

If there are any other fisheries and/or watershed Evaluations that are related to other timber sales within or adjacent to the Project Area, the Final EIS needs to describe the findings of the Evaluation reports.

If there has been Monitoring performed in any 1st, 2nd or 3rd order drainages within and/or adjacent to the Project Area, with accompanying Evaluation reports, the Final EIS needs to indicate the results of the Evaluation reports regarding improvements to fisheries, fisheries habitat, and watersheds.

The Final EIS also needs to indicate if there have not been any Evaluations written by the District for any previous timber sales associated with the IPNF Monitoring Program, within and/or adjacent to the Project Area.

5. Transportation:
Appendix F, page 1 indicates that there are approximately 288 miles of existing roads within the Project Area. Page 1 also indicates there are approximately 166 lies of system roads 122 miles of non-system roads in the Project Area. Appendix F does not indicate how many miles of road were constructed within the Project Area after 1972, when the CWA became law.

The Final EIS needs to supply data that will indicate how many miles of new roads were constructed after 1972 in the Project Area, and also indicate how many miles of roads have been reconstructed since 1972, in the Project Area.

The Final EIS should also supply data that will indicate how many miles of roads were constructed and reconstructed within the Project Area between the years 1957 and 1971, if data exists for this time period.

6. Old Growth:
It is not clear in the Vegetation section of Chapter III how many acres that contain old trees would be logged by each Action Alternative. The Final EIS should indicate how many acres of old trees, not classified as Old Growth and replacement Old Growth, exist in each Watershed within the Project Area. The Final EIS should also supply data that would indicate how many acres of Old Growth, and replacement Old Growth exist in the OGMU that is adjacent to the Iron Honey Project Area. This area would include the Savant Sage area mentioned on page 184 of Chapter III of the

DEIS.

Due to the numerous watershed and fisheries problems that currently exist within the Iron Honey Project Area and the entire LNF River System, Alternative 6 should be selected as the preferred Alternative.

Sincerely,

Mike Mihelich

Mike Mihelich Forestry Committee

0 8 JUN 2000

03

STATE OF IDAHO
DIVISION OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706-1255 • (208) 373-0502

Dirk Kempthorne, Governor
C. Stephen Allred, Administrator

June 5, 2000

Susan Jeheber-Matthews
District Ranger
Coeur d'Alene Ranger District
Idaho Panhandle National Forests
2502 East Sherman Ave.
Coeur d'Alene, ID 83814

Dear Ms. Jeheber-Matthews:

This letter is in response to the Federal Register (Vol. 65, No. 78; April 21, 2000) notice of availability of the Iron Honey Draft Environmental Impact Statement (DEIS). Our comments address air quality issues related to the use of wildland and prescribed fire. We appreciate the need to use prescribed fire as a forest health tool but this must be done in conjunction with protecting human health and welfare.

Prescribed burning is proposed on up to 4,200 acres (alternative 5) yet air quality was not discussed in detail in the DEIS (page 17). Without being able to review the "Air Quality Project File," it is difficult to evaluate if air quality was adequately addressed during the development of the DEIS. The DEIS should include a summary of the air quality analysis at the very least. We are including an enclosure which has information to assist you with the air quality analysis.

Good smoke management is still the responsibility of the burner, even if there is compliance with all existing requirements and programs. General information should be disclosed in the DEIS on: maximum number of acres to be burned in a day; acres per burn unit; maximum daily and burn unit PM_{10} and $PM_{2.5}$ emission estimates; smoke sensitive areas; emission reduction techniques; public notification process; mitigation actions during smoke intrusion episodes; non-burning alternatives considered and used; and coordination with other burn activity.

We support a coordinated effort between state, interstate, federal, tribal, and local agencies. All planned wildland and prescribed fire activities must include careful consideration of air quality impacts and requirements. We look forward to working with you as you develop the Final EIS and at the individual project level as well. Thank you for the opportunity to comment and if you have any questions, please contact me by phone at (208)373-0214, by e-mail at driley@deq.state.id.us, or at the address on the letterhead.

Sincerely,

Diane Riley

Diane Riley
Air Quality Analyst
Air Quality Management Unit

DR/slh C:\NOVELL\GROUPW~1\MATTHEW2.WPD

Enclosure

cc: COF
Smoke Management File

Detailed Comments on Federal Register Notice Vol. 65, No. 78; April 21, 2000

Idaho Division of Environmental Quality

The Idaho Division of Environmental Quality (DEQ), State Air Quality Program Office specifically, has the primary responsibility to carry out the requirements of the Federal Clean Air Act (CAA) in Idaho. DEQ has a state office in Boise and six regional offices (see Attachment 1). The state office staff oversee air quality compliance and enforcement, and support ambient air quality monitoring and planning activities. The regional office air quality staff issue air quality permits, operate the monitoring sites, conduct source inspections, work with the local communities, handle complaints, and prepare and implement plans.

DEQ is concerned about smoke emissions for several reasons. The state of Idaho is 64 percent federal lands and is surrounded by states where wildland and prescribed fires can be a major source of emissions. The Federal Wildland Fire Management Policy and Program Review Implementation Action Plan Report (May 1996) calls for an expanded program to reintroduce fire in fire-dependent ecosystems. This may mean a ten fold or more increase in the use of wildland and prescribed fire. EPA regulations and policies have increased the need for managing fire emissions. The following paragraphs discuss the most relevant regulatory issues for wildland and prescribed fire.

National Ambient Air Quality Standards

The National Ambient Air Quality Standards (NAAQS) are established by EPA to protect human health and welfare. There are NAAQS for the following six air pollutants: carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, lead, and particulate matter (see Attachment 2). An area that violates any of the NAAQS is designated nonattainment for the specific NAAQS. Of the six, particulate matter (PM) is the pollutant of most concern for smoke emissions. There are four forms of the PM NAAQS. Prior to July 1997, there were only two, the annual and 24-hour PM_{10} NAAQS. PM_{10} stands for PM less than 10 micrometers in aerodynamic diameter which is equivalent to 1/25,000th of an inch. Last July 1997, EPA promulgated new PM NAAQS. In addition, there is now an annual and 24-hour $PM_{2.5}$ NAAQS. $PM_{2.5}$ stands for PM less than 2.5 micrometers in aerodynamic diameter which is 1/4 the size of PM_{10}. Attainment/nonattainment designations for the new $PM_{2.5}$ NAAQS will begin in the year 2002.

Once an area has been designated nonattainment, DEQ must prepare an attainment plan to meet the NAAQS by EPA specified deadlines. A nonattainment area plan can take several years to complete and generally includes: background information, air quality and meteorological assessments, emissions inventories, control measures, modeled attainment demonstrations, and contingency measures for the specific nonattainment area. Idaho state currently has three nonattainment areas for PM_{10}: Portneuf Valley (Pocatello area); Pinehurst; and Sandpoint. A portion of Kootenai County (Coeur d'Alene area) is a proposed PM_{10} nonattainment area (see Attachment 3). Fort Hall Indian Reservation is a tribal/EPA nonattainment area for PM_{10}. The NAAQS violations are the result of exceedences of the 24-hour PM_{10} NAAQS in the winter as well as an exceedence of the annual PM_{10} NAAQS in Portneuf Valley. These nonattainment areas

have not had exceedences in over three years and are eligible for redesignation as attainment areas.

There is also a statewide State Implementation Plan (SIP). The statewide SIP includes information on DEQ's general authority to regulate air quality, stationary source permitting, compliance, enforcement, and monitoring programs, nonattainment area plans, rules, statewide emissions inventory, and air stagnation advisories.

Health Effects

$PM_{2.5}$ can lodge deeply in the lungs and are more likely to cause health effects than PM_{10}. The majority of PM from smoke emissions is composed of organic and elemental carbon, and inorganic ash in the $PM_{2.5}$ size class. Toxic gases such as polynuclear aromatic hydrocarbons (PAH) can condense and absorb into particles. DEQ believes that the new $PM_{2.5}$ NAAQS will be more difficult to meet compared to the PM_{10} NAAQS, particularly for wildland and prescribed fire.

Monitoring

DEQ operates an extensive ambient air monitoring network to monitor for the NAAQS (see Attachment 4 and 5). Sites are located in Idaho's major urban areas as well as a few remote areas. The data from DEQ's network is available to the public.

General Conformity

The 1977 CAA amendments made it very clear that the Federal Government is subject to the CAA requirements. Section 118(a) states that any air polluting activity under the jurisdiction of the Federal Government "shall be subject to, and comply with, all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of air pollution in the same manner, and to the same extent as any nongovernmental entity."

The 1990 CAA amendments added that the above shall apply to any requirement whether substantive or procedural, any fees or charges imposed by state and local agencies to defray program costs, and any federal, state, or local exercise of authority, process, or sanctions. The 1990 amendments also required EPA to establish the transportation and general conformity regulations. The general conformity rule, promulgated in November 30, 1993, applies to non-transportation related federal activities such as prescribed fire. A conformity determination must be made for projects emitting air pollutants over specified de minimis levels to show that the projects will not contribute to any NAAQS violations. If a project is found to contribute to NAAQS violations, then emissions must be reduced or offset (another source's emissions are reduced). Attachment 4 is a table that indicates the de minimis levels for the different nonattainment areas.

Visibility

The 1977 CAA amendments, section 169A, established the following national visibility goal: "Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from manmade air pollution." One hundred and fifty six Class I areas were established in 1977 and included all national parks greater than 6,000 acres, all wilderness areas greater than 5,000 acres, and a few other areas. Class I areas are subject to the most stringent restrictions on how much additional pollution (increment) can be allowed. States containing Class I areas are to develop state visibility plans including long term strategies and monitoring programs to meet this national goal. Only seven states have approved visibility plans. All other states, including Idaho, are under federal implementation plans. Idaho has all or portions of five Class I areas: Selway-Bitterroot; Hell's Canyon; Sawtooth; Craters of the Moon; and Yellowstone (see Attachment 3).

In the mid-1980's, the IMPROVE (Interagency Monitoring of Protected Visual Environments) network began operation. Currently there are at least 75 sites (see Attachment 6) in or near Class I areas. This network is currently being expanded to include 110 sites. These sites monitor visibility through optical, particle, and visual measurements. This data is also available to the public. The data are used to establish background visibility levels, identify chemical species and emission sources, and document long-term visibility trends for assessing progress toward the national visibility goal.

The 1990 CAA amendments established the Grand Canyon Visibility Transport Commission (GCVTC) which issued a report to Congress with recommendations in 1996 on how to address visibility for 16 Class I areas in the Colorado Plateau. Southwestern Idaho was identified as a clean air corridor for these Class I areas. The Western Regional Air Partnership includes federal, state, tribal, private, and public representatives from ten western states. It was formed to implement the recommendations from the GCVTC report. The recommendations were used by EPA to develop the new regional haze regulations which were published on July 1, 1999. The regulations require all states to develop visibility plans to address regional haze impairment to Class I areas within their state and to Class I areas outside their state which may be affected by emissions from within their state.

Smoke Management

Idaho Code includes two advisory programs related to smoke management. 1) The air quality advisory program is primarily to address woodstove and fireplace emissions during the winter. There are air quality advisory programs in Coeur d'Alene, Pinehurst, Sandpoint, Ada County, and Pocatello. 2) An air stagnation advisory issued by DEQ bans all open burning and can apply to any area in the state experiencing critical air quality levels (IDAPA 16.01.01.550-562). An air stagnation advisory is issued when a NAAQS violation is possible or occurring. There are also restrictions for burning of some materials such as trade waste, residential solid waste, garbage, tires, and plastics (IDAPA 16.01.01.600-616).

Idaho prefers to have voluntary rather than mandatory smoke management programs. A Memorandum of Understanding (MOU) between DEQ and the U.S. Forest Service (USFS) Regions 1, 4, and 6 has been in effect since 1988. The MOU is an agreement for the agencies to share information with each other. There has been a voluntary smoke management program for forest burning in northern Idaho since 1990. This is a joint program with the state of Montana and operates from September through November. Daily forecasts are made to determine if any restrictions are needed. As of fall, 1999, the program will include southern Idaho and the spring/summer burn seasons for both Montana and Idaho.

EPA released its "Interim Air Quality Policy on Wildland and Prescribed Fires" on May 21, 1998. The objective of the policy is to provide for fire to function naturally in the wildlands while protecting public health and welfare. The policy provides great incentive for states and federal land managers to work together to develop state smoke management programs. The programs, certified to the EPA, can be voluntary or mandatory at the state's choice, and will not be a required component of a SIP. If a NAAQS violation occurs due to wildland or prescribed fire emissions and there is a certified state smoke management program, EPA will have the discretion to not designate an area nonattainment or, if the area is already a nonattainment area, to not require a mandatory smoke management program. In addition, if fire emissions are managed within a state smoke management program, then general conformity requirements are met.

The policy establishes the basic components of a state smoke management program: burn authorization; emission reductions; non-burning alternatives; public education and awareness; and surveillance and enforcement. In addition, the policy requires burn plans to include: emission reduction actions; smoke dispersion evaluation; public notification; public exposure reduction; and air quality monitoring.

Additional Sources of Information

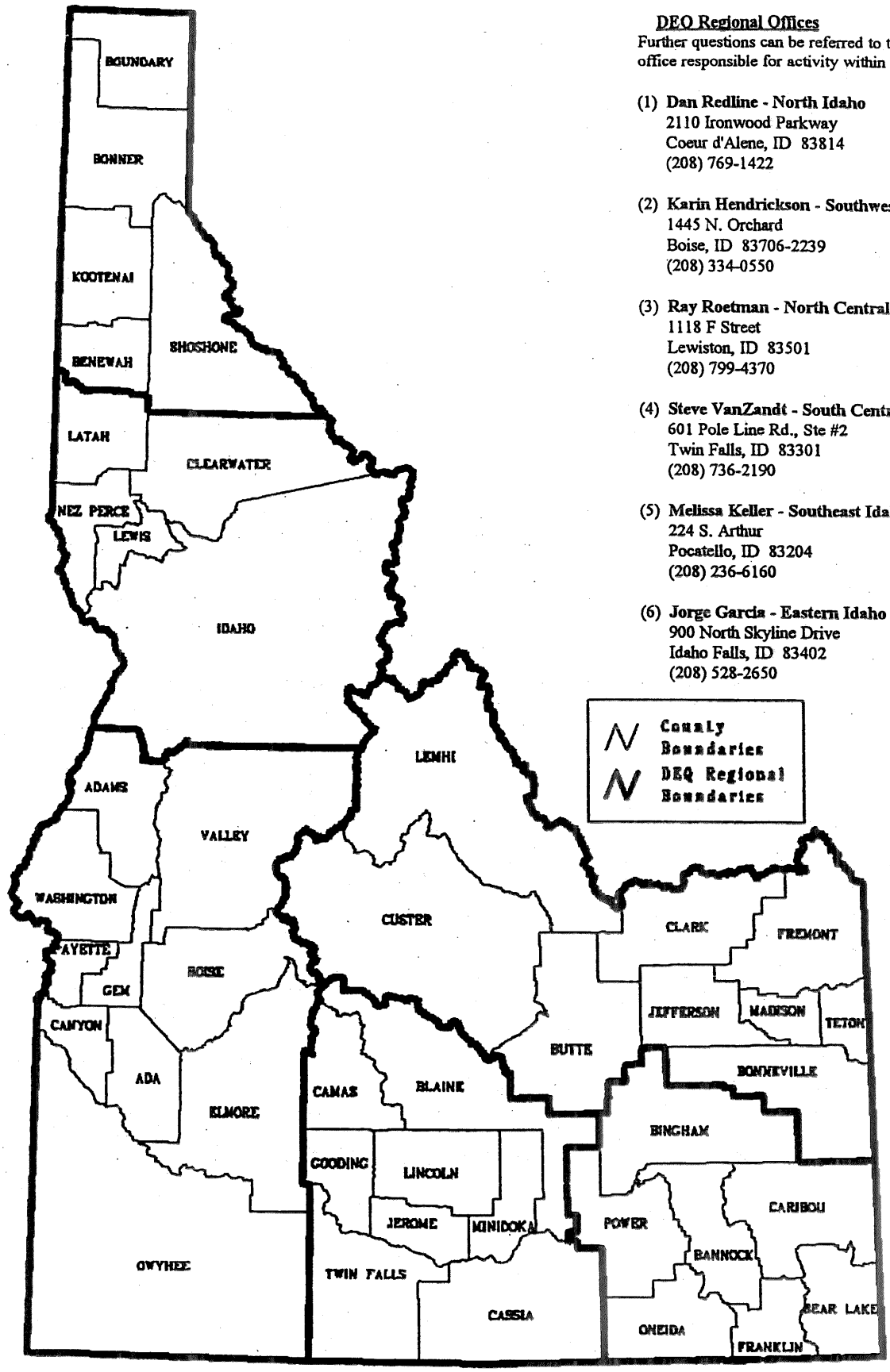
The USFS has prepared the following documents: "A Screening Procedure to Evaluate Air Pollution Effects in Region 1 Wilderness Areas, 1991"; "Guidelines for Evaluating Air Pollution Impacts" (1992); "National Strategic Plan for Air Resources Management" (1994); "A Desk Reference for NEPA Air Quality Analysis" (1995); "Air Quality Conformity Handbook" (1995); "When and How to Monitor Prescribed Fire Smoke: A Screening Procedure" (1997); "Describing Air Resource Impacts from Prescribed Fire Projects in NEPA Documents" (2000); and "An Introduction to Smoke Emissions and Dispersion Modeling" (ongoing USFS training course). The Interior Columbia Basin Ecosystem Management Project (ICBEMP) draft EIS and supporting documents also contain much information on fire.

The U.S. EPA has prepared the following documents: "Prescribed Burning Background Document and Technical Information Document for Prescribed Burning Best Available Control Measures" (U.S. EPA, 1992); "Interim Air Quality Policy for Wildland and Prescribed Fire" (1998); and "Regional Haze Regulations" (64FR35713, 7/1/99).

There are several web sites for further information:

ftp://alta_vista.cira.colostate.edu (download IMPROVE data)
http://www.4cleanair.org (STAPPA/ALAPCO)
http://www.aos.wisc.edu (weather forecasts)
http://www.aqd.nps.gov/natnet/ard/impr/index.htm (IMPROVE newsletter)
http://www.atmos.washington.edu/mm5rt/00latest/latest.html (ventilation index)
http://www.boi.noaa.gov (fire weather forecasts)
http://www.dri.edu/Programs/CEFA (Program for Climate, Ecosystem and Fire Applications)
http://www.epa.gov/airlinks (most recent EPA air activities)
http://www.epa.gov/airnow/statedata.html (state real-time air quality data)
http://www.epa.gov/airs/nonattn.html (nonattainment areas)
http://www.epa.gov/airsweb (EPA AIRS database)
http://www.epa.gov/oar/vis/index.html (EPA visibility site)
http://www.epa.gov/ttn/oarpg/t1pgm.html (interim policy on wildland and prescribed fire)
http://www.epa.gov/oar/oaq_caa.html (Clean Air Act)
http://www.epa.gov/r10earth (EPA Region 10)
http://www.epa.gov/ttn/chief/ap42.html#chapter (emission factors)
http://www.epa.gov/ttn/oarpg/naaqsfin/ (new ozone and particulate matter standards)
http://www.fire.org (USFS fire management tools)
http://www.fs.fed.us/r6/aq (USFS national air resources program)
http://www.fs.fed.us/r1/fire/nrcc (ID/MT smoke management program)
http://www.fs.fed.us/rl/gallatin/air/guidance.shtml (USFS Northern Region air resources program)
http://www.icbemp.org (ICBEMP reports)
http://www.nifc.doi.gov/joint_fire_sci/index.html (Joint Fire Science Program)
http://www.nifc.gov/fireinfo/nfn.html (national fire news)
http://www.odf.state.or.us/fireprot.htm (OR smoke management program)
http://www.osei.noaa.gov/ (satellite imagery)
http://www.smokemu.org (ID/MT smoke management fall program)
http://www.state.id.us/adm/adminrules/rules/idapa16/16index.htm (Idaho DEQ air quality rules)
http://www.state.id.us/deq (Idaho DEQ)
http://www.state.nv.us/ndep/bao/smoke1.htm (NV smoke management program)
http://www.utahsmp.net (Utah smoke management)
http://www.wa.gov/ecology/air/airhome.html (Washington Dept. of Ecology)
http://www.wrapair.org (WRAP, successor to GCVTC)

Attachment 1



DEQ Regional Offices

Further questions can be referred to the regional office responsible for activity within your county.

(1) **Dan Redline - North Idaho**
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
(208) 769-1422

(2) **Karin Hendrickson - Southwest Idaho**
1445 N. Orchard
Boise, ID 83706-2239
(208) 334-0550

(3) **Ray Roetman - North Central Idaho**
1118 F Street
Lewiston, ID 83501
(208) 799-4370

(4) **Steve VanZandt - South Central Idaho**
601 Pole Line Rd., Ste #2
Twin Falls, ID 83301
(208) 736-2190

(5) **Melissa Keller - Southeast Idaho**
224 S. Arthur
Pocatello, ID 83204
(208) 236-6160

(6) **Jorge Garcia - Eastern Idaho**
900 North Skyline Drive
Idaho Falls, ID 83402
(208) 528-2650

March 2000

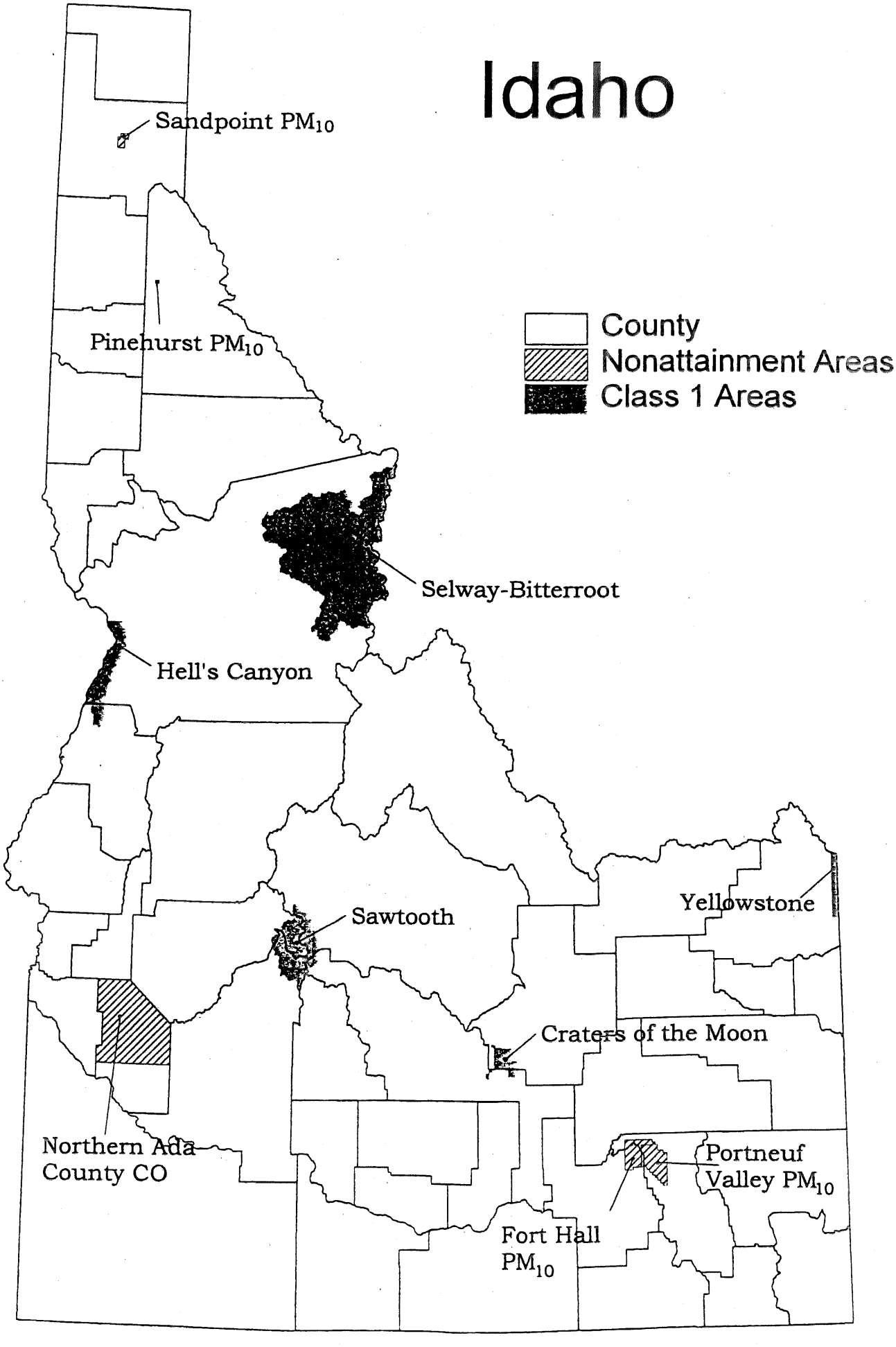
Attachment 2

National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Period	Primary NAAQS	Secondary NAAQS
Carbon Monoxide (CO)	8 hour	9 ppm (10,000 $\mu g/m^3$)	Same
	1 hour	35 ppm (40,000 $\mu g/m^3$)	Same
Lead (Pb)	Calendar Quarter	1.5 $\mu g/m^3$	Same
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.053 ppm (100 $\mu g/m^3$)	Same
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.03 ppm (80 $\mu g/m^3$)	None
	24 hour	0.14 ppm (365 $\mu g/m^3$)	None
	3 hour	None	0.5 ppm (1,300 $\mu g/m^3$)
Ozone (O_3) (pre-existing)	1 hour	0.12 ppm (235 $\mu g/m^3$)	Same
Ozone (O_3) (new)	8-hour max. (4th highest daily max.)	0.08 ppm (157 $\mu g/m^3$)	Same
PM_{10} (1987)	Annual Arithmetic Mean	50 $\mu g/m^3$	Same
PM_{10} (1987)	24-hour average	150 $\mu g/m^3$	Same
$PM_{2.5}$ (new)	Annual Arithmetic Mean	15 $\mu g/m^3$	Same
	24-hour (98th%ile)	65 $\mu g/m^3$	Same

C:\HAYLETT\WP61\DIANE\NAAQSTBL.W61

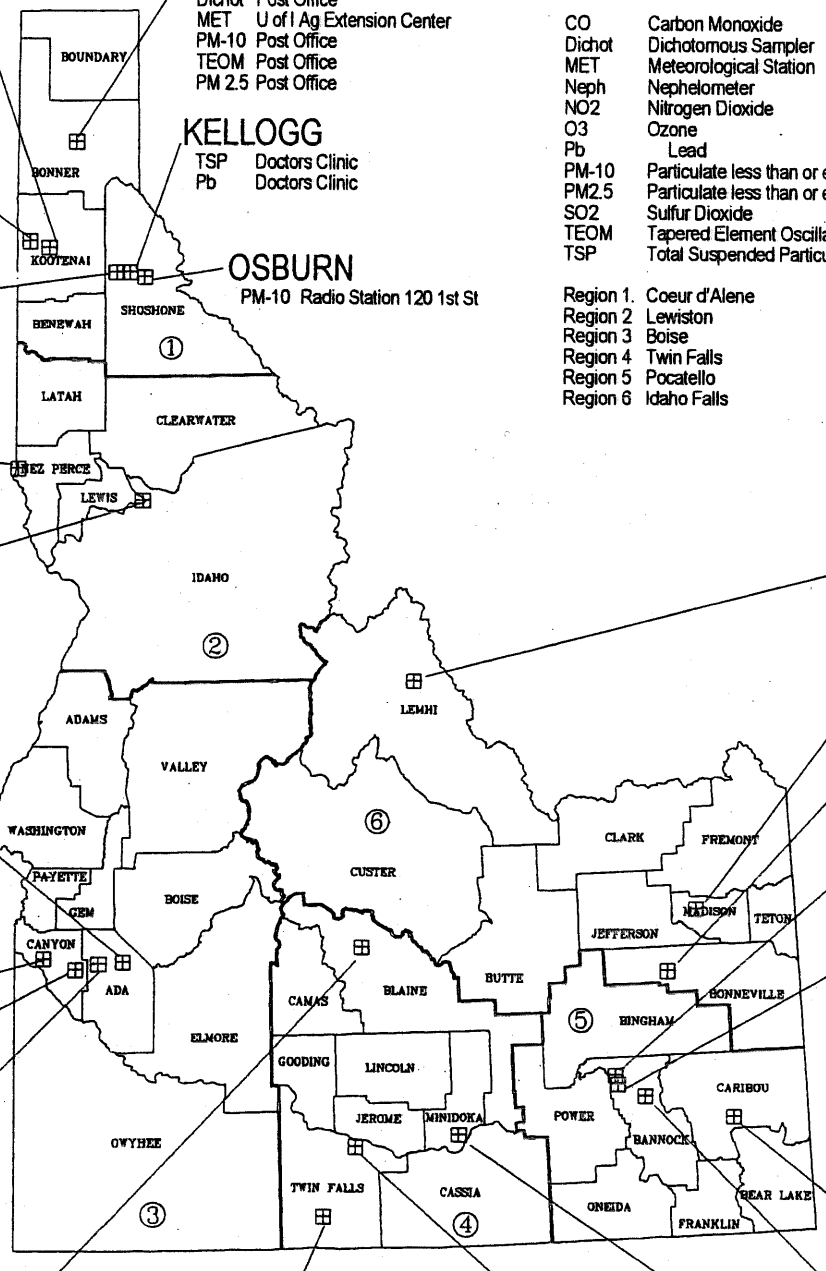
Attachment 3



Attachment 4

IDAHO

1998 Ambient Air Monitoring Network



COEUR d'ALENE
PM-10 Kootenai Medical Center
PM-10 Lakes Middle School
PM-10 Meyer's Ranch, Boekel Rd
MET Kootenai Medical Center
MET Meyer's Ranch, Boekel Rd
TEOM Lakes Middle School
TEOM Meyer's Ranch, Boekel Rd
PM 2.5 TEOM Lakes Middle School

POST FALLS
PM-10 West of Lincoln & 3rd
TEOM West of Lincoln & 3rd

WA TRANSPRT SITE
PM 2.5 Mountain View School

PINEHURST
PM-10 Elementary School
MET Elementary School
Neph Fire Station

LEWISTON
CO 3rd & D Street
Neph 3rd & D Street
PM-10 State Office Building
PM-10 ID State Police Bldg

KAMIAH
PM-10 1221 Hill Road

BOISE
Dichot 16th & Front
Neph 16th & Front
NO2 16th & Front
PM-10 16th & Front
TEOM 16th & Front
CO Eastman Bldg 168 N 9th St
MET West Boise Sewage Plant
PM-10 Cloverdale, Nicholson Rd
PM-10 Mountain View School
PM-10 Fairview & Liberty
PM 2.5 White Pine Elem School
PM 2.5 Mountain View School

CALDWELL
PM2.5 Syringa Elementary School

NAMPA
PM-10 823 1st Street
PM 2.5 NW Nazarene College

MERIDIAN
PM-10 151 S 1st Street

SANDPOINT
Dichot Post Office
MET U of I Ag Extension Center
PM-10 Post Office
TEOM Post Office
PM 2.5 Post Office

KELLOGG
TSP Doctors Clinic
Pb Doctors Clinic

OSBURN
PM-10 Radio Station 120 1st St

KETCHUM
PM-10 Warm Springs Rd

BACKGROUND SITE
PM 2.5 George Swan Ranch

TWIN FALLS
PM-10 1139 Addison Ave
Neph 1139 Addison Ave

RUPERT
PM-10 8th & G Street

SALMON
PM-10 Sharkey Street
PM-10 BLM
MET Bean Lane

REXBURG
PM-10 110 E Main Street

IDAHO FALLS
PM-10 1990 Rollandel Ave
Dichot 1990 Rollandel

CHUBBUCK
PM-10 Chubbuck HS
PM 2.5 Chubbuck HS

POCATELLO
Dichot Garrett & Gould Way
Neph Garrett & Gould Way
NO2 Garrett & Gould Way
PM-10 ISU Carter & 8th St
PM-10 Garrett & Gould Way
PM-10 Sewage Treatmnt Plnt
SO2 Garrett & Gould Way
SO2 Sewage Treatmnt Plnt
TEOM Garrett & Gould Way
PM 2.5 Garrett & Gould Way

SODA SPRINGS
PM-10 Norton Ranch
SO2 1st & 4th

INKOM
PM-10 251 Grant
MET Sewage Treatmnt Plnt

LEGEND

CO	Carbon Monoxide
Dichot	Dichotomous Sampler
MET	Meteorological Station
Neph	Nephelometer
NO2	Nitrogen Dioxide
O3	Ozone
Pb	Lead
PM-10	Particulate less than or equal to 10 micrometers
PM2.5	Particulate less than or equal to 2.5 micrometers
SO2	Sulfur Dioxide
TEOM	Tapered Element Oscillating Microbalance
TSP	Total Suspended Particulate

Region 1. Coeur d'Alene
Region 2 Lewiston
Region 3 Boise
Region 4 Twin Falls
Region 5 Pocatello
Region 6 Idaho Falls

Attachment 5

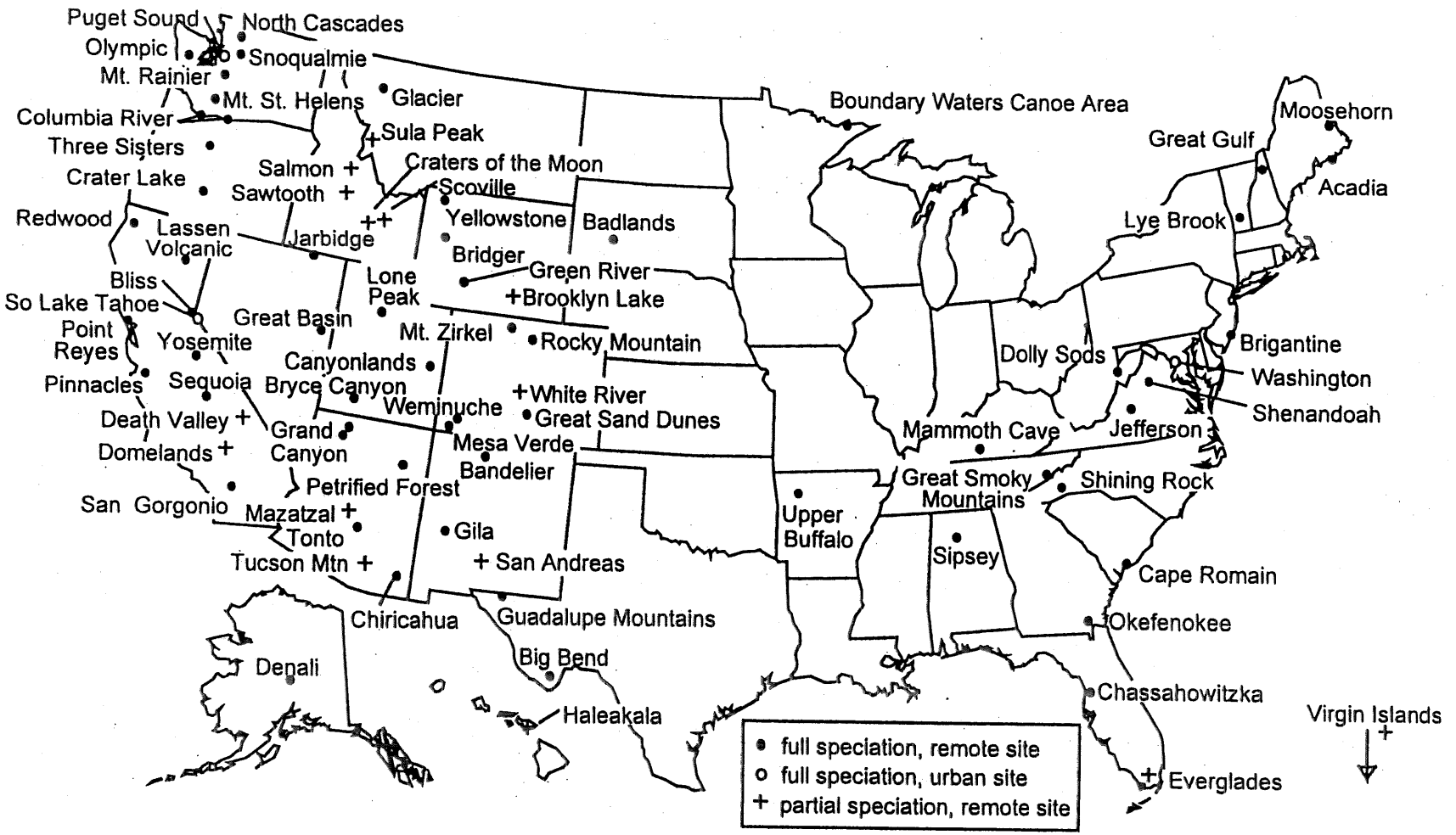
DE MINIMUS LEVELS FOR CONFORMITY

NON-ATTAINMENT AREAS

Criteria Pollutants	*Designation Class*	*Tons/Year*
Ozone (VOC's or Nox)		
	Serious NAA	50
	Severe NAA	25
	Extreme NAA	25
	Other ozone NAA outside an 03 transport region	100
CO (all non-attainment areas)		100
SO_2 or NO_2 (All NAA)		100
PM_{10}		
	Moderate NAA	100
	Serious NAA	70
Lead (all NAA)		25

MAINTENANCE AREAS

Ozone (NOx), SO_2, NO_2		100
Ozone (VOC's)		
	inside transport region	50
	outside transport region	100
CO		100
PM_{10}		100
Lead		25



IMPROVE sampling sites in operation January 1998.

IDAHO RIVERS UNITED

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Glenn Truscott
Coeur d'Alene River Ranger District
2502 East Sherman Ave
Coeur d'Alene, ID 83814

04

RE: Iron Honey Draft Environmental Impact Statement

Dear Mr. Truscott,

Please accept these comments from Idaho Rivers United (IRU) on the Iron Honey DEIS. IRU is statewide river conservation group with over 1,600 members.

The Forest Service should select an alternative that has the least impact on water quality, fish, riparian areas, overall river health, and threatened, endangered, or sensitive species. Of the alternatives presented in the DEIS, alternative 6 appears to have the least impact on these resources.

The selected alternative must not involve any clearcuts or so-called "regeneration harvests."

The selected alternative must also include sufficient riparian buffer zones for logging and road building activities that do occur. Logging in riparian areas is harmful to water quality and fish habitat. Such logging eliminates protective cover, decreases recruitment of large woody debris, and leads to increased water temperatures and unstable streambanks. It is not enough to rely on the INFISH buffers which are merely a minimum standard. In order to sufficiently protect water quality, fish habitat, and riparian areas, no logging or road building of any kind should occur within 1/4 mile of any stream.

New roads proposed for construction, regardless of location, must be properly engineered and constructed to withstand anticipated uses and weather conditions. Roads must also be carefully monitored and maintained.

The selected alternative should not involve any stream disturbing activities. The Forest Service should not conduct any in-stream activities except those intended strictly and solely to improve fish habitat and/or water quality.

Before taking action, the Forest Service must study all streams impacted by the project and/or within the project area for eligibility for Wild and Scenic River designation. The Forest Service must not take any action impacting streams until such studies have been performed. For any streams that are determined to be eligible or suitable for Wild and Scenic River designation, the Forest Service must not take any action that will impair the outstandingly remarkable values of those streams.

Sincerely,

Sara C. Denniston
River Conservationist

8 JUN 2000

05

STATE OF IDAHO
DIVISION OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway • Coeur d'Alene, Idaho 83814-2648 • (208) 769-1422

Dirk Kempthorne, Governor
C. Stephen Allred, Administrator

June 7, 2000

Susan Jeheber-Matthews
District Ranger
U.S. Forest Service
Coeur d'Alene River Ranger District
2502 East Sherman Ave
Coeur d'Alene, ID 83814

RE: Iron Honey Resource Area Project

Dear Ms. Jeheber-Matthews:

Thank you for providing DEQ with the opportunity to comment on the Iron Honey Draft Environmental Impact Statement. As the Idaho State agency charged with protection of water quality, we are currently developing a Total Maximum Daily Load (TMDL) for the Little North Fork of the Coeur d'Alene River from the headwaters to Laverne Creek. The pollutant of concern is sediment. Prior to the approval of the TMDL, interim rules prohibit further impairment of beneficial uses (IDAPA 16.01.02.054.05.).

After reviewing the seven alternatives provided in the draft impact statement, DEQ strongly supports alternative six. This alternative incorporates all of the actions necessary to begin recovery of beneficial uses of the Little North Fork. Removal of channel crossings and culvert upgrades are of major importance in reducing sediment transport. Obliteration of roads which are un-maintained, subject to slides or improperly constructed also reduces stream sedimentation. Designating old growth forest is important for future large woody debris recruitment in stream channels. Prohibiting timber harvest within the stream riparian zone in this Resource Area enhances beneficial use recovery. Finally, as expressed in the EIS, because there is no commercial harvesting, sediment and peak flows would not increase. This is also the only alternative which would result in significant improvements to the watershed.

We realize the difficulty of obtaining funding outside of the traditional timber sales receipts system, however, with the increasing emphasis on recovering the uses of impaired waters and the strongly worded goals of the April, 1999 "Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters" we remain hopeful that non-traditional funding sources for these projects will increase.

Sincerely,

June Bergquist

June Bergquist
Water Quality Compliance Officer

cf: DEQ-Harvey; IFG-Corsi

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07 JUN 2000

06

IDAHO FISH & GAME
PANHANDLE REGION
2750 Kathleen Avenue
Coeur d'Alene, Idaho 83814

Dirk Kempthorne/Governor
Rod Sando/Director

June 2, 2000

Ms. Susan Jeheber-Matthews
US Forest Service
2502 E. Sherman Avenue
Coeur d'Alene, ID 83814

Dear Susan:

REFERENCE: IRON HONEY DRAFT EIS

We have reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Iron Honey project in the Little North Fork Coeur d'Alene River drainage. Six alternatives, including a no action alternative, are analyzed. The purpose and need for the project includes four components: restoration of aquatic resources, encouraging a trend towards a more natural vegetative state, reducing fragmentation of old growth, and reducing fire hazard.

The Little North Fork Coeur d'Alene watershed is, in the Department's view, not functioning properly in terms of providing aquatic habitat to support a healthy native trout fishery. The Department's Five Year Fisheries Management Plan calls for management of westslope cutthroat trout in the Spokane River basin to provide both high catch rates and limited harvest – goals which we have found are attainable in portions of the system where habitat is in good condition. We concur with the findings in the DEIS that some tributary streams continue to support reasonable numbers of resident cutthroat trout, and that some mainstem reaches with good habitat still support migratory fish. Overall, however, the Little North Fork is in poor condition, with some reaches accumulating enough bedload in the last decade that flows go sub-surface during the late summer. Fish population work, accomplished by the Department and others during the 1990's, indicates that westslope cutthroat trout populations in the Little North Fork and many of its tributaries are severely depressed. Information in the DEIS indicating a high culvert failure rate under existing conditions make it clear that restoration efforts are necessary.

The DEIS also notes that elk habitat potential is below or barely meeting Forest Plan minimums. The existing high road density is well above the level identified by Department research as resulting in lower survival of bulls. Department big game management objectives for the Coeur d'Alene River basin call for long seasons, limited general season cow harvest, and maintaining a high percentage of mature bulls in the harvest. These objectives cannot be provided over the long term if security and habitat potential are not being provided.

Based on our review of the document, and discussions with Forest Service personnel, it is our understanding the desire is to use this project to attempt to simulate a large pulse disturbance,

similar to what a large, stand replacing fire might create under more natural conditions. Conceptually, we believe this approach has merit, as natural ecological processes have been interrupted during the last century by logging, road and railroad construction, splash-damming, debris removal, disease, and fire suppression. In Iron Creek and the mainstem Little North Fork, where fish populations are currently depressed, there is a relatively low risk of making conditions significantly worse than they already are. If watershed improvement work is implemented, long term benefits could be expected, although the response would be delayed due to the expected increases in peak flows on a system which has already had most of its resiliency eliminated by past management activities.

While conceptually we believe the approach has merit, we have significant concerns about the ability of the Forest Service to follow through with the project over the time frame necessary for the project to prove beneficial. The DEIS indicates much of the analysis area has an expected (under natural conditions) stand replacing fire return interval of approximately 200 years. While we recognize some stand tending activities may be needed over the long term, it seems unlikely the Forest Service would be able to commit to a long-term policy of not pursuing more significant timber harvest in the analysis area. Past management activities have resulted in a protracted disturbance which we believe is significantly more severe than what would have occurred with a stand replacing fire, but retain many of the elements of a stand replacing fire (such as more open canopy, increased peak flow and water yield, and loss of interior forest habitat). Thus, a management program which focused on addressing those features which are not elements of a natural fire event, but which are negatively impacting the system (including roads, loss of large woody debris, impacts to floodplains, etc.), is, in our view, the most appropriate way to begin restoration of the system.

Whichever alternative is chosen, we are concerned about the ability of the Forest Service to fund all of the needed watershed restoration work. It is our understanding the intent is to guarantee the identified work would be done under action alternatives that include timber harvest. For those alternatives that do not include timber harvest (alternatives 1 and 6), funding would not likely be available to accomplish necessary work.

Additional concerns include the short and long-term negative impacts to elk and other wildlife which would occur from the implementation of all of the action alternatives except Alternative 6. Concerns for elk and other big game are heightened due to the apparent emphasis by the District on providing an extensive trail network and access for motorized vehicles in the area.

Attempting a project which is designed to mimic a large, pulse disturbance is a relatively new concept. Thus, if the project goes forward, we believe it is critical that it be approached from an experimental standpoint, with thorough monitoring to include controls. The monitoring plan in Appendix C has some good aspects to it, but we do not believe that monitoring in years 1, 5, and 10 only will be adequate to understand all of the parameters being monitored. For instance, meaningful trend data for fish population abundance is best obtained with annual sampling, and in most cases ten years is a minimum time period for detecting actual trends.

Our comments on each of the specific alternatives are as follows:

Alternative 1 (no action) – Existing conditions in the analysis area are, and we believe will continue to be into the foreseeable future, largely below standards for fish and elk. Conditions

could be improved by emphasizing compliance with state and federal rules and guidelines for road maintenance. It is our understanding that roads have gone un-maintained due to lack of road maintenance funding. A number of culverts continue to act as fish migration barriers due to insufficient funding to bring them into compliance with fish passage regulations. If road maintenance and fish passage funds were available, it seems likely that Alternative 1 could be "implemented" in a fashion that improved conditions for fish, and security for big game, although not to the extent implementation of Alternative 6 would provide.

Without meeting compliance standards, we believe Alternative 1 will result in continued degradation of aquatic habitat as culverts and streamside roads continue to fail and otherwise impair stream channels and fish habitat. Security for big game would likely remain below Forest Plan standards if existing conditions and maintenance schedules continue.

Alternatives 2 and 7 – These alternatives are generally similar in that a substantial amount of timber harvest and road reconstruction is proposed, along with substantial treatment of road crossings and road obliteration. Of the two, alternative 2 poses a slightly lower risk to watershed condition and retains more acres allocated to the recruitment of old growth. At the same time, Alternative 2 does propose some riparian entry, and provides less benefits to elk habitat than alternative 7. Both pose substantial short-term risk to watershed condition from increased peak flows associated with expanding the level of canopy openings. Where streams currently have resiliency, and wide, undisturbed buffers would be provided, increased peak flows may not have significant negative effects on fish and watershed conditions. In streams such as Iron Creek, which are already impaired, increased canopy openings may result in additional stream damage and loss of fish habitat (particularly pools).

If one of the existing action alternatives which includes commercial timber harvest is chosen for implementation, we believe Alternative 2 is likely the best one for meeting the stated purpose and need, but still falls short of meeting important Forest Plan objectives. However, unless all watershed restoration activities are guaranteed (with many occurring prior to timber harvest), and monitoring is carried out at a level which will allow for detection of trends, we believe the level of timber harvest and ground disturbance proposed will result in significant negative impacts to fish and wildlife resources. Some additional mitigation in the form of road closures, at least over the short-term, may be necessary to provide adequate security for elk and other wildlife.

Alternative 3 – Alternative 3 proposes a lesser amount of timber harvest than other alternatives which prescribe logging. However, a substantial amount of road reconstruction (28 miles) is included and watershed treatments are limited to what appears to be less than what is necessary to bring the analysis area into compliance with state and federal rules and regulations for road maintenance and fish passage. Elk security would be reduced over the short term and fall below guidelines over an extended time period. Alternative 3 poses a significant threat to fish and wildlife resources without providing measures which, over the long-term, will improve conditions for either fish or wildlife. We do not consider Alternative 3 to be an acceptable alternative, unless significant measures are incorporated into the alternative to improve watershed conditions and improve security for big game.

Alternative 5 – Alternative 5 proposes nearly three times the amount of timber harvest and clearcut acreage of the next closest alternatives, and nearly twice the amount of road reconstruction of the next closest alternative. In addition, over 11 miles of temporary road would

be constructed, and proposed watershed recovery treatments are less than all of the other action alternatives except Alternative 3. In our view, Alternative 5 represents the type of project which created the unacceptable conditions currently found across much of the analysis area. Even if watershed improvements such as those proposed in Alternative 6 were proposed for inclusion in Alternative 5, we believe the risk to watershed condition would be to great to make this alternative worthy of consideration.

Alternative 6 – From the perspective of complying with state and federal rules and regulations regarding road maintenance and fish passage, meeting Forest Plan objectives for fish and wildlife, and allowing the Department to meet its fish and wildlife objectives, Alternative 6 is clearly the best alternative provided. As designed, it offers only limited opportunity to modify the vegetative community towards the desired trend. We believe, however, with treatment of existing brush fields and overstocked stands of young trees resulting from previous timber harvest activities, that some opportunity does exist to burn or otherwise treat these areas, and then restock them with desired species.

Based on discussions with District personnel, the primary obstacle to implementation of Alternative 6 is lack of funds. For this reason, we recommend the District consider combining Alternative 6 with aspects of one of the other action alternatives as a possible means of creating adequate funding. If this approach is taken, we recommend thorough examination of the risks to watershed condition and making every effort to minimize those risks. In particular, in watersheds such as Iron Creek, where over 40% of the watershed has been subjected to regeneration harvest, we recommend avoiding any further timber harvest that includes clearcut, shelterwood, or seedtree prescriptions, and that proposed road reconstruction be significantly reduced. Overall, the DEIS indicates that well over 20% of the analysis area has been subjected to regeneration harvest. Previous studies by IPNF hydrologists have indicated that ECA's exceeding 15% to 20% typically result in alterations to the hydrologic regime, with negative impacts to streams and fish habitat. The Iron Creek watershed would seem to be a good candidate for treating existing acreage which has not recovered hydrologically.

There are a number of other aspects of the DEIS that we believe need to be modified. The DEIS notes that projects could be completed with less risk if watershed restoration activities are completed prior to timber harvest and road reconstruction, yet the schedule for project actions indicates at least a significant portion of the watershed restoration will begin after timber harvest is initiated. Initiating restoration actions prior to timber harvest would not only reduce watershed risks but make a clear statement about the District's commitment to watershed restoration.

We also feel a correction is needed on page 119 where the DEIS states that increased fishing pressure is likely to result in greater losses to fish populations due to hooking mortality. The entire analysis area is within the Little North Fork Coeur d'Alene drainage catch-and-release area, where artificial flies and lures are required. Hooking mortality in similar situations has been demonstrated time and time again to be very low, with no significant impacts on fish populations. Some individuals may be impacted. Again, where habitat is in good condition, catch-and-release and other special regulations (including the slot limit in effect on the remainder of the drainage) have been demonstrated to improve populations, even in the face of very high fishing pressure.

In discussions of the environmental consequences to elk, the DEIS indicates that elk will be displaced from portions of the analysis area. Displacement implies that surrounding habitat is adequate to support elk (or other species) that are displaced by management activities or changes to habitat. Given the high road densities and substantial motorized use in adjacent parts of the Forest, and the District's apparent management direction to manage for motorized use in the Little North Fork drainage, we question whether elk will be displaced or carrying capacity reduced to the point where the area can support fewer elk. Elk and elk hunting are, we believe, critical resources and outputs on the IPNF. We recommend the Final EIS clarify whether elk and other wildlife will be simply be displaced, or whether habitat and elk will actually be lost.

The large amount of road reconstruction with the timber harvest alternatives creates a significant concern for both water quality and particularly big game security. Reconstructed roads will be much more usable to motorized recreationists than brushed in roads. We recognize the need to deal with brushed in roads which still have culverts and other drainage structures which are not being maintained. At the same time, the impacts to elk security from road improvements need to be clearly identified. A gated road provides less security than a brushed-in road, and we believe the EIS should recognize and account for the discrepancy.

Finally, we wish to reiterate that we are not opposed to the concept of mimicking a pulse disturbance, provided reasonable assurances are in place that risks will be reduced or eliminated where possible (and are reasonable), other, un-related actions do not compromise the expected beneficial outcomes, or further compromise negative outcomes, of the project (eg, increased motorized use affecting reduced quality elk habitat), monitoring will be adequate to actually detect outcomes over time, and the Forest Service can find a way to commit to not re-entering the analysis area with another pulse disturbance type activity for a period similar to what might occur under natural conditions. While we are not opposed to the concept, we also wish to reiterate that our preferred approach follows the philosophy of Alternative 6, which recognizes past human disturbances have already had a significant impact on the system and does not seek to add to the disturbance. If a suitable compromise between alternatives 2 or 7 and Alternative 6 can be found (ie. reduced risk with greater watershed restoration than found in either 2 or 7 as currently presented) we believe the approach has potential.

Thanks for the opportunity to comment.

Sincerely,

Greg Tourtlotte
Regional Supervisor

GIT:CEC:kh

C: Tracey Trent, IDFG, Boise
USFWS, Spokane

07 JUN 2000

07

The Ecology Center, Inc.
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June 5, 2000

Susan Matthews, District Ranger
Coeur d'Alene River Ranger District
2502 East Sherman Avenue
Coeur d'Alene, Idaho 83814

Ms. Matthews;

These are comments on the Iron Honey Draft EIS, on behalf of the Ecology Center, the Lands Council, and Alliance for the Wild Rockies.

The description in the DEIS is of an area that has experienced a very high level of road building and logging, primarily clearcutting. Project area streams are highly degraded from riparian logging, flumes, elevated water yields, and road sediments. With the analysis of Alternative 6, the IPNF seems poised on the threshold of moving its management philosophy into the realm of restoration for restoration's sake. The Iron Honey project area's existing conditions for streams and wildlife habitat make one of the strongest cases of anywhere in the IPNF for adopting such an approach. We strongly urge the IPNF to show the kind of leadership needed to make the leap into the type of stewardship the forest really needs, by choosing the correct alternative.

The maps supplied with the DEIS show the vast network of roads, but fail to display all the past logging, making it difficult to understand cumulative effects, see the vast areas of existing and cumulatively proposed openings, etc.

The DEIS points to vegetative (tree species) imbalance as a problem in the project area, notes that this has partly been because of the FS planting species it now considers inappropriate for the ecosystem, and yet fails to propose actions that would begin to fix the perceived imbalance on the sites that would have the least impacts to fish, water and wildlife—the presently regenerating clearcuts. The logging alternatives all propose some degree of removal of what is already scarce—larger, older trees.

The DEIS discloses that "The most serious process influencing the tributaries in the Upper Little North Fork is the failure of roads, road fills, and road channel crossings in close proximity to streams." The impacts from roads and logging on this river system have been tremendous, and have exacerbated the impacts of flooding downstream. The FS does a commendable job of frankly discussing the watershed problems, but the DEIS is confusing about the scale of road treatments proposed. Apparently roads would be decommissioned with all the road channel crossings proposed for removal. Yet this is unclear from the document and maps.

The DEIS states: "Fill failures from sections of riparian roads during the winter of 1995-1996 delivered approximately 11,5000 cubic yards of material in eighteen

streams within the analysis area and considerably altered the condition and trend for fish habitat" (p. 55). The DEIS doesn't disclose the frequency of recurrence of such storm events. The grim facts of foreseeable storm events stand in contrast to the DEIS's discussion of the Transportation Plan, which doesn't propose to obliterate nearly enough roads in the project area.

The DEIS fails to provide a sound financial analysis which displays, by alternative, the short- and long-term costs of maintaining all the roads and the costs of repairing foreseeable flooding and other storm events.

The DEIS treats the "Long Term Transportation Plan" as if some sort of Decision has been made, however we are not aware of past public involvement opportunities for this Plan. The DEIS assumes that certain aspects of access, such as with snowmobiles and ORVs, is needed. The DEIS does not provide enough information to substantiate these assumed needs of motorized recreationalists to be proposing even more access.

The DEIS does not provide an adequate cumulative effects analysis for the Little North Fork Coeur d'Alene River, nor of the North Fork as a whole.

The DEIS does not adequately discuss the impacts of cattle grazing on the streams, the riparian areas, and the values of Riparian Management Objectives as a whole.

The DEIS fails to disclose the impacts of ongoing and increased motorized access in the project area. The Access Management Environmental Assessment states: "Wildlife that is unable to move great distances [will] either become accustomed to the disturbance or their population numbers [will] be reduced...Those species that require large, undisturbed areas for their habitat will either be displaced or will not be able to survive" (p.94). Based upon the current high level of motorized access in the Iron Honey project area, the Access Management EA's disclosure surely applies to this area as well as any in the District.

The analysis of the cumulative effects of ongoing timber sales is inadequate. According to R-1, Our Approach to Effects Analysis, Desk Reference, "Any project affecting the same resources as the proposed project, over the same time period should be included in the examination of cumulative effects."

The DEIS's discussions of the streams strongly suggest they not fully supporting beneficial uses. Most are Not Functioning or Functioning at Risk. We believe that evidence exists for placing most or all of these streams on the list of Water Quality Limited Segments. We strongly urge the FS to provide this information to the State of Idaho so that the streams may properly be listed, and so that pollution abatement plans (TMDLs) can be developed forthwith.

The DEIS does not indicate if all old mass wasting sites and other landslide-prone areas have been designated as Riparian Habitat Conservation Areas, as the Forest Plan requires.

Please disclose the Equivalent Clearcut Acres for each subwatershed, by alternative. The EIS would also be more informative by disclosing total road mileage and road density plus the number of stream crossings for each tributary. The DEIS should also disclose how many acres of logging are proposed for each of the tributary watersheds.

The EIS should disclose such information as sediment elevations above natural, stream stability and data representing values of Riparian Management Objectives for all streams in the project area.

The DEIS discloses that old growth in the project area has been highly fragmented and heavily depleted from past logging. The DEIS does not discuss the old growth situation in terms of meeting Forest Plan standards for old growth. We don't believe the IPNF is meeting Forest Plan old growth standard 10(b), which requires the FS to "Maintain at least 10 percent of the forested portion of the IPNF as old growth." The DEIS does not discuss the IPNF meeting standard 10(c), which states, "Select and maintain at least five percent of the forested portion of those old-growth units that have five percent or more existing old growth.

The DEIS does not disclose whether or not the IPNF is meeting Forest Plan old growth standard 10(f), which requires "One or more old-growth stands per old-growth unit should be 300 acres or larger. Preferences should be given to a contiguous stand; however, the stand may be subdivided into stands of 100 acres or larger if the stands are within one mile. The remaining old-growth management stands should be at least 25 acres in size. Preferred size is 80 plus acres."

Forest Plan old growth standard 10(a) requires the IPNF to use an accepted definition of old growth, which has been changed from Thomas (1979) mentioned in the Forest Plan to the North Idaho criteria. The DEIS does not disclose how much of the allocated old growth in the project area meets accepted criteria. Nor does it state whether or not all areas, whether planned for logging or not, have been compared to old growth criteria.

The DEIS fails to disclose that the IPNF has failed to monitor the population trends of its old growth MIS—including pine marten, pileated woodpecker, and the northern goshawk. Forest Plan Monitoring item F-1 requires the annual monitoring of "Population trends of indicator species" and this monitoring information is to be reported every 5 years. Additionally, "Downward population trends" are the "threshold to initiate further action."

The IPNF's old growth standards are based, in part, upon pileated woodpecker habitat needs (see Forest Planning documents 27 and 28). The Warren documents cited in the DEIS discuss the importance of snags at least 30" dbh for pileated nesting, and snags at least 20" dbh as preferred for foraging. This project would log some of the largest trees, unfortunately the DEIS does not adequately discuss the impacts of removing these important components of the MIS pileated woodpecker's habitat.

The EIS must disclose the District's methodology for maintaining viable populations of old growth species in the project area and forestwide. Since project area OGMUs likely do not meet the Forest Plan 5% standard, and since the IPNF lacks population monitoring information, the FS must devise conservation strategies both forestwide and for the project area which will assure maintaining viable populations of old growth dependent species.

The DEIS discloses the overall lack of snag, cavity nesting, and large down wood habitat components in the project area. The proposed logging will exacerbate the situation and lead to longer delays in the development of such habitat components.

This would adversely affect populations of lynx, pileated woodpecker, black-backed woodpecker, white-headed woodpecker, pine marten, fisher, wolverine, Townsend's big-eared bat, northern goshawk, flammulated owls, barred owls, and other species which depend upon these habitat components.

The DEIS does not disclose whether or not the previously logged areas meet standards and guidelines for snag and snag recruitment habitat. They probably do not, since the kind of logging carried out in that era was rather careless of cavity nesting habitat. Therefore, the FS must devise conservation strategies both forestwide and for the project area which will assure that viable populations of species needing snags and large down woody debris are maintained.

The Coeur d'Alene River District is home to the Canada lynx, this year added to the Endangered Species list as a Threatened species. The Forest Plan includes goals to maintain viable populations of existing native and desirable non-native vertebrate species. In December 1999, the Forest Service and Bureau of Land Management completed the "Biological Assessment Of The Effects Of National Forest Land And Resource Management Plans And Bureau Of Land Management Land Use Plans On Canada Lynx" (Lynx BA). The Lynx BA concluded that the current programmatic land management plans "may affect, and are likely to adversely affect, the subject population of Canada lynx."

The Lynx BA team recommended amending or revising Forest Plans to incorporate conservation measures that would reduce or eliminate the identified adverse effects to lynx. We contend that the Lynx BA's "Likely to adversely affect" determination makes Section 7 formal consultation on the IPNF's Forest Plan <u>mandatory</u>.

The DEIS does not disclose that the Forest Plan "is likely to adversely affect" the lynx—effectively the Plan is a "taking" of lynx which is banned by the ESA. The IPNF must amend its Forest Plan before allowing the project activities in lynx habitat, because implementation of its present Plan is a factor that has led to the necessity for listing the lynx under the ESA.

The degree of understanding scientists and land managers have of lynx ecology is growing, but still uncertain. We believe the concept of Lynx Analysis Units (LAUs) vastly oversimplifies lynx habitat ecology, and this results in the DEIS not presenting a sufficient analysis for lynx.

Additionally, the analysis uses methodology—a data base query—that is not adequate for delineation of lynx habitat components. This same problems exist for analyses of other MIS and Sensitive species, including the fisher, the northern goshawk, the flammulated owl, and others. A big problem with relying on database-derived suitability models for habitat analyses is that such data is not reliable enough. The information is gathered by stand examiners who may or may not have biological training, and is often quite dated. The timber stand data was not designed nor intended for wildlife habitat analyses. Very recently, the IPNF has disclosed that the use of database habitat information is suspect:

> Habitat modeling based on the timber stand database has its limitations: the data are, on average, 5 years old; canopy closure estimates are inaccurate; and data do not exist for the abundance or distribution of snags or down woody material... (Idaho Panhandle National Forests 1998 Monitoring and Evaluation Report)

The DEIS does not adequately disclose the significance of the impacts from past logging and road building on populations of MIS and TES species. The DEIS does not adequately consider the cumulative impacts of developments in adjacent and nearby watersheds.

The DEIS did not disclose important information on the status of fishers. The ICBEMP "forest carnivore" report, states: "Home range sizes in Idaho average 83 km^2 for male fishers and 41 km^2 for females " (Witmer, et al, 1998).

That forest carnivore report raised issues concerning fisher conservation and management, including maintenance of riparian corridors to serve as travel routes and habitat supporting small mammals and birds as important prey patches for fishers. (Id. at 15.)

The EIS must include in its analysis the uncertain and precarious population status of fishers, as described in the ICBEMP forest carnivore report:

> The status of the fisher in the Western United States is poorly known but generally perceived as precarious and declining. This is a serious issue alone, but it also is a component of the larger problem of the decline of biological diversity. Recovery of species of concern must necessarily focus on the population level, because this is the scale at which genetic variation occurs and because population [sic] are the constituent elements of communities and ecosystems. Systematic habitat alteration and overexploitation have reduced the historical distribution of fishers in suitable habitat in the interior Columbia basin to isolated and fragmented populations. Current populations may be extremely vulnerable to local and regional extirpation because of their lack of connectivity and their small numbers.

Id. at 14 (internal citations omitted). The EIS must include this important information in its analysis.

The discussion of effects in the wildlife section is difficult to follow. Therein the DEIS's definition of cumulative effects is rather narrow. NEPA regulations at 40 CFR § 1508.7 define "Cumulative impact":

> "Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

It is not apparent that the DEIS identifies the FS's preferred alternative. NEPA regulations at 40 CFR § 1502.14(e) requires the FS to: "Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement..."

Tiedemann, et al., (2000) challenge the FS's claim to understand the concept of "historic range of conditions" and seriously calls into question the whole notion that we can, or even should, try to replicate such conditions. "Nearly 100 years of fire exclusion, possible climate changes, and past management practices may have caused these communities to cross thresholds and to reside now in different steady

states." We request the FS also review Tiedemann et al. (2000) in order to improve the analyses of the proposed prescribed fire.

Since the Forest Plan was written, there have been significant increases in the numbers of ORVs and snowmobiles in the Forest. The DEIS acknowledges that this is especially a problem in the Iron Honey project area. Also, the technology has evolved such that machines can move easier, faster, and over areas not previously accessible. Such cumulative impacts have never been analyzed at the Plan nor project level.

Without consistent and meaningful monitoring of ORVs and snowmobiles, it is extremely difficult for the IPNF to understand the cumulative effects of ORV impacts to resources such as wildlife populations, soil productivity, and water quality. The implications of increasing ORV use on the Forest include increasing the spread of noxious weeds along roads and trails. This is but another cumulative impact not analyzed in the Iron Honey DEIS.

The DEIS omits site-specific information which would confirm or validate the assumptions made about overly dense tree stands, and the "desired future conditions" concept. There is little site-specific data on the historical range of vegetative conditions in the project area to show it does not sufficiently meet "desired future conditions."

Vegetative condition analyses are based upon the level of understanding of the dynamics of forests. The FS usually relies upon single snapshots in time, which then become the target condition (i.e., "desired future condition") that ignores the vast range of potential conditions. Using a single snapshot in time or just the mean does not represent a true range of conditions that could conceivably be considered essentially normal. Tiedemann, et al., (2000) state: "Rather than attempting to covert forests to poorly described and understood presettlement conditions, it would seem prudent to examine present forest conditions and assess their potential to provide desired resource outputs and values."

We incorporate the Ecology Center's January 25, 2000 letter to the Forest Supervisor, which the Coeur d'Alene River District Ranger received a copy, as comments on this DEIS. Please place a copy of that letter in the Project File as responsive to your request for comments on this DEIS. The contents of the letter are based upon many years of experience in the public involvement process on the Coeur d'Alene River Ranger District, the IPNF and the national forests of the region as a whole. As one example of an issue the DEIS does not adequately discuss that is mentioned in our 1/25/2000 letter, consider cumulative impacts on soils. The Forest Plan requires the DEIS to disclose the locations of Activity Areas in the project area which do not meet Forest Plan Standards for detrimental conditions.

Thank you for considering these comments. Please keep each group on the list to receive all future communications regarding this proposal.

Sincerely,

Jeff Juel

(and on behalf of)
Mike Petersen
The Lands Council
517 S. Division
Spokane, WA 99202
(509) 775-2590

Mike Wood
Alliance for the Wild Rockies
P.O. Box 8731
Missoula, Montana 59807
(406) 542-0050

Literature cited

Austin, Karen K. 1993. Management Implications *in* Habitat Use and Home Range Size of Breeding Northern Goshawks in the Southern Cascades. MS. Thesis, Oregon State University, Corvallis, Oregon.

Lofroth, E.C., 1997. Northern wolverine project: wolverine ecology in logged and unlogged plateau and foothill landscapes. Wildlife Branch, Victoria, British Columbia, May 7, 1997.

Tiedemann, A. R., J. O. Klemmedson, and E. L. Bull, 2000. Solution of forest health problems with prescribed fire: are forest productivity and wildlife at risk? Forest Ecology and Management 127 (2000) 1-18.

USDA, Forest Service. 1993. Wolverine habitat guidelines for the Malheur National Forest. Prepared by Richard Haines, Malheur National Forest; Reviewed by Robert Naney, USFS Region 6, June 1993.

Witmer, Gary W.; Martin, Sandra K.; Sayler, Rodney D. 1998. Forest Carnivore Conservation and Management in the Interior Columbia Basin: Issues and Environmental Correlates. Gen. Tech. Rep. PNW-GTR-420. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 51 p. (Quigley, Thomas M., ed.; Interior Columbia Basin Ecosystem Management Project: scientific assessment).

15 JUN 2000

8

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

JUN 12 2000

Reply To
Attn Of: ECO-088

Susan Jeheber-Matthews, District Ranger
Idaho Panhandle National Forests
Coeur d'Alene River Ranger District
Attn: Iron Honey Resource Area Project
2502 East Sherman Avenue
Coeur d'Alene, ID 83814

Dear Ms. Jeheber-Matthews:

We have received and reviewed the draft environmental impact statement (EIS) for the **Iron Honey Resource Area Project**. We reviewed it in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act (CAA). Section 309, independent of NEPA, specifically directs EPA to review and comment in writing on the environmental impacts associated with all major federal actions. We review EISs to assess the environmental impacts of the proposed federal action and the document's adequacy in meeting NEPA requirements. For further explanation of our EIS review responsibility, please refer to *EPA's Section 309 Review: The Clean Air Act and NEPA*, which was enclosed with our scoping letter on April 23, 1998.

Based on our review, we have rated the draft EIS, EO-2, Environmental Objections - Lack of Information. Because there is no preferred alternative identified in the draft EIS, our overall rating is based on Alternative 5 which considers 4,335 acres of harvest. Most of the harvest is some form of clear cuts with openings that range as high as 383 acres. In addition, there will be 11 miles of temporary roads built. Our concern is heightened because the area has been heavily clearcut and has a high road density which could have significant impacts on water quality and wildlife. We rated Alternatives 1, 2, and 7 EC-2, Environmental Concerns, Lack of Information. We rated Alternatives 3 and 6 LO, Lack of Objections. Attached is an explanation of the EPA rating system. This rating and a summary of the comments will be published in the Federal Register. Our detailed comments follow.

Alternatives

This EIS has six alternatives (Alternatives 1 through 7, but Alternative 4 was dropped), including the requisite no-action alternative. We are pleased to see Alternative 6 included, an alternative that relies only on appropriated funds to achieve the Purpose and Need. It requires no commercial timber harvesting and thus no additional road building. Although the funding for

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this is likely to be insufficient to pay for all the desired mitigation, it does help to illustrate the funding dilemma the Forest Service faces in trying to address past impacts. The dilemma is that in order to pay for watershed improvements, additional logging and road building is needed to generate funds. These are the very activities that have brought the Forest Service to this Purpose and Need in the first place. A concern EPA has with using commercial harvests to pay for watershed restoration is that it can lead to sales of a size or in a location that is not "sustainable" in order to have a sale with sufficient K-V funds to pay for watershed restoration. It appears to be a one-step-back-two-steps-forward approach to recovering the watershed.

Alternative 3 appears to be a more sustainable approach to achieving the Purpose and Need by cutting on a smaller scale and spreading it out over longer time. However, the drawback with this alternative is that it doesn't generate enough receipts via the K-V funding process to address the watershed degradation created from past activities.

We object to Alternative 5 which considers 4,335 acres of harvest of which most is some form of clear cuts. This intense harvesting will occur over a relatively short period of time as compared to Alternative 3. In addition, the clear cut openings can range as high as 383 acres. There will be 11 miles of roads built. Although temporary, the impacts will remain for some time. The EIS should define in the glossary what is meant by obliteration if that is how the 11 miles of roads will be closed. If what the Ecology Center states is true, that 1/3 of the area has already been clearcut (We are not certain how this figure reconciles with your discussion of past activities on page 43.) and the road density is 8.6 miles per square mile, then this alternative appears to be out of line to what the area can sustainably handle.

Purpose and Need

We stated in our scoping comments that if the purpose of this project is ecosystem restoration and forest health the EIS should present a convincing discussion that active intervention is the best alternative. In response, the EIS states that this is not an ecosystem restoration project, but is active intervention to address the four specific areas of concern identified in the purpose and need. This may be an issue of semantics but the four objectives do seem to point to ecosystem restoration and improving forest health. The objectives are to: 1) improve water quality and riparian habitat, 2) trend the vegetative species composition toward historical levels, which include species more resistant to insects and disease, 3) increase age-class diversity and reduce old-growth fragmentation, and 4) reduce fire hazard and potential fire severity. The Purpose and Need stated in the EIS is a common theme in other EISs from National Forests in Idaho and eastern Washington. However, from the scoping comments received on this EIS and from comments read in other EISs with similar Purpose and Need, there is a fair amount of skepticism as to the legitimacy of the methods to be employed to achieve the Purpose and Need. Therefore, some of our comments are intended to get information in the EIS that further bolsters and explains these objectives. We still believe the EIS should present a discussion on the relative merits of passive and active restoration to meet project objectives.

Iron Creek Watershed

We focused our comments on the Iron Creek Watershed because it appears to be the watershed most heavily impacted from past activities. But many of these comments may be applied to discussions on the other watersheds as well (Hudlow Creek, Tom Lavin Creek, Lewelling Creek, Upper Little North Fork, Honey Creek, Sob Creek, Solitaire Creek, and face drainages of the Little North Fork).

Iron Creek is estimated to be above natural level for sediment yield by 272% and for peak flow by 9%. The EIS should explain the significance and reliability of these numbers. How does this relate to water quality standards? As an overall comment, when an EIS presents figures it should also interpret the significance of the figures.

The EIS should explain what is meant by the term, hydrologic recovery because the draft EIS does not clearly discuss what will happen to the hydrologic recovery of the Iron Creek Watershed under Alternatives 2 and 7. On one hand the draft EIS states that the hydrologic system of the watershed could take 20 years or longer to recover (page 74). But on the other hand, the draft EIS states that hydrologic recovery in Iron Creek would be accelerated under Alternatives 2 and 7 (page 75). However, it is unclear how hydrologic recovery would be accelerated because these alternatives involve so much clear cutting.

With regard to the 20 years for the hydrologic system of the watershed to recover, the EIS should give the baseline for recovery. If baseline is the current condition, are current conditions good or bad for the hydrologic system? If conditions are already bad, it appears that these alternatives will only delay further the complete recovery of the hydrologic system which has been degraded from past activities.

The management approach proposed for Iron Creek is to use clear cut harvest to mimic natural, infrequent disturbances such as catastrophic fire. However, there appear to be certain environmental side effects to using clearcuts to reset the landscape back to historical conditions. If done too intensely there will be an increase in sediment yield and peak flow that can degrade water quality. In addition, there will be loss of habitat. Therefore, this approach should be discussed further in terms of advantages and disadvantages in meeting the different objectives. How long has this approach been in use and how successful has it been? It appears that while a clearcut can mimic a fire by creating an opening, clear cuts do not provide the large influx of wood associated with fires. Are there other differences? Why is the Forest Service preemptively creating these openings rather than waiting for the natural fire? To get the economic value from these trees before they are lost in a fire? To protect nearby private property or structures?

Explain the concept of "recruitment old growth allocation" and how this works. This is not adequately explained nor is it defined in the glossary. This must be an important component of the third objective in the Purpose and Need.

Finally, we think the draft EIS was more responsive to public concerns by including comment letters received during the scoping period as well as your responses in the draft EIS.

Thank you for the opportunity to review and offer comments on this project. If you have questions, please contact me at (206) 553-8574 or Andy Smith at (206) 553-1750.

Sincerely,

Richard B. Parkin, Manager
Geographic Implementation Unit

Enclosure

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
500 NE Multnomah Street, Suite 356
Portland, Oregon 97232-2036

09

IN REPLY REFER TO:

June 13, 2000

ER 00/299

Ms. Susan Jeheber-Matthews, District Ranger
Idaho Panhandle National Forests
Attn: Iron Honey Resource Area Project
2502 East Sherman Ave.
Coeur d'Alene, Idaho 83814

Dear Ms. Jeheber-Matthews:

The Department of the Interior reviewed the Draft Environmental Impact Statement (DEIS) for the Iron Honey Resource Area, Idaho Panhandle National Forests, Kootenai and Shoshone Counties, Idaho. The Department does not have any comments to offer.

We appreciated the opportunity to comment.

Sincerely,

Preston A. Sleeger
Regional Environmental Officer

June 2, 2000

10

Ms. Susan Jeheber-Matthews
US Forest Service
2502 E. Sherman Avenue
Coeur d'Alene, ID 83814

Troy Tvrdy
President
Idaho Panhandle Chapter Trout Unlimited
11490 W. Pine Street
Sandpoint, ID 83864
208.265.2640

RE: Iron Honey DEIS

Dear Susan:

Thank you for the opportunity to comment on this publication. The Idaho Panhandle Chapter of Trout Unlimited is comprised of approximately 250 individuals living in North Idaho interested in cold-water fisheries conservation.

Based on the information provided we believe that Alternative 2 provides the best opportunity to try this type of management. It is our understanding that the fish populations and fish habitat are both poor in this area. If Alternative 2 is found to be successful we have made an accomplishment. If it is unsuccessful we have not lost that much. It would be difficult to make it worse. We would suggest that the monitoring program be extended beyond the 10 years stated in the DEIS (appendix C). Ten years seems to be somewhat short sided when taking into consideration the amount of time it takes in the natural world for ecosystems to go through changes.

We would also like to note that Alternative 6 has merit in meeting the objectives. We understand the difficulty in funding this type of proposal. We would like to see some of the proposed methods to meet the objectives in Alternative 6 used also. A combination of Alternatives 2 and 6 if you will. If there is any way that the Panhandle Chapter Trout Unlimited might help to facilitate the use of methods to meet objectives in Alternative 6 please feel free to contact us. Thank You.

Sincerely,

Troy Tvrdy

APPENDIX B
THREATENED, ENDANGERED AND SENSITIVE PLANTS

Regulatory Framework

Federal legislation, regulations, policy and direction that require protection of species and population viability, evaluation and planning process consideration of threatened, endangered and other rare (Forest Service "sensitive") plants species include the Endangered Species Act (1973) as amended; the National Forest Management Act (1976); the National Environmental Policy Act (1969); Forest Service manual (2670.1-2673.4); Idaho Panhandle National Forests (IPNF), Forest Plan (1987); and direction from the Regional Watershed, Wildlife, Fisheries and Rare Plants program and Washington Office.

Methodology

Assessment of Existing Conditions

This assessment describes the extent of all rare plant guilds in the project area. Discussion of effects will focus on the wet, moist and dry forest guilds, as these are the habitats most likely to be affected by proposed activities.

The geographic scope of the analysis for sensitive plants is the Iron Honey Resource Area Boundary. A prefield review was conducted of aerial photos, topographical maps, Idaho Department of Fish and Game Conservation Data Center (ICDC, 2001) element occurrence records, Timber Stand Management Records System (TSMRS), U.S. Fish and Wildlife Service National Wetlands Inventory Maps (USDI, 1987) and recent literature.

The potential for threatened and sensitive plant occurrence in the Resource Area was based on an assessment of potential habitat for the eight plant guilds, or groups, which may occur on the Coeur d'Alene portion of the IPNF. The Coeur d'Alene threatened and sensitive plant species list may be broken into seven general habitat guilds; moist forest, dry forest, grassland, alpine/subalpine, alluvial/deciduous shrub, wet forest, and aquatic, and peatland (Mousseaux, 1998). TSMRS queries were used to identify high potential Sensitive plant habitat by habitat guild in the Resource Area. Photo interpretation, FWS Wetland Maps, and personal knowledge of similar habitats were used to refine data derived from TSMRS. Areas considered to be high potential habitat for sensitive plants were mapped on a topographic map and are included in the Project File. High potential habitats where project work is proposed would be field surveyed prior to project implementation.

Assessment of Environmental Consequences

Analysis was conducted using results of past sensitive plant surveys, current distribution and condition of sensitive plant species in habitats similar to those found in the proposed treatment sites, types of proposed treatments and the likely effects to existing populations and habitat from the proposed activity based on current knowledge and professional judgment. It included a broad-scale assessment of the distribution and suitability of sensitive plant habitat in relation to proposed activities and a detailed analysis of each proposed activity and the need for mitigation, including field surveys.

The cumulative effects analysis area for TES plants was the Iron Honey Resource Area.

Effects to sensitive plant species or suitable habitat from proposed activities are generally described as very low, low, moderate or high, with the following definitions:

> ***very low*** *= no measurable effect on individuals, populations or habitat*
>
> ***low*** *= individuals, populations and/or habitat not likely affected*
>
> ***moderate*** *= individuals and/or habitat may be affected, but populations would not be affected, and habitat capability would not over the long term be reduced below a level which could support sensitive plant species*
>
> ***high*** *= populations may be affected and/or habitat capability may over the long term be reduced below a level which could support sensitive plant species*

Effects to population viability from disturbance events (natural or man-caused) are difficult to quantify with certainty for all sensitive plant species and species of concern. Specific knowledge of population ecology is lacking for several species addressed in this analysis, particularly the sensitive moonworts and certain orchid species: round-leaved rein orchid and phantom orchid. Much of the current knowledge regarding sensitive plant species is based on observational (non-empirical) and even anecdotal information. Recent literature and monitoring reports on several species, including: deerfern (Blake and Ebrahimi 1992), clustered ladies slipper (Greenlee 1997), Henderson's sedge and Constance's bittercress (Lichthardt 1998) and Idaho strawberry (Crawford 1980), provide a greater understanding of the relationship of habitat disturbance to the integrity of populations of these species.

For unsurveyed habitat that is highly suitable to support sensitive plants, presence is assumed. Protection of large occurrences and contiguous, unoccupied highly suitable habitat is assumed to be an effective conservation strategy. As described in Features Common to All Action Alternatives (Chapter II), populations would be protected; some isolated individuals may be impacted by activities. For occurrences that are likely to be discovered during field surveys prior to project implementation, mitigation measures would be designed by the project botanist to ensure populations are protected.

While a high number of acres have been identified as containing highly suitable habitat, based on past sensitive plant surveys, only a very small percentage of suitable habitat is likely actually occupied. Even with the presence of abundant suitable habitat, because the plant species addressed in this analysis are rare, most suitable habitat is unoccupied.

Indicators used to measure effects on sensitive plants and suitable habitat include: the effects of harvest treatments, the amount of each proposed activity, the extent of ground disturbance from activities, and the proximity of known sensitive plant occurrences and suitable habitat to proposed activities.

Existing Conditions

Threatened and Endangered Plant Species

A threatened species, as determined by the US Fish and Wildlife Service, is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Currently, the US Fish and Wildlife Service (USDI 2001) list two species as threatened for the Idaho Panhandle National Forests, water howellia (*Howellia aquatilis*) and Ute ladies'-tresses (*Spiranthes diluvialis*). There are no documented occurrences of these species on the Idaho Panhandle National Forests, although suitable habitat is suspected to occur outside the Resource Area in the vicinity of the Chain Lakes. It was determined that implementation of any alternative would have <u>no effect</u> on water howellia or Ute ladies'-tresses or their habitat. Refer to the Biological Assessment for more information on threatened species.

There are no Federally listed endangered plants for the Idaho Panhandle National Forests.

Proposed Threatened Plant Species

Spalding's catchfly (*Silene spaldingii*) is currently listed for the IPNF as proposed threatened by the United States Fish and Wildlife Service (USFWS). On October 10, 2001 a final rule was published in the Federal Register stating that this species will be moved from proposed to threatened status, effective November 9, 2001. It is expected that Spalding's catchfly (*Silene spaldingii*) will soon be added to the IPNF threatened list by the USFWS. This action would not change the determination of effects for this species. Suitable habitat for Spalding's catchfly (*Silene spaldingii*) consists of grasslands dominated by Idaho fescue or rough fescue, with scattered individual ponderosa pine and/or Douglas-fir in an elevation range of 1,500 to 5,500 feet. In the Iron Honey Area, the potential habitat would likely consist of open balds and small grassy openings in dry Douglas-fir forest. It is quite limited due to the predominance of moist and wet forest habitats. Field surveys were conducted in the Project Area for Spalding's catchfly (*Silene spaldingii*) in 2000 and 2001. The predicted habitat, upon field survey, was found to be of very low to marginal suitability. No occurrences of the species were found. More information on threatened species is contained in the plants section of the Iron Honey Biological Evaluation

Sensitive Plant Species and Forest Species of Concern

The subbasins of northern Idaho contain a wide array and diversity of habitats and plant communities, many of which contain plant species that are known or thought to be rare. Of the estimated 1,200 to 1,500 plant species known or

thought to occur here, about 10% are considered rare or uncommon. Sensitive species are determined by the Regional Forester as those species for which population viability is a concern, as indicated by a current or predicted downward trend in population numbers or in habitat capability which would reduce the species' existing distribution. Twenty-nine species of sensitive plants are known or suspected to occur within the Coeur d'Alene subbasin (refer to Table B-1). Plant species identified as "Forest species of concern" are species which may not be at risk on a rangewide, regional or state scale, but may be imperiled within a planning area, such as a National Forest (USDA 1997, p. 5). Forest species of concern are addressed in effects analysis to provide for maintenance of population viability as directed in NFMA. Biological Evaluations are not required to address Forest species of concern. A discussion of habitats for Forest species of concern is included within the discussion of rare plant guilds.

Sensitive plants and Forest species of concern can be assigned to one or more rare plant guilds. These guilds are artificial assemblages based on similar habitat requirements used for the purpose of analysis. For the Coeur d'Alene portion of the Idaho Panhandle National Forests the rare plant guilds are aquatic, deciduous riparian, peatland, cold forest, wet forest, moist forest, dry forest and subalpine. Rock seeps and springs are microsites that can support certain sensitive plants; however, these can occur across all guilds and are not identifiable at a coarse scale (refer to the Project Files, TES Plants, for specific plant guild descriptions). The following table lists Region 1 Sensitive and Threatened plant species by habitat guild which are known or suspected to occur in the Coeur d'Alene subbasin.

Table B-1. Coeur d'Alene Threatened, Endangered and Sensitive Plants by Rare Plant Habitat Guild (revised March 1999)*

Status and Species	Common Name	Habitat Guild
Threatened		
Howellia aquatilis	water howellia	Aquatic
Spiranthes diluvialis	Ute Ladies'-tresses	Deciduous Riparian
Proposed Threatened		
Silene spaldingii	Spalding's catchfly	Dry grassland/grassy openings in Dry Forest
Sensitive		
Asplenium trichomanes	maidenhair spleenwort	rock seeps in Moist/Wet Forest
Blechnum spicant *	deerfern	Moist/Wet Forest
Botrychium ascendens *	upswept moonwort	Wet Forest
Botrychium crenulatum *	dainty moonwort	Wet Forest
Botrychium lanceolatum *	triangle moonwort	Wet Forest/Moist Forest
Botrychium minganense *	Mingan moonwort	Wet Forest/Moist Forest
Botrychium montanum	western goblin	Wet Forest
Botrychium paradoxum	paradox moonwort	Wet Forest/Moist Forest
Botrychium pendunculosum *	stalked moonwort	Wet Forest
Botrychium pinnatum *	northwestern moonwort	Wet Forest/Moist Forest
Botrychium simplex	least moonwort	Wet Forest/Moist Forest
Buxbaumia aphylla	leafless bug-on-a-stick moss	Subalpine
Buxbaumia viridis *	green bug-on-a-stick moss	Wet Forest
Cardamine constancei *	Constance's bittercress	Deciduous Riparian/Moist/Wet Forest Wet Forest
Carex chordorrhiza	string-root sedge	Peatland
Carex hendersonii *	Henderson's sedge	Moist/Wet Forest
Carex livida	livid sedge	Peatland
Carex xerantica	dryland sedge	Subalpine
Cetraria subalpina	iceland-moss lichen	Subalpine
Collema curtisporum *	short-spored jelly lichen	Deciduous Riparian
Cypripedium fasciculatum *	clustered lady's slipper	Moist/Wet/Dry Forest
Hookeria lucens	clear moss	Wet Forest
Hypericum majus *	large Canadian St. John's wort	Peatland
Mimulus alsinoides	chickweed monkeyflower	rock cliffs/seeps in Wet/Moist/Dry Forest
Rhynchospora alba	white beakrush	Peatlands
Scheuchzeria palustris *	pod grass	Peatlands
Scirpus subterminalis	water clubrush	Peatlands
Thelypteris nevadensis	Sierra woodfern	Wet Forest Seeps
Waldsteinia idahoenesis *	Idaho barren strawberry	Moist and Wet Forest

** Species with documented occcurrences in the Coeur d'Alene subbasin, includes Forest Service and other ownership.*

Previously documented occurrences of the following sensitive plant species and Forest species of concern (ICDC 2001) *within the project area* indicate that these species/guilds have a high probability of occupying unsurveyed highly suitable habitat. The following tables list plant occurrences by analysis area.

Table B-2. Sensitive plant occurrences in the Iron Honey Resource Area.

Rare Plant Guild	Species	Occurrences
Moist/Wet Forest	Lance-leaved moonwort	3
Moist/Wet Forest	Mingan moonwort	1
Moist/Wet/Dry Forest	Northwestern moonwort	1
Totals	**3 species**	**5 occurrences**

Extent and Type of Suitable Habitat

Suitable habitat for five of the seven rare plant guilds exist in the Iron Honey Resource Area, as displayed in the table below.

Table B-3. Rare plant guilds with potential for effects in the Iron Honey Resource Area.

Rare Plant Guild	Acres of suitable habitat in resource area	% of resource area in suitable habitat
Moist Forest	2,576	12%
Wet Forest	483	2%
Dry Forest	658	2%
Grassland	500	2%
Subalpine	8	<1%
All Guilds	4,225	19%

* *Table acreage and % area pertains to National Forest System Lands only.*

The moist forest guild is the predominant rare plant habitat in the Resource Area, and therefore has the greatest likelihood of supporting undocumented occurrences. The acreage shown in the table above for wet forest guild under-represents the occurrence of this habitat guild in the Resource Area. The majority of riparian areas would fall into the wet forest guild classification, however TSMRS (Timber Stand Management Record System) data often does not reflect riparian stand characteristics due to the way in which stands are mapped. Also, wet forest habitats often occur as inclusions within otherwise moist habitats. The actual occurrence of wet forest habitat exceeds dry forest habitat in the Iron Honey Resource Area. Most of the sensitive plants listed for the Coeur d'Alene portion of the IPNF are found in moist and wet habitats. There is a relatively small amount of suitable dry forest guild habitat present, with few activities proposed for these locations, so the risk to dry forest guild habitats and species is low. There is very little alpine/subalpine habitat represented, and there are no activities planned in this habitat guild, therefore there would be no impacts to this guild and associated species. Grassland habitat which may support Spalding's catchfly (*Silene spaldingii*) is present, but limited in the Resource Area. It is found primarily on southeast to southwest facing slopes and as inclusions in dry forest habitats. There is no potential habitat for sensitive species of the peatland guild. There is also no potential habitat for the threatened, aquatic species, water howellia (*Howellia aquatilis*), or the deciduous riparian species Ute ladies tresses (*Spiranthes diluvialis)* in the Iron Honey Resource Area.

The project files contain descriptions of rare plant guilds and species with potential for effects from proposed activities in the Iron Honey Project Area (Project Files, TES Plants).

Previous Plant Surveys

Activities proposed in highly suitable threatened and sensitive plant habitats would be field surveyed prior to project implementation. To date approximately 6% of the Project Area has been field surveyed for rare plants. From 1997 to 2000, approximately 245 acres of rare plant field surveys were completed for unrelated projects in the Iron Honey Resource Area. In 2001, approximately 1,170 acres of field surveys were conducted in units proposed for treatment under Alternative 8. Copies of the surveys are contained in the project files. There are 5 documented occurrences of sensitive plants in the Project Area (refer to table B-2), however, none are documented within, or in close proximity to, areas

proposed for activities. No occurrences of threatened and endangered plants or Forest species of concern have been documented from the Project Area. Activity areas in suitable habitat, but not yet surveyed, would be field surveyed in 2002 prior to implementation. The Coeur d'Alene River Ranger District is committed to carrying out features and mitigation measures as specified in NEPA documents. Examples of recent projects for which sensitive plant surveys were completed after the Decision, but prior to implementation include the Douglas-fir Beetle project (1999) and Icestorm Salvage (1997). Survey documentation is located in the respective project files.

Table B-4. Sensitive plant surveys completed in the Iron Honey Resource Area.

Project	Year	Acres	Occurrences found
Watershed rehabilitation – Little North Fork Coeur d'Alene River	1997	25	1 *Botrychium lanceolatum*
Hudlow green slip	1997	18	None
Iron Mokins grazing allotment	1998	54	None
North Chilco NFTE	1998	10	1 *Botrychium minganense*
Hudlow Ice Timber Salvage	1998	88	None
Grazing Allotment E. A.	2000	50	None
Iron Honey EIS	2001	1,169	None
Total		1,414 acres	2 occurrences

Mitigation measures (Chapter II), provide for field surveys to be completed in all previously unsurveyed areas of highly suitable habitat where high risk activities for sensitive plants would take place. Refer to the project file table, "Summary of risk to sensitive plants and Forest species of concern from proposed activities in highly suitable habitat, by plant guild". All surveys would be completed prior to project implementation. Regional direction (Leonard 1992) states that the need for and extent of field reconnaissance should be commensurate with the risk associated with the project and species involved, and the level of knowledge already in hand. Refer to Features Common to All Action Alternatives (Chapter II) for survey requirements prior to project implementation.

Environmental Consequences

Alternative 1 (No Action)

Direct and Indirect Effects

Alternative 1 (No Action) would have no direct impact on any Threatened or Sensitive plant species. While there would be no direct impacts to these species with this alternative, there would also be no improvement made to watershed conditions and riparian plant communities which could, in the long term, supply potential sensitive plant habitat.

Under Alternative 1, no activities would take place that would trend watershed and vegetation conditions toward the desired condition and historic levels. Without stream restoration, road channel crossing removal, and road obliteration, riparian conditions in many drainages would remain at risk or non-functioning (see also Chapter III, Water Resources). In the long term, this would indirectly effect primarily wet forest guild habitat, and undetected sensitive plant populations. The current vegetation condition is such that stand structure, patch size and stand species composition are far outside the natural range of variability for the Coeur d'Alene Basin. The lack of certain natural disturbances, such as fire, has also strongly influenced the vegetation and plant community composition (see also Chapter III, Vegetation). Unhealthy forest conditions currently prevail in many portions of the watershed, with associated high rates of insect and disease related mortality. Although efforts to improve the current vegetation and hydrologic conditions would be a long-term process, no strides towards more favorable conditions in the Resource Area would be made under Alternative 1.

Indirect effects from Alternative 1 on suitable sensitive plant habitat and undetected populations are likely for certain guilds/species, if those guilds/species are present within affected stands. In stands where a high percentage of the canopy (greater than 50% loss of the basal area) would be lost due to mortality from insects and diseases, the likely effects to certain sensitive plant species present could range from a beneficial response, due to factors like increased levels of light and available moisture, a neutral response, species persist but there is no evident change in population levels, to an intolerant response because of factors like loss of shade and decrease in relative humidity. Indirectly, there would be a increased risk to sensitive plants and habitat due to the gradual increase in fuel loads through time. The increase in ignition risk and a resulting fire would also have an array of likely effects for sensitive plant species, ranging from

beneficial to intolerant, depending on factors like the intensity of the fire, the species ability to survive the event, and compete in early successional habitat. The ability to analyze these direct effects for all sensitive plant species is limited given our current level of knowledge.

Certain species have populations in earlier seral habitats established by fire within the last 50 years, or in habitats that likely had frequent historical fires. It appears that these species are at least tolerant of more open forest conditions, and natural disturbance events such as fire. One such species is Constance's bittercress, a moist to wet forest guild plant. This species has been observed to survive and multiply, at least vegetatively, after wildfire on the St. Joe Ranger District (Mousseaux 1998). Indications are that survival of Constance's bittercress after fire may be dependent on the availability of moist microsites. Lichthardt (1998) noted from monitoring data, that this species had the highest stem densities in the earliest seral stages of forest communities. Low stem densities and population vigor were observed in advanced seral stages of stand development.

Bank monkey-flower, a dry forest guild species, may be present in dry, open forest habitats in the project area. It favors steeply sloping (greater than 60%), southeast to southwest aspects with a thin soil layer. These habitats historically have had a higher frequency of non-stand replacing fires, than the moist and wet habitats. This annual plant's reliance on a soil seed bank for reproduction may contribute to its ability to survive low intensity fire.

Spalding’s catchfly habitat is not likely to suffer adverse effects under Alternative 1. The dry grasslands and grassy openings in Douglas-fir/ponderosa pine habitat that this species may have inhabitated historically were maintained by frequent, low-intensity fires. Studies of Spalding’s catchfly (Lessica 1995) suggest that fire may contribute to maintenance of grassland habitats through removal of excess litter and creation of sites for seedling recruitment. Increased recruitment and plant vigor were observed following spring and fall burns on experimental plots in Montana. The risk of weed invasion is a potential threat to grassland habitats when weeds such as goatweed or cheatgrass are present; these species can increase after a fire.

All the other moist forest, dry forest, and wet forest guild species have populations in mid- and later successional habitats, preferring more closed canopy conditions. Some of these species such as moonworts (*Botrychium* species), round-leaved rein orchid, phantom orchid, and clustered ladies' slipper, have factors like obligate soil mycorrhizae relationships that are likely to be affected by canopy reduction of greater than 50%, and moderate to intense (duff-replacing) fires. Stand-replacing fires were an important part of ecosystem processes in northern Idaho and the Coeur d'Alene Basin prior to the beginning of suppression efforts in the 1930's. While not much is known about the historic condition of rare plant communities, it is evident that with the decrease in the quality and amount of highly suitable habitats, and increase in fragmentation due to human activities, the ability of most rare plants to recolonize following disturbance has been reduced.

Cumulative Effects of Alternative 1

Cumulative effects under Alternative 1 include those resulting from no action, as well as foreseeable actions discussed above under Effects Common to All Action Alternatives.

Wet Forest Guild

Cumulative impacts to wet forest habitat would be predicted to be low, given the small amount of such habitat that is present in the Resource Area.

Moist Forest Guild

Cumulative impacts to highly suitable moist forest habitat related to loss of canopy cover are predicted to be low where stands have been sufficiently opened to promote establishment of early seral understory vegetation. The likeliest cumulative impacts would be to those species with a broader habitat range (moonworts, round-leaved rein orchid, phantom orchid and clustered lady's slipper) which seem to require dense shade and/or soil mycorrhizae and which may not compete successfully with early seral forbs. Cumulative impacts to moist forest habitat where canopy cover has not been significantly reduced would be low.

Cumulative impacts resulting from recent insect and disease activity in moist forest habitat could include high-intensity, duff-replacing wildfires from predicted high fuel loading in untreated areas. Such a fire, if it were to occur, would be detrimental to obligate mycorrhizal species such as the moonworts, phantom orchid, clustered lady's slipper, and round-

leaved rein orchid. Populations of these species could be destroyed if such a fire were intense enough to remove a significant amount of duff and organic material. The prospect of recolonization of affected habitat by any of these species would depend on the extent and duration of habitat alteration and the availability of an adjacent seed source. Cumulative impacts to these species related to stand-replacing wildfire would be predicted to be low to moderate.

Long-term impacts to deerfern could occur in the event of a stand-replacing wildfire as a result of heavy fuel loads. Deerfern is apparently able to survive light surface fires, and may recolonize by sprouting from rhizomes or by spores from adjacent populations. Its response to severe wildfire is not known. Fire intervals in its cool, wet forest preferred habitat are estimated to be several hundred years, so that large-scale fires are usually catastrophic. Cumulative impacts on deerfern from a potential future wildfire would be difficult to predict.

Dry Forest Guild

Cumulative effects to dry forest guild species and habitat with Alternative 1 are expected to be very low. Suitable dry forest habitat is relatively low in the Resource Area, making up less than 1% of the total acreage. Dry forest habitats would be inherently more at risk of stand replacing wildfire with fire suppression, and in the absence of harvest or fuels reduction treatments. Since dry forest species are adapted to habitats which, historically, experienced a greater fire frequency, some would likely survive a stand replacing fire in scattered microsites. Successful recolonization for species after such disturbance events would be more difficult than it was historically due to fragmentation and overall habitat reduction.

Effects Common To All Action Alternatives

No harvest or project-related activities are proposed within deciduous riparian, subalpine, peatland or aquatic habitats in the Resource Area. Based on the location of proposed activities and professional judgment, no deciduous riparian, peatland, subalpine or aquatic habitat able to support any sensitive plant species would be impacted by implementation of any of the action alternatives; there would be no direct or indirect impacts to any sensitive species occurring in these guilds.

No suitable habitat exists in the Resource Area for the listed Threatened species water howellia (*Howellia aquatilis*) and Ute ladies tresses (*Spiranthes diluvialis*). There would be **No Effect** to these species as a result of activities proposed in any action alternative. For further information, please refer to the Biological Assessment in the Project Files.

Five hundred acres of potential habitat for the proposed Threatened species Spalding's catchfly (*Silene spaldingii*) has been identified in the Iron Honey Resource Area. Harvest units are proposed in Spalding's catchfly habitat under all action alternatives (refer to map in project file "*Silene spaldingii* habitat in Alternative 8"). A maximum of approximately 10% of this habitat (50 acres) is included within units proposed for harvest under Alternative 5, with 2% (10 acres) under Alternative 8. All potential habitat in activity areas has been surveyed; no occurrences of Spalding's catchfly were found. If occurrences are found during the implementation process, protective measures would be carried out as described under Mitigation in Chapter II. The determination of effects for Spalding's catchfly is **"No Effect".**

There are no documented sensitive plant occurrences within areas proposed for activities in any of the action alternatives. Based on the presence of suitable habitat in proposed activity areas, the determination of effects for the following moist, dry and wet forest species is "**May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Toward Federal Listing Or Cause A Loss Of Viability To The Population Or Species".** The *sensitive* species affected include: maidenhair spleenwort, green bug-on-a-stick moss, deerfern, upswept moonwort, dainty moonwort, triangle moonwort, Mingan moonwort, western goblin, peculiar moonwort, stalked moonwort, northwestern moonwort, least moonwort, Constance's bittercress, Henderson's sedge, clustered lady's slipper, clear moss, chickweed monkeyflower, Sierra woodfern, and Idaho barren strawberry.

For certain species, moderate to low risk activities such as selective harvest, low intensity fire, and road reconstruction are not likely to adversely affect population viability, even though individual plants may be affected. Observations and monitoring information indicate that some activities may have little effect or even a positive effect on species tolerant of low to moderate levels of disturbance, such as deerfern (Blake and Ebrahimi 1992, p. 6), Idaho strawberry and Constance's bittercress (Crawford 1980, p. 47).

Timber Harvesting: Direct impacts of timber harvest can include elimination of individual plants through ground disturbance. Indirect impacts to sensitive plants can include changes in fuel loading, duff levels, moisture regime, and

light levels. Effects to sensitive plants would vary according to species and harvest prescription. Most timber harvest would take place in moist forest habitats, so most of the effects would be confined to moist forest guild species. Fewer acres of dry and wet, as opposed to moist forest guild habitat, would be potentially impacted by harvest in any alternative. Since Riparian Habitat Conservation Area guidelines would be followed for all action alternatives, most wet forest habitat would be excluded from harvest activities. Stream restoration work, road construction and road obliteration activities could potentially impact wet forest habitat. The following table displays the acres of suitable sensitive plant habitat potentially affected by timber harvest.

Table B-5. Summary acres of suitable sensitive plant habitat potentially affected by harvest treatment, by alternative*.

Rare Plant Guild	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Moist Guild	0	424	52	779	97	424	653
Dry Guild	0	141	0	237	35	141	193
Wet Guild	0	0	0	13	0	0	13
Grassland	0	8	0.3	53	0	8	10
Total Guild Acres	**0**	**573**	**52**	**1082**	**132**	**573**	**869**

**Acreage figures were derived from Timber Stand Management Records System data and Satellite Imagery (SILC).*

Selective Harvest and Commercial Thinning: Selective harvesting would take place in all action alternatives, including Alternative 6, which would remove trees of a specific size for use in stream restoration projects. The effects of selective harvest would be similar to the effects of mortality induced by insect and disease agents, as in Alternative 1, No Action. The main difference would be the change in fuel loadings in untreated stands and resulting increased risk to sensitive plants from future stand-replacing wildfires. There would be some direct effects from selective harvest in suitable habitats for sensitive plants of the moist, dry, and wet guilds, especially those that are intolerant of changes in the moisture and light regime (i.e. mycotrophic species, moonworts and orchids). The other species are not likely to be adversely affected by selective harvest treatment. Commercial thinning of larch would take place in some alternatives. Commercial thinning, as an intermediate harvest method, is similar to selective harvest in the amount of tree canopy cover removed, but it differs in that it would result in a more uniform spacing of trees than with selective harvest. The effects of commercial thinning on sensitive plants would generally be the same as selective harvest.

Regeneration Harvest: Approximately 80% of the overstory canopy would be removed with regeneration treatments. Regeneration harvest would take place in all action alternatives except Alternative 6. Live green trees, as well as dead and dying trees would be cut in order to provide conditions suitable for reforestation with disease resistant tree species. Fuels treatment would occur in most regeneration units, consisting of either underburning, top attached yarding, or hand or machine piling and burning. Regeneration harvest would directly affect moist, dry, and only slightly wet guild sensitive plant habitat. The limited data and observations available indicate that most species in these Guilds are intolerant of major canopy removal. Bank monkeyflower, while not likely to be affected by an increase in sunlight due to canopy removal, could be impacted by excessive ground disturbance. Mycotrophic species such as moonworts and sensitive orchids are very vulnerable to regeneration harvest. The most detrimental sort of regeneration harvest treatment appears to be with ground based equipment, followed by a hot burn which consumes a lot of the organic matter on the site, or with mechanical fuels treatment. The least detrimental would be that in which top attached yarding was used as the fuels treatment, though the potential for impacts due to alteration of the moisture regime would still be high. The action alternatives display various fuels treatment and harvest combinations.

Yarding System Methods: The yarding methods proposed for the action Alternatives consist of helicopter, skyline, and tractor yarding. Helicopter yarding would have an insignificant effect on sensitive plants and habitat because there would be little or no ground disturbance. Some damage to the live crowns of leave trees would be expected, but it would be minimal. The effects of skyline yarding would be intermediate between helicopter and tractor yarding. Skyline would necessitate construction of corridors for yarding purposes in which long narrow canopy openings would be created. Some ground disturbance would result from the yarding process. Tractor yarding would cause the most detrimental and long lasting impacts to the sensitive habitat, but mainly on designated skid trails. Here, compaction and soil displacement would be the primary negative effects. In all alternatives, Forest Plan Standards and Guidelines would be met for woody debris retention on site and minimizing soil displacement and compaction.

New Road Construction, Road Reconstruction, and Reconditioning: New road construction, road reconstruction, and reconditioning would take place in all action alternatives, ranging from 0.5 to 11.4 miles. These activities vary in the potential for effects to moist, wet, and dry forest guild habitats and species. New road construction is a high ground

disturbance activity, constituting a high risk to sensitive species in these guilds. Prior to new road construction, previously unsurveyed, highly suitable habitat in the activity area would be surveyed and any new occurrences deemed critical to species/population viability would be protected. In contrast, road reconstruction and reconditioning are low risk activities in terms of direct or indirect effects to sensitive plants and habitat. For these activities, existing road prisms would be treated which are already disturbed and of very low habitat suitability. While there are a few sensitive plant occurrences on the IPNF on old roads or cutbanks, they are, in general, individuals isolated from the main occurrence.

Fuels Treatment: Various methods of fuels reduction are proposed under action alternatives, all having the potential to directly and indirectly impact sensitive plants. Slashing, yarding tops and lop and scatter fuels treatments would have a negligible effect on sensitive plant species. Underburning for fuels reduction would be done within harvest unit boundaries only. Spring burning has the potential to impact sensitive plant individuals, particularly clustered lady's slipper and moonwort species. Specific mitigation measures (identified in Chapter II) would protect populations and highly suitable habitat that may be discovered during field surveys prior to project implementation. There would be a risk of increasing certain noxious weed species with burning, depending on the proximity to existing infestations and the cover type of the area treated (refer to Project Files, Noxious Weeds). Regeneration units would generally have fireline constructed to contain the fire (refer to Chapter III, Fire and Fuels). Fireline construction has the potential to impact sensitive plants and habitat through vegetation and ground disturbance. There would be no underburning within designated Riparian Habitat Conservation Areas, effectively buffering riparian wet forest habitats from this type of activity. Impacts to moist forest habitat would be very low. Specific features of all action alternatives (described in Chapter II) would protect documented populations and mitigate for new ones discovered prior to implementation.

Watershed Rehabilitation, Including In-stream Work, Road Obliteration and Removal/Replacement of Road Channel Crossings: Watershed rehabilitation activities have the potential to directly and indirectly impact moist, wet and dry forest guild habitats. Road channel crossing removal would have effects mainly to moist and wet forest habitat and is considered to be a low to moderate risk activity for sensitive plants, depending on the amount of ground disturbance. Road channel crossing upgrades that would be done during reconstruction are considered to be lower risk activities to sensitive plants. In-stream channel work would constitute a short term risk to sensitive plant habitat, but have long term benefits because channel stability and riparian community habitat would be improved.

Old Growth Recruitment Allocation: Many of our moist and wet forest guild species are associated with late seral and old growth forests. Old growth forest is in short supply in the Resource Area; patches tend to be small and scattered. There would be no harvesting in designated old growth in any action alternative. Some stands have been identified for future management as recruitment old growth to improve connectivity between existing patches of old growth and old growth recruitment, and to help provide for a desired level of old growth in the long term. Varying levels of old growth recruitment have been identified in the action alternatives, with the exception of Alternative 3, which would not designate any. Designation of additional recruitment old growth would be beneficial to potential sensitive plant habitat in the Iron Honey Area. The effects would be over the long term, because not all of the stands designated currently meet all criteria for highly suitable sensitive plant habitat. The long term effect would be positive in tending to move this element more toward historic conditions in the watershed.

Weed Treatment and Prevention: Noxious weed treatment and prevention would be performed consistent with the Coeur d'Alene River Ranger District Noxious Weed Environmental Impact Statement and Record of Decision (USDA Forest Service, 2000). Weed treatment and prevention measures would reduce, but not eliminate the risk of weed spread in the project area. Mowing along identified, infested haul roads would reduce seed production, thus minimizing the risk of weed spread in treated areas. Mowing is considered a low-risk activity for sensitive plants. Mowing would affect vegetation for approximately eight feet on either side of the roadway. Although there is a slight chance of impacting individual deerfern or moonwort plants with this activity, large occurrences/populations would be unlikely to be impacted. Individuals of these species occasionally colonize disturbed roadsides and cutbanks; however, these locations constitute marginal habitat, and are usually isolated from the main occurrence or population.

Tree Planting: Tree planting would result in a minor amount of soil disturbance with hand tools. The risk of incidental effects to sensitive plants from this activity are predicted to be very low.

Alternative 2

Direct and Indirect Effects

Under Alternative 2, approximately 573 acres of high potential sensitive plant habitat would be harvested with regeneration harvest treatments, primarily shelterwood with reserves. Approximately 424 acres of the proposed harvest falls within moist forest, 141 acres is within dry forest, and 8 acres is within grassland habitat. The proposed treatments would simulate the extent of historic patterns of disturbance, which would, in the long term, provide indirect benefits to plant communities and suitable sensitive plant habitat. The direct and indirect impacts to sensitive plant guilds and associated species with this alternative would be the same as in Alternative 7. Predicted impacts, in terms of timber harvesting, would be less than Alternative 5, but greater than Alternative 3 or 6.

This alternative would designate 1,379 acres as old growth recruitment, which would have indirect benefits to sensitive plants, primarily of the moist forest guild. Alternative 6 is the only other action alternative that allocates an equivalent acreage to old growth recruitment. Actions which would have a short term impact on wet forest guild habitat, but long term benefits to this guild and associated sensitive species include the removal of 117 road channel crossings. Alternative 2 ranks third in the number of crossings removed, of the action alternatives. Roads 794 and 1532 would be obliterated with this alternative. This would have direct, short term impacts to sensitive plant habitat of the moist, wet and dry guilds, but long term benefits interms of improving habitat suitability. Alternative 2 ranks fourth in the miles of road and the short term risks and long term benefits to sensitive plants. Two-tenths of one mile of new road construction is proposed under this alternative, directly impacting potential dry forest guild habitat.

Cumulative Effects

Cumulative effects to suitable sensitive plant habitat are expected to be low and would be concentrated in the Iron Creek subwatershed.

Alternative 3

Direct and Indirect Effects

In Alternative 3 a total of 52 acres of high potential moist forest sensitive plant habitat would be harvested, the lowest of any action alternative. A trace amount (0.3 acres) of grassland habitat may be affected. Alternative 3 would, therefore, have the second lowest direct impact of any action alternative on sensitive plant habitat. All of the potential habitat harvested would be with regeneration treatments. Indirectly, there would be little progress toward restoration of historic vegetation patterns, forest species composition, and plant communities with this alternaitve. Since the size of regeneration units would be small, varying from 5-10 acres in size, harvest treatments would not tend to approximate the extent of natural disturbance patterns on the landscape, as in Alternatives 2, 5, and 7. Units would be widely scattered throughout the watershed, contributing to the already highly fragmented forest structure. In addition, similar stand type harvests would be necessary about every 10-15 years to treat ongoing forest health problems.

Although Alternative 3 would be low in direct impacts to sensitive plant habitat, it would have very little indirect benefit to rare plant communities and habitat through restoration activities. Alternative 3 is the only action alternative which would designate no old growth recuitment, thus this alternative would have no indirect benefits to moist and wet guilds by providing for suitable habitat in the long term. There is no new permanent road construction proposed under this alternative in potential sensitive plant habitat. There would be no impacts due to new road construction to sensitive plant habitat. Road channel crossing removal is not featured in this alternative, it is an opportunity only. Since there would be no road channel crossings removed, there would be no indirect, long term benefit through road channel crossing removal in Iron Creek.

Cumulative Effects

The cumulative effects of Alternative 3 are expected to be very low, due mainly to the small acreage of suitable sensitive plant habitat affected by proposed activities, and the widely dispersed pattern of treatments.

Alternative 5

Direct and Indirect Effects

This Alternative would harvest a total of 1,082 acres in high potential sensitive plant habitat, having the greatest direct negative impact on habitat of any action Alternative (almost twice that of Alternatives 2 and 7). Of the proposed harvest treatments, 779 acres are classified as moist forest, 237 acres as dry forest, 13 acres as wet forest habitat, and 53 acres as grassland habitat guild. The large 40 to 476 acre regeneration units would approximate landscape level disturbance across most sub-watersheds in the Resource Area. In contrast to the direct impacts to suitable habitat, this type of harvest would tend to promote vegetation conditions on the landscape more closely resembling historic patterns by linking up existing openings and regenerating seral species.

Indirectly, benefits to sensitive plant guilds and associated species due to old growth recruitment designation would be identical to Alternative 7, but not as great as Alternatives 2, 6, and 8. Actions which would have a short-term impact on moist and wet forest guild habitat, but long-term benefits to these guild and associated sensitive species include the removal of 76 road channel crossings and one mile of Road 209. This alternative ranks fourth in terms of road channel crossing removal, however the road obliteration would be a long term benefit to restoring plant communities in the Little North Fork of the Coeur d'Alene River. Effects of new road construction (permanent and temporary) would be the greatest of any alternative.

Cumulative Effects

It is difficult to determine what the cumulative effects of this sort of harvesting on sensitive plant guild habitat and species would be. Although more historic vegetation conditions would be approximated, it may be more difficult for sensitive plants to recolonize such large openings, which could total up to 960 acres in size, including existing openings. These patterns of disturbance were typical in the Coeur d'Alene subbasin prior to management, however, the extensive history of habitat fragmentation and riparian impacts have undoubtedly had negative cumulative effects on sensitive plants and plant communities. Rare plants may have a reduced ability to recolonize habitats resulting from the silvicultural treatments in Alternative 5, compared to habitats that resulted from historic disturbances. Given the history of the Project Area and proposed activities, cumulative effects are expected to be low to moderate for this alternative.

Alternative 6

Direct and Indirect Effects

No commercial timber harvesting would occur under Alternative 6. Harvesting would take place on approximately 380 acres to obtain material for woody debris placement in streams. Approximately 97 acres of this harvesting would be in moist forest guild habitat and 35 acres would be in dry guild habitat. The harvest method would be selective cutting, focusing on trees greater than 12 inches in diameter. The effects of this sort of treatment in terms of sensitive plant habitat would be similar to a commercial thinning. The removal pattern would be less regular than a thinning, but the amount of canopy removal would be closely approximated, and there would be no fuels treatment or regeneration as in a shelterwood. This type of harvest has a relatively low impact on suitable sensitive plant habitat, however the tractor yarding method proposed with this harvest would cause understory ground disturbance and compaction, posing a higher risk to sensitive plants and habitat. Under this alternative, watershed restoration is proposed to take place which would contribute to stabilizing watersheds and recovering riparian communities. These actions would of an indirect benefit to sensitive plants and suitable habitat. The level of watershed work to be done would depend on available funding, and is unknown at this time.

Old growth recruitment under Alternative 6 would be the same as under Alternatives 2 and 8, and greater than under Alternatives 3, 5, and 7. This action would be an indirect long term benefit to sensitive plant guilds, primarily of the moist and wet forest type. There would be no impact to sensitive plant guilds or species from the proposed road construction over the long term.

Assuming that funding was available for the watershed work, Alternative 6 would be similar to Alternative 3 in terms of direct impacts on moist forest and riparian sensitive plant habitat. Indirectly, it would be less favorable due to the lack of recruitment old growth recruitment allocated. Choosing this alternative carries with it an inherent risk that funding could be limited or non-existent in the future to implement the proposed activities. If this were to occur, the impact of Alternative 6 would be the same as Alternative 1 (No Action).

Cumulative Effects

Cumulatively, the effects of Alternative 6 would be low because the type of harvest that would occur would have limited impact to sensitive plant habitat.

Alternative 7

Direct and Indirect Effects

Alternative 7 harvesting would directly impact the same guilds and acreage as Alternative 2. The shelterwood silvicultural system would be used in areas that would impact plant guilds. This alternative would harvest approximately 180 acres more than in Alternative 2, however these units do not fall within habitats identified as suitable for sensitive plants. As in Alternative 2, most of the harvesting is concentrated in Iron Creek and all the impacts to plant guilds due to harvesting would be confined there.

The amount of old growth recruitment designated and resulting indirect benefits to sensitive plants and habitat would be the same as Alternatives 5. Actions which would have a short term impact on wet forest guild habitat, but long term benefits to this guild and associated sensitive species include the removal of 103 road channel crossings. Alternative 2 and Alternative 7 would remove the highest number of crossings of the action alternatives, providing the greatest long term benefit to sensitive plants for this activity.

Roads 794 and 1532 would be obliterated with this alternative. This would have direct, short term impacts to sensitive plant habitat of the moist, wet and dry guilds, but long term benefits in terms of improving habitat suitability. Alternative 2 also includes these proposed activities. Alternative 2 and 7 would exceed all other action alternatives in terms of road obliteration and the short term risks and long term benefits to sensitive plants.

Alternative 7 would have the same level of new road construction and effects to sensitive plant habitat as Alternative 2. Two-tenths of a mile of new road construction is proposed under this alternative, directly impacting potential dry forest guild habitat.

Cumulative Effects

Cumulatively, the impacts of Alternative 7 would be low, and confined mainly to the Iron Creek sub-watershed.

Alternative 8

Direct and Indirect Effects

Alternative 8 would fall between Alternatives 2 and 5 in terms of the magnitude of effects to TES plant habitat. It would directly impact 653 acres of moist forest, 13 acres of wet forest, 174 acres of dry forest and 10 acres of grassland habitat with shelterwood harvests. The benefits of the watershed restoration activities for rare plant habitats would be similar to those described for Alternative 5. The benefits of recruitment old-growth allocation would be the same as described for Alternatives 2 and 6. Approximately 0.7 miles of new road construction would impact moist forest guild habitat and 0.12 miles would impact dry forest habitat.

Cumulative Effects

No cumulative impacts to Threatened and Sensitive species or suitable habitat in aquatic, deciduous riparian, peatland, or subalpine forest guilds are expected from implementation of any of the action alternatives, since they would be buffered from all activities as disclosed in Features Common to All Action Alternatives (Chapter II).

Past activities on Federal lands prior to policies affording protection of rare plants, have affected populations and habitat of sensitive plant species. Current activities proposed on Federal lands are required by law and policy to address sensitive plant species. Populations, when found, are managed for. Activities on State and private lands are not required to protect these species, therefore, loss of populations and modification of habitat is likely occurring. Two parcels of private land are included in the project area; a mining claim and an airstrip. There are currently no known plans for any change in

activities on these lands. A low level of cumulative effects is being contributed by these parcels and that is not anticipated to change in the foreseeable future.

A list of reasonably foreseeable and ongoing projects on the Coeur d'Alene River Ranger District is included in Chapter II. Projects include timber harvest on Federal lands, the listing of threatened species, repairs and resurfacing on National Forest roads, wildlife burns, noxious weed treatment, recreation and road access, grazing allotment management, and slash disposal. The effects of grazing were considered in the cumulative effects analysis for TES plants. The cumulative effects of grazing on sensitive plants in the Iron Mokins grazing allotment were determined to be insignificant (USDA 2000), and therefore would contribute very low additional effects to the preferred alternative in this assessment.

Weed control is a reasonably foreseeable future action. Guidelines for weed treatment would be similar to those included in the Final Weeds EIS. There is an increased risk of weed spread under all action alternatives, particularly in regard to certain species such as goatweed, in susceptible habitats. The risk would be greatest in habitats where more than 50% of the canopy is lost. Weeds increase in beetle-affected stands may indirectly impact sensitive plants and highly suitable habitat where present in affected areas.

Implementation of projects on National Forest lands would contribute insignificant impacts to sensitive plants or suitable habitat, since Federal lands are managed to maintain sensitive plant populations. Sensitive plant and habitat assessment are conducted for all ground and/or vegetation disturbing on in the District. While individuals of some sensitive plants may occasionally be impacted, cumulative impacts to species and habitats are expected to be low.

Effects of Opportunities

It should be noted that accomplishment of additional watershed/wildlife restoration projects, weed treatment and prevention other than those under contract clauses and timber stand improvement work would be subject to availability of KV or other appropriated funding. The direct and indirect effects would be the same for these potential activities as discussed above.

Timber stand improvement work: Timber stand improvement projects would occur in stands with overall low potential to support sensitive plant species. Individual sensitive moonworts could be impacted, with a low level of cumulative impacts expected.

Aquatic improvement work: Implementation of watershed rehabilitation opportunities including road obliteration, road channel crossing removal and culvert upgrades would be subject to the availability of K.V. funding. Watershed rehabilitation activities have the potential to directly impact primarily the moist and wet forest guild species. Indirectly, watershed rehabilitation activities would carry long-term benefits to restoring plant communities and potential TES plant habitat. Effects to plant populations would be avoided by application of the mitigation measures for TES plants outlined in Chapter II. All watershed improvement activities would be reviewed by a Botanist, field surveyed as necessary, and have the appropriate mitigation measures enacted prior to project implementation.

Determination of Effects

Based on the above analysis, and with the provisions for surveys and protection of sensitive plant populations (Features Common to All Action Alternatives, Chapter II), the following table represents the determination of effects to sensitive plants for each alternative. The Biological Evaluation from which the table was derived is in the project file. A description of habitat guilds and list of sensitive species is included in the Project Files (TES Plants).

Table B-6. Summary of determination of effects on sensitive plant species, by guild, for each alternative.

Species Guild	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Moist Forest Guild	MIIH	MIIH	MIIH	MIIH	MIIH	MIIH	MIIH
Dry Forest Guild	MIIH	MIIH	MIIH	MIIH	MIIH	MIIH	MIIH
Wet Forest Guild	MIIH	MIIH	MIIH	MIIH	MIIH	MIIH	MIIH
Subalpine Guild	NI	NI	NI	NI	NI	NI	NI
Peatland Guild	NI	NI	NI	NI	NI	NI	NI
Deciduous Riparian Guild	NI	NI	NI	NI	NI	NI	NI

NI = No Impact
MIIH = May Impact Individuals or Habitat with no trend to federal listing or loss of species or population viability
WIIH = Will Impact Individuals or Habitat with a likely trend to federal listing and/or loss of population or species viability
BI = Beneficial Impact

Consistency With Forest Policy and Legal Mandates

A Forest Plan management goal is to "manage habitat to maintain populations of identified sensitive species of animals and plants" (Forest Plan, II-1). A Forest Plan standard for sensitive species is to "manage the habitat of species listed in the Regional Sensitive Species List to prevent further declines in populations which could lead to Federal listing under the Endangered Species Act" (Forest Plan, II-28). The Forest Plan also identifies the need to "Determine the status and distribution of Threatened, Endangered and Rare (sensitive) plants on the IPNF" (Forest Plan, II-18). All of the proposed activities with the requirements for surveys and implementation of mitigation measures would meet the intent of the Forest Plan. The No Action Alternative would also meet the intent of the Forest Plan.

APPENDIX C
AQUATIC RESOURCES MONITORING AND EVALUATION PLAN

INTRODUCTION

The objective of the aquatic resources monitoring is to determine if land management activities implemented are meeting the resource protection and improvement objectives. Mandates for monitoring originate from the National Forest Management Act, the Clean Water Act, and State of Idaho water quality laws and regulations. Monitoring is an essential element in the Memorandum of Understanding (MOU) between the Forest Service and the State of Idaho. The MOU designates the Forest Service as the management agency responsible for water quality protection on the National Forest System lands in the State of Idaho (Forest Plan, Appendix JJ).

Approved Best Management Practices (BMP's) identified in the Idaho water quality standards include the Idaho Forest Practices Rules and the Rules and Regulations and Minimum Standards for Stream Channel Alterations. The essence of implementation of Best Management Practices is to protect beneficial uses. The effectiveness of Best Management Practices is determined by instream monitoring and comparison against established criteria designed to protect beneficial uses. The specific criteria used in assessing water quality effects are the standards defined in the Idaho Agricultural Pollution Abatement Water Quality and Wastewater Treatment Standards, Title 1, Chapter 2 (IDAPA 16.01.2250,04 through 08). The Coordinated Water Quality Monitoring program developed by the Idaho Division of Environmental Quality (Idaho Department of Health and Welfare, 1990), addresses interactions and monitoring requirements for timber harvest activities. The Forest Practices program outlined in that document emphasizes effectiveness monitoring through implementation audits, pollutant source and transport monitoring, and beneficial use monitoring. These monitoring activities should focus on "the most sensitive landtypes, the substantial nonpoint source activities, Best Management Practices that have not been adequately evaluated, stream segments of concern, waters with beneficial use impairment, or areas of increasing development" (IDHW, 1990).

In order to evaluate water quality, stream channel stability, and beneficial use protection, this monitoring plan will address five monitoring categories:

1. BMP implementation
2. Watershed restoration project implementation
3. BMP effectiveness
4. Watershed restoration project effectiveness
5. Corporate monitoring

To evaluate the categories, three types of monitoring will be implemented as part of the proposed project: **Implementation Monitoring** documents whether or not prescribed BMPs and restoration activities were implemented as designed. This is also the point that core data for the corporate monitoring is tracked. **Effectiveness Monitoring** demonstrates if BMPs were effective in controlling pollutants and whether restoration projects were effective in improving natural watershed function and beneficial uses. **Trend Monitoring** demonstrates if the long-term trends of restoration projects were maintained as implemented.

MONITORING PLAN DESIGN

Distribution of Monitoring

The distribution of implementation and effectiveness monitoring will differ for BMPs and watershed/fisheries restoration projects. BMP implementation and effectiveness monitoring will be documented on ten percent of all units, road miles, and road channel crossings associated with the preferred alternative. The distribution of the units will be determined during sale activities. Criteria for selecting units, road miles, and channel crossings will be hillslope erosion sensitivity and the likelihood for channel damage.

Implementation monitoring will be performed on all watershed and fisheries restoration projects. Detailed monitoring of the effectiveness of the watershed/fisheries restoration work will be performed in, and documented for the Iron Honey watersheds. Two considerations were used to select the watersheds to represent the effectiveness of watershed/fisheries

restoration projects: the intensity and variety of the restoration work, and area of the drainage that is in the National Forest System.

The most extensive restoration work, with the greatest variety of activities, could be performed in the channel and flood-prone areas of the lower 2.9 miles of Iron Creek and the upper 3.8 miles of the Little North Fork Coeur d'Alene River. There will be no type of restoration activity performed elsewhere in the analysis area that is not performed in either of the above watersheds. There are stream segments within the project area that will not be treated that should be monitored. The Upper Coeur d'Alene River or Independence Creek could also be monitored as a reference area. Selected headwater reaches will be evaluated for hillslope and headwater channel restoration opportunities.

All of the land area in all watersheds where monitoring would occur are in the National Forest System. This will reduce the risk that activities on private lands would negatively affect the implemented restoration.

Duration of Monitoring

The duration of the monitoring and frequency of data collection is determined by the activity or process being monitored. Implementation Monitoring of activities being implemented (timber harvest, road reconstruction, restoration and habitat improvement) would be ongoing during the life of the respective activity. The monitoring of project effectiveness is dependent upon the physical and biological processes being monitored, and the expected rates of change of the processes.

The effectiveness of the Best Management Practices would be monitored during the harvest activity and for years one and three following completion of harvest activity. The greatest risk for hillslope erosion and channel damage resulting from the harvest activities would occur within three years and should be monitored closely.

The processes governing the recovery of the balance between streamflow and sediment supply and size, and the return to a channel and flood-prone area morphology that support stable stream processes, is primarily dependent upon the size of the drainage area and the degree of past and present disturbance. The disturbance to the channel and flood-prone area in Iron Creek and the Little North Fork Coeur d'Alene River has been extensive. Under current conditions, the return of a channel morphology needed to support stable stream processes would not likely begin until riparian road development is removed and the stream channels are stabilized, through restoration or natural recovery.

The tools selected to monitor the channels, flood-prone areas, and associated beneficial uses following implementation of the restoration activities are:

- *channel cross sections*
- *longitudinal profiles*
- *pebble counts*
- *a network of photo points*
- *pool areas and volumes*
- *inventories of large woody debris*
- *inventories of riparian vegetation*
- *fish abundance*
- *scour chains and bank pins*

Complete data sets for the lower 2.9 and 3.8 miles of Iron Creek and the Little North Fork Coeur d'Alene River, respectively, would be collected during years one, five and ten following completion of proposed activities. The purpose of monitoring over a ten-year period is to ensure that the proposed restoration work is functioning as designed and to evaluate whether a trend toward the desired condition has been initiated or accelerated.

The following tables describe the frequency of monitoring of Best Management Practices and the watershed/fisheries restoration projects in Iron Creek and the Little North Fork Coeur d'Alene River. Methodologies currently being utilized for inventory and monitoring on Idaho Panhandle National Forests as well as methodology as described by Overton et al (1997), Rosgen (1996), Harrelson (1994), Platts et al (1983 and 1987), and Hankin (1986) will be utilized. The responsible official for all monitoring activities will be the Coeur d'Alene River District Ranger.

Table C-1. Aquatics restoration *implementation* monitoring plan of operation.

Element/Parameter	Frequency
Best Management Practices	At Implementation
Restoration	At Implementation

Table C-2. Aquatics restoration *effectiveness* monitoring plan of operation.

Element/Parameter	Frequency (years)*
Best Management Practices	1, 3
Restoration (Iron Creek and Little North Fork Coeur d'Alene River)	
-channel cross sections	1, 5 and Variable**
-longitudinal profiles	1, 5 and Variable
-riffle stability networks	1, 5 and Variable
-scour chains and bank pins	1, 5 and Variable
-photo points	1, 5 and Variable
-pool area	1, 5 and Variable
-residual pool volume	1, 5 and Variable
-total volume	1, 5 and Variable
-inventory of stable large woody debris	1, 5 and Variable
-fish abundance	variable
-riparian canopy opening	variable
- riparian vegetation condition	variable

**Number of years following timber harvest activity and/or implementation of watershed/fisheries projects.*
*** Because biological parameters are inherently more variable, they will be monitored more frequently than physical parameters. Physical parameter monitoring will be designed to collect information on changes from periodic flow events of various magnitudes.*

Table C-3. Aquatics restoration *corporate* monitoring core data.

Issue	Core Data	Unit of Measure
Hydrologic integrity	Road density	Miles/sq mile
Water yield	Hydrologic openings (eca's)	Acres
Riparian function	Riparian road density	Miles/sq mile
Mass failures and erosion	Road density on sensitive landtypes	Miles/sq mile
Sediment input and fish migration	Stream crossing frequency	Number of crossings per stream
Fish habitat and sediment production	Roads encroaching on streams	Miles
Riparian function, temperature and large wood recruitment	Hydrologic openings-riparian	Percent
Sediment	Net associated risk	Tons/year
Restricted fish use	Fish passage increased or improved	Number of culverts being upgraded

Specific Monitoring in the Iron Honey Watershed

Several types of information are already being collected as part of the watershed monitoring for the Iron Honey project. Stream flow data is being monitored with horizontal staff and crest gauges in Iron and Tom Lavin Creeks. These two drainages were selected because they are very similar in drainage area, elevation and precipitation. Tom Lavin would have limited management activity under the Iron Honey project, while substantial activity would occur within Upper Iron Creek.

An electronic chart drive gauging station is being set up in the Little River near the junction of Roads 206 and 209. This instrument records stream flow every 15 minutes, and will be used to establish a hydrograph for the portion of the Little River upstream of the gauge. Data will be collected before, during and after implementation of the activities proposed under the Iron Honey project. Using this data, we will be able to develop a hydrograph for the Upper Little North Fork Coeur d'Alene River. Cross sections and longitudinal profiles have been completed in the Iron Honey Resource Area and will be used to monitor channel characteristics. Fish habitat and woody debris surveys were also conducted in longitudinal profile areas. Fish snorkeling surveys were conducted to estimate fish numbers. These snorkeling surveys can be repeated to track fish abundance in the project area.

APPENDIX D
WATERSHED CHARACTERISTICS, CONDITION INDICATORS, AND DOMINANT WATERSHED DISTURBANCES

PHYSICAL CHARACTERISTICS

Each watershed or watershed area in the Iron Honey Resource Area is listed by its Hydrological Unit code (HUC). The HUC is a hierarchal watershed classification. For example, the "17" in HUC 17010216 represents the Columbia River Basin. Each successive pair of numbers in the HUC represents the next lower hierarchical watershed area. The U.S. Geological Service defines watersheds up to the 8th digit (4 pairs), which is referred to as the "4th code" HUC, which is the subbasin level. Therefore, 17010304 represents the Coeur d'Alene subbasin. HUC numbers with additional digit pairs indicate watersheds and subwatersheds delineated by the Forests. The drainage area for the watershed or watershed area is identified in square miles as derived from GIS analyses.

Cumulative effects analyses were addressed for the entire watershed at this level. In order to facilitate supportable assessment of forest practices and logging effects, particularly the portion of those assessments that involved watershed modeling, the downstream limit of the analysis watershed was defined at a point where the watershed is essentially defined by National Forest System (NFS) lands. The reason for this adjustment was to maintain the use of the models within the scope that they were calibrated and validated, which is on NFS lands where landtypes have been mapped and disturbance histories (roading and logging) are known to the necessary resolution. The interpretations of modeled estimates for NFS watersheds are combined with other data, analyses, inventories, and other information and professional judgment to address the entire watershed, including that portion downstream of NFS lands.

All National Forest lands have been classified into units known as landtypes that are based on local geomorphology, hydrology, and soils characteristics. Landtypes address physical responses to forest practices, including road development, logging, and fire. Each watershed or watershed area is characterized by the percent of the drainage area that is made up of sensitive landtypes (those that are more susceptible to mass erosion and increased sediment delivery to streams). As a point of reference, watersheds with more than about 30% sensitive landtypes are often very sensitive to cumulative disturbances. Portions of the Inland Northwest are influenced by the maritime climate from the West Coast. This climatic characteristic, along with local orographics and elevation, often result in winter snowpacks that rapidly respond to warm moist mid-winter storms. These responses are rapid melt and runoff. If a watershed is typically dominated by this snow characteristic, then the watershed is often subject to flashy and rapid mid-winter runoff. Therefore, the percentage of the watershed that supports this sensitive snowpack is a measure that partially characterizes the overall sensitivity of the watershed. As a point of reference, watersheds with a small proportion of sensitive snowpack (less than 30%) do not appear to be very responsive to rain-on-snow events at the watershed scale. Watersheds with a large proportion (greater than 70%) of sensitive snowpacks are often highly volatile and are very sensitive to other disturbance regimes in terms of runoff from the stream system.

The sensitive landtypes and sensitive snowpack parameters characterize the inherent sensitivity of each watershed based on the natural conditions under which it evolved. These parameters do not change with forest development, and therefore are not carried into the Environmental Consequences section of Chapter III. They do, however, provide a basis and reference point for the watershed effects estimated in the consequences section, as well in the design and location considerations of each alternative.

QUALIFICATIONS

Section 303(d) of the Clean Water Act requires the States to list water bodies (stream segments and lakes) that do not support beneficial uses, even though Best Management Practices are employed. These are identified as Water Quality Limited stream segments in the table for each watershed. The apparent watershed status has been estimated based on known conditions in the watershed, its sensitivity and resilience, and the disturbance history in the drainage. The three descriptors ''properly functioning" (PFC), ''functioning at risk" (FAR), and ''not properly functioning" (NPFC) were described in the previous section and are noted in the table.

In this assessment, tributaries to the analysis watershed or watershed area were used as the primary basis for the analysis of the entire watershed. This may be due to land ownership, data limits, non-forest, and areas dominated by lake or large

river lands. The analysis addresses the entire watershed or area, and the more intensely studied subwatersheds used for analysis are listed.

HYDROLOGICAL REGIME

The level of estimated peak flow that is expected to occur on the average about every two years (Q2) is listed for characterization as cubic feet per second per square mile of drainage area. The anticipated runoff modification and equivalent clearcut area for a watershed or watershed area were derived from methods documented in the R1/R4 Sediment Guides 2 and the Watbal Technical User Guide 3; and calibrated on the Idaho Panhandle National Forests. The current runoff modification is shown as a percent of the ‘‘natural" peak month discharge and reflects watershed climate patterns and disturbance history. The equivalent clearcut area is used to express the percentage of hydrologic openings in a watershed and accounts for vegetative recovery since the initial disturbance.

WATERSHED HYDROLOGIC RESPONSE ESTIMATES AND WATSED

Overview: WATSED is the cumulative effects model used to evaluate forest management impacts on the Idaho Panhandle National Forest. It is designed for watersheds ranging from approximately 2000 acres to 50 sq. mi. in size (Patten 2000, USFS 1990). WATSED estimates the cumulative effects of four management activities (logging, road building/maintenance, and burning) on water yield, peak flow and sediment yield. Effects estimates are presented as percent (%) change over the predicted "natural" (*i.e.*, unmanaged) conditions. Four basic scenarios were analyzed:

- ***Existing Condition***: Existing Condition is the present condition of the watershed, which includes the cumulative effects of past management. In an unmanaged watershed, the percent change over natural conditions for flow and sediment yield is equal to zero because there are no effects from past management. In most watersheds, however, Existing Condition estimates are greater than zero because the land has been actively managed.
- ***No-Action Alternative***: The No-Action Alternative includes foreseeable activities that are not connected with the project being analyzed, but will occur independently of -- and in addition to – the proposed management activities. The effects of foreseeable actions are modeled independently in Alternative 1 and included in all subsequent Action Alternatives.
- ***Action Alternatives without Road Restoration***: The Action Alternatives without planned restoration include logging, road building/maintenance, and burning *only* (Alternatives 2-7).
- ***Action Alternatives with Road Restoration***: In Action Alternatives where road restoration was planned, the effects were modeled using two WATSED runs. The first run included all roads in the project area (Tables 6-12). The second run did not include the roads that would be obliterated (Tables 13-19). The two scenarios were combined in the Sediment Yield graphs to display the effects of restoration. The graphs include all roads up to the year that restoration activities are completed. Beginning in that year (which is entered manually on the Title Page), the graphs do not include obliterated roads. The lag time in recovery immediately following restoration could not be accurately modeled and is assumed linear.

Model Limitations: WATSED estimates cumulative effects based on the average, measured response of the watersheds used to develop the model. Different watersheds respond differently to stress due to a vast number of climatic and environmental factors (Brooks and others 1991, Troendle and King 1985, Megahan 1983, Christner and Harr 1982). WATSED cannot account for the multitude of factors that cause variability among watersheds. Therefore, it uses simplified rules and assumptions set by the author (Patten 1989, Patten 2000, USFS (unpubl)). As a result, *WATSED outputs should not be interpreted as measured values from the watershed being analyzed*. Natural variability, technical limitations, measurement error, and model limitations must be considered when interpreting hydrologic models (Harr 1986, Thomas and Megahan (1998)). For example,

- WATSED assumes that a road prism stays open and maintained to perpetuity. Many forest roads are little used and heavily re-vegetated. This model limitation would tend to result in *overestimates* of sediment yield.
- WATSED does not explicitly evaluate the risk of stream crossing failure, which is a major factor in sediment risk in the Coeur d’Alene River. This model limitation tends to result in *underestimates* of the bedload component of sediment yield. (An additional Risk Analysis procedure is used for evaluating stream crossings).
- Natural resilience to disturbance. Low-level changes in sediment yield and peak flow do not usually cause measurable changes in stream condition unless they are sustained for long periods of time (Patten 2000).

The effects of variability are seen when comparing monitoring results to WATSED estimates for flow and sediment on the IPNF (USFS 1999):

Peak Flow: WATSED estimates ranged from 83% to 97% of measured values.

Flow Duration: WATSED estimates ranged from 87% to between 100% and 105% of measured values.

Sediment Yield: WATSED estimates ranged from 106% to 300% of measured values.

Monitoring results correlated reasonably well with measured values. For peak flow and flow duration, WATSED estimates were slightly low. For sediment, WATSED tended to overestimate both sediment yield and the length of recovery (USFS 1999).

Model error, measurement error, and natural variability all contribute to differences between WATSED estimates and actual values for water yield, peak flow and sediment yield. According to Patten (2000), "Rarely … are differences in estimated sediment (of) less than 10 to 20%, and peak flows (of) less than 5%, even detectable in any given watershed due to technical limitations in measurement and the natural variability of these parameters."

Interpretation of WATSED. Because of the inherent sources of variation, WATSED results should be interpreted as relative indicators of watershed response rather than absolute predictors of flow and sediment. The WATSED model is useful for evaluating watershed condition and comparing management alternatives, but it does not provide highly accurate estimates of flow and sediment yield for every watershed. Therefore, WATSED interpretations provided are based on ranges of values rather than discreet numerical outputs of the model (for the exact ranges used, see the "Interpretation" section of the WATSED project file reports). The interpretations for each category estimate the likelihood that measurable increases in flow and sediment yield will occur in association with the modeled increases predicted by WATSED. "Measurable increases" are defined as increases in flow or sediment yield associated with management activities that could be differentiated from pre-harvest levels. For example, a 2% increase in average annual peak flow following timber harvest (if it occurred) could not be differentiated from background variability. On the other hand, a 20% increase would be more easily distinguished from background variability and would be more likely to result in stream impacts. Analysts using WATSED, and others interpreting its results, must be familiar with the model and its limitations to draw meaningful conclusions. WATSED results should be used with other sources of information such as road density, road use, sensitive landtypes, quantitative risk estimates for stream crossings and encroaching road data.

Table D-1. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Total Iron Creek Watershed.

Physical Characteristics	
HUC:	
Drainage Area (square miles)	9.9
Sensitive Landtypes (percent of watershed)	37
Sensitive Snowpack (percent of watershed)	80
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Non-Functioning
Subwatersheds used for analysis	Rablens and Cataract Creeks
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	37
Current Runoff Modification (percent of peak)	10
Equivalent Clearcut Area (percent of watershed)	17
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	191
Current Sediment Load Modification (percent)	247
Road Density (miles/mile2)	12.4
Sensitive Road Density (miles/mile2)	4.5
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	2.1
Riparian Road Density (miles/mile2)	.7
Stream Crossings	
Number of Inventoried Crossings	52
Risk of Failure for Inventoried Crossings (tons/year)	467
Stream Crossing Frequency (#/mile of stream)	3.0
Number of Fish Migration Barriers	3

Table D-2. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in the Upper Iron Creek Above Rablens.

Physical Characteristics	
HUC: 17010301035400 & 17010301035403	
Drainage Area (square miles)	2.7
Sensitive Landtypes (percent of watershed)	42
Sensitive Snowpack (percent of watershed)	85
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Non-Functioning
Subwatersheds used for analysis	Upper and Lower Iron
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	35
Current Runoff Modification (percent of peak)	11
Equivalent Clearcut Area (percent of watershed)	15
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	132
Current Sediment Load Modification (percent)	178
Road Density (miles/mile2)	13.2
Sensitive Road Density (miles/mile2)	5.0
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	1.2
Riparian Road Density (miles/mile2)	.6
Stream Crossings	
Number of Inventoried Crossings	3
Risk of Failure for Inventoried Crossings (tons/year)	15
Stream Crossing Frequency (#/mile of stream)	2.4
Number of Fish Migration Barriers	2

Table D-3. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in Rablens Creek.

Physical Characteristics	
HUC: 17010301035406	
Drainage Area (square miles)	1.8
Sensitive Landtypes (percent of watershed)	36
Sensitive Snowpack (percent of watershed)	74
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Non-Functioning
Subwatersheds used for analysis	Rablens
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	41
Current Runoff Modification (percent of peak)	10
Equivalent Clearcut Area (percent of watershed)	17
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	51
Current Sediment Load Modification (percent)	311
Road Density (miles/mile2)	11.5
Sensitive Road Density (miles/mile2)	1.3
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	.8
Riparian Road Density (miles/mile2)	1.1
Stream Crossings	
Number of Inventoried Crossings	12
Risk of Failure for Inventoried Crossings (tons/year)	146
Stream Crossing Frequency (#/mile of stream)	3.0
Number of Fish Migration Barriers	1

Table D-4. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in Cataract Creek.

Physical Characteristics	
HUC: 17010301035409	
Drainage Area (square miles)	2.0
Sensitive Landtypes (percent of watershed)	22
Sensitive Snowpack (percent of watershed)	70
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Non-Functioning
Subwatersheds used for analysis	Cataract
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	40
Current Runoff Modification (percent of peak)	10
Equivalent Clearcut Area (percent of watershed)	18
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	43
Current Sediment Load Modification (percent)	186
Road Density (miles/mile2)	12.9
Sensitive Road Density (miles/mile2)	3.2
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	.1
Riparian Road Density (miles/mile2)	.25
Stream Crossings	
Number of Inventoried Crossings	14
Risk of Failure for Inventoried Crossings (tons/year)	116
Stream Crossing Frequency (#/mile of stream)	2.0
Number of Fish Migration Barriers	0

Table D-5. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in Hudlow Creek.

Physical Characteristics	
HUC: 17010301033900	
Drainage Area (square miles)	5.4
Sensitive Landtypes (percent of watershed)	40
Sensitive Snowpack (percent of watershed)	90
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Functioning-at risk
Subwatersheds used for analysis	WF, EF, and MF of Hudlow
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	37
Current Runoff Modification (percent of peak)	8
Equivalent Clearcut Area (percent of watershed)	14
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	134
Current Sediment Load Modification (percent)	186
Road Density (miles/mile2)	7.5
Sensitive Road Density (miles/mile2)	1.3
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	1.4
Riparian Road Density (miles/mile2)	0.6
Stream Crossings	
Number of Inventoried Crossings	7
Risk of Failure for Inventoried Crossings (tons/year)	25
Stream Crossing Frequency (#/mile of stream)	0.9
Number of Fish Migration Barriers	0

Table D-6. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in West Fork Hudlow Creek.

Physical Characteristics	
HUC: 17010301033903	
Drainage Area (square miles)	1.9
Sensitive Landtypes (percent of watershed)	37
Sensitive Snowpack (percent of watershed)	96
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Functioning-at risk
Subwatersheds used for analysis	WF Hudlow
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	35
Current Runoff Modification (percent of peak)	12
Equivalent Clearcut Area (percent of watershed)	19
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	54
Current Sediment Load Modification (percent)	269
Road Density (miles/mile2)	8.1
Sensitive Road Density (miles/mile2)	2.2
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	1.0
Riparian Road Density (miles/mile2)	1.5
Stream Crossings	
Number of Inventoried Crossings	7
Risk of Failure for Inventoried Crossings (tons/year)	23
Stream Crossing Frequency (#/mile of stream)	1.4
Number of Fish Migration Barriers	0

Table D-7. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in Middle Fork Hudlow Creek.

Physical Characteristics	
HUC: 17010301033906	
Drainage Area (square miles)	2.2
Sensitive Landtypes (percent of watershed)	32
Sensitive Snowpack (percent of watershed)	78
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Functioning-at risk
Subwatersheds used for analysis	MF Hudlow
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	37
Current Runoff Modification (percent of peak)	5
Equivalent Clearcut Area (percent of watershed)	8
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	60
Current Sediment Load Modification (percent)	228
Road Density (miles/mile2)	7.4
Sensitive Road Density (miles/mile2)	1.8
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	.1
Riparian Road Density (miles/mile2)	0.09
Stream Crossings	
Number of Inventoried Crossings	0
Risk of Failure for Inventoried Crossings (tons/year)	0
Stream Crossing Frequency (#/mile of stream)	1.4
Number of Fish Migration Barriers	0

Table D-8. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in East Fork Hudlow Creek.

Physical Characteristics	
HUC: 17010301033900	
Drainage Area (square miles)	0.7
Sensitive Landtypes (percent of watershed)	49
Sensitive Snowpack (percent of watershed)	100
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Functioning-at risk
Subwatersheds used for analysis	EF Hudlow
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	41
Current Runoff Modification (percent of peak)	9
Equivalent Clearcut Area (percent of watershed)	17
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	28
Current Sediment Load Modification (percent)	126
Road Density (miles/mile2)	6.5
Sensitive Road Density (miles/mile2)	3.3
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	0
Riparian Road Density (miles/mile2)	0
Stream Crossings	
Number of Inventoried Crossings	0
Risk of Failure for Inventoried Crossings (tons/year)	0
Stream Crossing Frequency (#/mile of stream)	0
Number of Fish Migration Barriers	0

Table D-9. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in Tom Lavin Creek.

Physical Characteristics	
HUC: 17010301033900	
Drainage Area (square miles)	3.2
Sensitive Landtypes (percent of watershed)	16
Sensitive Snowpack (percent of watershed)	58
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Properly Functioning Condition
Subwatersheds used for analysis	Tom Lavin
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	34
Current Runoff Modification (percent of peak)	5
Equivalent Clearcut Area (percent of watershed)	9
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	76
Current Sediment Load Modification (percent)	103
Road Density (miles/mile2)	7.4
Sensitive Road Density (miles/mile2)	1.0
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	.1
Riparian Road Density (miles/mile2)	.5
Stream Crossings	
Number of Inventoried Crossings	19
Risk of Failure for Inventoried Crossings (tons/year)	42
Stream Crossing Frequency (#/mile of stream)	0.6
Number of Fish Migration Barriers	0

Table D-10. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in Lewelling Creek.

Physical Characteristics	
HUC: 17010301033900	
Drainage Area (square miles)	2.2
Sensitive Landtypes (percent of watershed)	25
Sensitive Snowpack (percent of watershed)	64
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Properly Functioning Condition
Subwatersheds used for analysis	Lewelling
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	37
Current Runoff Modification (percent of peak)	3
Equivalent Clearcut Area (percent of watershed)	5
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	56
Current Sediment Load Modification (percent)	80
Road Density (miles/mile2)	5.7
Sensitive Road Density (miles/mile2)	1.6
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	.1
Riparian Road Density (miles/mile2)	.1
Stream Crossings	
Number of Inventoried Crossings	13
Risk of Failure for Inventoried Crossings (tons/year)	122
Stream Crossing Frequency (#/mile of stream)	0.4
Number of Fish Migration Barriers	1

Table D-11. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in Honey Creek.

Physical Characteristics	
HUC: 17010301033900	
Drainage Area (square miles)	2.5
Sensitive Landtypes (percent of watershed)	24
Sensitive Snowpack (percent of watershed)	75
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Functioning-at-Risk
Subwatersheds used for analysis	Honey
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	31
Current Runoff Modification (percent of peak)	6
Equivalent Clearcut Area (percent of watershed)	10
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	52
Current Sediment Load Modification (percent)	239
Road Density (miles/mile2)	7.5
Sensitive Road Density (miles/mile2)	3.4
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	.07
Riparian Road Density (miles/mile2)	0.04
Stream Crossings	
Number of Inventoried Crossings	4
Risk of Failure for Inventoried Crossings (tons/year)	75
Stream Crossing Frequency (#/mile of stream)	1.1
Number of Fish Migration Barriers	0

Table D-12. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in Sob Creek.

Physical Characteristics	
HUC: 17010301033900	
Drainage Area (square miles)	1.2
Sensitive Landtypes (percent of watershed)	13
Sensitive Snowpack (percent of watershed)	68
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Functioning-at-Risk
Subwatersheds used for analysis	Sob
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	35
Current Runoff Modification (percent of peak)	6
Equivalent Clearcut Area (percent of watershed)	10
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	26
Current Sediment Load Modification (percent)	156
Road Density (miles/mile2)	6.9
Sensitive Road Density (miles/mile2)	2.2
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	0.05
Riparian Road Density (miles/mile2)	0.08
Stream Crossings	
Number of Inventoried Crossings	2
Risk of Failure for Inventoried Crossings (tons/year)	32
Stream Crossing Frequency (#/mile of stream)	2.7
Number of Fish Migration Barriers	1

Table D-13. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in Solitaire Creek.

Physical Characteristics	
HUC: 17010301033900	
Drainage Area (square miles)	2.6
Sensitive Landtypes (percent of watershed)	25
Sensitive Snowpack (percent of watershed)	83
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Functioning-at-Risk
Subwatersheds used for analysis	Solitaire
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	38
Current Runoff Modification (percent of peak)	12
Equivalent Clearcut Area (percent of watershed)	19
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	54
Current Sediment Load Modification (percent)	152
Road Density (miles/mile2)	9.9
Sensitive Road Density (miles/mile2)	3.5
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	.1
Riparian Road Density (miles/mile2)	0.06
Stream Crossings	
Number of Inventoried Crossings	27
Risk of Failure for Inventoried Crossings (tons/year)	153
Stream Crossing Frequency (#/mile of stream)	1.2
Number of Fish Migration Barriers	1

Table D-14. Watershed Characteristics, Condition Indicators, and Dominant Watershed Disturbances in Upper Little North Fork.

Physical Characteristics	
HUC: 17010301033900	
Drainage Area (square miles)	1.8
Sensitive Landtypes (percent of watershed)	2
Sensitive Snowpack (percent of watershed)	69
Qualifications	
Is all or part listed as Water Quality Limited?	No
Apparent Watershed Status	Functioning-at-Risk
Subwatersheds used for analysis	Upper Little North Fork
Hydrologic Regime	
Estimated Peak Flow (Q2 cfsm)	30
Current Runoff Modification (percent of peak)	12
Equivalent Clearcut Area (percent of watershed)	18
Erosion and Sediment	
Estimated Annual Sediment (tons/mile2/year)	31
Current Sediment Load Modification (percent)	108
Road Density (miles/mile2)	10.7
Sensitive Road Density (miles/mile2)	9.5
Channel Conflicts	
Road Encroaching at Bankfull Stage (miles)	.3
Riparian Road Density (miles/mile2)	.7
Stream Crossings	
Number of Inventoried Crossings	20
Risk of Failure for Inventoried Crossings (tons/year)	268
Stream Crossing Frequency (#/mile of stream)	3.8
Number of Fish Migration Barriers	0

General Effects of Activities

Effects of Stream Crossing Failures on Abandoned or Unmaintained Roads: Extensive road networks were constructed in the 1960's throughout the analysis area. Typically these older roads were designed to last about 20 years. The majority of these roads presently are stabilized with vegetation, and are not actively delivering sediment to stream channels. However, many of these roads still have culverts and fills at stream crossings which can be expected to fail over time. These failures are usually associated with relatively infrequent hydrologic and climatic events. A typical example is when warm, moisture-laden air masses move into the region over a watershed that is dominated by a ripe snowpack (near freezing temperature and loaded with water), that is ready to melt. The results are often a rapid and flashy runoff that is referred to as a "rain-on-snow" flood. During these events, water flow can exceed the capacity of the crossing structure, or blocks it with debris. In these cases, water overtops the fill and the resulting erosion deposits material into the creek. In some locations, pore water pressure in the soil actually destabilizes the fill material and the hillslope, causing them to slump into the creek.

Effects of Stream Crossing Failures on Sustained Grade Roads: Stream crossings on steep sustained grades are sometimes inadvertently installed. At these crossings, the downhill approach of the road is lower than the road surface at the stream crossing. When the structure is blocked by debris or its capacity somehow is exceeded, the water overtops the pipe and begins flowing down the road. Instead of flowing directly over the road and back into the channel, it flows downslope on the road or in the ditch line until an obstruction, such as a low point in the road, forces the flow across the road surface and onto the fill. The water often erodes the road surface, causing gullies in the road tread, road fill, and the slope below the fill as the water travels back to the stream. The amount of sediment delivered to the stream from this type of erosion would exceed the amount of sediment delivered from only the stream crossing failure and would include erosion from the crossing, the ditch line, the road prism and the fill. In some cases, failure of a crossing and subsequent overflow can initiate mass failure of the hillslope above the failure.

Flow relief drivable and hardened dips can be installed at stream crossings where flows could escape as described down the road. This would reduce the amount of sediment delivered to the stream for the long term. Some sediment may be delivered to the stream during installation of the dips, but the amount would be small and not expected to reduce water quality or alter stream condition.

General Effects of Stream Crossing and/or Large Fill Failure: When large fills fail, such as at stream and draw crossings or at encroaching roads, they often inundate the stream with quantities of sediment that cannot easily be flushed through the stream. The deposited materials tend to remain intact as a mass or 'slug' of sediment that can severely alter smaller streams by filling both channel pools and flood prone areas. The result is a loss or inhibition of important channel processes that are necessary to support beneficial uses of the water. As the sediment mass moves downstream and enters larger streams, the sediment begins to disperse, thereby reducing the channel effects of the single failure. Multiple failures can combine and result in long-term adverse channel effects downstream.

Effects of Stream crossing or pipe upgrades or Removal: Increasing the size of a culvert or the crossing structure, or removing the drainage structure would reduce the chance that a fill may fail as a result of lack of capacity. Providing flow relief or overflow culverts or other structures in the event of excess streamflows or blockages also would reduce the chance of failure. Short-term increases in fine sediment inputs could be expected, but no major channel adjustment. Reduction of the risk of failure results in long-term benefits to the stream channel.

Effects of Armored Bypass Installation: Installation of armored bypass dips reduces the risk that the fill would enter the stream if a culvert plugs or flow exceeds its capacity. The armored dip is designed to allow water to flow over the road without eroding the fill. As with any construction or restoration activity, there is a chance that some incidental fine sediment would enter the stream in the short term. This incidental loading would be far overshadowed by the long-term and pronounced reduction of risk from the failure of the crossing.

Effects of Stream Crossing Maintenance: Regular maintenance of stream crossings would reduce sediment delivery to streams. Additional cross drainage structures installed away from the live stream would capture sediment coming from the road surface and ditch and reroute it to the forest floor. This would not eliminate sediment delivery, but would reduce the amount currently delivered to the stream.

Effects of Installation of Relief Culvert Crossings: Installation of relief culverts would reduce the timing, magnitude and quantity of surface runoff because runoff from the ditch line would be dispersed and allowed to infiltrate into the forest floor. The dispersion of surface runoff would help "normalize" the flow regime of a basin by recharging the groundwater. The groundwater would slowly release into the live streams.

Effects of Increased Sediment due to Road Use: Use of roads during project activities would increase sediment delivered to streams. The heavy use of vehicles, mainly logging trucks, and frequent surface blading of the road surface would increase the amount of sediment eroded during summer rainfall events. Some of this sediment may be delivered to the stream where the road is near the stream or when runoff is carried down a ditch line. The amount of increased sediment would be expected to be immeasurable and would not reduce water quality or affect stream condition.

Effects of Harvest-Related Activities on Sediment Delivery at the Localized/Site Scale: No sediment would be expected to be delivered to streams from logging yarding activities because of the implementation of Best Management Practices. Yarding activities also would be located beyond the riparian areas of streams or lakes. Undisturbed lands between all logging activities and Riparian Habitat Conservation Areas (RHCAs) would trap any sediment that may reach the margins of disturbed areas (Belt, G.H., et al, 1992). All landings would be located outside of RHCAs and designed to minimize the risk of sediment delivery and to prevent mass failure potential. These mitigation measures are included in Chapter II.

Effects on Harvest-Related Activities on Stream Temperatures: Water temperature is the principal regulator of biological activities for aquatic organisms and often the limiting factor in their survival. Stream temperatures are a function of a variety of factors including some inherent to a stream and others which may be manipulated by management activities. Factors include: direct solar radiation, orientation of the channel, site topography, substrate color, groundwater contribution and dilution with other streams. Direct solar radiation is the main factor that can be altered by management activities. Research has documented that the single greatest means of increasing stream temperature is to remove that portion of the riparian vegetation that blocks direct solar radiation. The proposed Iron Honey project activities would not impact existing stream temperatures. There would be no harvesting of trees in riparian areas under any of the action alternatives.

Effects of Timber Harvest: Timber harvest and road construction are major contributors to increases in total runoff. Some of the factors that are involved are; reduced interception losses, transpiration, increased snow accumulation and melt rates, and increases in the channel network associated with construction methods. The hydrologic responses to these increases in peak flow can initiate changes to runoff patterns in several respects; 1) peak flows may be longer in

duration, 2) the timing of runoffs may be altered, and 3) increases in the magnitude of the peak flow events may occur. In turn negative effects to stream channel morphology can be initiated as a result of these disturbances to runoff patterns

Effects of Encroaching Roads: Road fill from encroaching roads constrict the active flood prone area of the stream or, in extreme cases, occupy part of the active channel itself. Those road sections reduce capacity of the stream at flood stages, alter flow patterns, increase local velocities, redistribute sediment loads, and compromise the function of the stream. During flood flows, the depth of flow is increase and the channel is narrowed. This often causes scouring of opposing stream banks and undercuts opposing hillslopes, which in turn causes sediment input into the stream. Sometimes the scour undercuts the opposing slope which destabilizes it and initiates a mass failure (such as a slump or debris avalanche) of material into the stream. In some cases, the road constricts the channel enough that the natural meanders are straightened and stream slope is steepened. This can result in rapid adjustments by the stream to regain its balance with the water flow and sediment load. The result is an unstable stream which will compromise the support of beneficial uses.

Roads located close to streams usually deliver more sediment to streams than other roads for two reasons: 1) roads in close proximity to streams are more likely to be subject to the erosive forces of running water; and 2) eroded materials do not have to travel far to be delivered to the streams. The closer a road is to the stream, the smaller the expanse of forest floor and its rough materials available to capture and store sediment. Road surface treatments, such as application of gravel would reduce sediment delivered to streams by reducing the amount of sediment eroded from the road surface. Streams that have been constricted by roads are less able to handle the increased energy associated with large flow or sediment inputs. Channel pattern changes resulting from streamside road placement may result in drastic and long-term changes to the streamflow and sediment routing regime. Additionally, streamside roads are subject to frequent or continual stress of flow against the roadfill, particularly during peak discharges. These roads manifest frequent and often large failures and can be a chronic source of sediment to the stream.

Effects of Encroaching Road Removal: Removal of encroaching roads would reduce sediment delivery in the short and long-term. Improvement in stream condition and habitat in terms of clarity, accumulation of sediment, loss of cover, erosive velocities, etc., would occur at the road removal site and immediately downstream.

During and after road removal, some fine sediment would likely be delivered to the water. The majority of sediment delivered to the stream would be in the form of suspended sediment. The suspended sediment would route through the stream system quickly and the primary effect would be turbidity (loss of clarity of the water). The increase in turbidity would be measurable for a short time immediately following disturbance and would be evident for short distances downstream from the fill removed (generally less than 1,000 feet). The amount of sediment from road fill removal would be low, especially when compared to the long-term reduction that would result. Standard Best Management Practices (including silt fences, mulch, and coffer structures to de-water the work site) as well as other erosion control techniques would minimize the amount of sediment delivered in the short-term. The re-establishment of effective vegetation would essentially eliminate long-term sediment inputs.

Effects of Sediment from Temporary Road Construction: Temporary roads are equivalent to system roads in that they are designed and planned as part of the transportation network. The difference between temporary and system roads is that a temporary road is intended to be restored to a hydrologically inert state after use. Slope stability would be restored, surface erosion would be eliminated. All crossings and associated fill would be removed and stabilized. The site should need no future maintenance after this restoration. The restoration of the site of a temporary road would be the responsibility of the timber sale purchaser before the end of the timber sale contract. Some timber sale contracts would last approximately five years.

Temporary roads would cause the same risk to water resources as any other road when they are in place. There would be some additional risk with temporary roads in that they are not designed to the same specifications as a system road. Locations, however, would either be specified or agreed upon between the timber sale purchaser and the timber sale administrator or engineer.

Effects of Stream Channel Restoration: Restoring the stream channel pattern, profile and dimension would reduce sediment delivery from unstable streambanks over the long term. Streams would route both sediment and water while maintaining stable channel conditions. Channels would be more complex with a greater number of (and deeper) pools. In areas where channels are reconstructed, there would be short-term loss of riparian vegetation. Channels would become more narrow and deeper. Increases in large woody debris would increase cover components and fish habitat.

Watershed Processes

1. Water yield changes through vegetative changes: Water yield describes the changes in the rate, frequency, and timing that a watershed exhibits in response to runoff from hydro-climatic events such as rainfall and snowmelt. Changes in peak flow are often used to measure the effects of vegetative changes on water yield. Patterns of regeneration harvest, large stand-consuming fires, and forest insects and diseases can alter snowmelt patterns because of vegetation changes on the slopes. These changes in snowmelt patterns can result in higher peak flows earlier in the spring.

2. Increased peak flows through extended channel networks: Forested watersheds like the North Fork Coeur d'Alene River typically transport runoff subsurface until it reaches a stream channel. As long as the water movement is subsurface, the rate of movement is relatively slow compared to free water flow on the surface. A watershed has a network of channels that expand in length (and width) as a substantial runoff event occurs. As this network expands, such as during the spring snowmelt, not only is more water being moved but it is also moved faster. Roads, landings and excavated skid trails (especially those on steeper land types) have often been excavated to a depth that intercepts the subsurface water. This water flows on the surface until it either infiltrates the ground or reaches a stream channel. Many watersheds and subwatersheds of the project area have exceptionally high road densities. Where the associated land types are susceptible to interception of subsurface slope water by those roads, there is a potential for substantial expansion of the channel network and contributing areas during runoff-producing events.

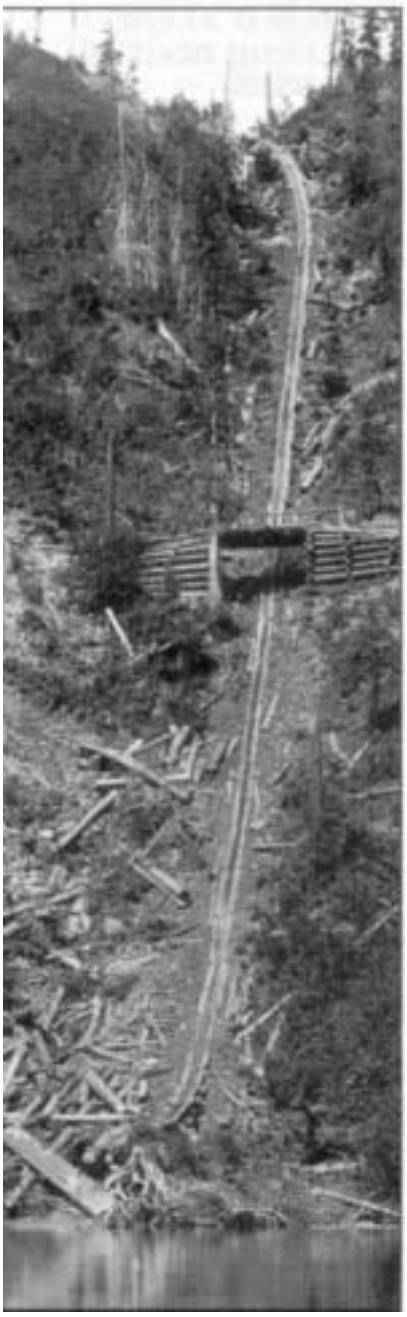
3. Rain-on-snow events and watershed responses: Northern Idaho experiences a strong maritime influence with warm moist weather fronts invading in the winter from the Pacific Coast. These relatively warm and moisture-laden air masses are frequent and have a profound effect on the climate and hydrology of the Coeur d'Alene River basin. As a result, midwinter snowmelt, thaws, and rainfall are common in the region. In northern Idaho, the snowpack within the 3,000 to 4,500-foot elevation range is most susceptible to rain-on-snow events. Below 3,000 feet, the snow pack often may accumulate and abate several times during the season and not be a substantial contributor to overall basin runoff. Many years the snow pack above about 4,500 feet is usually "cold" and less susceptible to rain-on-snow events. Rain-on-snow is a natural process under which the streams of the basin developed. The historic streams of the basin were very stable and resilient because they developed in response to the variability of the climatic processes and the dominant geology of the basin. Rain-on-snow events probably did not cause the loss of mainstream equilibrium historically. Changes in vegetation resulting from management or natural events can affect the frequency and magnitude of rain-on-snow events.

4. Direct delivery of bedload materials from the hillslopes to streams: Perhaps the most important process influencing the Coeur d'Alene River and its tributaries is the failure of roads, road fills, landings, and other encroachments in close proximity to streams. When these fail and the slope is capable of transporting the debris (i.e. on steep slopes or on slopes dissected by frequent streams and draws), sediment and debris is delivered into stream courses.

5. Direct riparian and instream disturbances: Logging practices and other management activities in riparian areas and stream bottoms have frequently resulted in adverse effects. These activities have caused extensive and long-term loss of large wood-replacing vegetation, stream channelization and changes of alignment, loss of structural components, compaction of soils, and other hydraulic modifications. Roads and other facilities in valley bottoms inevitably encroach on the stream channel and its floodplain and low terraces. This encroachment creates a constriction in the normal stream environment. Consequently, large streamflows are forced through a smaller (constricted) channel and floodplain than it was "designed" for after thousands of years of floods. The smaller channel results in deeper water flows causing flooding and an increased velocity of flows. These in turn results in accelerated bed scour and bank erosion. The resulting sediment and can cause abnormal drastic and prolonged channel adjustments that may even trigger new adjustments downstream. These disturbances cause a loss of stream equilibrium, which is extensive in the Little North Fork of the Coeur d'Alene and several of its tributaries.

Recent watershed and road projects have upgraded pipes and increased available habitat for native fish. Restoration of failing banks and culverts occurred in the upper portion of the the Little North Fork in 1997 and 1998. Three stream channel crossing were removed on the upper portion of Road 209, but this work is not completed and a number of pipes are still in place. In 1999, two pipes were upgraded in the Hudlow watershed to meet requirements of the Inland Native Fish Strategy. Pipes have also been replaced at the mouth of Tom Lavin Creek, providing fish passage. Channel crossings will be upgraded on Road 385 during the summer of 2000.

Effects of Past Activities on Fish Habitat Connectivity



Environmental conditions in the planning area have been influenced by natural events and processes as well as human activities. Effects of natural disturbances such as volcanic eruptions (such as Mt. St. Helens and Mt. Mazama), historic fires, landslides, and flooding have interacted with other land-evolving processes (for example, geologic uplift and stream channel downcutting) to form the basic character of watersheds and the dependent stream resources. Due to variability in the location, frequency, intensity, and ultimately, the effects of natural processes on the physical environment, dynamic landscapes with diverse conditions are formed at various spatial scales. Biological communities (including native fish populations) led to development of functional ecosystems that are inherently resilient to effects from natural disturbance regimes representing pulse-type disturbance (Reeves et al, 1995). Pulse disturbances influence the natural range of environmental conditions that are expected for ecosystems functioning at broad geographic scales but typically allow systems to begin recovering to pre-disturbance conditions after the disturbance.

Natural disturbance regimes and their associated properties (sedimentation rates and other influences on aquatic habitat) have been altered in the cumulative effects area by human activity. Land use activities that have modified natural disturbance characteristics include railroads, roads, flumes/chutes, settlements/towns, grazing, mining, stream modifications (constriction, channelization, diversion, dams, culverts, and cleaning - removal of woody debris), logging, and fire suppression. Many of these human influences are considered press-type disturbance that continue to affect the condition and trend for fisheries resources long after the initial disturbance. Press disturbance differs from pulse disturbance in several aspects but generally press disturbance is persistent in ecosystems and impairs the ability for ecosystems to recover to pre-disturbance conditions (Reeves *et al.* 1995). Within the cumulative effects area, the recovery process from pulse disturbance has been hindered by the presence of various press disturbances. The following discussion relates these findings to the existing condition of fish habitat.

Habitat requirements of Westslope cutthroat trout and bull trout vary by age and time of year (Baltz, et al 1991; Moore and Gregory 1989; Rieman and Apperson 1989; Campbell and Neuner 1985; Hickman and Raleigh 1982). Young-of-the-year fish initially seek stream margins with heterogeneous habitat structure. Where this habitat is not present or is lost, juvenile trout populations are virtually eliminated (Moore and Gregory 1989). Cover and complex habitat are especially important to salmonids (Griffith 1972; Pratt 1984; Irving 1987). During winter, trout typically seek out deeper, lower velocity water associated with large woody debris. Over all, salmonids may spend more than 75 percent of their life history associated with pools (Moore and Gregory 1989; Reiman and Apperson 1989).

Headwater streams, which frequently are not considered "fish-bearing streams," are of great importance to downstream fisheries. Aside from providing cold water and seasonal spawning and rearing habitat to fish, the large wood and debris dams are important components in maintaining primary links in the food chain to the aquatic ecosystem downstream (Schlosser 1982; Bilby and Likens 1980). Woody debris also creates pools and provides cover in trout streams (Pratt 1984; Lider upublished; Gamblin 1988). The removal of trees adjacent to streams has resulted in the elimination of woody debris recruitment. As downed wood decays and is not replaced, pools and cover are lost. Woody debris also plays an important role in stream stability and the storage of sediments (Gamblin 1988). The persistence of native fish species can best be provided for over time by maintaining instream habitat complexity in association with channel stability (Karr and Freemark 1983; Karr and Dudly 1981; Gorman and Karr 1978).

Intact riparian areas throughout the stream system not only provide constant recruitment of wood to the stream, but also affects the water temperature. Reductions in the amount of vegetation can result in increased water temperatures in the summer and decreased water temperatures in the winter. This is important when Westslope cutthroat trout rarely survive

water temperatures that exceed 22 degrees Centigrade (Behnke and Zarn 1976) and bull trout cannot tolerate water temperatures in excess of 15 degrees Centigrade (Ratliff 1992; Brown 1992; Fraley and Shepard 1989).

Changes in stream flow, water quality, and riparian vegetation due to timber harvest, road building and lack of timely road maintenance can all affect the quality and quantity of habitat available to native fish. There is strong evidence that shifts away from channel equilibrium can result in negative changes in the structure and function of stream ecosystems (Bilby and Likens 1980; Schlosser 1982) and their dependent fish populations. Bisson and Sedell (1984) reported that where stream channels have become destabilized, riffles elongated and in many cases extended through former pool locations resulting in loss of pool volume and large stable debris for cover. They suggested that declines in older fish may have resulted due to their dependency upon deeper water habitats.

Overall survival of a metapopulation within a watershed basin depends on the continued existence of good habitat for populations from all life histories: resident, fluvial and adfluvial. Good habitat has a strong correlation with the amount of large wood in the system (Young et al, 1999). As large wood and debris dams deteriorate, so do the wood-dependent pools and cover complexity. Therefore, good habitat does not exist over long periods of time within a single locale (Hanski and Gilpin 1991; McCauley 1991; Mangel and Tier 1994). Also, the stream habitat changes as the terrestrial habitat changes, whether the change is from logging or a natural wildfire. A range or mosaic of habitat conditions occurs throughout a natural watershed at any time as a consequence of natural habitat disturbance and recovery. The fish populations decline and grow within specific stream reaches over time as the habitat within these reaches decline and recover. Fish will either die, reduce their population size or migrate out of a degraded stream reach and move into one with better habitat (Rieman et al. 1993). The result is that, while it is common over time for populations within a specific reach or stream to become extinct (Hanski 1985; Hanski and Gilpin 1991; Sjogren 1991), the overall metapopulation within the natural watershed tends to remain constant (May 1994), as the fish relocate into other portions of the drainage where habitat is improving.

Human activities, such as agriculture, urbanization and timber harvest, have extensively altered the aquatic ecosystem (Bisson et al. 1992) to the point of losing habitat types or ecosystem states (Holling 1973; Rapport et al. 1985; Steedman and Regier 1987). As focal systems degrade (either naturally or through human activities) and the adjunct and nodal watersheds are degraded or prevented from maturing into focal watersheds due to human activities, there are no longer areas for fish to immigrate. This results in a decrease in the metapopulation of the entire drainage.

A healthy ecosystem is capable of withstanding large disturbances without dramatically changing its original processes and functions (Holling 1973, Rosgen personnel communication). If a disturbance or series of disturbances is greater than a system's resiliency, the system's processes (stream gradient, flow rate, sinuosity, width, depth, etc.) may shift and a new set of unstable processes would occur. While it is possible for a stream to adjust to a new hydraulic situation within a relatively short period of time (Heede 1980), fish cannot always do so. Species that have evolved specific habitat requirements in the original hydraulic condition face a higher risk of extinction if those specific requirements are not met in the new hydraulic condition and unstable stream conditions. (Reeves et al. 1995).

Yount and Niemi (1990) described two types of disturbances: "press" and "pulse". The pulse disturbance occurs periodically, and then allows an ecosystem to return to its original processes or hydraulic condition before occurring again. A press disturbance is a series of disturbances that do not allow the ecosystem to return to its original condition. This forces the system into a new equilibrium. Human disturbances, such as chronic sediment deposition and channel constriction from roads and stream crossings, are examples of press disturbances. Because there are no analogues in the natural disturbance regime, native species may not have evolved strategies to survive these disturbances. The functional extinction of bull trout in the Coeur d'Alene River drainage and the severe decline of westslope cutthroat trout underscores this possibility. These declines can be attributed to the cumulative effects of human activities (Nehlsen et al. 1991; Bisson et al. 1992; Reeves et al 1993). Though land managers have attempted to mitigate the impacts of their activities on habitat, this strategy has not proven to be successful in most cases (Bisson et al. 1992).

In general, watersheds within Northern Idaho can be described by one of four disturbance regimes: unburned watersheds without management activities, unburned watersheds with management activities, burned watersheds without management activities, and burned watersheds with management activities.

Unburned Watersheds Without Management Activities: There are few watersheds (greater than 5000 acres) within the Forest that meet these criteria and none within the analysis areas. Conditions of these watersheds include complex stream conditions with complex fish habitat. The probability of persistence of resident fish within these basins is high. The stream conditions within these basins serve as reference conditions for other unburned watersheds. There are no watersheds with this condition within the project area.

Unburned Watersheds With Management Activities: Watersheds not burned since the early 1900's in the cumulative effects area, have experienced more recent disturbances associated with land management. Various intensities of road activity (e.g. construction, reconstruction, and maintenance), timber harvest, mining, and/or recreational facilities have influenced the rate of fish habitat recovery from historical disturbances in several streams. The existing transportation system in the cumulative effects area is an extension of historic road locations that paralleled stream courses from the valley bottoms to the mountain ridges in many cases. Riparian roads in the cumulative effects area have high levels of erosion during flood events, accelerate stream sedimentation rates, reduce channel stability, inhibit flood plain functions, reduce large woody debris recruitment potential, reduce stream shade, and otherwise impair the development and maintenance of quality fish habitat. The table below lists the fish-bearing streams that have valley bottom roads that are affecting fish habitat conditions at various levels (as displayed in the table below). Existing fish habitat conditions are generally below desired levels and the trend is not favorable in all these subwatersheds within this area, except Lewelling Creek.

Table D-15. Watersheds not burned by large fires, in which timber harvest activities have occurred. The values listed in the effects to riparian areas is approximate.

Stream Name	HUC #	Area of Riparian Roads	Area of Riparian Harvest
Little North Fork Coeur d'Alene River above Hudlow (total)	170103010327	>25%	>25%
Hudlow (Middle Fork and lower)	17010301033900	0 - MF, add in lower	<10%
Hudlow (East Fork)	17010301033909	None	<10%
Hudlow (West Fork)	17010301033903	>25%	>25%
Iron Creek (total)	17010301035400	>25%	>25%
Rusty Creek			
Cataract Creek	17010301035409	None	>25%
Moose Creek			
Rablens Fork	17010301035406	>25%	>25%
Silver Run			
Little North Fork Coeur d'Alene River (above Iron Creek)	170103010327	>25%	>25%
Honey Creek	17010301034806	>25%	>25%
Lewelling Creek	170103010342	<25%	>25%
Sob Creek	17010301034809	None	<25%
Solitaire Creek	17010301035100	None	>25%

Burned Watersheds Without Management Activities: Early 20th century fires burned over these parts of the planning area and altered the condition and trend for many streams. Areas that reburned within a relatively short time span have been slower to recover from these fires. Most stream channels in areas that have not been entered for harvest have adjusted to altered hydrologic conditions resulting from historic fires and these channels are generally stable. Riparian areas affected in this way typically offer less protection for stream temperatures (i.e. stream shade) and have a lower recruitment potential for large woody debris. A lack of large woody debris recruitment can inhibit the development and maintenance of diverse habitat conditions including quality pool habitat and complex cover. Though the condition of fish habitat components (maximum stream temperatures, aquatic habitat diversity, and cover complexity) in watersheds has recently been influenced, the trends are favorable for sustaining salmonid populations. There are no watersheds with this condition within the project area.

Burned Watersheds With Management Activities: Streams in watersheds that were logged following historic fires have experienced similar but more prolonged residual effects than those streams in watersheds where salvage logging did not occur. Logging and associated activities intensified the effects of fires because unburned trees that would otherwise have been available to facilitate fish habitat maintenance and recovery were removed by various means (*e.g.* roads, railroads, flumes, and splash dams) which often resulted in additional disturbance to stream channels and associated riparian areas.

Increased impacts to streams and riparian areas have extended the recovery period necessary to develop quality fish habitat. As a result, fish habitat conditions in streams that have most recently been influenced, primarily by wildfires and the ensuing salvage logging activities, are generally earlier in the recovery process than streams in watersheds that were not salvage logged. Nonetheless, a favorable trend for fish habitat conditions exists for Tom Lavin creek.

Table D-16. Watersheds burned by large fires, in which timber harvest activities have occurred. The values listed in the effects to riparian areas is approximate.

Stream Name	HUC #	Area of Riparian Roads	Area of Riparian Harvest
Tom Lavin	170103010345	>25%	>25%

APPENDIX E
SPECIFIC UNIT INFORMATION

INTRODUCTION

The following tables provide specific harvest unit information under each alternative. No timber harvest is proposed under Alternatives 1 and 6; therefore there is no information provided here regarding those two alternatives. Please refer to Chapter II for complete alternative descriptions.

Table E-1. Specific unit information, Alternative 2

Unit #	Acres	Prescription	Skyline yarding	Tractor yarding	Helicopter yarding	Under-burning	Flying tops	Volume (MBF)	Average diameter
1	74	Shelterwood	59	15	0	74	0	1,319	21
2	49	Shelterwood	39	10	0	49	0	700	18
3	163	Shelterwood	82	82	0	163	0	2,420	17
4	166	Shelterwood	133	33	0	166	0	1,329	11
5	146	Shelterwood	131	15	0	146	0	1,022	14
6	46	Shelterwood	46	0	0	46	0	897	10
7	189	Shelterwood	170	19	0	189	0	2,840	14
8	266	Shelterwood	239	27	0	266	0	4,265	12
Total	1,100	~~~	900	200	0	1,100	0	14,800	13

Table E-2. Specific unit information, Alternative 3

Unit #	Acres	Prescription	Skyline yarding	Tractor yarding	Helicopter yarding	Under-burning	Flying tops	Volume (MBF)	Average diameter
1	5	Clearcut with reserves	5	0	0	5	0	57	10
2	5	Clearcut with reserves	5	0	0	5	0	50	8
3	5	Clearcut with reserves	5	0	0	5	0	50	8
4	10	Clearcut with reserves	10	0	0	10	0	242	13
5	10	Clearcut with reserves	10	0	0	10	0	242	13
9	5	Clearcut with reserves	5	0	0	5	0	42	11
10	5	Clearcut with reserves	5	0	0	5	0	73	13
11	5	Clearcut with reserves	9	0	0	9	0	226	11
13	5	Clearcut with reserves	5	0	0	5	0	59	7
14	5	Clearcut with reserves	0	5	0	5	0	43	14
15	5	Clearcut with reserves	0	5	0	5	0	60	12
16	5	Clearcut with reserves	5	0	0	5	0	99	12
17	5	Clearcut with reserves	5	0	0	5	0	99	12
18	5	Clearcut with reserves	0	5	0	5	0	60	18
19	5	Clearcut with reserves	5	0	0	5	0	80	18
20	5	Clearcut with reserves	5	0	0	5	0	80	18
21	5	Clearcut with reserves	0	5	0	5	0	80	19
22	5	Clearcut with reserves	0	5	0	5	0	80	18
23	5	Clearcut with reserves	5	0	0	5	0	84	15
24	5	Clearcut with reserves	5	0	0	5	0	68	16
25	5	Clearcut with reserves	5	0	0	5	0	52	15
26	5	Clearcut with reserves	5	0	0	5	0	55	7
27	5	Clearcut with reserves	5	0	0	5	0	44	15
28	5	Clearcut with reserves	5	0	0	5	0	98	11
29	5	Clearcut with reserves	5	0	0	5	0	69	7
30	27	Thinning	0	0	27	0	27	205	8
31	96	Thinning	0	0	96	0	96	521	9
32	18	Thinning	0	0	18	0	18	152	11
33	10	Clearcut with reserves	0	10	0	10	0	50	7
34	6	Clearcut with reserves	0	6	0	6	0	35	7
35	8	Clearcut with reserves	0	8	0	8	0	40	7
36	8	Clearcut with reserves	0	8	0	8	0	30	7
37	8	Clearcut with reserves	0	8	0	8	0	40	7
38	8	Clearcut with reserves	8	0	0	8	0	35	7
39	5	Clearcut with reserves	5	0	0	5	0	75	13
Total	330	~~~	130	70	140	192	141	3,400	11

Table E-3. Specific unit information, Alternative 5

Unit #	Acres	Prescription	Skyline yarding	Tractor yarding	Helicopter yarding	Under-burning	Flying tops	Volume (MBF)	Average diameter
1	74	Shelterwood	59	15	0	74	0	1,319	12
2	49	Shelterwood	39	10	0	49	0	700	18
3	163	Shelterwood	82	82	0	163	0	2,420	17
4	166	Shelterwood	133	33	0	166	0	1,329	11
5	146	Shelterwood	131	15	0	146	0	1,022	14
6	46	Shelterwood	46	0	0	46	0	897	10
7	189	Shelterwood	170	19	0	189	0	2,840	14
8	266	Shelterwood	239	27	0	266	0	4,265	12
9	330	Shelterwood	314	17	0	330	0	4,648	12
10	327	Shelterwood	311	16	0	327	0	4,593	12
11	60	Shelterwood	60	0	0	60	0	667	12
12	118	Shelterwood	118	0	0	118	0	789	12
13	353	Shelterwood	353	0	0	353	0	5,615	11
14	185	Shelterwood	185	0	0	185	0	2,705	13
15	259	Shelterwood	220	39	0	259	0	3,426	11
16	158	Shelterwood	150	8	0	158	0	1,019	10
20	384	Clearcut with reserves	326	58	0	384	0	1,501	9
21	122	Clearcut with reserves	110	12	0	122	0	405	9
22	169	Clearcut with reserves	169	0	0	169	0	553	8
23	94	Shelterwood	85	9	0	94	0	688	12
24	43	Shelterwood	30	13	0	43	0	280	12
25	123	Shelterwood	117	6	0	123	0	459	12
26	144	Shelterwood	144	0	0	144	0	969	12
27	100	Shelterwood	95	5	0	100	0	1,055	11
28	126	Shelterwood	126	0	0	126	0	672	12
30	27	Thinning	0	0	27	0	27	205	8
31	96	Thinning	0	0	96	0	96	521	9
32	18	Thinning	0	0	18	0	18	152	11
Total	4,300	~~~	3,800	400	140	4,200	140	45,700	12

Table E-4. Specific unit information, Alternative 7

Unit #	Acres	Prescription	Skyline yarding	Tractor yarding	Helicopter yarding	Under-burning	Flyin g tops	Volume (MBF)	Average diameter
1	74	Shelterwood	59	15	0	74	0	1,319	12
2	49	Shelterwood	39	10	0	49	0	700	18
3	163	Shelterwood	82	82	0	163	0	2,420	17
4	166	Shelterwood	133	33	0	166	0	1,329	11
5	146	Shelterwood	131	15	0	146	0	1,022	14
6	46	Shelterwood	46	0	0	46	0	897	10
7	189	Shelterwood	170	19	0	189	0	2,840	14
8	266	Shelterwood	239	27	0	266	0	4,265	12
3-1	5	Clearcut with reserves	0	5	0	5	0	57	10
3-2	5	Clearcut with reserves	0	5	0	5	0	50	8
3-5	10	Clearcut with reserves	10	0	0	10	0	242	13
3-10	5	Clearcut with reserves	5	0	0	5	0	73	13
3-14	5	Clearcut with reserves	3	3	0	5	0	43	14
3-30	27	Thinning	0	0	27	0	27	205	8
3-31	96	Thinning	0	0	96	0	96	521	9
3-32	19	Thinning	0	0	18	0	18	152	11
3-33	10	Clearcut with reserves	5	5	0	10	0	50	7
Total	1,300	~~~	930	220	140	1,140	140	16,200	13

Table E-5. Specific commercial harvest unit information, Alternative 8

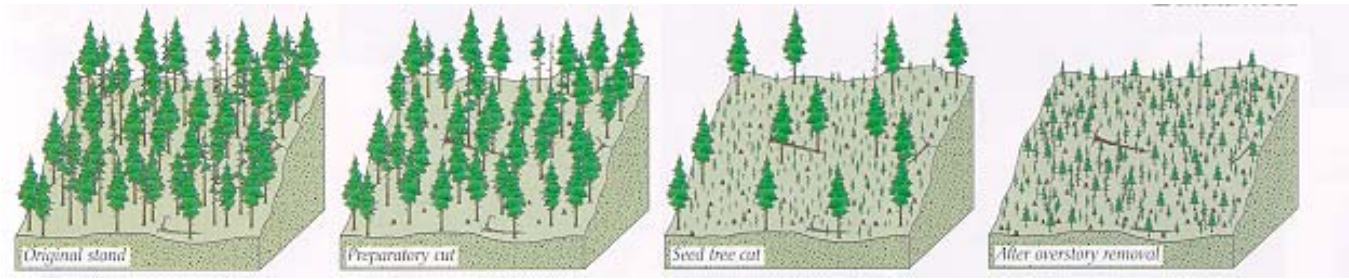
Unit #	Acres	Prescription	Skyline yarding	Tractor yarding	Helicopter yarding	Under-burning	Flying tops	Volume (MBF)	Average diameter
1	74	Shelterwood *	59	15	0	74	0	1,319	12
2	49	Shelterwood *	39	10	0	49	0	700	18
3	163	Shelterwood *	82	82	0	163	0	2,420	17
4	166	Shelterwood	133	33	0	166	0	1,329	11
5	146	Shelterwood	131	15	0	146	0	1,022	14
6	46	Shelterwood	46	0	0	46	0	897	10
7	189	Shelterwood	170	19	0	189	0	2,840	14
8	266	Shelterwood	239	27	0	266	0	4,265	12
9	111	Shelterwood	105	5	0	111	0	2,506	12
10	327	Shelterwood	311	16	0	327	0	4,593	12
11	60	Shelterwood	60	0	0	60	0	667	12
12	118	Shelterwood	118	0	0	118	0	789	12
13	77	Shelterwood	77	0	0	77	0	3,157	11
16	127	Shelterwood	121	6	0	127	0	709	10
Total	1,900	~~~	1,700	200	0	1,340	0	27,200	13

* *Proposed in-stream wood structure source areas are located within these units; and the acreages of these areas are shown in the table below (units C, D and E).*

Table E-6. Specific instream wood source unit information, Alternative 8

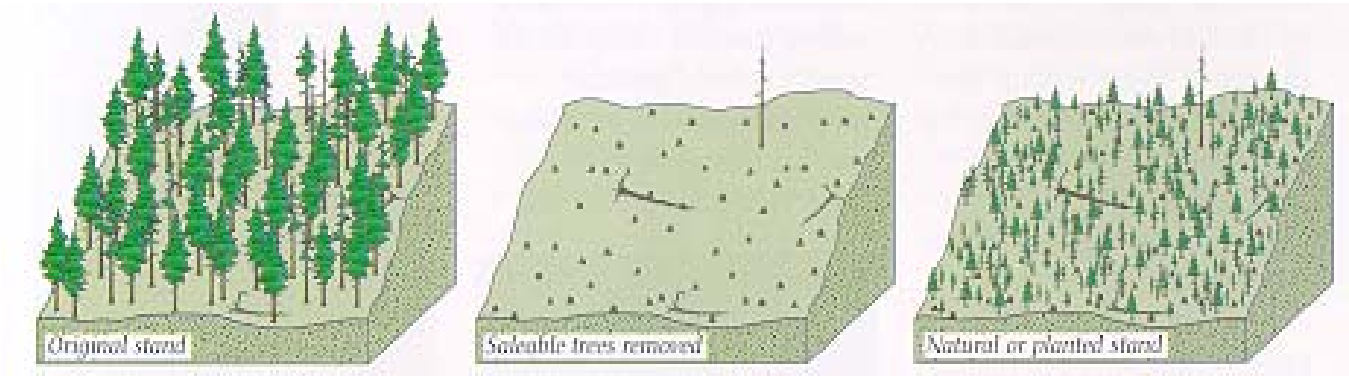
Unit #	Acres	Prescription	Skyline yarding	Excavator yarding	Helicopter yarding	Under-burning	Flying tops	Volume (MBF)	Average diameter
A	14	Thin	0	14	0	0	0	n/c	n/c
B	22	Thin	0	22	0	0	0	n/c	n/c
C	12	Within Unit 1	0	12	0	0	0	n/c	n/c
D	24	Within Unit 2	0	24	0	0	0	n/c	n/c
E	61	Within Unit 3	0	61	0	0	0	n/c	n/c
F	100	Thin	0	100	0	0	0	n/c	n/c
G	49	Thin	0	49	0	0	0	n/c	n/c
H	30	Thin	0	30	0	0	0	n/c	n/c
I	11	Thin	0	11	0	0	0	n/c	n/c
J	31	Thin	0	31	0	0	0	n/c	n/c
Total	354	~~~	0	354	0	0	0	n/c	n/c

Shelterwood Harvest



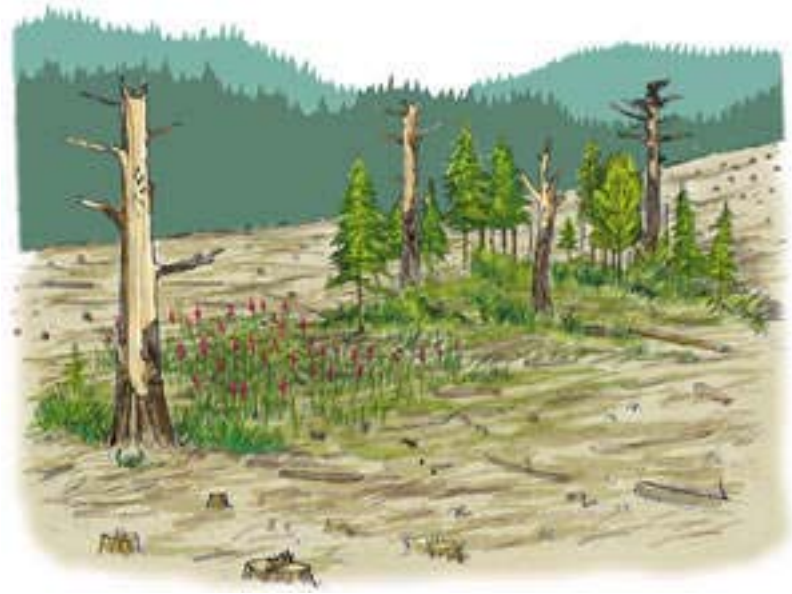
Original stand **Preparatory cut** **Seed tree cut** **After overstory removal**

Clearcut Harvest



Original stand **Saleable trees removed** **Natural or planted stand**

Clearcut with Reserve Trees



APPENDIX F
TRANSPORTATION

INTRODUCTION

Approximately 288 miles of existing roads are found within the Iron Honey Project Area; and approximately 85 miles of these roads are open at this time in the project area. WATSED reports show a slightly higher number, largely due to a difference in rounding methods.

Road 332 provides access into the project area from the north. This road also forms the northern boundary of the project area. Road 437 allows access into the area from the west. Road 209 provides access from the south and Road 258 runs along the eastern boundary. Many of the interior roads were built for timber harvest and are either brushed-in or have access to them restricted by a gate or earth barrier. The open roads in the area are designed to pass a moderate volume of multi-purpose traffic involving a variety of forest uses, from recreation to timber and heavy-equipment transport.

Road use in the project area is based on the Coeur d'Alene River Ranger District Travel Plan. This plan leaves approximately 48 miles of road open within the area (See section 4 of the Transportation Plan). Those roads that are not designated as open, but are on the long-range transportation system as stand-tending roads, will be open only when needed for administrative use.

The use of helicopter yarding was considered and applied using the following parameters:

- The analysis area contains a high density of existing roads that can be used for skyline yarding systems.
- Skyline yarding is typically less expensive than helicopter yarding.
- From a watershed restoration standpoint it is highly desirable to greatly reduce and/or render inert the number of roads in the area.
- To help maintain Lewelling Creek and Tom Lavin Creek as properly functioning drainages (as classified by the Geographic Assessment) no new construction is desired in those drainages at this time.

The above parameters formed one of the paradigms around which most of the Iron Honey alternatives were formed: to maximize the opportunities to render roads hydrologically inert by:

1. Selecting roads that a timber sale purchaser could use (for skyline yarding) and then be required to remove/stabilize; and, at the same time,….
2. Use(ing) a yarding system mix that would enhance the probability that bid monies would be left for funding both the removal/stabilizing of other roads and in-channel improvement work. (It is envisioned that this work would be accomplished via a KV-Other account.)

And thus, for the Iron Honey EIS, helicopter yarding was proposed only in the Lewelling Creek and Tom Lavin Creek area.

Roads obliteration is a short-hand term that is used in the Iron Honey FEIS for rendering roads hydrologically inert. In other words removing and/or reducing the long-term risk of catastropic introduction of sediment into the watersheds of the area is considered watershed recovery treatment. The level of treatment have been named based on the extent of the work to be accomplished:

> ***Level 1 Obliteration*** *includes removal and recontour of all stream crossings and, as needed, recontour of unstable fill slopes, cutslope stabilization, ripping the road tread, installation of no-maintenance cross ditches, and revegetation. Obliteration also includes some closure method, such as a guard-rail barrier, gate, earthen berm, or short section of full recontour, referred to as "front-end" obliteration. Front-end obliteration includes recontouring of about the first 250 feet of the road, to stop motorized traffic from entering onto the road.*

Level 2 Obliteration *includes removal of all stream crossings and full recontour of the entire road prism, introduction of woody debris, and revegetation as needed.*

Table II-2 of the Iron Honey FEIS displays the amount of watershed recovery treatment proposed, by level and by alternative. The specifics as to which treatment on which road is listed in the project files. Again; the roads identified for obliteration under the Iron Honey project are roads that were already closed to general motorized use under earlier decisions or closure orders.

The desire to maintain public access within and through the area, especially for recreation, was another factor used in determining which roads would remain open year around, and how other roads would be rendered hydrologically inert. Public comment, specific to the Iron Honey Analysis Area, and the Access Management Plan served as the backbone for this planning. A narrow trail would be retained on roads that are designated both as ATV trails and are also to be rendered hydrologically inert.

A formalized roads analysis process was initiated for the Forest Service well after the Iron Honey project started. Subsequently, a summation of the information that had been brought together and analyzed for the roads in the Iron Honey Resource Area (titled Roads Analysis for the Iron Honey Resource Area) was completed The purpose of the process is to " provide line officers with critical information to develop road systems that are safe and responsive to public needs and desires", and provide roads that "are affordable and efficiently managed and have minimal negative ecological effects on the land" (USDA Forest Service, 1999). A copy of this document is in the project file.

TRANSPORTATION SYSTEM

Existing Condition

Currently there are approximately 166 miles of system roads located in the Iron Honey project area. Approximately 76 miles of these roads are open at this time. There are also approximately 122 miles of non-system roads within the project area. All roads within the project area consist of a native or gravel surface. A list of existing roads within the project area is in the Transportation Plan (see project file). This list contains the number of inventoried culverts for the roads that have been inventoried, as well as any current restrictions on the road. The diameter of these culverts, along with the amount of fill over each one, was used in the Risk Analysis for the project area.

There are almost 21,600 acres (33.9 square miles) within the project area. Thus the current average density of existing roads, for the resource area as a whole, is approximately 8.6 miles per square mile.

About 14 miles of road have been obliterated and are now classified as Historical Roads. This means they are no longer functioning as a road, although there may be sections of road prism existing.

Road Construction

Alternative 1 (No Action): There would be no new road construction associated with the Iron Honey project under Alternative 1. Road construction would occur in conjunction with the long-term transportation plan for the area.

Alternative 2: Approximately 0.2 mi. of new system road construction would be required under Alternative 2. An additional 0.7 mi. of temporary road would need to be constructed in order to yard unit 8. These temporary roads would be obliterated upon completion of yarding and haul

Alternative 3: There would be no new system road construction associated with Alternative 3. Units 4 and 13 would need a total of approximately 0.5 mi. of temporary road to be constructed. These roads would be obliterated upon completion of yarding and haul.

Alternative 5: Approximately 0.2 mi. of new system road construction would be required under Alternative 5. Approximately 14 mi. of temporary road would need to be built. The temporary roads would be obliterated upon completion of yarding and haul.

Alternative 6: There would be 0.2 mi. of new system road construction under Alternative 6.

Alternative 7: Approximately 0.2 mi. of new system road construction would be required under Alternative 7. An additional 0.7 mi. of temporary road would be needed to yard Unit 8. These temporary roads would be obliterated upon completion of yarding and haul.

Alternative 8: Approximately 0.2 mi. of new system road construction would be required under Alternative 8. An additional 4.0 miles of temporary road would be needed to yard Unit 8. These temporary roads would be obliterated upon completion of yarding and haul.

Road Reconstruction

Alternative 1 (No Action): This alternative would not require any roads to be reconstructed.

Alternative 2: This alternative would replace approximately seven culverts, which are located on roads needed for hauling timber. These culverts do not meet the 100 year flood requirement. Approximately 23 miles of road would need to be reconstructed. This would consist of brushing, blading, shaping and replacing these culverts. The brushing for the reconstruction would consist of removing trees growing in the roadbed as well as brush.

Alternative 3: There are approximately 45 culverts, located on existing roads, which would need to be replaced to handle hundred year flood events. These culverts are on roads that are needed for hauling timber. Approximately 28 miles of road would need to be reconstructed. This would consist of brushing, blading, shaping and replacing culverts. The brushing for the reconstruction would consist of removing trees growing in the roadbed as well as brush.

Alternative 5: This alternative would resize approximately 31 culverts that are located on existing roads and needed for hauling timber. Those culverts do not meet the 100-year flood requirement. Approximately 58 miles of road would need to be reconstructed. This would consist of brushing, blading, shaping and replacing culverts. The brushing for the reconstruction would consist of removing trees growing in the roadbed as well as brush.

Alternative 6: There would be no reconstruction with this alternative.

Alternative 7: Approximately 30 culverts, located on roads that are needed for hauling timber, would need to be replaced. Approximately 37 miles of road would need to be reconstructed. This would consist of brushing, blading, shaping and replacing culverts. The brushing for the reconstruction would consist of removing trees growing in the roadbed as well as brush.

Alternative 8: Approximately 21 culverts, located on roads that are needed for hauling timber, would need to be replaced. Approximately 30 miles of road would need to be reconstructed. This would consist of brushing, blading, shaping and replacing culverts. The brushing for the reconstruction would consist of removing trees growing in the roadbed as well as brush.

Road Reconditioning

Alternative 1 (No Action): Alternative 1 would not require any roads to be reconditioned.

Alternative 2: This alternative would require approximately 13 miles of road to be reconditioned. This reconditioning would consist of light blading and brushing.

Alternative 3: Approximately 17 miles of road would need to be reconditioned with this alternative. This reconditioning would consist of light blading and brushing.

Alternative 5: Alternative 5 would require the reconditioning of approximately 57 miles of existing roads. This reconditioning would consist of light blading and brushing.

Alternative 6: This alternative would not have any reconditioning required as part of a timber sale. However, about 37 mile would be re-conditioned because some roads would be opened to access timber stands that can provide trees for the in-stream watershed restoration work.

Alternative 7: Approximately 17 miles of road would need to be reconditioned with this alternative. This reconditioning would consist of light blading and brushing.

Alternative 8: Approximately 56 miles of road would need to be reconditioned with this alternative. This reconditioning would consist of light blading and brushing.

ROAD MANAGEMENT

Effects of the Alternatives

Alternative 1 (No Action): The transportation system would remain the same as the existing condition. The management of each road would not change. This alternative would have a total road density of 8.6 miles of road per square mile of land. There would not be any roads scheduled for obliteration.

Alternative 2: Road construction, re-construction, and reconditioning would begin in 2002. Yarding of the units could also begin in 2002. The management of each road is summarized in a Road Management Plan chart that is located in the Transportation Plan. During the sale, this alternative would have an open road density of 3.4 miles of road per square mile of land. After the completion of post sale activity, the open road density would decrease to 1.7 miles of road per square mile of land. The total road density would increase to 2.9 miles of road per square mile of land after all post sale activities are completed; and decrease once again to 1.7 miles of road per square mile of land once all of the measures called for under the long-term transportation plan are in place.

Alternative 3: Road construction, reconstruction, and reconditioning would begin in 2002. Yarding of the units could also begin in 2002. The management of each road is summarized in a Road Management Plan chart that is located in the Transportation Plan. During the sale, this alternative would have an open road density of 4.0 miles of road per square mile of land. After the completion of post sale activity, the open road density would decrease to 1.5 miles of road per square mile of land. The total road density would decrease to 3.2 miles of road per section of land after all post sale activities are completed; and decrease once again to 1.7 miles of road per square mile of land once all of the measures called for under the long-term transportation plan are in place.

Alternative 5: Road construction, reconstruction , and reconditioning would begin in 2002. Yarding of the units could also begin in 2002. The management of each road is summarized in a Road Management Plan chart that is located in the Transportation Plan. During the sale, this alternative would have an open road density of 4.9 miles of road per square mile of land. After the completion of post sale activity, the open road density would decrease to 1.6 miles of road per square mile of land. The total road density would increase to 3.2 miles of road per section of land after all post sale activities are completed; and decrease once again to 1.7 miles of road per square mile of land once all of the measures called for under the long-term transportation plan are in place.

Alternative 6: This alternative would not have a timber sale and road obliteration would begin in 2002. The management of each road is summarized in a Road Management Plan chart that is located in the Transportation Plan. Currently the open road density is 2.5 miles of road per square mile of land. Upon completion of road obliteration, the open road density would be 1.7 and the total road density would increase to 2.9 miles of road per square mile of land after all post sale activities are completed; and decrease once again to 1.6 miles of road per square mile of land once all of the measures called for under the long-term transportation plan are in place.

Alternative 7: Road construction, reconstruction, and reconditioning would begin in 2000. Yarding of the units could also begin in 2002. The management of each road is summarized in a Road Management Plan chart that is located in the Transportation Plan. During the sale, this alternative would have an open road density of 3.6 miles of road per square mile of land. After the completion of post sale activity, the open road density would decrease to 1.6 miles of road per square mile of land. The total road density would increase to 3.1 miles of road per section of land after all post sale activities are completed; and decrease once again to 2.0 miles of road per square mile of land once all of the measures called for under the long-term transportation plan are in place.

Alternative 8: Road construction, reconstruction, and reconditioning would begin in 2002. Yarding of the units could also begin in 2002. The management of each road is summarized in a Road Management Plan chart that is located in the Transportation Plan. During the sale, this alternative would have an open road density of 3.4 miles of road per square mile of land. After the completion of post sale activity, the open road density would decrease to 1.4 miles of road per square mile of land. The total road density would remain at 1.7 miles of road per section of land after all post sale activities are completed and all of the measures called for under the long-term transportation plan are in place.

Road Management Objectives

Road Management Objectives were determined for each road. The Road Management Objective tables show the objectives that were determined for each of these roads based on the following categories:

1. Access Management Objective
2. Environmental Constraints
3. Safety
4. Physical Features
5. Traffic Volume
6. Traffic Service Level
7. Critical Vehicle
8. Design Criteria Present and/or needed
9. Traffic Management
10. Maintenance

The completed Road Management Objectives for each existing and proposed road is located in the Transportation Plan, which is part of the Project Files.

ACCESS MANAGEMENT

Private Property

There are two separate parcels of private property within the analysis area. Access to either parcel would not be changed with any of the alternatives.

The land owned by the Shoshone Silver Mining Company is located on Prospect Peak. Access to this property is provided by Road 332.

The private property at Horse Heaven landing strip is owned by Oscar Steinley et al. Road 794 and Road 2346 traverse this property. The Forest Service does not have an easement for either one of these roads. Negotiations will be started to obtain easements for both of these roads.

New District Travel Plan

The Transportation System for Alternatives 2, 5, 6, 7 and 8 would be consistent with the reasonably foreseeable Coeur d'Alene River Ranger District Travel Plan. The transportation system for Alternative 3 would not be consistent with the anticipated Access Management Plan for the district. Features of the Travel Plan in the vicinity of the Iron Honey Resource Area include:

1) *Replacing the route provided by Road 794 with the route provided by Roads 1560 and 1550*
2) *Replacing the route provided by Road 1532 with the route provided by Roads 2346 and 2346C*
3) *Replacing the route provided by Road 437 (which currently runs from Road 209 to Road 1507) with the route provided by Roads 1507 and 385*

Alternatives 2, 5, 6, 7 and 8 would initiate the first two of these changes to expedite hydrologic improvement in the condition of the Iron Creek watershed.

LONG-RANGE TRANSPORTATION SYSTEM

Under the District Travel Plan, the following changes in road systems would be common to all alternatives except as noted:

> *Road 794 would be replaced by Roads 1560 and 1550 as groomed snowmobile routes. Moose Creek Road 1532 would be replaced by the route over Road 2346 and Road 2346C (upon completion of the new construction on Road 2346C). Road 392 (in the Hayden-Hudlow drainage) would remain as a groomed snowmobile trail along with Road 385, between Road 338 and the lower portion of Road 209 (from the*

mouth of Tom Lavin Creek to Road 332) as a groomed snowmobile trail. The section of Road 437 that currently runs from Road 209 to Road 1507, would be replaced by Road 1507. Road 209 below Tom Lavin Creek would remain as a groomed snowmobile trail. Road 332 and Crooked Ridge Road 258 would remain on the snowmobile trail system. Grooming of the trails would depend upon such as things as snow conditions, weather, and a variety of other factors.

Alternative 1

Under Alternative 1, there would be no change in management of the transportation system in the Iron Honey Resource Area, as described under "Introduction" and "Existing Condition" at the beginning of this appendix. Over the long term, the changes described under "Access Management Plan" above would be initiated as funding becomes available, and as other resource management plans are implemented.

Alternative 2

The long-range transportation system for this alternative would consist of approximately 57 miles of road. This would result in a total road density of 1.7 miles of road per square mile of land. The long-range transportation system would have approximately 48 miles of open road and would have an open road density of 1.4 miles of road per square mile of land. A complete list of the roads on the long-range transportation system is located in the Transportation Plan.

Alternative 3

The long-range transportation system for this alternative would consist of approximately 68 miles of road. This would result in a total road density of 2.0 miles of road per square mile of land. The long-range transportation system would have approximately 48 miles of open road and would have an open road density of 1.4 miles of road per square mile of land. A complete list of the roads on the long-range transportation system is located in the Transportation Plan.

Road 1532 would remain as a snowmobile route, because the new tie-through between Roads 2346 and 2346C would not be constructed under Alternative 3.

Alternative 5

The long-range transportation system for this alternative would consist of approximately 69 miles of road. This would result in a total road density of 2.0 miles of road per square mile of land. The long-range transportation system would have approximately 48 miles of open road and would have an open road density of 1.4 miles of road per square mile of land. A complete list of the roads on the long-range transportation system is located in the Transportation Plan.

Alternative 6

The long-range transportation system for this alternative would consist of approximately 53 miles of road. This would result in a total road density of 1.6 miles of road per square mile of land. The long-range transportation system would have approximately 48 miles of open road and would have an open road density of 1.4 miles of road per square mile of land. A complete list of the roads on the long-range transportation system is located in the Transportation Plan.

Alternative 7

The long-range transportation system for this alternative would consist of approximately 66 miles of road. This would result in a total road density of 2.0 miles of road per square mile of land. The long-range transportation system would have approximately 48 miles of open road which would equate to an open road density of 1.4 miles of road per square mile of land. A complete list of the roads on the long-range transportation system is located in the Transportation Plan.

Alternative 8

Road construction, reconstruction, and reconditioning would begin in 2002. Yarding of the units could also being in 2002. The management of each road is summarized in a Road Management Plan chart located in the Transportation Plan. During the sale, this alternative would have an open road density of 3.4 miles of road per square mile of land. After completion of post-sale activities, the open road density would decrease to 1.4 miles of road per square mile of land. The total road density would decrease to and remain at 1.7 miles of road per square mile of land once all measures called for in the long-range transportation plan are in place.

Table F-1. Proposed changes to system roads, by alternative.

Proposed Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Miles of reconditioning on system roads	NA	13	17	57	34*	17	56
Miles of reconstruction on system roads	NA	23	28	58	0	37	30
Miles of new system road construction**	NA	0.2	0	0.2	0.2	0.2	0.2
Miles of other system roads open during activities	76	115	133	164	119	121	115

** Some roads would be opened to access timber stands that can provide trees for the in-stream watershed restoration work.*
*** Construction is needed to complete a replacement route through Horse Heaven-Argument Saddle, allowing the Moose Creek route to be removed as part of the watershed restoration.*

Table F-2. Proposed changes to amount of total roads open, by alternative.

Proposed Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Miles of total road open during activities	76	115	133	164	119	121	115
Miles of total road open after activities are completed*	76	57	51	54	57	40	48
Miles of total road in the project area after implementation of the long-term transportation plan	288	57	68	69	53	66	57

** With implementation of the District Travel Plan, there would be a total of 48 miles of roads open under all alternatives.*

Table F-3. Proposed changes to road densities (miles per square mile), by alternative.

Proposed Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Open road density during activities	2.5	3.4	4.0	4.9	3.5	3.6	3.4
Open road density after activities	2.5	1.7	1.5	1.6	1.7	1.6	1.4
Total road density in analysis area upon completion of post-sale activities	8.6	2.9	3.2	3.2	2.9	3.1	1.7
Total road density after implementation of the long-term transportation plan	2.5	1.7	2.0	2.0	1.6	2.0	1.4

Table F-4. Proposed changes to roads designated for ATV/motorcycle use, by alternative.

Proposed Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Miles of system roads designated specifically for ATV and smaller-size vehicles*	0	6	23	18	2	15	15
Miles of system roads designated specifically for motorcycle use**	4	4	4	4	4	4	4

** These roads would also be used for forest administration activities, such as stand management and fire control.*
*** Roads that are not open to all motorized vehicles may be used by vehicles of ATV size and smaller. If culverts are removed, trails may be constructed through the crossings where the culverts are removed.*

Table F-5. Proposed watershed restoration work, by alternative.

Proposed Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 5	Alt. 6**	Alt. 7	Alt. 8
Miles of road to be closed by purchaser	0	5	8	25	0	6	17*
Miles of roads to be closed with funds generated by the sale of timber	0	44	0	14	0	42	64*
Miles of road in need of special restoration funding	0	103	147	133	147	105	86
Number of crossings to be replaced by purchaser	0	7	45	51	0	30	21
Number of crossings to be removed by purchaser	0	9	10	49	0	10	30
Number of crossings removed with funds generated by the sale of timber	0	108	0	27	0	103	146
Number of crossings in need of special funding for removal	0	217	324	258	334	221	158
Number of crossings in need of special funding for upgrading	0	31	0	0	38	8	17

** See comments in project files under Risk Analysis for differences in mileages due to measurement methods (hand vs. computer/graphic information system).*
*** No timber sale is associated with this alternative, thus no restoration work would be assigned to a purchaser. The funding of all work would depend on congressional allocation of monies and/or grants.*

APPENDIX G
PROPOSED HARVEST OPENINGS GREATER THAN 40 ACRES

INTRODUCTION

The following table identifies those units which would exceed 40 acres, either due to the size of the proposed unit, or the size of the unit in conjunction with adjacent openings.

For the purpose of this analysis, past regeneration harvests were no longer considered created openings when both vegetation and watershed conditions met management objectives. In addition, stands regenerated prior to 1980 were no longer considered openings.

Table G-1. Proposed harvest openings greater than 40 acres.

Alternative(s)	Unit #	Unit Acres	Adjacent Opening Size (Acres)	Total Opening Size (Acres)
2, 5, 7, 8	1	74	0	74
2, 5, 7,8	2	49	0	49
2, 5, 7,8	3	163	0	163
2, 5, 7,8	4	166	53	219
2, 5, 7,8	5	146	0	146
2, 5, 7,8	6	46	0	46
2, 5, 7,8	7	189	0	189
2, 5, 7,8	8	266	0	266
5	9	330	0	330
5,8	10	327	0	327
5,8	11	60	0	60
5,8	12	118	0	118
5	13	353	0	353
5	14	185	0	185
5	15	259	0	259
5	16	165	0	165
5	20	180	0	180
5	21	101	0	101
5	33	135	0	135
5	34	40	0	40
5	35	22	0	22
5	36	18	0	18
5	22	169	50	219
5	23	94	55	149
5	24	43	77	120
5	25	123	115	238
5	26	144	94	238
5	27	126	58	184
5	28	100	31	131
8	9	111	0	111
8	13	77	0	77
8	16	127	0	127

APPENDIX H
PRUNING AND THINNING OPPORTUNITIES

Opportunities for vegetation restoration include 956 acres of precommercial thinning and 587 acres of white pine pruning. Precommercial thinning stands are prioritized to treat those stands with a large component of early seral species (white pine, western larch and ponderosa pine) first. This would allow those species to better compete with the more shade-tolerant species so they can better provide the desired forest structure and composition. Pruning of white pine reduces the potential of infection by white pine blister rust and improves the tree's ability to survive infection by removing infected branches. Pruned trees have a better change of reaching maturity and contributing to the desired forest structure and composition.

The following table identifies those stands in the Iron Honey Resource Area where there is an opportunity to accomplish thinning or pruning activities. These activities could occur under any action alternative.

Table H-1. Pruning and thinning opportunities in the Iron Honey Resource Area.

Stand #	Activity	Acres	Thin Priority Rating[1]	Trees per acre (TPA)[2]	Estimated percent of crop trees by species (following thinning)	Pruning Priority
30201009	prune	32		1,130	35% white pine	high
30202012	prune	38		1,575	8% white pine	low
32002031	prune	36		1,231	4% white pine	low
30202035	prune	41		1,685	17% white pine	mod
30202038	prune	25		1,708	37% white pine	high
30202039	prune	31		2,353	42% white pine	high
30202046	prune	42		1,668	0% white pine	low
30202052	prune/thin	14	23	440	0% white pine	low
30202053	prune	14		1,000	24% white pine	mod
30203005	prune	14		1,150	26% white pine	mod
30203006	prune	31		1,323	32% white pine	high
30203009	prune	19		768	26% white pine	mod
30203016	prune	26		1,120	15% white pine	mod
30305030	prune	29		1,212	22% white pine	mod
30305031	prune	28		1,481	24% white pine	mod
30305033	prune	15		833	63% white pine	high
30305035	prune	7		440	14% white pine	low
30305044	prune	13		693	44% white pine	high
30305045	prune	2		768		high
30401014	thin	8	15	1,460	70% grand fir/Douglas-fir	low
30401015	thin	8	15	1,460	70% grand fir/Douglas-fir	low
30401016	thin	6	15	1,460	70% grand fir/Douglas-fir	low
30501007	prune/thin	28	17	1,121	89% grand fir/Douglas-fir, 8% white pine	low
30502007	prune/thin	9	14		grand fir/Douglas-fir/Western hemlock	low
30502009	prune/thin	39	16	513	83% grand fir/Douglas-fir/Western hemlock, 5% white pine	low
30502010	prune/thin	31	20	583	71% grand fir/Western hemlock/Douglas-fir, 11% white pine	low
30502016	prune/thin	21	17	1,025	97% grand fir/Western hemlock/Douglas-fir, 3% Western larch	low
30505001	thin	111	14	866	92% grand fir/Douglas-fir	low

[1] *This is based on the IPNF Precommercial Thinning Prioritization Criteria.*
[2] *Trees per acre on the site includes both crop and noncrop trees.*