Kootenai National Forest

Forest Plan – Volume 2

United States
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Forest Service

Kootenai
National Forest

KOOTENAI NATIONAL FOREST

FOREST PLAN

NORTHERN REGION

FOREST SERVICE

U.S. DEPARTMENT OF AGRICULTURE

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APPENDICES

KOOTENAI NATIONAL FOREST

FOREST PLAN

APPENDIX ONE

LAND CLASSIFICATION

Appendix 1

Land Classification

Classification		Acres
1.	Grand Total Kootenai NF land base	2,245,000
2.	Non-Forest (including water)	- 82,000
3.	Forest land	2,163,000
4.	Forest land withdrawn from timber production (unavailable)	- 35,000
5.	Forest land not capable of producing crops of industrial wood (not capable)	- 291,000
6.	Forest land physically unsuitable: irreversible damage likely to occur; not restockable within 5 years	- 49,000
7.	Forest Land - inadequate information*	- 0
8.	Subtotal: Tentatively suitable forest land	1,788,000
9.	Forest land not appropriate for timber production**	- 525,000
10.	Subtotal: Suitable Forest land	1,263,000
11.	Subtotal: Unsuitable forest land***	900,000

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* Lands for which current information is inadequate to project responses to timber management. Usually applies to low site lands.

** Lands identified as not appropriate for timber production due to: (a) assignment to other resource uses to meet Forest plan objectives; (b) management requirements; and (c) not being cost effective in meeting Forest Plan objectives over the planning horizon.

*** Sum of items 4, 5, 6 and 9.

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APPENDIX TWO

VEGETATION MANAGEMENT PRACTICES

Appendix 2

VEGETATION MANAGEMENT PRACTICES

Introduction: All vegetation management practices on forested lands will be preceded by a silvicultural examination, which is an on-the-ground analysis of the area and a site-specific prescription written or reviewed by a certified silviculturist. The prescription process considers direction and objectives set forth in this Appendix, the Kootenai Forest Plan (Chapters II and III), site-specific factors, and a review of the applicable technical and scientific literature as well as practical experience. The prescription will detail the actual vegetative manipulation to be done on a case-by-case basis, and will include the silvicultural standards found in the Northern Regional Guide and Silvicultural Practices Handbook (FSH 2409.17).

The silvicultural prescription process is a concurrent activity with the interdisciplinary team process in preparing projects. Prescriptions are formulated within Kootenai Forest Plan guidance to achieve the specific objectives of the Management Areas involved (See Chapter III of the Kootenai Forest Plan). The full range of silvicultural systems are available for use on the Kootenai National Forest, which are individual tree selection to clearcutting and described in more detail below.

The selected vegetative management practices for individual sites will comply with management requirements listed in 36 CFR 219.27(b).

Refer to the Kootenai Forest Plan Final EIS references for complete discussions of silvicultural systems and their various environmental effects.

Clearcutting: as a silvicultural system will be employed to harvest timber under the Forest Plan, and is selected on the basis of physical and biological site factors, existing timber types, and overall economics. It will be selected only when it is determined to be the optimal sivicultural system.

Clearcutting allows considerable flexibility in determining the character and composition of future timber stands. The species, degree of stocking, etc., can be controlled with various silvicultural techniques. This is especially useful in situations where existing stands are occupied by less valuable and undesirable species, or the current species composition is at high risk for losses due to insects or disease.

Clearcutting may be the most effective harvest method to achieve certain desired multiple-use objectives of a stand. An example is a big-game winter range where clearcutting is the most successful system for maximizing growth of desirable forage and browse vegetation. But, clearcutting can be detrimental if applied to sites where physical conditions will change to extremes of heat and cold if the forest cover is totally removed. In these cases, regeneration efforts can be difficult and costly.

The clearcutting method is usually the most economical harvest system to use because all merchantable timber is removed and the volume and value per acre treated and accessed is maximized. Fuels treatment and subsequent cultural

treatments are also less costly than with other systems, since there is no residual stand to be protected.

The following are general descriptions of sites and situations when clearcutting may be selected as the optimal harvesting method:

1. The moisture and temperature regimes of the site, following timber harvest and site preparation for artificial or natural regeneration, will be favorable for the regeneration of a desired species. In general, north and east aspects fit this category but conditions can vary by geographic location and slope position.

2. The existing stand is stocked with species that are not desired in the regenerated stand because of disease or insect susceptibility, or the physiological condition of the existing overstory is such that natural regeneration is unlikely to occur.

3. The change in forested appearance created by the harvest opening does not conflict with objectives for visual management.

4. Management objectives for the area can be better achieved by clearing all of the trees in one operation. An example is when increases in browse and forage for wildlife or domestic livestock are desired.

Clearcutting is most likely to be prescribed for habitat types in the western red cedar (Thuja plicata) series, western hemlock (tsuga heterophylla) series, on the cool/moist habitat types of the grand fir (Abies grandis) and the subalpine fir (Abies lasiocarpa) series. It will also be the predominant silvicultural system for regenerating lodgepole pine stands, especially stagnated lodgepole pine stands. Examples of these habitat types include:

Western red cedar/queencup beadlilly (Thuja plicata/Clintonia uniflora)
Western hemlock/queencup beadlilly (Tsuga heterophylla/Clintonia uniflora).
Grand fir/queencup beadlilly (Abies grandis/Clintonia uniflora)
Grand fir/twinflower (Abies grandis/Linnaea borealis)
Subalpine fir/queencup beadlilly (Abies lasiocarpa/Clintonia uniflora)

NOTE It is possible that a site-specific, on-the-ground analysis may identify situations where clear-cutting may be the optimal harvest method and those conditions do not meet the ones described in the above general descriptions. It is also possible that site-specific conditions and an on-the-ground analysis could determine that clear-cutting may not be the optimal harvest method for all the lands that fit these general descriptions.)

Seed Tree Cutting: will also be used to harvest timber under this Forest Plan. In this system the basic objective is to have the second crop of trees (natural regeneration) start on a site before all of the standing timber is removed.

Seed tree cutting is usually used in physical site conditions similar to those described above for clearcutting. The primary difference is that desirable seed trees exist on the site; and these seed trees, along with desirable trees in adjacent stands, provide the seed source for the next stand. The seed tree

system offers the opportunity to reduce regeneration costs and meet a higher visual quality objective.

Once regeneration is established, removal of the residual stand requires carefull harvest planning and implementation to protect the new crop of trees.

The following is a list of general factors that will be considered when determining whether or not the seed tree system will be applied to a particular area. A site-specific silvicultural prescription may consider additional factors and timber sale conditions.

1. The moisture and temperature regimes of the site, following timber harvest and site preparation for natural regeneration, will be favorable for regenerating the desired species. In general, north and east aspects fit this category but conditions can vary by geographic location and slope position.

2. The existing stand is stocked with species that are desired in the regenerated stand and the physiological condition of the trees is such that seed production and successful regeneration are likely to occur.

3. The seed trees are free of damaging agents (disease and/or insects) which will harm the planned understory before removal of the overstory.

4. The change in forested appearance created by the harvest opening does not conflict with objectives for visual management.

5. The phenotypic appearance of the seed trees indicate their progeny (seedlings) will be of a desirable genotype.

Seed tree cutting is most likely to be prescribed for habitat types similar to those mentioned above for clearcutting; which are western red cedar (Thuja plicata) series, western hemlock (Tsuga heterophylla) series, on the cool/moist habitat types of the grand fir (Abies grandis), and the subalpine fir (Abies lasiocarpa) series. It can also be used for regenerating lodgepole pine stands. Examples of these habitat types include:

Western red cedar/queencup beadlilly (Thuja plicata/Clintonia uniflora)
Western hemloch/queencup beadlilly (Tsuga heterophylla/Clintonia uniflora)
Grand fir/queencup beadlilly (Abies grandis/Clintonia uniflora)
Grand fir/twinflower (Abies grandis/Linnaea borealis)
Subalpine fir/queencup beadlilly (Abies lasiocarpa/Clintonia uniflors)

In prescribing seed tree harvest methods, consideration will be given to future harvests required including the feasibility of removing the residual overstory from the established stand of seedlings and the effectiveness of site preparation and slash treatment.

Shelterwood: is a silvicultural system that will also be used to harvest timber under the Kootenai Forest Plan. The basic objective is to have the second crop of tress (natural regeneration) started on a site before all of the standing timber is removed, similar to the Seed Tree system described above.

Shelterwood systems are used in situations where the physical site conditions created by clearcutting or seed tree cutting would be too harsh for tree regeneration or would not be favorable to the establishment and growth of the desired species. The residual stand provides protection from temperature extremes on the site and modifies the climatic factors in general. The shelterwood system offers the opportunity to reduce regeneration costs, if factors are suitable for establishing natural regeneration from the seed source provided by the residual stand.

Shelterwood systems can be the most effective means of achieving the visual quality objectives of Retention or Partial Retention. This is because a high percentage (40-50%) of the larger more commercially valuable trees are left standing after the initial harvest entry. This can result in a lower volume and value per acre removed from the site which usually increases the unit costs of access and harvest.

Once regeneration is established, removal of the residual stand requires careful harvest planning and implementation to protect the new crop of trees, similar to the Seed Tree system.

The following is a list of general factors that will be considered when determining whether or not the Shelterwood system will be applied to a specific site. A site-specific silvicultural prescription may consider additional factors and timber sale conditions.

1. The existing stand is stocked with species that are desired in the regenerated stand and the physiological condition of the trees is such that seed production and successful regeneration are likely to occur.

2. The moisture and temperature regimes on the site are such that without some shading and cover, conditions will become too harsh for successful tree regeneration. South and west aspects generally fit into this category, but conditions can vary by location.

3. Management objectives for the area can best be achieved by maintaining some tree cover on the site until regeneration is established.

4. The seed trees are free of damaging agents (disease and/or insects) which will harm the planned understory before removal of the overstory.

5. The change in forested appearance created by the harvest opening does not conflict with objectives for visual management.

6. The phenotypic appearance of the seed trees indicate their progeny (seedlings) will be of a desirable genotype.

Shelterwood harvesting is the most likely to be prescribed on the warmer/drier habitat types of the grand fir (Abies grandis) series and the Douglas fir (Pseudostuga menziesii) habitat types. Some examples of these habitat types include:

Douglas fir/pinegrass (Pseudotsuga menziesii/Calamagrostis rubescens)
Douglas fir/common snowberry (Pseudotsuga menziesii/symphoricarpos albus)
Douglas fir/ninebark (Pseudotsuga menziesii/Physiocarpus malvaceus)

In prescribing shelterwood harvest methods, consideration will be given to future harvests required. The feasibility of removing the residual overstory from an established stand of seedlings, effectiveness of site preparation/slash treatment, and options such as artificial shading shall be considered when prescribing shelterwood harvests.

Selection Harvests: such as individual tree and group selection methods may be applicable to certain combinations of timber management and other resource objectives identified by the land designations in the Forest Plan. The most probable situations for implementing these silvicultural systems would be in riparian areas and in areas with visual quality objectives of Retention.

The existing timber types, stand conditions and site characteristics are critical factors that will be evaluated when considering the applicability of uneven-aged systems. Stands with high percentages of low vigor trees with little seed producing potential and species highly susceptible to disease and insect damage are examples of situations where uneven-aged management may not meet overall objectives.

Intermediate Harvests: such as commercial thinnings will generally be prescribed only in stands that have not reached the culmination of mean annual increment. Salvage or sanitation harvest may be considered as intermediate treatments in stands that have already culminated in growth, but cannot be harvested and regenerated because of multiple-use constraints on scheduling (maintaining wildlife cover). This treatment may be considered in lodgepole pine stands that are rated high risk for mountain pine beetle infestation.

Timber Stand Improvement: such as pre-commercial thinning, clearing, and weeding treatments will be used on sapling-sized stands where stocking exceeds the level necessary or desirable to meet the future stand objectives. Thinnings will be designed to promote stand diversity, while maintaining stand growth and yield projections at levels prescribed in the management prescriptions.

Reforestation: will be done on all cutover sites planned for regeneration. Hand planting will be prescribed for areas where natural regeneration will not meet the target stand description. Hand planting may also be prescribed in seed tree and shelterwood units when natural regeneration appears to be inadequate to meet required stocking levels, or a species change is needed. Natural regeneration may be prescribed in clearcut, shelterwood, and seed tree systems where regeneration is likely to occur within 5 years.

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APPENDIX THREE

TIMBER PRODUCTIVITY CLASSIFICATION

Appendix 3

Timber Productivity Classification

Potential Growth* (cubic feet/acre/year)	Suitable Lands (acres)	Unsuitable Lands (acres)
Less than 20	0	744,000
20-49	64,000	39,000
50-84	470,000	44,000
85-119	581,000	58,000
120-164	148,000	15,000
165-224	0	0
225+	0	0
TOTALS	1,263,000	900,000

* Based on the potential biological growth of natural stands, with no consideration given to stocking or other intensive practices.

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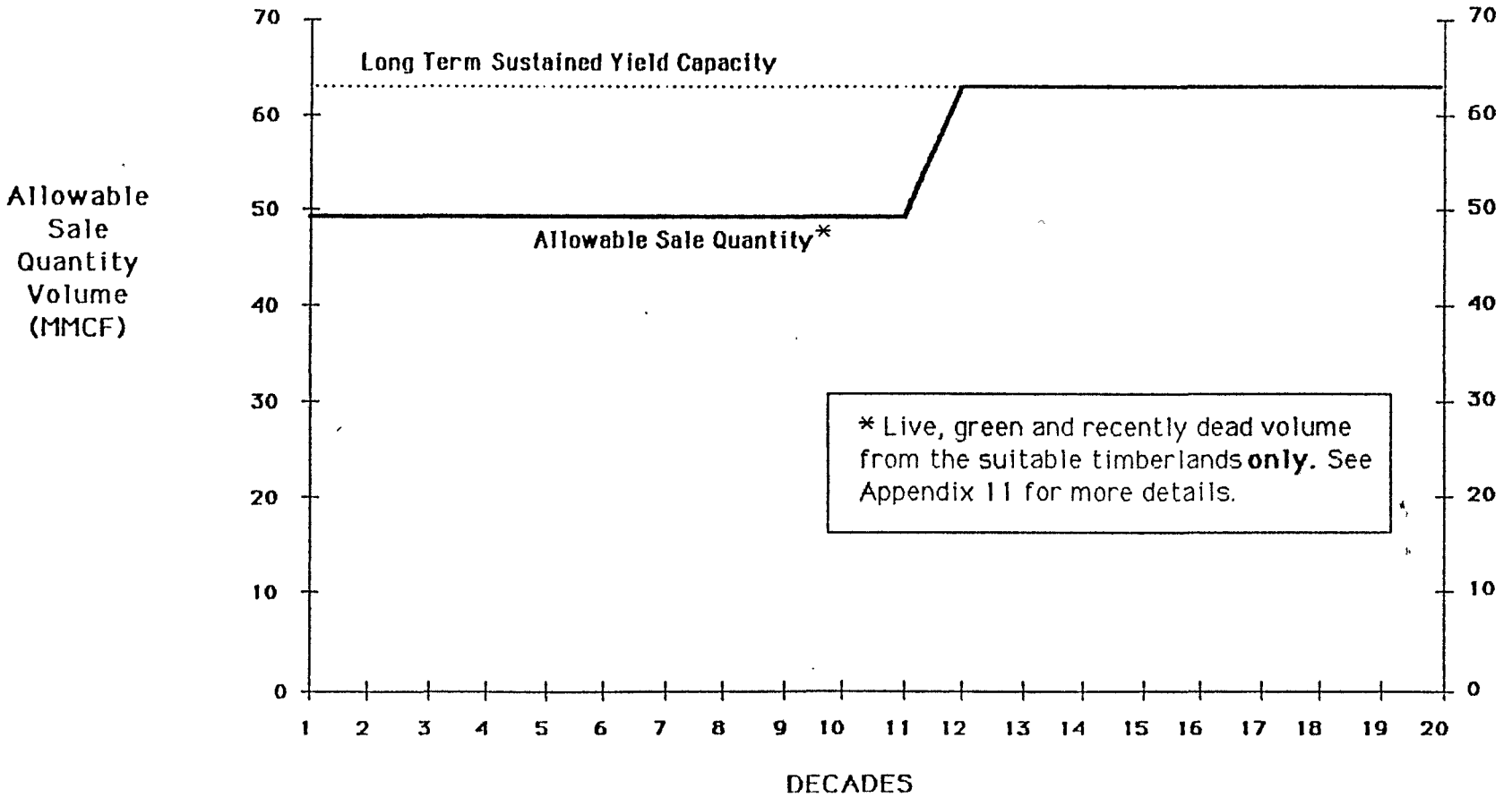
APPENDIX FIVE

LONG-TERM SUSTAINED YIELD AND ALLOWABLE SALE QUANTITY

LONG-TERM SUSTAINED YIELD AND ALLOWABLE SALE QUANTITY*

(Average Annual Volumes)



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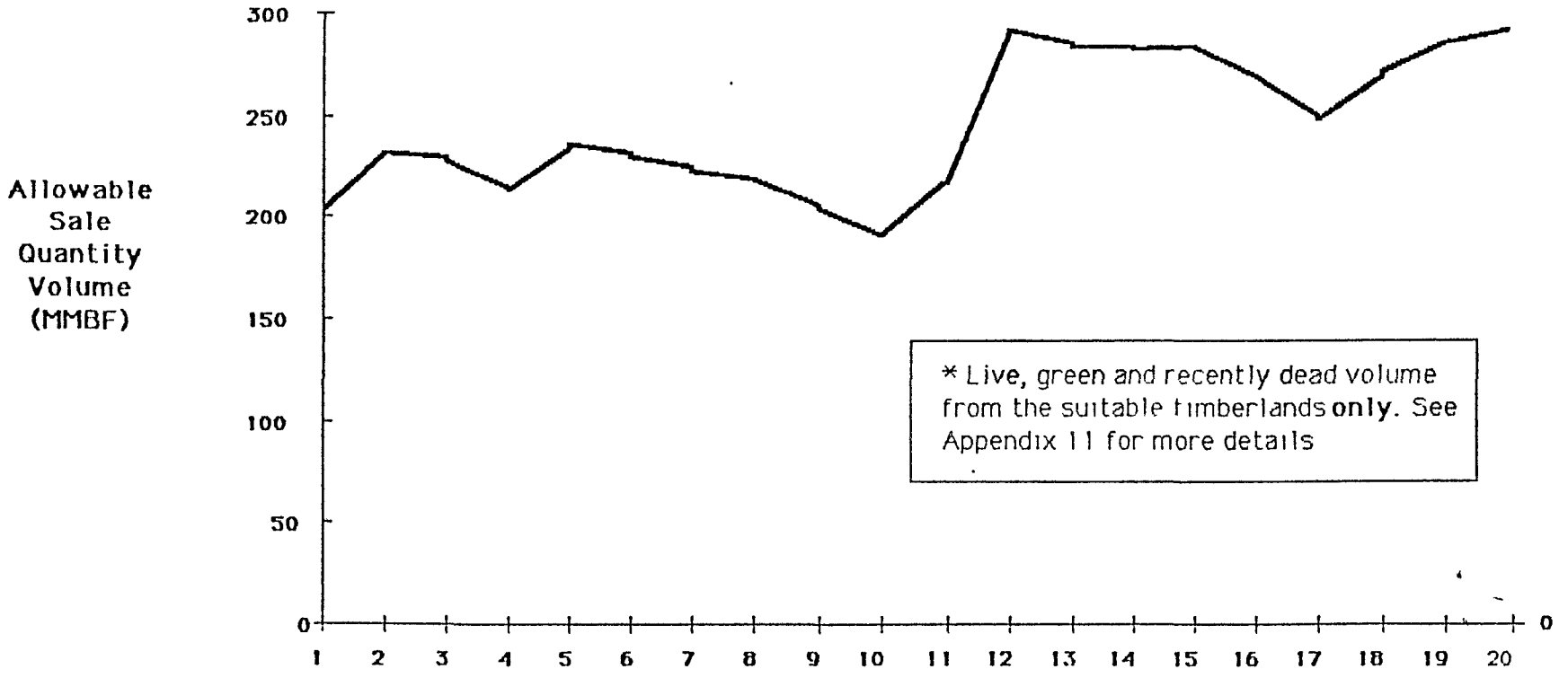
ALLOWABLE SALE QUANTITY*

(Average Annual Volumes)



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APPENDIX SIX

PRESENT AND FUTURE

Appendix 6

Present and Future Forest Conditions

	Unit of Measure	Suitable Land	Unsuitable Land
Present forest:			
Growing stock	MMCF	3,187	1,763
	MMBF	13,130	7,261
Live cull	MMCF	N/A	N/A
	MMBF	N/A	N/A
Salvable dead	MMCF	17	N/A
	MMBF	50	N/A
Annual net growth	MMCF	19	N/A
	MMBF	116	N/A
Annual mortality	MMCF	13	6
	MMBF	49	21
Future forest (at 200 years):			
Growing stock	MMCF	2,957	
Annual net growth	MMCF	63	
Rotation age	Years	80 to 130	

Age class distribution acres (suitable lands)/1/

Age Class	Present Forest	Future Forest/2/
0 -10	4,000	104,000
20*	57,000	112,000
30	0	139,000
40	0	186,000
50	218,000	153,000
60*	356,000	115,000
70	0	122,000
80	0	102,000
90	0	97,000
100*	141,000	66,000
110	0	11,000
120	0	16,000
130*	190,000	19,000
140	0	13,000
150	0	3,000
160*	297,000	5,000
170	0	0
180	0	0
190	0	0
200+	0	0

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* For modeling purposes average ages of existing stands were used as follows:

All Seedling/Sapling Stands	- 20 years
Poles & Immature Sawtimber (Mixed Conifer)	- 60 years
Poles & Immature Sawtimber (lodgepole pine)	- 50 years
Mature Sawtimber (Mixed Conifer I)	- 160 years
Mature Sawtimber (Mixed Conifer II)	- 130 years
High Risk Lodgepole Pine	- 100 years

Non-stocked stands are shown as age 0 to 10 years

/1/ Excludes old-growth timber management areas for dependent wildlife species

/2/ At 200 years

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APPENDIX SEVEN

PROJECTED BUDGET

Appendix 7

Projected Budget Required to Implement the Forest Plan
(Average Annual in Thousands of Dollars for First Decade)

Funding Item	Budget Activity	FY 78 Dollars*	(x1.57=) FY 86 Dollars
00	General Administration	1465	2300
01	Fire	530	850
02	Fuels	59	95
03-05	Timber	2648	4157
06,07	Range	59	92
08	Minerals	287	450
09	Recreation	561	880
10	Wildlife and Fish	648	1017
11	Soil, Air, Water	269	422
12	Facility Maintenance	145	228
13-15	Lands/Land Management	156	245
42,43	Lands-Status/Acquisition	96	150
16	Landline Location	285	447
17	Road Maintenance	764	1200
18	Trail Maintenance	115	181
19	Co-op Law Enforcement	12	19
20	Reforestation-Appropriated	871	1367
21	TSI-Appropriated	562	882
23	Tree Improvement	20	31
26-28	KV (Trust Fund)	1427	2241
29	CWFS-Other (Trust Fund)	348	547
30	Timber Salv. Sales (Perm. Fund)	275	432
31	Brush Disposal (Perm. Fund)	694	1090
32	Range Improvement	6	10
33	Recreation Construction	99	155
34	Facility Construction-FA&O	111	175
35	Engineering Construction Support	2360	3706
36	Const.-Capital Investment Roads	1801	2828
37	Trail Construction/Reconstruction	32	50
24,38	Timber Road Const. PC or Election	2399	3766
	Total	19,104	29,993

* FY 78 is the base year for costs used in Forest planning.

NOTE: Budget figures may differ slightly from those used in the EIS. They have been adjusted based upon professional judgement and special analyses by the Forest Management Team.