

THREATENED AND ENDANGERED WILDLIFE SPECIES

Grizzly Bear (Threatened)

Analysis Area

The project area is within the Northern Continental Divide Grizzly Bear Ecosystem (NCDE) and the majority of it has been designated as Management Situation 1, which is identified as an area needed for the survival and recovery of the species, where management actions would favor the needs of the grizzly bear. Two spatial scales for analyses of effects were used: Bear Management Areas (BMA) and Subunits. The BMA is an area that ranges between 5,000 to 15,000 acres in size and is used for site-specific direct and indirect effects and for determining consistency with Forest Plan standards/guidelines. The subunit is an area that approximates the size of a female home range, generally ranges from 30 to 50 square miles in size, and is used for determining the level of compliance that meets Amendment 19 motorized access/security core objectives and for overall cumulative effects analysis. A larger-scale assessment was conducted to address population viability concerns (Exhibit Rg-5).

Information Sources

Data used in the analysis were from existing resource information sources, research literature, post-fire aerial photos, project area field visits and research literature. ArcView geographical information system was used for quantification of various habitat characteristics.

Affected Environment

BMA Characterization

The Blackfoot Lake Fire Complex (BLFC) burned portions of twelve BMAs (refer to Figure 3-22); however, proposed salvage logging activities would only occur in eight of them. Given this, the description of the existing condition and effects analysis focused on the eight BMAs where proposed salvage logging is proposed. Five of eight BMAs are comprised entirely of Management Situation 1 habitat (areas considered necessary for the survival and recovery of the species) and the other three (Doris Creek, Wounded Buck Creek and Lid Creek) contain minor inclusions (around campgrounds and boat launch sites) of Management Situation 3 habitat designations (habitat maintenance and improvement are not management considera-

tions) in and adjacent to existing campground areas. The Doris Creek BMA contains a relatively unimportant strip of land between road #895 (Westside Reservoir road) and Hungry Horse Reservoir that is designated as Management Situation 2 (may or may not be necessary for the recovery and survival of the species).

The BLFC burned each of the eight BMAs where salvage logging may occur to varying severity levels (Table 3-97). The amount of areas burned within each BMA varied and only in one (Goldie) did it exceed 50%. However, there was a range of 5%-44% of area burned for the other seven BMAs. Perhaps as important as anything was the effect of the BLFC fires on food resources for grizzly bears. In this context, at least 70% of the burned areas in five of the eight BMAs burned at high/moderate severity level, equating to approximately 13,000 acres of grizzly bear habitat that will not be producing huckleberries for at least another 10-15 years. However, spring forage production is expected to dramatically increase over the next few years due to the prevalence of early succession plant dominance of grasses and forbs.

Table 3-97. Fire severity levels of forested stands within BMAs with salvage logging proposals.

BMA	BMA Size (acres)	Amount of BMA in Burn		Fire Severity Classes of Burn Area Perimeter ¹ (%)			
		#AC	%	High	Mod.	Low	Unburned
Doris Creek	12,623	4809	38	26	47	15	12
Wounded Buck Creek	10,750	2119	20	20	41	37	2
Lid Creek	8532	1207	14	52	26	22	0
Goldie Creek	6888	5802	84	51	27	17	5
Knieff Creek	9863	4382	44	49	22	26	3
Quintonkon Creek	14,210	681	5	0.3	57	42	0
Ball Branch	16,686	5577	33	52	17	31	0.1
Kah Mountain	11,443	1645	14	54	16	31	0

¹High = complete consumption of duff/understory vegetation; 80-100% mortality of over-story canopy.
 Mod. = significant reduction of duff/understory vegetation; 40-80% immediate mortality of over story.
 Low = low to moderate duff reduction and large patches of unburned or lightly burned vegetation; immediate mortality of over story is less than 40%.
 Unburned = the area within the delineated burned polygon (area) that was not burned by fire.

The existing habitat conditions created by the BLFC, means that not all Forest Plan standards/guidelines related to grizzly bear habitat management are currently being met. As indicated in Table 3-97, each of the BMAs was burned to varying degrees of fire severity. An important aspect of the results of the BLFC is the resulting amount of cover that was changed to non-cover. To determine this, the categories of high and moderate (see Table 3-97) were used as estimates of the amount of cover to non-cover change; it was assumed that the low category probably contained enough understory vegetation to still function as security cover. The results of this examination of cover to non-cover change showed that only in one BMA (Goldie) did the BLFC change more than half of the area to a non-cover status; the other BMAs had a range of 10-32% of cover to non-cover change (Table 3-98).

Figure 3-22. Grizzly Bear Management Areas

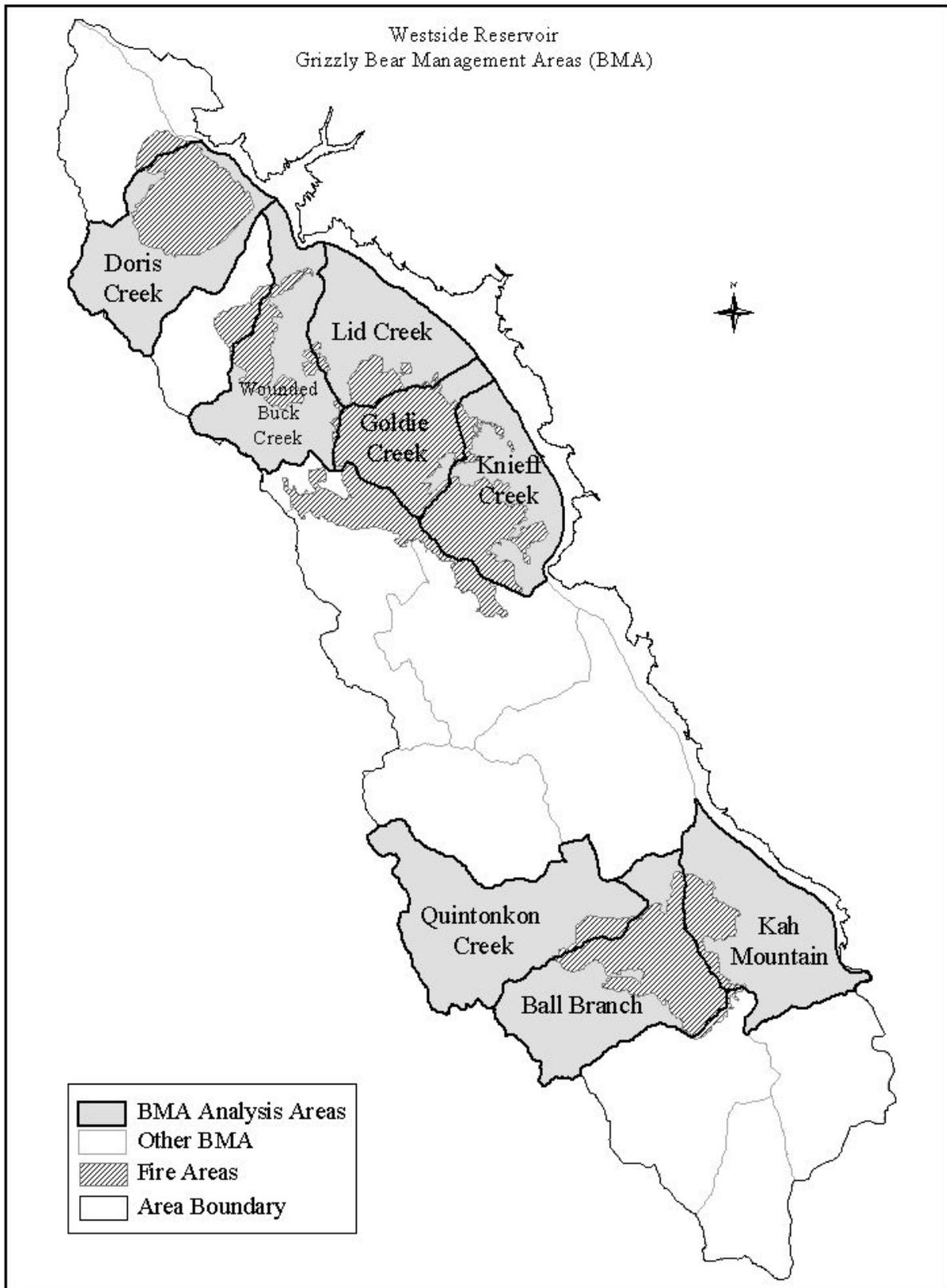


Table 3-98. Amount of area within each BMA that was affected by high and moderate fire severity during the 2003 Blackfoot Lake Fire Complex.

BMA	High and Moderate Fire Severity		Percent of BMA Affected
	%	Acres	
Doris Creek	73	3511	28
Wounded Buck Creek	61	1293	12
Lid Creek	78	941	11
Goldie Creek	78	4526	66
Knieff Creek	71	3111	32
Quintonkon Creek	57	388	3
Ball Branch	69	3848	23
Kah Mountain	70	1151	10

Forest Plan guidelines applicable at the BMA scale of project analysis deal with cover, security areas/disturbance and habitat diversity. The guidelines are intended to assist in meeting habitat goals for grizzly bear. Determinations were made on whether the existing situation currently meets these Forest Plan guidelines (Table 3-99).

Table 3-99. Post-fire conditions relative to grizzly bear guidelines within BMAs.

BMA	Consistency With Guidelines				
	Cover ¹ (%)	Security Area ²	Activity Timing ³	Distance to Cover ⁴	Habitat Diversity ⁵
Doris Creek	Yes	Yes	No	No	Yes
Wounded Buck Creek	Yes	Yes	No	No	Yes
Lid Creek	Yes	No	Yes	No	Yes
Goldie Creek	No	Yes	No	No	No
Knieff Creek	Yes	Yes	No	No	Yes
Quintonkon Creek	Yes	Yes	Yes	Yes	Yes
Ball Branch	Yes	Yes	No	No	Yes
Kah Mountain	Yes	Yes	No	No	Yes

¹At least 40%; ²Adjacent 5000 ac area with <1 mi/mi²; ³No more than 3 consecutive years of major disturbance in 10 year period; ⁴No point within harvest unit can be further than 600 ft to cover; ⁵Achieve even distribution of forest successional stages.

Within the eight BMAs in the affected environment, approximately 26,000 acres burned at different severity levels and Tables 3-97 and 3-98 quantified this in terms of severity and amount of area changed from forested cover to non-cover. However, these numbers provide an incomplete picture into the relatively complex condition that was created by the BLFC. One of the more important aspects of the existing condition concerns the usability of the burned landscape by grizzly bears in the context of habitat security. The burned landscape is a natural part of the ecology of the affected environment and aspect, elevation, burn severity, pre-burn vegetation, and habitat security levels will determine when bears resume use of burned habitats. Because the understory vegetation of the areas that burned at low and moderate severity levels will recover sooner than areas that burned at high severity levels, it is likely that they will become the first habitat areas to be used by bears. An important determi-

nant of how much of the burned areas will be used by grizzly bears in the coming years is the proportion of area adjacent to roads open to motorized use. In order to estimate this, all open roads in each BMA were buffered by 500 meters and the amount of burned habitat within and outside the buffered area was quantified (Table 3-100). This may indicate how much of the post-fire regenerating habitat area where risk of mortality (due to lack of security cover) may be greatest.

Table 3-100. Amount of area within each BMA that was affected by high and moderate fire severity during the 2003 Blackfoot Lake Fire Complex.

BMA	Amount of Burned Habitat Inside and Outside 500 meter Buffer Adjacent to Open Roads			
	Ac Inside	%	Ac Outside	%
Doris Creek	2841	59	1968	41
Wounded Buck Creek	452	21	1667	79
Lid Creek	227	19	980	81
Goldie Creek	2217	38	3585	62
Knief Creek	931	21	3451	79
Quintonkon Creek	64	9	617	91
Ball Branch	110	2	5520	98
Kah Mountain	43	3	1602	97

In summary, eight BMAs could be affected by proposed tree-salvaging activities. Each of these BMAs was affected by the BLFC to varying degrees of fire severity (Tables 3-97 and 3-98). Due to the effects of the fires, the Forest Plan grizzly bear habitat management guideline that is consistently not being met in the BMAs is distance-to-cover (Table 3-99). The amount of burned habitat adjacent to roads open to motorized vehicles was determined as an indicator of the amount of post-fire regenerating habitat where there may be an increased risk of mortality, especially during the spring black bear season.

Subunits

The subunit is an area in which the status of grizzly bear habitat security, as affected by motorized access, is evaluated and for determining cumulative effects. Six subunits were included in this analysis and their status relative to Amendment 19 is shown in Chapters 1 and 2. The subunits are depicted on the Transportation Plan Maps for each of the alternatives described in these chapters. Amendment 19 contained five and ten-year objectives relative to open motorized access density, total motorized access density and security core (areas that are either non-motorized or further than 500 meters from a motorized road/trail and ≥ 2500 acres in size). The five-year objectives were not met in many of the forest's subunits and this resulted in the Flathead National Forest re-consulting with the FWS; the Forest was still in consultation at the time of this assessment.

The existing condition (environmental baseline) is that none of the six subunits currently provides the level of habitat security specified in Amendment 19. In March of 2002, a decision was made on the 'Spotted Beetle Resource Management Project' that would put the Kah Soldier subunit into compliance with Amendment 19's 10-year objectives by the year

2010 with the exception that the decision did not change motorcycle use on the Sullivan Creek Road/trail up to the Swan Crest and the Solider Creek Trail.

Motorized access was recognized by the Forest Plan in 1986 as a major factor affecting grizzly bear habitat security and has been confirmed by research conducted in the Swan Mountains of Montana (Mace and Waller 1997, pages 64-73). Wielgus et al. (2002) demonstrated the tendency for grizzly bears to select against open roads in a 1986-1991 study in the Selkirk Mountains of northern Idaho and southern British Columbia.

Amendment 19 (1995) of the Flathead Forest Plan currently represents the most comprehensive programmatic strategy that addresses grizzly bear habitat security. The U.S. Fish and Wildlife Service (FWS) in their Biological Opinion for Amendment 19 put forth Terms and Conditions with which the Forest is required to comply. The requirements were to gradually achieve motorized access objectives across the Forest in grizzly bear habitat. Amendment 19 established five and ten-year numerical motorized access density objectives were established. The existing conditions are displayed in Table 3-101.

If priorities are to be given to subunits in most need of Amendment 19 implementation, then the amount of area burned by the BLFC in 2003 could provide guidance. Nearly half (46%) of the acreage burned (31,600 acres) by the BLFC fires occurred within the Wounded Buck Clayton subunit. This subunit is now appreciably devoid of cover, which along with road density is an important determinant of over all grizzly bear habitat security. This may suggest that this subunit is in greater need of habitat security than the other subunits and could indicate a priority for implementing Amendment 19 motorized access objectives.

Table 3-101. Grizzly Bear; National Forest Plan Standards, Incidental Take Statements, And Other Plan Standards.

Forest Plan Standards	Subunit ¹	Existing Situation	Compliance
Core is ≥68% in Subunits where FS ownership >75%) (10 year goal)	Doris Lost Johnny	31%	No
	Wounded Buck Clayton	38%	No
	Jewel Basin Graves	56%	No
	Wheeler Quintonkon	54%	No
	Kah Soldier	46%	No
	Ball Branch	76%	Yes
Core is ≥60% in Subunits where FS ownership >75%) (5 year goal)	See Above	See Above	Yes for one; No for Others
Core areas ≥2500 acres in size, distributed to provide seasonal habitats approximately proportional to availability, and remain in place for at least 10 years once established and effective.	Doris Lost Johnny	31	No
	Wounded Buck Clayton	38	No
	Jewel Basin Graves	56	No
	Wheeler Quintonkon	54	No
	Kah Soldier	46	No
	Ball Branch	76	Yes
ORD ² is <19% of MS 1 and MS2 with density >1mi/sq. mi (in Subunits >75% FS ownership) (10 year goal)	Doris Lost Johnny	60%	No
	Wounded Buck Clayton	38%	No
	Jewel Basin Graves	22%	No
	Wheeler Quintonkon	29%	No

Forest Plan Standards	Subunit ¹	Existing Situation	Compliance
	Kah Soldier	33%	No
	Ball Branch	20%	No
ORD is <19% of MS 1 and MS2 with density >1mi/sq. mi (in Subunits >75% FS ownership) (5 year goal)	See Above	See Above	No
TRD ² is <19% of MS 1 and MS2 with density >2mi/sq. mi (in Subunits >75% FS ownership) (10 year goal)	Doris Lost Johnny	22%	No
	Wounded Buck Clayton	42%	No
	Jewel Basin Graves	24%	No
	Wheeler Quintonkon	25%	No
	Kah Soldier	38%	No
	Ball Branch	8%	Yes
TRD is ≤24% of MS 1 and MS2 with density >2mi/sq. mi (in Subunits >75% FS ownership) (5 year goal)	See Above	See Above	Yes for 3; No for 3
No increase in motorized access density on FS lands in subunits with intermingled ownership pattern and/or are not predominately FS (<75% FS ownership).	Not Applicable	Not Applicable	Not Applicable

¹ Amendment 19 standards for Kah Soldier will nearly be achieved later in this decade because of a decision made on the Spotted Beetle Timber Sale in 2000.

² ORD = Open Motorized Access Density; TRD = Total Motorized Access Density.

Post-fire Habitat Suitability and Potential Grizzly Bear Use

The existing condition of grizzly bear habitat within the burned portions of the fire-affected areas is that of the beginning of the forest life cycle and grizzly bears will use whatever forage and cover resources are available in the area. There has not been much research documenting grizzly bear response to and use of post-fire habitats; therefore, what has been documented was considered the best available science.

Data collected from radio-collared grizzly bears from 1989 to 1992, in response to the Yellowstone fires of 1988, showed that bears tended to avoid burned sites during 1989, but not during subsequent years. Based on 867 locations of 44 grizzly bears from 1989-1992, bears used burned habitats in proportion to their availability within their ranges (Blanchard and Knight 1993). Also, their pooled locations indicated avoidance of burned sites during 1989, especially by females with cubs-of-the-year, but not during subsequent years. The 1988 fires had no apparent harmful short-term affects upon Yellowstone grizzly bears, and were in fact likely beneficial, largely due to increased production of grizzly bear diet items such as forb foliage and tuberous root crops (*ibid*). Similar landscapes that have evolved with fire should be expected to undergo similar biological responses, and is what is expected for the West Side affected areas.

At the time of this assessment, grizzly bears have been observed within the BLFC (Exhibit Rt-13). In addition, there was one known human-caused grizzly bear mortality within the analysis area and it was a mistaken identity kill during the 2004 annual spring black bear season; this occurred in the Clayton Creek drainage (Jim Williams, Montana Department of

Fish Wildlife and Parks, Region 1, personal communication). This suggests that it should be expected that bears would continue to use the area and find/use whatever forage resources are available to them. It is unlikely that those bears that had the BLFC as part of their home ranges will abandon them, unless they get displaced because of excessive human disturbance. There may likely be some predictable shifts in seasonal habitat use in response to available food resources. For example, bears may spend more time in or near ungulate winter ranges seeking out winter kill; and they may spend considerable time on the southerly slopes and riparian areas because these areas should be providing relatively high spring range values, especially in the first few years post-fire. During summer, habitat values in high/moderate severity burned areas should be expected to be relatively low, as berry-producing shrubs will take a few years to recover. Bears will most likely shift their use into “green” forests that have high densities of huckleberry and other berry-producing shrubs.

Environmental Consequences

The following Effects Indicators were used to focus the grizzly bear analysis and disclose relevant environmental effects:

- Whether Forest Plan standards/guidelines, and the FWS recommendation related to grizzly bear would be met.
- Potential loss of habitat values associated with salvaging of dead trees.
- Potential for displacement of grizzly bear use of habitats due to human disturbance.

Direct and Indirect Effects

Alternative A (No Action)

The no action alternative would allow natural processes to return the BLFC burned areas to forested conditions. Minimal levels of reforestation would occur; therefore, natural conifer regeneration would be the rule rather than the exception. Since a large proportion of a grizzly bear’s diet is plant material including roots/tubers, leaves of grasses and forbs, and a variety of berries, the post-fire condition of the BLFC fire affected area should be expected to be relatively attractive to grizzly bears. Perhaps the fire affected-area won’t be used much by grizzly bears during the first year post-fire (2004), as the Yellowstone study showed (Blanchard and Knight 1993), but during subsequent seasons the area would be expected to produce increases in forage production and increasingly become more valuable for the next 30-40 years. This alternative would provide a relatively disturbance-free burned-area landscape condition that grizzly bears could exploit with no issues of having to avoid human presence. In general, artificial reforestation of burned or harvested areas shortens the amount of time that disturbed sites last in the early successional phase (where grasses/forbs/shrubs dominate the plant community life forms) of the forest cycle. This landscape condition is very productive and provides a significant amount of forage for grizzly bears; this alternative would allow this landscape condition to exist for the maximum amount of time.

This alternative would impose no further habitat changes within the burned forest, beyond what has already occurred (i.e. felling of trees considered to be safety concerns, adjacent to open roads). Existing habitat security levels, as prescribed by Amendment 19, would stay at their current levels within the six subunits in the analysis area and no further improvements in grizzly bear security levels would occur.

The following responds to the effects indicators:

1) Whether Forest Plan standards/guidelines, and the FWS recommendation related to grizzly bear would be met:

Those standards/guidelines and FWS recommendations where there are options to meet/not meet would be met except for the motorized access objectives of Amendment 19.

2) Potential loss of habitat values associated with dead trees:

No dead trees would be salvaged, therefore, all potential grizzly bear habitat values associated with dead trees including security cover and long term potential sources of insects (e.g. ants) when trees have fallen to the forest floor, would be maintained.

3) Potential for displacement of grizzly bear use of habitats due to human disturbance:

Since there would be no project activities, there would be little to no potential for displacement of grizzly bears from burned habitats.

Alternatives B, C, D and E - SALVAGE

Each of these alternatives would, through a combination of helicopter and ground-based logging systems equipment, remove trees burned by the BLFC. The numbers of acres vary by alternative, but generally are in the range of 3900 to 5300 acres (see description of alternatives in Chapter 2).

The effects indicators (above) were evaluated against the alternatives potential effects to grizzly bear/habitat are discussed.

Forest Plan Standards/Guidelines for Management of Grizzly Bear Habitat

1. With the possible exception of activity timing (discussed below), none of the alternatives would change the existing status of BMA adherence to standards/guidelines displayed in Table 3-99 because there is no longer a green forest in the areas proposed for salvaging. It is apparent that Forest Plan standards/guidelines had the management of predominantly living, green forest habitats, not extensively burned dead-tree habitats, as the assumed landscape condition when they were formulated. Therefore, the implementation of either of the alternatives really would not change standards/guidelines such as distance to cover, habitat

diversity, or percent cover within a BMA. However, the project would have effects on activity timing, which is measured by the 3&7 rule (discussed below).

Relative to the amount of cover in a BMA, a burned forest does not qualify as hiding cover; however, often there is a residual level of cover value that dead-standing trees can provide for grizzly bears. It is not known whether it matters to a bear if a burned area contains the original stand of trees or if most are salvaged in terms of habitat use and/or security. Dead trees will fall over time; however, it is possible that by the time enough trees fall down to make an area totally open, that enough re-vegetation of the site will have occurred sufficient to provide quality hiding cover. Therefore, if dead standing trees provide hiding cover/security value for grizzly bears then this value will be eliminated by salvage logging across the westside reservoir landscape. This condition could last for approximately 10 years, when vegetation re-growth may be sufficient to provide hiding cover. The application of the snag prescription will provide some level of dead-standing tree hiding cover. However, where security is most needed (i.e. along open roads), the prescription assumed that firewood cutters would eventually take snags and therefore emphasized snags to be left further than 200 feet from open roads. Salvaging dead-standing trees will create considerably more open landscape habitats and this may have the unintended effect of reducing habitat security that dead trees may provide grizzly bears. This will be a particular effect within the Goldie BMA, where the existing condition is already below 40% (see Table 3-99).

2. The revised Biological Opinion on the Forest Plan (1989) recommended a “3&7” rule for Management Situation 1, “5&5” for Management Situation 2, that would guide activity scheduling by BMA. The “3&7” rule refers to human activities, especially timber sales, within BMAs lasting longer than 30 days can only occur for a maximum of three consecutive non-denning years and then rest (i.e. no major activity) for seven; this, in theory, assures that only one litter of cubs out of a 10 year period would not get familiar with the mother’s home range because of displacement. This rule is to be used until security core areas as per Amendment 19 are identified and effective on a site-specific basis. In this context, there was a significant amount of human activity during the fire suppression efforts in August and September of 2003 in each of the BMAs in this analysis. Due to the large amount of salvage acreage that is expected to take a minimum of two years to complete, none of the alternatives would meet the intent of the “3&7” rule and therefore displacement of grizzly bears from disturbance areas should be expected.

3. The 10-year numerical motorized access objectives of Amendment 19 would be fully met in all six subunits in two of the four action alternatives (Table 3-102). For the two alternatives where motorized access standards would not be met, a project-specific Forest Plan amendment is proposed. Each of the motorized access alternatives is discussed separately.

Table 3-102. Amendment 19 motorized access density and security core habitat parameters as affected by the West-side Reservoir Post-fire Project alternatives.

Subunit	Amendment 19 Parameter Percentages By Alternative ¹														
	Open Motorized Access Density					Total Motorized Access Density					Security Core Habitat				
	A	B	C ²	D ²	E	A	B	C	D	E	A	B	C	D	E
Doris Lost Johnny	60	44	19	19	57	22	16	13	13	19	31	55	73	72	36
Wounded Buck Clayton	38	21	19	19	27	42	29	19	19	30	38	68	70	68	65
Jewel Basin Graves	22	19	19	19	19	24	19	19	19	19	56	68	68	68	68
Wheeler Quintonkon	29	25	19	19	25	25	19	18	19	19	54	68	71	68	68
Kah Soldier	32	19	19	19	19	20	18	17	18	18	59	68	68	68	68
Ball Branch	20	12	8	12	12	8	3	3	3	3	76	82	86	82	82

¹ See Chapter 2 for complete description of differences in the alternatives; Alternative A reflects the existing condition except for Kah Soldier where previous decisions, not fully implemented yet, are in the percentages shown.

² Alternative C emphasizes closing more trails to motorized use; Alternative D emphasizes closing more roads to motorized use.

Access Management Alternatives

Alternative B. A project-specific Forest Plan amendment is proposed that would change Amendment 19 objectives to those shown in Table 3-102. These two alternatives would certainly improve habitat security when compared to the existing situation and only falls short of fully meeting the existing Amendment 19 parameters on six of 18 parameters (Table 3-102). In three of the six subunits (Jewel Basin Graves, Kah Soldier, and Ball Branch), all motorized access and security core parameters would be met. In the three others (Doris Lost Johnny, Wounded Buck Clayton and Wheeler Quintonkon) the open motorized access density (OMAD) objective would not be met. Additionally, the total motorized access density (TMAD) and security core (SC) objectives would not be met in the Wounded Buck Clayton and Doris Lost Johnny subunits, respectively. Effects within individual subunits for this alternative are summarized.

- 1) **Doris Lost Johnny** – Mostly as a result of the proposed closure to motorized use on two trails in this subunit, security core habitat jumps from the existing 31% to 55%. The main difference between roads and trails in recruitment of security core habitat is that roads get a physical structure (earthen berm) that prevents motorized use, whereas with trails there is no physical structure. Therefore, how effective trail closures to motorized use will be is somewhat questionable; however, this alternative assumes closures will be effective. In terms of the value of habitat gained in security core, NCDE seasonal habitat data (Exhibit Rt-11) show: in spring, 52% is high/moderate value and 48% is low; in summer, 42% is high/moderate value and 58% is low; and in autumn, 51% is high/moderate value and 49% is low. Security core habitat would not be contiguous with secure habitat on the west side of the crest of Columbia Mountain. Within the subunit, there would be three patches of security core habitat. Overall subunit habitat effectiveness would go from the existing 19%, 14% and 20% to 20%, 16% and 21% for spring, summer, and autumn seasons, respectively.

In terms of motorized access density, improvements would occur in both OMAD and TMAD (Amendment 19 objective would be met for TMAD). Though the OMAD objective of 19% would not be met, this alternative proposes approximately 11 miles of the currently year round open Alpha Beta Road (895H) as a spring seasonal closure. The seasonal habitat maps show moderate to high spring habitat value adjacent to this road and, therefore, this proposal is potentially positive. The miles of roads open to motorized access would remain the same as the no action alternative, however approximately 13 miles of trails would be closed to wheeled motorized use.

- 2) **Wounded Buck Clayton** - Security core habitat increases significantly from the existing 38% to 68% (meets Amendment 19 objective) due to: Jimmy Ridge trail closure to motorized use, berms on the Wildcat Creek road (5339) and upper Wounded Buck road 895C, and additional berms and decommissioning of roads along the mid to lower elevations of the subunit. In terms of habitat values gained in security core, NCDE seasonal habitat data show: in spring, 58% is high/moderate value and 42% is low; in summer, 24% is high/moderate value and 76% is low; and in autumn, 27% is high/moderate value and 73% is low. Security core habitat would be contiguous within the subunit; only a one-half mile security core patch would connect the east side with the west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 18%, 11% and 14% to 21%, 13% and 15% for spring, summer, and autumn seasons, respectively. Overall, implementation of this alternative would secure approximately 70% and 90%+ of available spring and summer/autumn habitat values, respectively.

In terms of motorized access density, improvements would be made in both OMAD and TMAD; however, Amendment 19 objectives would not be met (Table 3-102). The miles of open road access would decrease from the existing 44 to 29. The amount of bermed roads would increase from the existing 12 miles to 34 miles, and this equates to approximately 8,000 acres of habitat gained that will, over time, not be avoided by bears.

- 3) **Jewel Basin Graves** - Security core habitat increases from the existing 58% to 68% (meets Amendment 19 objective) due to: Margaret Lake trail (410) closure to motorized use, berms on roads 9796 (south end of Pioneer Ridge), upper portion of 9797 (Aeneas Creek), 1607 (Jones Creek), and road 1609 (between Forest and Wheeler Creeks). In terms of habitat values gained in security core, NCDE seasonal habitat data show: in spring, 80% is high/moderate value and 20% is low; in summer, 35% is high/moderate value and 65% is low; and in autumn, 40% is high/moderate value and 60% is low. There would be good security core habitat connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 26%, 19% and 24% to 26%, 19% and 24% for spring, summer, and autumn seasons, respectively. Overall, implementation of this alternative would secure approximately 60% and 90%+ of available spring and summer/autumn habitat values, respectively.

In terms of motorized access density, improvements are made in both OMAD and TMAD and Amendment 19 objectives would be met (Table 3-102). The miles of open road access would decrease from the existing 21 to 18. The amount of bermed

roads would increase from the existing 12 miles to 18 miles, and this equates to approximately 2,300 acres of habitat gained that will, over time, not be avoided by bears.

- 4) **Wheeler Quintonkon** - Security core habitat increases from the existing 55% to 68% (meets Amendment 19 objective) due to: motorized closure on the Alpine Trail (#7), a berm on the Trapper Creek road (#1666), berms on several roads in the Heinrude Creek area, and a berm on the Posey Creek road (5345). In terms of habitat values gained in security core, NCDE seasonal habitat data show: in spring, 71% is high/moderate value and 21% is low; in summer, 48% is high/moderate value and 52% is low; and in autumn, 62% is high/moderate value and 38% is low. There would be two security core habitat patches and each would have good habitat connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 25%, 21% and 26% to 26%, 22% and 27% for spring, summer, and autumn seasons, respectively. Overall, implementation of this alternative would secure approximately 60% and 90%+ of available spring and summer/autumn habitat values, respectively. Important spring, summer and autumn habitat values in upper Quintonkon Creek drainage would continue to be avoided by bears.

In terms of motorized access density, improvements are made in both OMAD and TMAD (meets objective), however, Amendment 19 objectives would not be met for OMAD (Table 3-102). The miles of open road access would decrease from the existing 26 to 25. The amount of bermed roads would increase from the existing 13 miles to 24 miles, and this equates to approximately 4,400 acres of habitat gained that will, over time, not be avoided by bears.

- 5) **Ball Branch** - Security core habitat increases from the existing 76% to 82% (meets Amendment 19 objective) due to: motorized closure on the Connor Creek Trail (#396). In terms of habitat values gained in security core, NCDE seasonal habitat data show: in spring, 84% is high/moderate value and 16% is low; in summer, 47% is high/moderate value and 53% is low; and in autumn, 53% is high/moderate value and 47% is low. There would no security core habitat connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 30%, 27% and 31% to 31%, 27% and 32% for spring, summer, and autumn seasons, respectively. Overall, implementation of this alternative would secure approximately 70% and 80% of available spring and summer/autumn habitat values, respectively.

In terms of motorized access density, improvements are made in both OMAD and TMAD (meets objective) bringing the subunit into compliance with Amendment 19 objectives (Table 3-102). The miles of motorized access would decrease due to the closure of Connor Creek trail.

- 6) **Kah Soldier** - Security core habitat increases from the existing 59% to 68% (meets Amendment 19 objective) due to the motorized closure of the Soldier Creek Trail (#268). In terms of habitat values gained in security core, NCDE seasonal habitat data show: in spring, 64% is high/moderate value and 36% is low; in summer, 12% is high/moderate value and 88% is low; and in autumn, 16% is high/moderate value and 84% is low. There would be good security habitat connectivity between this and the

Ball Branch subunit, but no security core habitat connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 30%, 27% and 31% to 31%, 27% and 32% for spring, summer, and autumn seasons, respectively. Overall, implementation of this alternative would secure approximately 65% and 90%+ of available spring and summer/autumn habitat values, respectively.

In terms of motorized access density, improvements are made in both OMAD and TMAD and both would meet Amendment 19 (Table 3-102). The miles of motorized access would decrease by virtue of the motorized closures of both the Sullivan Creek road and the Soldier Creek trail to motorcycles. All other access management actions would be implemented as per the decision made on the Spotted Beetle Timber Sale 2001.

Alternative C: This alternative emphasizes motorized access restrictions on trails and would meet all of Amendment 19 objectives (Table 3-102) for each of the six subunits. Effects within individual subunits where different from Alternative B, are summarized.

- 1) **Doris Lost Johnny** – A significant increase in the amount of security core habitat (Table 3-102) would occur with this alternative resulting from the following actions: motorized closures on the Alpine (#7), Doris Lakes (309), Doris Creek (295), and Jimmy Ridge (297) trails; and placing a berm on road 895H (Alpha Beta). In terms of habitat gained in security core, NCDE seasonal habitat data show: in spring, 54% is high/moderate value and 46% is low; in summer, 51% is high/moderate value and 49% is low; and in autumn, 63% is high/moderate value and 37% is low. There would be two security core habitat patches and each would have connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 19%, 14% and 20% to 23%, 18% and 23% for spring, summer, and autumn seasons, respectively.

In terms of motorized access density, both OMAD and TMAD Amendment 19 objective would be met. The miles of roads open to motorized access would be reduce from the existing 27 to 10 miles. The amount of bermed roads would increase from the existing 7 miles to 15 miles, and this equates to approximately 3,000 acres of habitat gained that will, over time, not be avoided by bears.

- 2) **Wounded Buck Clayton** – Similar to Alternative B, a significant increase in the amount of security core habitat (Table 3-102) would occur with this alternative. The main difference between this and alternative B relative to security core habitat is that the Alpine Trail (#7) would be closed to motorized use, resulting in contiguous security habitat over the west side of the crest of the Swan Mountains. In terms of habitat gained in security core NCDE seasonal habitat data show: in spring, 59% is high/moderate value and 41% is low; in summer, 27% is high/moderate value and 73% is low; and in autumn, 30% is high/moderate value and 70% is low. There would be one contiguous security core habitat patch and it would have adequate connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effec-

tiveness would go from the existing 18%, 11% and 14% to 22%, 14% and 16% for spring, summer, and autumn seasons, respectively.

In terms of motorized access density, both OMAD and TMAD Amendment 19 objectives would be met. The miles of roads open to motorized access would be reduced from the existing 44 to 27 miles. The amount of habitat gained that will, over time, not be avoided by bears would be the same as that for alternative B, however, approximately 200 additional acres would be more available due to the Alpine Trail motorized closure.

- 3) **Jewel Basin Graves** – This alternative would be identical in effects as described for alternative B.
- 4) **Wheeler Quintonkon** – Similar to Alternative B, a significant increase in the amount of security core habitat (Table 3-102) would occur with this alternative. The difference in effects between this and alternative B relative to security core habitat is that two portions of the Alpine Trail (#7) and trails #72 and #74 would be closed to motorized use. This alternative would create a wider swath of contiguous habitat over to the west side of the crest of the Swan Mountains in the north and south west portions of the subunit. In terms of habitat gained in security core NCDE seasonal habitat data show: in spring, 71% is high/moderate value and 29% is low; in summer, 53% is high/moderate value and 47% is low; and in autumn, 67% is high/moderate value and 33% is low. There would be one contiguous security core habitat patch and it would have good connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 25%, 21% and 26% to 26%, 22% and 27% for spring, summer, and autumn seasons, respectively.

In terms of motorized access density, both OMAD and TMAD Amendment 19 objectives would be met. The miles of roads open to motorized access would be reduced from the existing 26 to 23 miles. The amount of habitat gained that will, over time, not be avoided by bears would be the same as described for alternative B.

- 5) **Ball Branch** – This alternative would be identical in effects as described for alternative B.
- 6) **Kah Soldier** - This alternative would be identical in effects as described for alternative B.

Alternative D: This alternative emphasizes motorized access restrictions on roads while allowing motorized use on trails and would meet all of Amendment 19 objectives (Table 3-102) for each of the six subunits. Effects within individual subunits where different from other alternatives, are summarized.

- 1) **Doris Lost Johnny** – A significant increase in the amount of security core habitat (Table 3-102) would occur with this alternative, which most resembles alternative C in effects. The differences in effects already summarized for alternative C are as follows: a) there would be a motorized restriction on trail #51; b) road #895A (Doris

Creek) would be bermed and habitat adjacent to it would become secure; c) the Alpine Trail (#7) would continue to allow motorized use. In terms of habitat gained in security core, NCDE seasonal habitat data show: in spring, 52% is high/moderate value and 48% is low; in summer, 39% is high/moderate value and 61% is low; and in autumn, 46% is high/moderate value and 54% is low. There would be one security core habitat patch and it would not have good connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 19%, 14% and 20% to 24%, 18% and 23% for spring, summer, and autumn seasons, respectively.

The miles of roads open to motorized access would be reduced from the existing 27 to 6 miles. The amount of bermed roads would increase from the existing 7 miles to 19 miles, and this equates to approximately 4,600 acres of habitat gained that will, over time, not be avoided by bears.

- 2) **Wounded Buck Clayton** – Similar to Alternative C, a significant increase in the amount of security core habitat (Table 3-102) would occur with this alternative. The main difference between this and alternative C relative to security core habitat is that the Alpine Trail (#7) would be open to motorized use, resulting in reducing the amount of contiguous security habitat over to the west side of the crest of the Swan Mountains. In terms of habitat gained in security core NCDE seasonal habitat data show: in spring, 58% is high/moderate value and 42% is low; in summer, 24% is high/moderate value and 76% is low; and in autumn, 26% is high/moderate value and 74% is low. There would be one contiguous security core habitat patch and it would not have adequate connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 18%, 11% and 14% to 22%, 13% and 15% for spring, summer, and autumn seasons, respectively.

The miles of roads open to motorized access would be reduced from the existing 44 to 26 miles. The amount of habitat gained that will, over time, not be avoided by bears would be the same as that for alternative C.

- 3) **Jewel Basin Graves** – This alternative would be identical in effects as described for Alternative C.
- 4) **Wheeler Quintonkon** – This alternative would have effects on security core habitat almost identical to those described for Alternative B. The only difference being that road 381A would be bermed in its entirety for a net gain of approximately 140 acres of more secure habitat. In terms of habitat gained in security core NCDE seasonal habitat data show: in spring, 72% is high/moderate value and 28% is low; in summer, 48% is high/moderate value and 52% is low; and in autumn, 61% is high/moderate value and 39% is low. There would be two security core habitat patches and each would have good connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 25%, 21% and 26% to 26%, 22% and 27% for spring, summer, and autumn seasons, respectively.

The miles of roads open to motorized access would be reduced from the existing 26 to 18 miles. The amount of habitat gained that will, over time, not be avoided by bears would be the same as described for alternative C.

- 5) **Ball Branch** – This alternative would be identical in effects as described for alternative B.
- 6) **Kah Soldier** - This alternative would be identical in effects as described for alternative B.

Alternative E: This alternative emphasizes seasonal motorized access restrictions to provide for grizzly bear security during spring. Three subunits would fully meet Amendment 19 objectives and three would not. Effects within individual subunits where different from other alternatives, are summarized.

- 1) **Doris Lost Johnny** – Primarily as a result of the proposed closure to motorized use on the connector trail from upper Lost Johnny road to the Alpine Trail, security core habitat increases from the existing 31% to 36%. In terms of habitat gained in security core, NCDE seasonal habitat data show: in spring, 72% is high/moderate value and 28% is low; in summer, 69% is high/moderate value and 31% is low; and in autumn, 73% is high/moderate value and 27% is low. There would be three security core habitat patches and there would no good connectivity between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 19%, 14% and 20% to 20%, 15% and 21% for spring, summer, and autumn seasons, respectively.

In terms of motorized access density, improvements are made in both OMAD and TMAD (Amendment 19 objective would be met for TMAD). Motorized road access would be reduced from the existing 27 miles to 26 miles; this alternative essentially maintains the status quo of the existing situation.

- 2) **Wounded Buck Clayton** - Security core habitat increases in size the same as that under Alternative B (Table 3-102) but due to Trail #297 (Jimmy Ridge) remaining open to motorized use, does not fully achieve the Amendment 19 objective of >68%. Important spring, summer, and autumn habitats adjacent to Trail #297 would not be protected under the security core habitat status. In terms of habitat gained in security core NCDE seasonal habitat data show: in spring, 56% is high/moderate value and 44% is low; in summer, 19% is high/moderate value and 81% is low; and in autumn, 21% is high/moderate value and 79% is low. There would be one contiguous security core habitat patch and it would not have very good connectivity (see Alternative B) between the east and west side of the Swan Mountains. Overall subunit habitat effectiveness would go from the existing 18%, 11% and 14% to 21%, 12% and 15% for spring, summer, and autumn seasons, respectively.

In terms of motorized access density, improvements are made in both OMAD and TMAD (Amendment 19 objectives would not be met). Motorized road access would be reduced from the existing 44 miles to 23 miles. Different from any of the other al-

ternatives for this subunit, there would be seasonal restrictions on two road systems to allow for greater potential grizzly bear use of lower elevation spring habitats; both the Wounded Buck (895C) and Clayton Creek (1633) roads would be closed from April 1 to July 1.

- 3) **Jewel Basin Graves** – This alternative would be identical in effects in security core as described for Alternative B. In terms of motorized access density, as with the other alternatives both OMAD and TMAD Amendment 19 objectives would be met using the same basic open, closed and decommissioning strategy. However, this alternative would impose highly beneficial seasonal restrictions on two roads that are currently open on a year round basis to allow for greater potential grizzly bear use of lower elevation spring habitats. The upper portion of the Graves Creek (897) and Mazie Creek (5326) roads would be closed from April 1 to July 1; both roads access high value spring habitat and mostly low value during summer and autumn. Therefore, the seasonal restriction of these roads would appear to be a positive management action for grizzly bears.
- 4) **Wheeler Quintonkon** – This alternative would have effects on security core habitat identical to those described for Alternative B. In terms of motorized access density, the TMAD Amendment 19 objective would be met in the same manner as it would under Alternative B; the OMAD would not be met and is the same as for Alternative B. However, a highly beneficial seasonal restriction would be imposed on the Quintonkon Road (381) to allow for greater potential grizzly bear use of lower elevation high value spring habitats; this road also accesses high value summer and autumn habitat in the upper third of the drainage.
- 5) **Ball Branch** – This alternative would have effects on security core habitat, OMAD and TMAD identical to those described for Alternative B.
- 6) **Kah Soldier** – This alternative would have effects on security core habitat, OMAD and TMAD identical to those described for Alternative B.

The following responds to the effects indicators for the Action alternatives:

1) Whether Forest Plan standards/guidelines, and the FWS recommendation related to grizzly bear would be met:

The objectives of Amendment 19 would not be met if either alternative B or E were selected, rather a new set of objectives would be the standard as per the site specific Forest Plan Amendment. It would take an unknown number of years to fully implement either Alternative C or D. None of the alternatives would meet the intent of the “3&7” rule and therefore displacement of grizzly bears from disturbance areas should be expected.

2) Potential loss of habitat values associated with dead trees:

The removal of a relatively small proportion of burned dead trees (when compared to what would be left within fire affected areas) would have some but probably not significant effects on grizzly bears or grizzly bear habitat potential. A review of literature on dead trees, including the Grizzly Bear Compendium (1987), did not yield any information on the habitat value of burned dead-standing trees to grizzly bears, indicating there is no obvious relationship. However, if there is grizzly bear dependence on burned, dead trees especially when they fall, for invertebrate proteins, then each of the alternatives would remove some of this potential food resource. Considering that the maximum number of acres to be treated represents less than 17 percent of the burned portion of the BLFC, this does not appear to be a significant decrease in overall dead-tree/down log habitat potential for grizzly bears. Additionally, the important riparian areas and the snag prescription (see section on Snags), which contain large-diameter standing and downed trees, would be left intact and available for grizzly bear use.

3) Potential for displacement of grizzly bear use of habitats due to human disturbance:

With each of the alternatives, widespread salvage logging activities throughout the analysis area involving helicopter (>70%) and ground-based (<30%) logging systems is expected to cause disturbance and probable displacement of grizzly bears. Grizzly bear normal activity patterns during late spring, summer and autumn seasons will likely be disrupted with the expected high level of logging activities over the next two years.

Each of the alternatives would salvage harvest trees off of varying amounts of acres within existing grizzly bear security core habitat (Table 3-103; Exhibit Rt-7). This salvage logging is likely to disturb and displace any grizzly bears that might be in the vicinity of salvage sites. Security core areas where salvage is proposed will compromise the function of providing secure habitat, i.e. habitat free of major forest management disturbance activities. This impact will likely be greatest during the first year of salvage logging and diminish during the second and third years of the contract, which is typically three years. Ground based salvaging requiring roads would occur during the grizzly bear denning season; therefore, no impacts on grizzly bears are expected.

Table 3-103. West Side Reservoir Post Fire Project proposed salvage harvesting within existing grizzly bear security core habitat.

Subunit	Existing Security Core Acres	# Acres of Salvage In Core By Logging System and Alternative								
		Ground			Helicopter			Skyline		
		B/E	C	D	B/E	C	D	B/E	C	D
Doris Lost Johnny	8,104	139	68	139	506	552	519	165	171	171
Wounded Buck Clayton	12,339	15	0	15	287	284	281	0	0	0
Wheeler Quintonkon	18,436	0	0	0	137	7	127	0	0	0
Ball Branch	19,508	0	0	47	201	417	429	0	0	76
Kah Soldier	14,665	565	0	0	404	172	193	115	0	0
Total	88,935	719	68	201	1,535	1,432	1,549	280	171	247

Cumulative Effects

Alternative A –No Action

Past Actions

Within the six grizzly bear subunits that comprise the cumulative effects analysis area, there are no private lands, however past management activities on public land have altered habitat conditions considerably. Probably two of the most significant human-induced habitat alterations within the analysis area that have influenced grizzly bear habitat use are: 1) the inundation of approximately 38 miles (23,000 acres) of the South Fork Flathead River floodplain and upland habitats by the Hungry Horse Dam/reservoir in the early 1950s, and 2) the extensive construction of roads over the last fifty years. The Hungry Horse dam totally eliminated prime floodplain and upland grizzly habitat and created a barrier to movement of bears from the Swan to the Flathead mountain ranges and vice versa, whereas motorized use on roads have caused bears to avoid suitable habitat (Mace and Waller 1997). Therefore, these two major landscape alterations have reduced the amount of fully utilizable grizzly bear habitats considerably.

The majority of timber harvesting within the analysis area occurred over the last fifty years. There is apparently wide variation of grizzly bear responses to cutting units; however, cutting units less than 12 years old were much less likely to be used than older units (Mace and Waller 1997). Older (30 to 40 years) cutting units were more likely to be used than older or newer cutting units (Mace and Waller 1997). This suggests that there may be somewhat of an unsuitable phase in the life of a cutting unit. Habitat modification thru timber harvesting has therefore had short-term avoidance effects by bears but apparently become more suitable and used when cutting units are >12 years of age. In the Swan Mountains [Montana], the negative effects of cutting units were related more to open roads than to reduction of habitat to earlier seres (Mace and Waller 1997).

The hazard tree felling along roads that occurred during fire suppression activities probably reduced screening cover adjacent to roads to some extent.

Ongoing Actions

A wide variety of ongoing Forest Service and recreational activities will continue to occur within the analysis area including: road and trail maintenance; fire suppression; private individuals seasonally living/visiting the 19 Heinrude home sites along Hungry Horse Reservoir; hunting/fishing/trapping, hiking/biking/motorcycle riding, camping/boating, firewood cutting, huckleberry picking, snowmobiling, and other non-consumptive forms of recreational activities. All of these activities have some level of avoidance effect by bears.

Administrative uses of closed roads, for salvage sale, research, reforestation, or road-related work, are expected to exceed Amendment 19 allowable administrative use levels within the BLFC fire areas. This means that the open road density will be increased for the season.

Present, Connected and Reasonably Foreseeable Actions

Morel mushroom harvesting is a forest activity that was determined to have potential to adversely affect grizzly bears (USDA Forest Service 2004). This activity is currently occurring, bringing hundreds of people into the analysis area. This program was expected to result in displacement of grizzly bears and/or have a high potential for human-bear conflicts. Increased law enforcement/monitoring of campsite conditions and temporary road closures adjacent to burned areas were measures that were implemented to minimize impacts on grizzly bears. Mushroom harvesting was expected to occur from May thru August 2004.

Best Management Practices (BMP) on roads is a connected action for the action alternatives (salvage timber harvest work), a portion of which is scheduled to occur in 2004. However, some of this work may occur even if salvaging does not occur. The BMP project was determined, through the biological assessment process to have potential to adversely affect grizzly bears (USDA Forest Service 2004a). The work was determined to be necessary to prevent both chronic and catastrophic erosion from forest roads, which may result in large volumes of sediment being delivered to streams. The BMP work includes activities such as: maintenance of road drainage structures including cross drains; brushing, maintenance of fill slopes, cut slopes, ditches, road way surfaces, bridges, culverts; culvert removal; culvert upsizing; temporary replacement of a washed out bridge; and re-opening the Wounded Buck quarry. Up to 328 miles of roads across the forest have been identified for BMP work, of which, approximately 161 miles are within the analysis area. Project design criteria were used to minimize impacts on grizzly bears. BMP activities are expected to be completed by November 2005.

The spring black bear hunting season, administered by Montana Department of Fish, Wildlife and Parks, is expected to continue in the analysis area and given the current lack of hiding cover within the burned areas, the risk of shooting a grizzly bear due to mistaken identity is possible. In fact, though details of the exact location of the mortality site are not available due to the ongoing investigation, an adult grizzly bear male was killed during May 2004 within the analysis area (Clayton Creek drainage).

A decision was made on the ‘Spotted Beetle Resource Management Project’ in 2001 to meet Amendment 19 objectives in the Kah Soldier grizzly bear subunit with the exception that the decision did not change motorcycle use on the Sullivan Creek Road/trail up to the Swan Crest and the Solider Creek Trail. Roadwork is scheduled to occur throughout this subunit with approximately 6, 12, and 17 miles to be decommissioned in 2005, 2006, and 2007, respectively. These activities, depending on duration will have some level of disturbance effects on bears.

Determination

The analysis area nests within the study area used for the South Fork Grizzly Project conducted between 1987 and 1996 (Mace and Waller 1997). Considering this, it seems appropriate to highlight some of the major conclusions that the researchers documented relative to grizzly bear population status and habitat use. Excerpts of some of the conclusions from this grizzly bear ecology study included:

- The local population of grizzly bears was tenuously stable during the period of study.
- It is important to remember that the interplay of each human and habitat feature affected probability of grizzly bear use incrementally.
- Habitat degradation and urbanization were the primary factors limiting population growth. Habitat managers will be challenged to increase bear numbers and improve long-term local population trend in source-sink landscapes such as the Swan Mountains.
- Avoidance of roads increased as road densities and traffic volumes increased. At all landscape scales, bear density declined as road densities and traffic volume increased. Under certain habitat conditions and seasons, the positive attraction to specific cover types were stronger than the negative impacts of roads...Thus management efforts should focus on minimizing road density and road-use, and protecting seasonally preferred habitats.
- In the Swan Mountains, the negative effects of cutting units were related more to open roads than to reduction of habitat to earlier seres.
- Until effective management programs are developed for private lands, federal lands should be considered invaluable source areas and managed to reduce man-caused mortality. This would be accomplished by establishing high security core areas that include seasonal habitats and where vehicle access is restricted.
- The two biggest sources of mortality were mistaken identification during spring black bear season and management removal.

The no action alternative means that there would be no salvaging of trees burned by the BLFC during 2003. It also means that there would be no proposal to improve the existing road density situation and either move closer to or fully meet the objectives of Amendment 19. However, previous decisions made to meet the objectives in the Kah Soldier subunit would still occur. The other five subunits in the analysis area would still be out of compliance with Amendment 19, which means the existing condition is providing an insufficient amount of habitat security for grizzly bears. As a reminder: 1) the analysis area (i.e. the six subunits) lies entirely within the South Fork Grizzly Study area (Mace and Waller 1997); 2) Amendment 19 was a direct interpretation of preliminary findings at the mid-way point of the South Fork Grizzly Study; and 3) in cooperation with the US Fish and Wildlife Service (the lead Agency charged with providing guidance for recovery of Federally listed species) the Flathead National Forest (FNF) is still obligated to implement Amendment 19 objectives;

Therefore, considering the above discussion on cumulative impacts of human developments/activities, including the recent fire suppression efforts in 2003, the morel mushroom harvest program and BMP implementation in 2004, and because there is no other foreseeable strategy for improving and/or implementing actions to meet Amendment 19 objectives, the

selection of this alternative (Alternative A) would result in a determination of “may affect-likely to adversely adverse affect” the grizzly bear.

Action Alternatives: B, C, D, and E – Dead-tree Salvage

The above cumulative effects discussion for the no action alternative regarding past, ongoing and foreseeable actions is also incorporated for the action alternatives. In addition, the excerpts of conclusions from the South Fork Grizzly Study are also incorporated into this discussion.

Widespread fire suppression efforts across the analysis area (i.e. the six subunits) and post-fire BAER (burned area emergency rehabilitation) activities in 2003 probably had some level of displacement-effect on grizzly bears. However, considering that the focus of fire suppression and BAER activities was on the areas that a) were burning and/or b) that already burned, places where bears may have avoided anyhow, the displacement effect from human activities may have been low. Still, many restricted roads outside of burned/burning areas were used frequently during the suppression/BAER effort and were areas where disturbance/displacement effects on grizzly bears may have occurred.

Normal timber harvesting in living, green forests requires compliance with grizzly bear habitat standards/guidelines related to thermal/hiding cover, effects on food production, forest age class diversity, and disturbance/displacement of bears. As discussed in the direct/indirect effects section, in a burned forest these standards/guidelines are not attainable nor does salvage alter the ability to attain them in the future. Nevertheless, each of the alternatives would salvage trees on between 3,900 and 5,300 acres, depending on alternative, and make those parts of the landscape where trees would be removed even more open. Bears using these sites for foraging purposes could become more vulnerable to being illegally killed. How much more vulnerable is unknown. Certainly, the further away from an open road the lower the mortality risk and probably the less need grizzly bears would have for cover. Nevertheless, as mentioned in the direct effects section above, the proposed salvage sites do not meet hiding cover status, but the removal of dead standing trees would reduce the already limited cover in the short term (10-15 years), until forest regeneration provides hiding cover. Cumulatively, this would reduce the already limited amount of cover.

In the case of potential disturbance/displacement of bears, this is still an issue for the action alternatives because bears that lived in the pre-burned forest will likely continue to use the burned areas, albeit at lower use levels because of the reduction of food resources. With each of the alternatives there will be widespread logging activity across the analysis area for the next couple of years (2005-2006). This will occur within each of the subunits in the analysis area, except Jewel Basin Graves. It is doubtful that the 3&7 rule (see Direct and Indirect Effects for Salvage, above) can be met within six of the nine BMAs in the analysis area. It is likely that the local bear population in the Swan Mountains will already be under some level of stress due to the fire-caused reduction in availability of the most important summer food (huckleberry) across the combined approximately 31,000 acres of habitat in the BLFC. Adding to this both aerial and ground based logging disturbances across the analysis area for what is likely to be two non-denning seasons, will make for a challenging time for grizzly bears. Exactly how these major disturbances will affect the local grizzly bear population is

unknown. Generally this amount and duration of disturbances and activities will lead to disruption of normal bear routines and may affect breeding and foraging behaviors. Additionally, the proposed level of salvage activities, combined with the 2003 fire suppression/BAER activities, the 2003 morel mushroom harvest program, and implementation of BMP road related work can preclude adult female grizzly bears from teaching their cubs favored foraging sites within the home range. Securing drainages adjacent to salvage areas through motorized restrictions can provide short-term security areas and help mitigate the substantial disturbance that will occur with implementation of any of the action alternatives.

Action Alternatives: B, C, D, and E – Habitat Security

Widespread relatively intense human presence within the cumulative effects analysis area (the six subunits) during the 2003 fire suppression efforts, morel mushroom harvesting program in 2004, BMP related work in 2004, and administrative motorized entries on restricted roads for a variety of reasons have reduced the amount of habitat security that the local grizzly bear population has been used to. Continued use of restricted roads for salvage logging is expected to continue for the next couple of years. Habitat security has been on a decreasing trajectory since 2003 and will continue for the next couple of years. However, once salvage-logging activities are completed habitat security will be on the increase.

Cumulatively, each of the alternatives would continue a recent forest-wide trend of improving habitat security for bears through implementation of motorized access restrictions as per Amendment 19. Two of the four alternatives (B & E) would not fully meet Amendment 19 objectives and two would (C & D). Though each of the proposed alternatives would improve habitat security, due to the issue of funding sources there is uncertainty as to when full implementation of any of the alternatives would occur. This means that insufficient habitat security will continue in the short term.

Determination

The same excerpts from the South Fork Grizzly Study (Mace and Waller 1997) used for the no action biological determination of effects should also be remembered here. In addition, the following were considered: 1) past incremental reductions in grizzly bear habitat and security as a result of the road-building program, 2) the ongoing human activities as discussed above, 3) the existing level of motorized access density for the subunits in this analysis, and 4) the reality that that, due to funding limitations, full implementation of any of the alternatives relative to Amendment 19 motorized access restrictions, particularly decommissioning of roads, would not occur for an unknown number of years. Given these considerations, the selection of any of the action alternatives would, in the short-term (3-5 years) result in a determination of “may affect-likely to adversely affect” the grizzly bear or its habitat. In the longer term, alternatives B and E could provide satisfactory habitat security levels if USFWS concludes that proposed new Amendment 19 objectives for Doris Lost Johnny, Wounded Buck Clayton and Wheeler Quintonkon subunits would not compromise conservation of grizzly bears. Alternatives C and D could meet the numerical objectives of Amendment 19 sometime in the future, if funds are available, in somewhat different ways (see Direct

and Indirect Effects section), and would be expected to not have long term adverse effects on grizzly bears.

REGULATORY FRAMEWORK

The project area lies within grizzly bear Management Situation 1 (MS1), as designated by the Forest Plan. The grizzly bear is listed as threatened in Montana and the Grizzly Bear Recovery Plan (1993) provides recovery goals and objectives for the grizzly bear. The Flathead Forest Plan (pages II-38 to II-42) provides management direction and standards and guidelines to guide project planning. The Interagency Grizzly Bear Guidelines (1987) provide additional guidance for habitat management. Amendment 19 to the Forest Plan provides standards for grizzly bear habitat management through motorized access and security core habitat standards and objectives. The Grizzly Bear Compendium (National Wildlife Federation 1987) provides published and unpublished information on most areas of interest regarding grizzly bears. A Special Order (NCDE Food Storage Order) is in effect and requires all users of national forest system lands within the NCDE to store food, garbage and other bear attractants in a bear resistant manner.

REGULATORY CONSISTENCY

The post-fire environment baseline (the existing condition) does not meet Amendment 19 grizzly bear habitat standards and some of the Forest Plan guidelines. In general, the proposed action is consistent with the Interagency Grizzly Bear Guidelines. The Flathead National Forest will be in formal consultation with the US Fish and Wildlife Service regarding this project. A biological opinion issued by the U.S. Fish and Wildlife Service would be necessary before any action alternative could be selected for implementation.

Gray Wolf (Threatened)

Analysis Area

The key components of wolf habitat are fairly simple: 1) a sufficient, year-round prey base of ungulates (big game) and alternate prey, 2) suitable and somewhat secluded denning and rendezvous sites, and 3) sufficient space with minimal exposure to humans (US Fish and Wildlife Service 1987). For these reasons, wolves require relatively large areas to meet their biological needs. From the perspective of effects analysis for the proposed project, the area analyzed included as much of the known range of the potentially affected wolf pack within the influence zone of project activities. The size of this analysis area was approximately 31,000 acres and included all of the Kah Soldier grizzly bear subunit and the portion east of Battery Mountain (to the reservoir) of the Wheeler Quintonkon subunit (Figure 3-23). The wolves that use the project area are members of the Spotted Bear pack and only that portion of the proposed project that is within the likely influence zone was included in the wolf analysis area. A larger-scale assessment was conducted to address population viability concerns (Exhibit Rg-5).

Information Sources

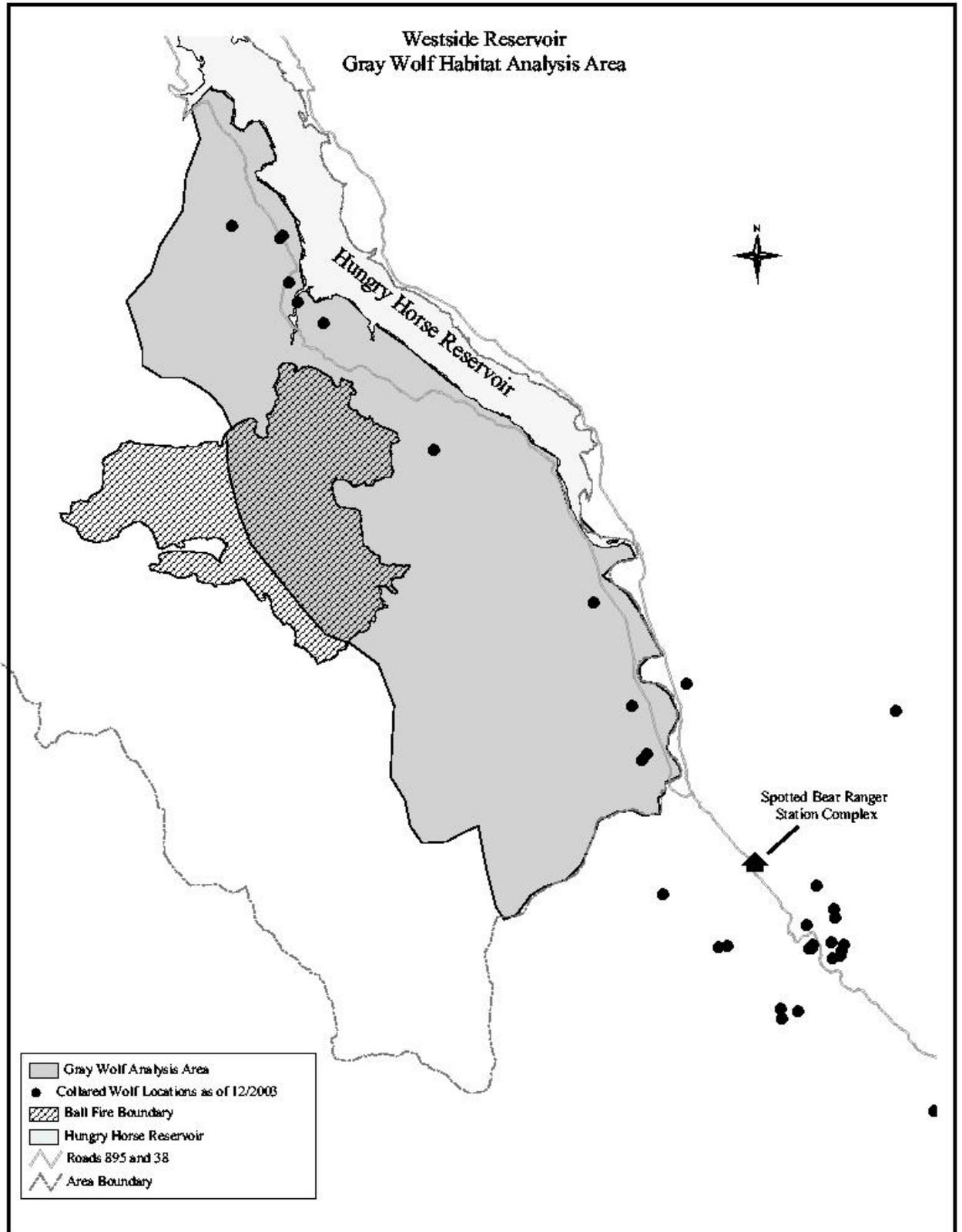
Data used in the analysis were from existing resource information sources, research literature, post-fire aerial photos, and field trips. ArcView geographical information system was used for quantification of various habitat characteristics.

The project area is within habitat that has been designated in the Flathead Forest Plan as Management Zone 1 (contains key habitat components in sufficient abundance and distribution on an annual basis to sustain a viable wolf population) (Forest Plan page II-43) and is in the Northwest Montana Recovery Area.

Affected Environment

After widespread extirpation during the last and first half of the 19th and 20th centuries, respectively, the gray wolf has re-colonized northwestern Montana with pack activity documented in the North Fork of the Flathead River since the early 1980s (US Fish and Wildlife Service 1987). From the 1980's to the present time, wolves have made a such successful comeback in northwest Montana that 2003 marked the fourth consecutive year that 30 or more breeding pairs of wolves were documented in the northern Rocky Mountain (NRM) states (US Fish and Wildlife Service et al. 2004). The US Fish and Wildlife Service has concluded that the population of wolves in the NRM states has achieved biological recovery objectives.

Figure 3-23. Grey Wolf Habitat Analysis Area and Collared Wolf Locations



Despite the many wolf dispersals that have occurred from the North Fork Packs since the mid-1980s, the Spotted Bear wolf pack actually began as a hard release of four wolves in January of 1999. An additional 5 wolves were brought in and were soft released in December of 1999. Only a male wolf from the January release of wolves remained around the Spotted Bear area when the December release occurred. This male joined up with the December-released wolves and formed the Spotted Bear pack. Currently there are five wolves in this pack (US Fish and Wildlife Service et al 2004). Radio-telemetry locations of collared wolves indicate that at least a portion of the Ball Fire area is a part of the Spotted Bear pack's territory (Figure 3-23, previous map).

Prey Base Habitat

Ungulates are the primary prey species for wolves and wolf distribution is generally related to ungulate density. The analysis area contains year round habitat for white-tailed deer, mule deer, elk, and moose and is probably the primary reason why it is a part of the territory for the Spotted Bear wolf pack. However, other physical habitat attributes can also be used to predict wolf presence. Boyd-Heger (1997) found that wolves appeared to select for landscapes with relatively lower elevation, flatter terrain, and closer to water and roads at both smaller and larger scales in the central Rocky Mountains; these attributes exist in the analysis area.

Winter range for moose, elk, and mule deer occurs up the Sullivan Creek drainage and along the west and southwest facing slopes off of Kah Mountain; white-tailed deer winter along the South Fork Flathead River. Spring ranges generally occur where green-up of the vegetation happens after snow has melted off and takes place first on the southerly/westerly slopes and on the flatter areas. High quality summer range for elk and mule deer can be found in the higher elevations around Battery/Kah/Soldier Mountains and in the Bruce Ridge area; white-tailed deer will summer up to the mid-slope areas of the analysis area. Fall ranges occur throughout the area, the size of which decreases as winter snows force the issue and ungulates are compelled to go to lower elevations in order to survive winter.

The Ball Fire affected approximately 4,700 acres (15%) of the wolf analysis area. The numbers and observed landscape condition indicate that the Ball Fire either burned hot or at a low severity level. Most of the area (59%) burned at a high severity level meaning that over half of the burned area resulted in areas devoid of living vegetation, while 32% of the area burned at low severity, meaning that most of the vegetation that existed prior to the burn probably survived. The result of the Ball Fire for wolf prey is that for those areas that burned at a high severity level (Figure 3-4, in vegetation section), big game will probably be relatively scarce for the next few years until substantial vegetation re-growth occurs. Therefore, in areas that burned at a high severity level, wolf use should be expected to be relatively low for the next few years. Areas that burned at moderate and low vegetation severity levels probably will not see the same level of expected decline in ungulate/wolf use as the high severity burned areas; wolf use may be possible in these areas.

Potential Denning and Rendezvous Sites

The Spotted Bear pack has been known to den south and southwest of Spotted Bear, well outside of the wolf analysis area for this project. Nevertheless, based on criteria known to be important for wolf denning, the amount of potential denning habitat contained within the analysis area was quantified.

Approximately 4,900 acres (16%) is potential denning habitat according to the GIS wolf denning habitat coverage (Exhibit Rt-14). Of this, approximately 290 acres (6%) was burned by the Ball Fire; 63% (183 acres) of this burned at a high severity level, basically rendering it unusable for the time being; the remaining 107 acres of denning habitat mostly burned at a low severity level and these areas are probably still potentially suitable.

Habitat Security

The ability of wolves to avoid exposure/contact with humans probably relates mostly to 1) roads open to motorized use and 2) availability of vegetation cover for concealment purposes. The risk of mortality to wolves from human sources generally decreases when either the open road density is low and/or when there is a high amount of cover. The wolf analysis area contained approximately 34 miles of open or seasonally open roads, which equates to approximately 0.7 miles of open road per square mile. In terms of cover, 9% (~2,800 acres) of the wolf analysis area was burned at the high severity level, leaving no cover at all. However, the remainder of the area is dominated by vegetation suitable as cover, suggesting that there should be a relatively high level of habitat security.

Environmental Consequences

There are no Forest Plan standards for road density or vegetation cover related to habitat security for gray wolf habitat, therefore, the potential effects of these habitat variables relied on relevant research findings. The main Forest Plan standard for wolf conservation related to logging activities requires that no activities within one mile of known or suspected denning and/or initial rendezvous sites during denning season.

The following Effects Indicators were used to focus the gray wolf analysis and disclose relevant environmental effects:

- The effect on ungulate habitat.
- The change in habitat security.

Direct and Indirect Effects

Alternative A (No Action)

This alternative would maintain the status quo of the overall habitat condition and would mostly allow for natural recovery. Ungulate habitat carrying capacity would remain low in the short-term but would increase with time as forage and cover resources replenish. Since no roads open to motorized vehicles traverse thru the Ball Fire area, lack of vegetation cover is not an important issue as it relates to security.

Alternatives B, C, D, and E – Tree Salvage

Management activities associated with salvage logging in these alternatives that affect ungulate availability/survivability would indirectly affect wolves. Each of these alternatives would affect ungulate habitat as discussed for elk/mule deer and white-tailed deer habitat (refer to big game section of Chapter 3). The plan is for helicopter salvage logging of most of the Ball Fire area, however, there is potential that winter logging could occur. If so, winter logging would add considerable stress to wintering ungulates in the Sullivan Creek area and the disturbance associated with logging may cause potential wolf hunting use of the area during winter to either be curtailed or to occur during evenings or nights. However, because winter range habitat suitability has been temporarily diminished, this is expected to result in low ungulate carrying capacity. Therefore, this should also mean that wolf use of this part of the territory should also be expected to be low for the next few years.

The potential effect on ungulate calving/fawning habitat is expected to be minimal because of the relatively low density of animals suspected in the area. Therefore, any potential indirect effects on wolves due to salvage operations during the calving/fawning time period (mid-May to mid June) would be expected to be minimal.

Alternatives B, C, D, and E – Habitat Security

Within the wolf analysis area, each of the alternatives would improve habitat security for wolves thru reduced motorized access. At some level, each alternative would be beneficial for wolves in the long term because the risk of mortality would be reduced since wolves often use roads as travel corridors (Boyd-Heger 1997). The alternatives are all the same in how they affect habitat security except for Alternative E. In addition to what the other alternatives propose, alternative E would impose a spring (April 1 – July 1) seasonal restriction on the Quintonkon Road (#381) and this would be highly beneficial as this drainage has great potential for range expansion for wolves of the Spotted Bear Pack.

Cumulative Effects

Alternative A

No further management activities within the wolf analysis area would occur if this alternative is selected and the cumulative effects of past management activities (especially roads) would continue to affect wolves/wolf habitat. Given that the Spotted Bear wolf pack has been

successful at producing pups, it seems reasonable to conclude that the environmental baseline is currently suitable. The recent decision on the Spotted Beetle Resource Management Project (2000) to meet Amendment 19 objectives for the Kah Soldier and other subunits (not in this analysis) within the Spotted Bear wolf pack territory indicates that wolf habitat security will improve over the next five to ten years.

Determination

Considering the above discussion, including past habitat modifications, the existing relatively low ungulate carrying capacity on the Kah Mountain winter range (Sullivan Creek), and reasonably foreseeable actions, the determination is that implementation of this alternative would have “no effect” on the gray wolf or its habitat.

Alternatives B, C, D, and E

Past forest management activities within the analysis area have apparently not been detrimental to wolf recovery, as evidenced by continued occupation and pup production of the Spotted Bear wolf pack since 2000 (Exhibit Rt-15). Past extensive road building and timber harvesting may have initially had negative security effects on ungulate populations because of increased and more effective access by hunters. However, the conversion of mature forests into early succession habitats has generally provided increased levels of forage and higher population potential for ungulates. An increased emphasis on road closures over the last fifteen years has probably had a generally positive effect on ungulate survivability during hunting seasons.

The main wolf-habitat issues related to the absence of cover involve: the effect on ungulates (prey base) and habitat security (risk of mortality). Absence of cover can result in lowered habitat security and when this is coupled with roads open to motorized use in preferred habitats, risk of mortality increases, but if the prey base is low, wolf use of the area would also be expected to be low. Therefore, each of the alternatives could affect the prey base by removing standing trees that might otherwise be useful in concealing animals during the hunting season, thus making them more vulnerable to being harvested. However, for most of the hunting season, regulations for deer and elk only allow males (bucks and bulls) to be harvested and since they constitute a relatively small proportion of the population, the potential reduction in prey base may not be significant.

In terms of habitat security, past road building has generally been more negative than positive for wolves. However, each of the action alternatives would provide improvement when compared to the existing situation. Additionally, Alternative E, on the strength of a seasonal motorized access restriction in lower elevation gentle terrain habitat (Quintonkon Creek), would provide valuable habitat security during the spring.

Ongoing and foreseeable management actions as discussed in the grizzly bear cumulative effects for no action, are not expected to have adverse cumulative effects on the Spotted Bear wolf pack.

Determination

The above discussion considered, including past habitat modifications, the existing relatively low ungulate carrying capacity on the Kah Mountain winter range, and reasonably foreseeable actions, the determination is that the implementation of any of the action alternatives is “may effect-not likely to adversely affect” the gray wolf or its habitat.

REGULATORY FRAMEWORK AND CONSISTENCY

The gray wolf is listed as threatened in Montana, and the Northern Rocky Mountain Wolf Recovery Plan (1987) provides recovery goals and objectives for the gray wolf. The project area lies within gray wolf Management Zone 1 as designated by the Flathead Forest Plan and is contained within the Northwest Montana Wolf Recovery Area. It contains habitat components, particularly ungulate populations necessary to support wolves. The Flathead Forest Plan provides management direction and standards to guide project planning.

Bald Eagle (Threatened)_____

Analysis Area

The area used for direct/indirect effects analysis was the Clayton Island Bald Eagle Nest Territory as determined by McClelland (1992). For cumulative effects, the shoreline on the west side of Hungry Horse Reservoir from the dam southward to the upper end of the reservoir was used.

Information Sources

Data used in the analysis were from existing information sources. Critical habitat was never designated for bald eagles. A larger-scale assessment was conducted to address population viability concerns (Exhibit Rg-5).

Affected Environment

The bald eagle nesting territory on Hungry Horse Reservoir has been known since 1975 (McClelland 1992). However, the nest location in 1975 was in Knieff Creek, which is approximately three miles southeast of Clayton Island. In 1976, this nest fell from the tree and the eagles did not rebuild at that site and in 1979 two juvenile bald eagles were observed on an osprey nest located on Clayton Island (McClelland 1992). Since 1979, bald eagle nesting on the Hungry Horse Reservoir has occurred on Clayton Island and annual monitoring data show average nest productivity at approximately 0.8 fledged per nesting season.

McClelland (1992) determined that average nest productivity during her study (1985-1988) was 0.5 young per year.

Clayton Island was formed when the Hungry Horse dam construction was completed in 1953. No tree clearing on the island occurred and the nest was located in the center of a mixed conifer old growth forest stand (McClelland 1992). Clayton Island is approximately one half mile east of the west shore of Hungry Horse reservoir, between Clayton and Goldie Creek outlets. The Blackfoot Fire burned to the shoreline in the Goldie and Clayton Creek areas but did not spot onto Clayton Island. Therefore, the nest stand on the island was unaffected by the fire.

McClelland (1992) determined the primary use, key foraging and nest site areas for the Clayton Island nesting territory. Three nest site areas were identified and included: 1) Clayton Island; 2) an unnamed small island to the south of Clayton Island; 3) the west reservoir shoreline adjacent to Goldie Creek 9 (see Figure 3-24). Nest site areas were identified based on: must provide suitable nest trees; a potential alternate nest site; day and night roost areas near the nest; refuge from disturbance; and access to key foraging areas. The Blackfoot Fire burned a portion of the Goldie Creek nest site (GCNS) area.

The GCNS area is approximately 79 acres in size and 42% (33 acres) burned at high severity and 37% (29 acres) burned at low severity; 22% (17 acres) was unburned. Key foraging areas in the Clayton Creek key foraging habitat areas burned at a high severity level on the south facing slope and moderate severity level on the more northerly slope into Clayton Creek inlet.

A bald eagle nest territory management plan for the Hungry Horse reservoir was completed by McClelland (1989) and contains recommendations for avoiding adverse impacts on bald eagle and habitat.

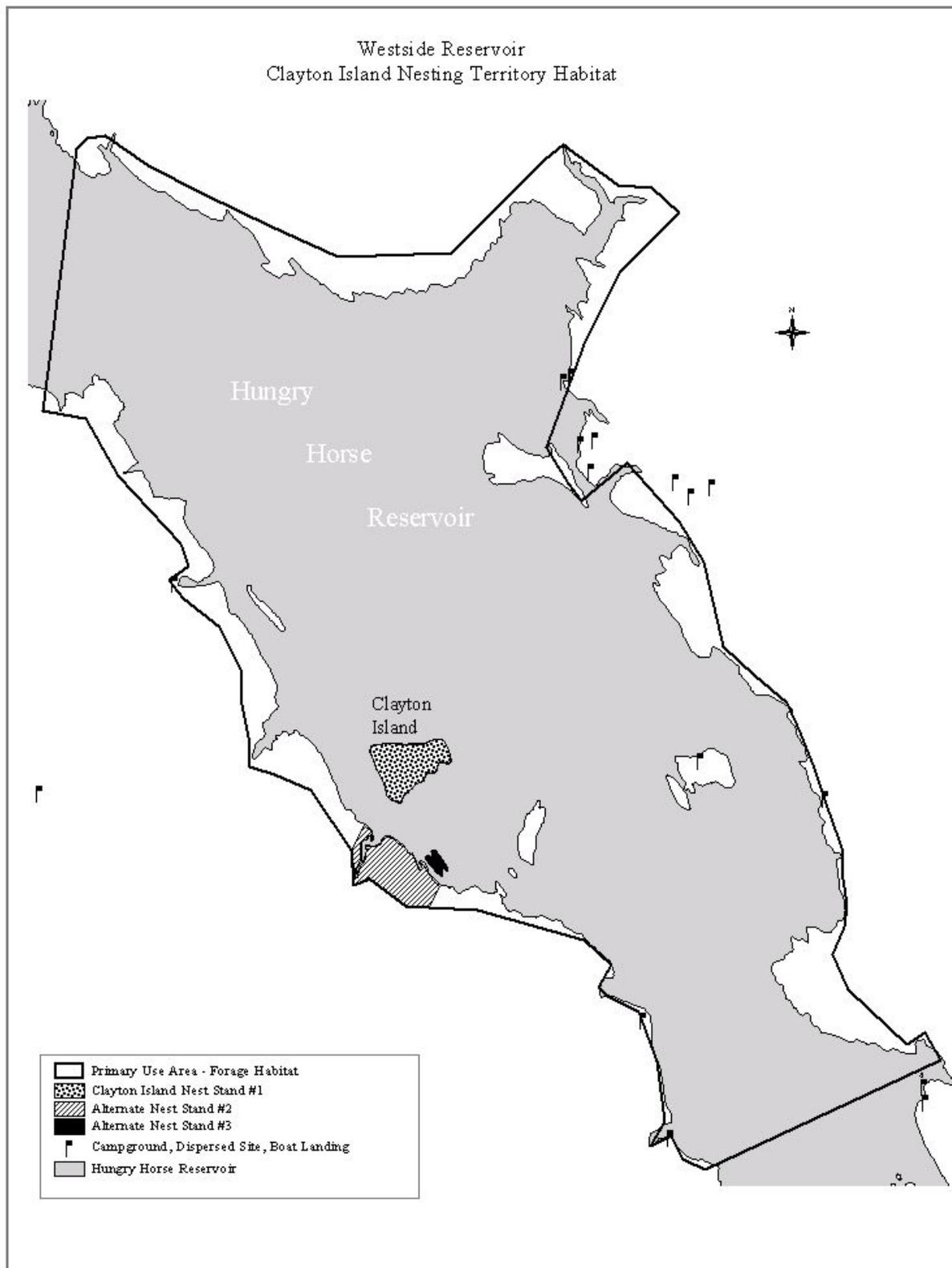
During the fall, migrating eagles from the Canada utilize the reservoir on route southward toward wintering areas. Spawning runs of mountain whitefish and big game gut piles seem to be local food sources that eagles utilize during their stay. Most observations of eagles during the fall are along the Hungry Horse Reservoir shoreline and in the uplands at hunter kill sites.

Environmental Consequences

The following effects indicators were used to focus the bald eagle analysis and disclose relevant environmental effects:

- The amount of habitat alteration within the nest site area.
- The probability that management activity would disturb nesting or fall migrating bald eagles and cause disruption of natural behavior.
- Adherence to Clayton Island Bald Eagle Management Plan nest territory recommendations.

Figure 3-24. Bald Eagle Nesting Territory Habitat



Direct and Indirect Effects

Alternative A (No Action)

This alternative allows natural processes to dominate the habitat recovery process within the Clayton Island bald eagle nest territory. Habitat changes would occur primarily in two ways: 1) those areas within 200 feet of the Westside Road (895) will probably experience intense firewood cutting over the next several years; therefore the area within the primary use area (between the reservoir and road 895) will probably have a large-snag deficit within 200 feet of road 895; and 2) by trees that were either killed or weakened by the BLFC naturally falling to the forest floor. These fallen trees would obviously no longer be available for eagles as perch or potential nest trees. This may produce a snag-deficit in the affected area for a period until forest regeneration begins to produce suitable snags, probably in about 200 years.

Since no management activities related to tree salvaging would occur along the Hungry Horse Reservoir, disturbance would not be an issue to nesting or migrating bald eagles. Nest site, primary use, and home range areas would be unaffected. There would be no deviations from management recommendations of the nest management plan.

Alternative B, C, D, and E

Habitat Alteration

Each of these alternatives would treat four different sites (#205, #208H, #210H, #210) within the Clayton Island nest territory. Two of the sites (210 and 210H) are within what McClelland (1992) identified as the GCNS area (see Affected Environment) and the other two are within the forage area. It is questionable whether the two sites in the GCNS could still function as a nest site area, given the criteria (McClelland 1992). Both sites were classified as old growth stands prior to being burnt, indicating that they could function as roosting, foraging or nesting habitat. However, both sites burned at a high severity level and probably are no longer in a condition that meets the nest site area criteria. However, these two sites still have potential for bald eagle use in the form of perching, and due to the proximity of both these sites to an open road, it seems an unlikely place for eagles to nest. Considering these things, the immediate direct effect within both of these tree-salvaging sites would be the removal of large-diameter trees on approximately 17 acres that potentially could be used as either perching or a remote possibility as nest trees by bald eagles.

The other two sites (205 & 208H) in the nest territory are within the primary use area, which contains key foraging areas. If both sites were salvage-logged then both sites would be rendered unsuitable as perch sites for foraging. However, as with the GCNS area, considerable portions of each of these proposed salvage sites are within 200 feet of road #895 meaning that firewood cutting will likely remove most large diameter snags.

Disturbance

The Forest Plan standard requires that disturbance-causing activities such as logging and road construction within one-half mile of an active bald eagle nest during the nesting period (February 1 – August 1) is prohibited. However, the site-specific nest territory management

plan (McClelland 1989) recommended that timber projects take place in the primary use area between 15 October and 15 January to allow eagles access to needed resources during the breeding season. Because the nest territory management plan is site-specific and based on actual observations from research of the Clayton Island eagles from 1985-1988, use of the nest territory recommendations should take precedence over the more general Forest Plan standard. Therefore, two potential scenarios for analysis of effects exist: 1) salvage logging activities occur on the four sites (#205, #208H, #210H, #210) between 15 January and 15 October; or 2) salvage logging activities occur on the four sites between 15 October and 15 January.

If salvage activities occur under scenario 1, it could cause eagle avoidance of key foraging areas, and the assumption would be that the Clayton Island bald eagles could be adversely affected. If scenario 2 occurred, the assumption is that activities would occur during a non-critical period and is not likely to adversely affect the eagles.

It is possible that helicopter operations associated with salvage sites west of road #895, between Clayton and Goldie Creeks, may cause minor impacts to eagles within sight of the operation. In terms of fall migrating eagles, any logging activities during October 15 and December 1 between road #895 and the reservoir could cause disturbance and displacement.

Adherence to Nest Territory Recommendations

McClelland (1989; 1992) provided management recommendations (Exhibit Rt-16) for the bald eagle nest territory at Hungry Horse Reservoir, located on Clayton Island. These recommendations are intended to maintain the viability of the nest territory and address vegetation management, recreation influences, and potential hazards to bald eagles. Since the proposed action and alternatives deal with vegetation management, only those recommendations need to be considered for effects analysis. Further, vegetation related recommendations deal with: retention of mature and old growth vegetation along inlets; along the shoreline of the Reservoir; and to provide buffers for roost and perch sites. Since the focus of the proposed project is for merchantable trees that were killed by the BLFC fires, recommendations dealing with retention of mature and old growth buffers are not applicable because live trees will not be salvaged. Therefore, only recommendations that deal with snags are addressed below.

Alternatives B, D and E each proposes to salvage merchantable trees that were killed by the BLFC fires in the primary use area of the nest territory. Treatment sites #205, #208H, #210H and #210, with a combined total of approximately 39 acres, are in the primary use area. Therefore, these treatment sites would become local non-use sites because perch trees will be removed. This would not adhere to the recommendation for retention of mature and old growth snags. Whether this should be considered an adverse effect on eagles is dependent on whether there is a shortage of snags in the area. In this context, there will not be a shortage of snags because each of the salvage sites within the primary use area borders a major tributary that burned and will not be salvaged: #205 is adjacent to Clayton Creek outlet and the other 3 sites are adjacent to Goldie Creek outlet. In addition, history has shown that snags within 200 feet of open roads with good potential for firewood, will eventually be harvested by firewood cutters even if prohibited/signed. Considering that approximately 50% of sites #208, #210 and #210H are within 200 feet of the year round open Westside Road (895) there is a high

probability that many of the snags will be removed as firewood. Therefore, the salvaging of each of the sites within the primary use area is not likely to adversely affect the long-term viability of the Clayton Island nest territory. However, retention of non-commercial snags within the treatment sites may provide perch options for eagles.

Alternative C

This alternative would have similar effects on bald eagle habitat (primary use area) as discussed for the no action alternative, which means either firewood cutting will harvest some/maybe most of the snags or natural processes would prevail. Otherwise, as with the action alternatives, there is potential for helicopter operations associated with upland salvage logging may impact/disturb eagles within eyesight of the operation. All things considered, this alternative would have minimal impacts on the nest territory.

Cumulative Effects

Alternative A and C

The Clayton Island bald eagle nest has been known since 1979 and a site-specific nest territory management plan was completed in 1989 (McClelland 1989). Since the completion of the nest territory plan all projects have been screened to insure compliance with management recommendations contained in the plan. Therefore, it seems reasonable to conclude that since past (since 1989), current (e.g. morel mushroom harvesting) and foreseeable (BMP road work) projects will comply with nest plan recommendations that implementation of this alternative will not cumulatively adversely affect bald eagles.

Alternatives B, D, and E

For the primary use area, as with Alternatives A and C, adhering to the recommendations of the nest management plan is not expected to result in adverse effects on the Clayton Island eagles or their habitat, assuming timing of activities is adhered to. However, the cumulative effects analysis area includes habitat between road #895 and the reservoir, from the Hungry Horse Dam to the South Fork Flathead River proper. Within this area, the only other area of tree salvaging that may affect eagles is between the dam and Doris Creek, outside of the Clayton Island nest territory. Ten treatment sites are of concern from a cumulative effects perspective: #1H, #1R, #3H, #3R, #21H, #20, #4R, #26H, #27, and #28. These sites if treated after October 15 will likely result in disturbance and or displacement of eagles that use the reservoir shoreline during the fall migration. Therefore, in order to avoid adversely affecting eagles during fall, salvage harvesting of these sites should occur prior to October 15 or after December 1.

Since this project would be neutral in terms of adding to or taking away from the current recreational uses humans make of the reservoir, the action alternatives would not be expected to be cumulatively additive to this potential impact on bald eagles that use the reservoir, if the recommended time period for salvage harvesting is adhered to.

Reasonably foreseeable actions are proposed to occur in upland sites and as such have little potential for impacting reservoir habitat, including bald eagles or their nesting habitat. Therefore, no adverse cumulative effects are expected from such things as mushroom picking, trail maintenance/reconstruction, and BMP roadwork. Considering the estimated potential direct and cumulative effects from any of the alternatives analyzed, it is unlikely that any kind of a threshold would be crossed that would produce adverse effects on bald eagles or their continued use of the Clayton Island nest or fall use of the reservoir shoreline, therefore, the implementation of either of these alternative would result in a determination of “may effect - not likely to adversely affect” the bald eagle or its habitat.

REGULATORY FRAMEWORK

The bald eagle is listed as threatened in Montana and the Pacific Bald Eagle Recovery Plan (1986) provides recovery goals and objectives. Critical habitat was never designated for bald eagles. The Montana Bald Eagle Management Plan (1994) provides management guidelines to help conserve the species and its habitat. Critical habitat was never designated for bald eagles. The Forest Plan prohibits disturbance-causing activities such as road construction and logging within one half mile of active bald eagle nests during the nesting period from February 1 – August 1. The Flathead Forest Plan (page II-36) provides additional management direction and standards to guide project planning.

REGULATORY CONSISTENCY

The action alternatives are consistent with Forest Plan standards and guides, and with the Endangered Species Act with regard to bald eagles.

Canada Lynx (Threatened)

Analysis Area

Previously established analysis units, in accordance with the Lynx Conservation and Assessment Strategy (Ruediger et al 2000), were used to assess the effects of proposed actions on lynx and lynx habitat. These units approximate the size of an area used by an individual lynx and encompass both lynx habitat and areas classified as non-habitat. Seven Lynx analysis units (LAUs) were affected by the BLFC, which included these individually named fires: Beta, Doe, Wounded Buck, Blackfoot Lake, and Ball fires of 2003. Because the proposed action would occur in only six LAUs, the six with proposed salvage management activities made up the analysis areas for determining direct, indirect and cumulative effects to lynx (see Figures 3-25 and 3-26). A larger-scale assessment was conducted to address population viability concerns (Exhibit Rg-5).

Information Sources

Data used in the analysis were from existing resource information sources, research literature, field reconnaissance, and post-fire aerial photos. ArcView geographical information system was used for quantification of habitat components.

Affected Environment

In Montana, west of the Continental Divide, lynx habitat is contained in subalpine fir habitat types, generally between 4000 and 7000 feet. Cover types can be mixed species composition (subalpine fir, lodgepole pine, Douglas-fir, grand fir, western larch and hardwoods) as well as pure lodgepole stands (Ruediger et al. 2000). Primary lynx habitat in the Rocky Mountains and on the Flathead National Forest includes lodgepole pine, subalpine fir, and Engelmann spruce forest types. Secondary vegetation interspersed within subalpine forests; including cool, moist Douglas-fir, grand fir, western larch, and aspen, may also contribute to lynx habitat. Moist Douglas-fir types are considered secondary habitat that can provide red squirrels, an alternate prey species for lynx during periods when snowshoe hare (primary lynx prey species) densities are low.

Lynx prefer to move through continuous live forest and frequently use forested saddles, ridges, and riparian areas (*ibid*) during travels. They prefer to forage in areas that support their primary prey, the snowshoe hare. Vegetation characteristics that do so include a dense, multi-layered understory that maximizes cover and browse at both the ground level and at varying snow depths throughout the winter (crown cover within the lower 15 feet in order to provide cover and food for hares to 6 feet high at maximum snow depths).

Habitat Conditions in the Project Area

Lynx habitat was classified/ modeled within each of the LAUs to show both pre and post West Side Fire conditions (Table 3-104). Habitat modeling used vegetation burn severity classes (Exhibits Rt-9 and Rt-17) to make determinations on potential change to habitat component function. The high and moderate burn severity classes were used to indicate changes to habitat component function between pre and post fire condition, while the low severity burn severity class produced no changed habitat component function.

Classifying habitat into categories of function is a way of understanding the potential options that lynx may have in an LAU to carry out life cycle requisites (e.g. hunting/foraging; denning). However, lynx are wide ranging carnivores and, for example, lynx may hunt/forage in habitat categories other than what has been classified as foraging habitat. Therefore, it is important to understand that the habitat classifications shown in Table 3-104 are estimates of availability of what is currently understood to be the basic functions of certain kinds of forest successional stages and that lynx may not necessarily limit their use of these classified habitats to the labeled habitat component function. For example, the category of denning may also be used as hunting/foraging habitat (see Figures 3-25 and 3-26 for locations of classified habitat components).

Table 3-104. Pre and post fire habitat components in six LAUs affected by the BLFC fires of 2003.

LAU	Pre and Post Fire Habitat Component Classifications ¹ Within LAUs (%)								
	Denning		Forage		Travel		Unsuitable		Non-Habitat
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
Doris Creek	79	63	11	9	4	3	5	24	1
Wildcat Mountain	53	43	10	9	19	17	6	30	13
Clayton Anna	60	27	15	10	5	3	11	51	10
Quintonkon Crk	54	52	19	17	11	11	3	7	14
Sullivan Creek	54	46	8	7	27	25	4	16	7
Kah Soldier	57	52	15	15	14	14	7	12	7

¹ Denning – mature and old growth forest stands; forage = sapling sized regenerating forest stands (>15 ft); Travel = immature pole-sized forest stands and hardwood/shrub mixed stands; unsuitable = recently harvested or burned areas that are less than sapling size, but will become suitable in 10-15 years; Non-habitat = water, barren ground, and or drier south facing sites containing dry forest types or not capable of growing forests.

Foraging Habitat/Prey Base

The BLFC fires reduced the amount of forest vegetation that provides necessary cover for lynx hunting/foraging and increased the amount of unsuitable habitat. This situation has set the stage for a significant increase in foraging habitat over the next 10-30 years where there will be large proportions of hunting/foraging habitat within each of the LAUs in the analysis area. An average of 13% of the LAUs currently provides hunting/foraging habitat for lynx.

Figure 3-25. Canada Lynx Potential Habitat Components (North Half)

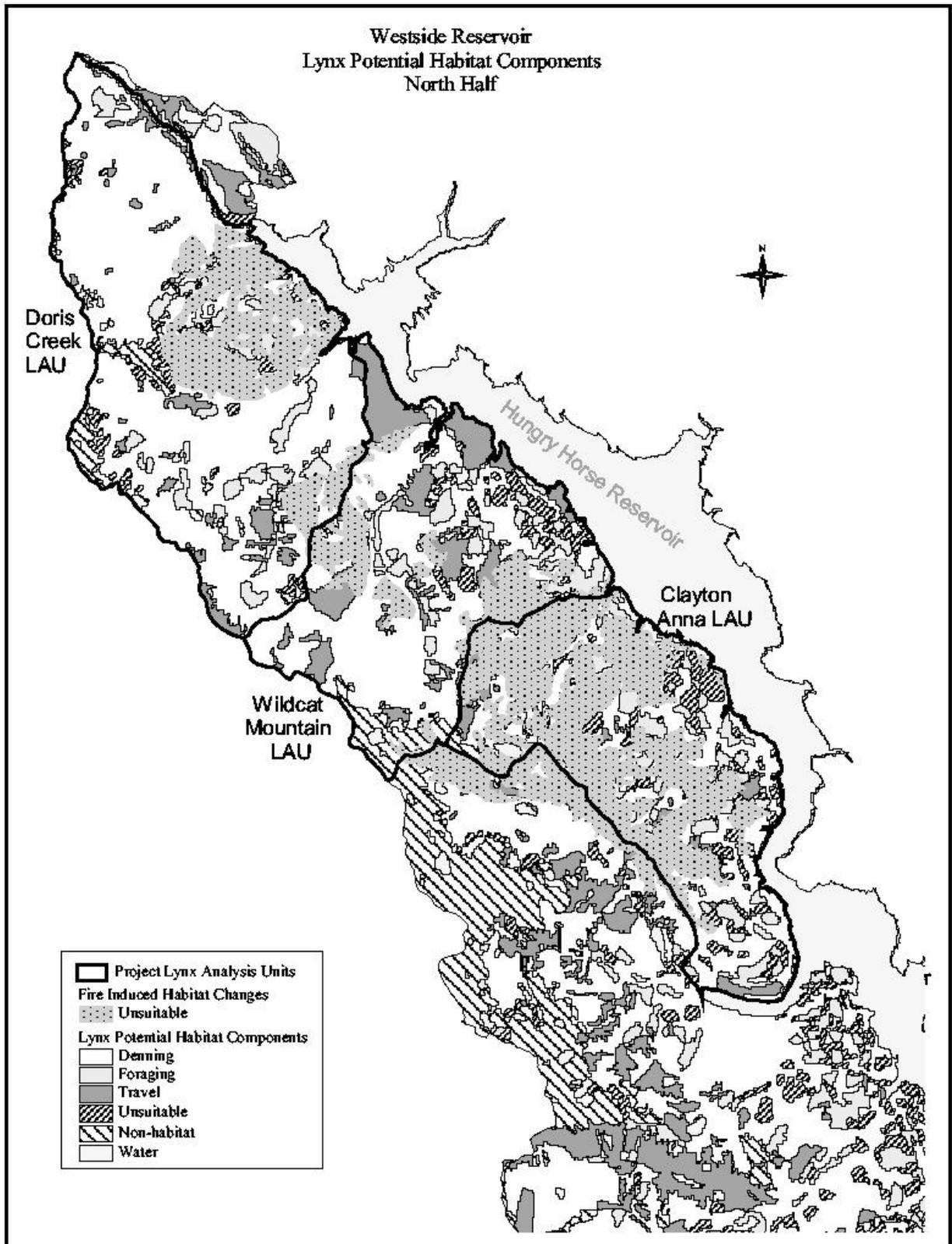
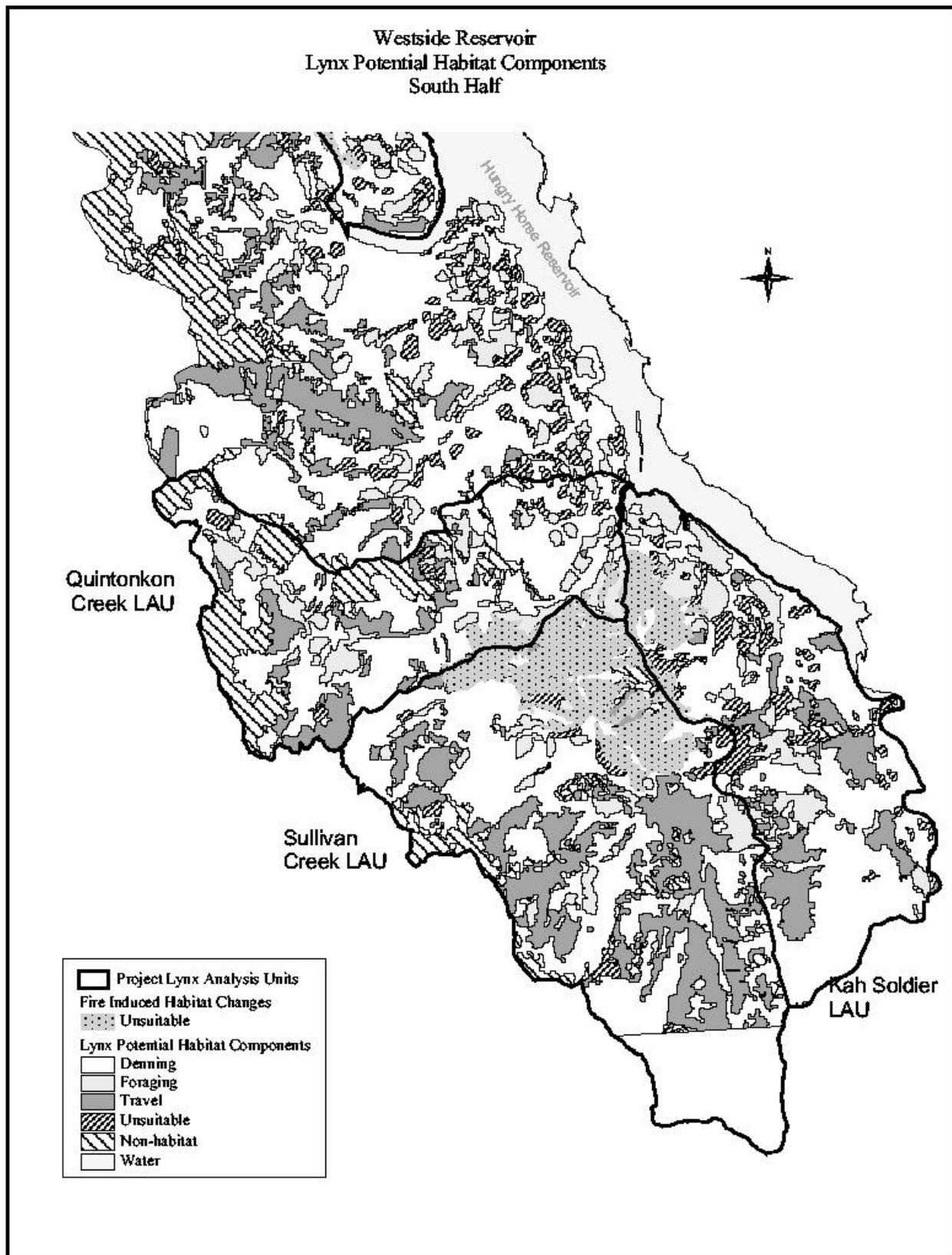


Figure 3-26. Canada Lynx Potential Habitat Components (South Half)



Denning Habitat

It was assumed that all mature and old growth forest stands that burned at high or moderate burn severity levels, would no longer function as potential denning habitat. However, in some cases such as spruce and subalpine fir forest stands, low burn severity may actually mean high tree severity. Therefore, the proportions of denning habitat contained in each of the LAUs (Table X), could actually be different if the same mapping exercise was conducted next year, when heat stress-related mortality expresses itself in tree species such as spruce and subalpine fir. The amount of denning habitat, therefore, may actually be lower than displayed in Table 3-104, however, it was the best reflection of the situation with the available data.

Potential denning habitat is highly associated with large amounts of coarse woody debris (Squires and Laurion 2000). For those areas that burned at high and moderate severity levels, it is likely that most of the down coarse woody debris were either consumed or at least charred to the point of not providing the protective cover/security that lynx seek out for denning. There may be some charred, large diameter trees still left on the ground in some areas, but estimating how much and where such concentrations are located has not been done.

An average of 47% of the LAUs currently provides potential denning habitat for lynx. The Clayton Anna LAU was most affected by the BLFC fires as evidenced by a drop from 60% to 27% of the area in denning habitat. This is above the suggested minimum amount of denning habitat for an LAU (Ruediger et al 2000). It appears that there are still adequate amounts of potential denning habitat within each of the LAUs.

Travel and Unsuitable Habitat

Travel habitat components are those vegetation conditions, usually immature pole-sized forest stands, within an LAU that lynx probably utilize to access denning and/or foraging habitat. Travel habitat generally does not contain the characteristics necessary for foraging or denning habitat. However, travel habitat may eventually become denning habitat as the forest stand matures and forest floor accumulations of coarse woody debris occurs. Unsuitable habitat conditions are generally avoided by lynx because these are areas of recent burns or vegetation management and are currently devoid of sufficient vegetation conditions to support prey (snowshoe hares).

The BLFC fires had limited effects on travel habitat but greatly increased the amount of unsuitable habitat in most of the affected LAUs (Table 3-104). This situation means that in the next 10-15 years, assuming no additional large fire events, forage habitat recruitment will occur in relatively large proportions.

Environmental Consequences

The following Effects Indicators were used to focus the lynx analysis and disclose relevant environmental effects:

- Effects on potential lynx habitat components.

- Potential disturbance and/or displacement of lynx during salvage logging operations.

Direct and Indirect Effects

Alternative A (No Action)

Under this alternative there would be no harvest and burned areas would recover naturally over time into combinations of forage/hunting, travel, and denning habitat as vegetation establishes and burned dead trees fall to create patches of cover across the burned area. It is expected that this alternative would provide a high level of potential den habitat structural components (i.e. downed logs). As tree seedlings and shrubs recover across the burned areas, snowshoe hares should begin to colonize the area creating foraging habitat for lynx within 10-15 years. This habitat phase would be expected to decline when trees and shrubs grow out of reach of hares, or until another disturbance occurs.

Under this alternative additional insect-killed trees are likely in the future but the long-term effects on this lynx are not likely to be negative because additional dead trees would supply denning habitat material and increase conifer seedling and shrub habitat favored by snowshoe hare, a primary lynx prey species. All applicable lynx conservation standards would be met alternative; there would be no direct or indirect effects to lynx under this alternative.

Alternatives B, C, D and E

The focus of the proposed salvage project under each of the alternatives is to remove fire-killed trees that presumably are surplus to ecosystem function needs. By definition, areas targeted for salvage fall under the category of unsuitable because of lack of vegetation cover that provides prey habitat, denning or travel/movement cover. Fire-killed trees are not a prerequisite for suitable forage or travel habitat; therefore, the proposed salvage is unlikely to affect the future status or potential of these two habitat categories. However, there is a relationship between dead standing trees and potential denning habitat, in that, lynx dens are associated with coarse wood debris concentrations (Ruediger et al 2000). Therefore, future potential lynx denning habitat may be affected by salvage logging.

The proposed salvage (under any alternative) of fire-killed trees can directly affect lynx habitat primarily in one major way: by reducing future potential denning habitat structural components, i.e. down wood concentrations. The worst-case scenario for effecting future denning habitat is if the salvage logging was done in a clearcut manner, where no standing dead trees were left within harvested sites. However, this is not the case and each alternative has a specific snag prescription (see section on Snags/deadwood) associated with it. This means there will be a proportion of each proposed salvage site that will contain standing dead trees or patches of dead trees that will eventually fall to the forest floor and potentially be available as denning habitat. Given the relatively large size of the BLFC area (approximately 31,600 acres within fire perimeters) and the maximum amount of salvage harvest proposed (approximately 5,300 acres) demonstrates that a relatively large proportion of the fire areas will have no salvage harvesting, including important wildlife areas such as riparian habitats. Therefore, yes, there will be less potential denning habitat within individual salvage logged sites to provide suitable denning habitat in the future because dead-tree densities will have

been reduced, however, in the bigger picture it does not appear that denning habitat will be a limiting factor for the lynx population in the analysis area given the amount and locations of unharvested areas.

There is potential for salvage logging operations to affect lynx, however, to what degree is unknown. If one assumes that lynx living in the analysis area will be in habitats where they can either den, raise their kittens, and/or forage/hunt then the areas where salvage logging will occur (currently unsuitable habitat) will not be the areas where one would expect lynx to be. However, if one considers the amount of noise that helicopters generate, it is possible that lynx occupying suitable habitat in close proximity to salvage sites could be affected. This is an area of uncertainty since studies have not been conducted to specifically deal with the question. Because a relatively high proportion (>70%) of salvage will be conducted by helicopters, the assumption being made here is that there probably will be some level of disturbance effects on lynx from helicopter operations. Therefore, it is possible, that lynx can be affected (displaced from habitat) by the salvage logging operations.

Some of the proposed salvage sites have a requirement for winter logging and many others have the option of being winter logged. In order for this to happen means snow will have to be plowed. As discussed above, the sites where snowplowing and salvaging will occur are not the areas that one would expect lynx to be; therefore, it is possible but unlikely that lynx will be affected by winter logging operations. Indirectly, however, snowplowing can facilitate movement of competitors (e.g. coyote) for snowshoe hares. But, again, locations of salvage sites are not where one would expect lynx to be (i.e. currently unsuitable burned habitat).

Cumulative Effects – No Action

No further management of the burned forestlands within the lynx analysis area would occur if this alternative is selected and the cumulative effects of past management activities would continue to affect lynx/lynx habitat. The recent decision on the Spotted Beetle Resource Management Project (2000) to meet Amendment 19 objectives for the Kah Soldier and other grizzly bear subunits (not in this analysis) within the lynx analysis area indicates that lynx habitat security will improve over the next five to ten years. Natural processes and firewood cutting (along open-to-motorized use roads) would be the major change agents in lynx habitat.

Determination

Considering the above discussion, including past habitat modifications, current and ongoing activities (see grizzly bear section), and reasonably foreseeable actions, the determination is that implementation of this alternative would result in “no effect” on the Canada lynx or its habitat.

Cumulative Effects – Action Alternatives

There are no private or State lands within the analysis area, therefore, there would be no cumulative effects on Canada lynx/habitat from non-Forest Service administered projects/programs. Obviously, however, the sum total of all past forest management actions has produced the existing habitat conditions for lynx.

The construction of the Hungry Horse dam and inundation of over 23,000 acres of land did three detrimental things unfavorable for lynx: 1) fragmented habitat continuity; 2) it permanently removed usable habitat; and 3) the resulting reservoir created a movement barrier between the Swan and Flathead Mountain Ranges for the length of the reservoir, approximately 30 miles.

Past timber harvesting and road construction has significantly contributed to altering habitat conditions for lynx over the last five decades. How these two major habitat modifications over the last half-century have affected lynx is not clear. One tradeoff from past timber harvesting is that suitable habitat was converted into an unsuitable/unusable condition. However, because past fire suppression of wildland fires substantially reduced the presence of early successional, regenerating forest vegetation, favorable for snowshoe hares, timber harvest tended to be the surrogate for creating landscape level forest age class diversity. Therefore, similar to wildland fires, past timber harvesting has had both detrimental (converts suitable habitat to unsuitable condition) and beneficial (after 10-15 years provides snowshoe hare habitat) effects on lynx habitat. However, up until the Canada lynx was listed in April 2000, the silvicultural practice of thinning reforested timber harvest units at about the age (10-15 years) when they became suitable for snowshoe hares was routine in the analysis area. Apparently this was counter productive for snowshoe hares because current understanding seems to indicate that densely stocked early successional forests are optimum snowshoe hare foraging habitat.

Road construction over the last 50 years has created extensive motorized access routes into lynx habitat. Though there is much uncertainty as to the sum total of effects this has had on lynx/habitat, it has been postulated that this facilitation of travel could help explain possible lynx reductions in the west via human-facilitated competition from coyotes and other generalist predators (Buskirk et al 1999). In addition, roads in lynx habitat have facilitated past trapping of lynx that may have been a gradual contributor to reductions in lynx populations.

Descriptions of other past, current/ongoing and foreseeable actions can be reviewed in the cumulative effects discussion for the no action alternative for grizzly bear. From a cumulative effects perspective, the alternatives would do a couple of things to lynx/habitat: 1) they continue the past practice of removing standing trees that otherwise could function in the future as denning habitat structure; and 2) they deal with access into lynx habitat, except in a positive way by decommissioning roads. As for the continuation of removing standing trees that could function as denning habitat, it has been determined (above) that the combination of a relatively large proportion of the landscape burned by the BLFC that will undergo natural processes with no harvesting and the snag prescription (see section on Snags) that would be applied to each treatment site, it is expected there will be an abundance of coarse woody debris across the landscapes of the analysis area, and denning habitat is not expected to be a

limiting factor on the local lynx population. In terms of access, cumulatively it appears that increasing motorized access density is a thing of the past and because Amendment 19 requires more unroaded land and lower open motorized access densities, lynx habitat integrity is expected to improve. Perhaps the most beneficial aspect of each of the alternatives is the amount of decommissioned roads that would occur under each of the alternatives. In this context, alternatives C and D would be more beneficial than either B or E; however, each alternative would decommission at least 49 miles of road, improving habitat integrity.

Determination

The following were considered: 1) past incremental detrimental impacts in Canada lynx habitat; and 2) the beneficial and detrimental aspects of each of the action alternatives. Given these considerations, the selection of any of the action alternatives would result in a determination of “may affect-not likely to adversely affect” the Canada lynx or its habitat.

REGULATORY FRAMEWORK AND CONSISTENCY

The proposal meets conservation measures contained in the Lynx Conservation and Assessment Strategy (LCAS; Ruediger et al. 2000), and Flathead Forest Plan management direction and standards.

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