VI. WILDLIFE

Introduction

The Firefighter Project includes management activities that would create open forest stand conditions to achieve several purposes of the project: managing forest stands to achieve a mix of closed canopied forests and early seral open forest stands in Forest Plan designated elk winter range, and increasing forest tree species diversity and achieving the productive forest growing potential of selected sites. Improving upon the existing amount of grizzly bear/wildlife habitat security is also an important purpose of the Firefighter Project. These kinds of forest resource management activities will be considered on how they can/may affect wildlife/habitat in the project area.

The Firefighter Project would occur within the South Fork Flathead River drainage (South Fork); however, the particular location of the project is adjacent to the dammed portion of the South Fork (Hungry Horse Dam/Reservoir). Unlike other similar-sized drainages in Montana, the South Fork is a relatively unique drainage because it is almost entirely within public land ownership (Table 3-15). Approximately 82% of the South Fork is either designated wilderness (Bob Marshall and Great Bear) or in an Inventoried Roadless Areas status. As a result, the South Fork has functioned as an important "source area" for wildlife, even in the context of allowed hunting/trapping.

The South Fork provides a collection of wildlife habitats not usually observed in other drainages in the lower United States. It provides habitat necessary for the recovery of Threatened and Endangered species (grizzly bear and Canada lynx), for all of the ungulates, most of the avian, small mammal, and amphibian species known to occur on the Flathead National Forest (Forest). Examples include:

- Year-round range for white-tailed deer, mule deer, elk, and moose.
- Year-round habitat for grizzly bear, black bear, gray wolf, coyote, cougar, lynx, bobcat, and wolverine.
- Existing older-aged forest habitats provide habitat for species such as fisher, marten, and other forest interior habitat inhabitants, such as northern goshawk.
- Nesting habitat for bald eagles.
- A wide variety of forest cover types and successional stages that include dry Douglas-fir with some ponderosa pine; western larch dominated conifer mixes; lodgepole pine; spruce/subalpine fir; and whitebark pine. Some of these forest types provide specific habitat values for some species. For example, flammulated owls are associated with Douglas-fir/ponderosa pine, and pileated woodpeckers are associated with mature/older aged western larch forests containing snags >20 inches in diameter.
- Harlequin ducks are known to occur and reproduce within several tributaries of the South Fork.
- Rich riverine habitats that provide for aquatic-oriented mammals and birds such as river otter, mink, beaver, great-blue heron, belted kingfisher, common merganser, spotted sandpiper, and a host of migratory songbirds that utilize the riparian cottonwood, willow, dogwood and grass/forb complexes.

Considering the above and data in Table 3-15, it should be apparent that the South Fork contains high wildlife diversity due to the productive array of habitats present. The Wilderness portion of the South Fork comprises a significant portion of the drainage where hunting and/or trapping of wildlife is allowed, but contains no motorized routes, and natural processes (fire, wind, floods, insects/disease, etc.) are the primary habitat change agents. Therefore, as compared to the roaded portion of the South Fork, Wilderness and Inventoried Roadless Areas play a significant role in the overall viability of wildlife populations.

Table 3-15. A Profile of the South Fork Drainage[1]

Area/Feature	Acres or Miles	%
Entire South Fork Drainage		
Size of Drainage (watershed)	1,072,572 acres	100%
Proportion of Drainage in Private Land	186 acres	<1%
Proportion of Drainage in Designated Wilderness	693,620 acres	65%
Proportion of Drainage in Inventoried Roadless Areas	187,336 acres	17%
Proportion of Drainage in Wilderness and/or Inventoried Roadless Areas	880,956 acres	82%
Miles of Roads[2]	803 miles	--
Miles of Trails	951 miles	--
Recent Fires (1984-2003)	169,451	16%
South Fork Drainage not in Wilderness and/or Roadless		
Size of Drainage Not in Wilderness and/or Roadless (NWR)	191,616 acres	100%
Proportion of Drainage NWR in Reservoir	23,601 acres	12%
Proportion of Drainage NWR Suitable for Timber Management[3]	162,785 acres	85%
Proportion of Drainage NWR with Past Major Timber Harvest	64,223 acres	39%
Proportion of Drainage NWR that is MA13[4]	19,932 acres	10%
Proportion of Drainage NWR that is MA13A[4]	8,900 acres	5%

[1]Includes the hydrological perimeter of the entire South Fork Flathead River drainage.
[2]Includes all roads (closed and open); the total is probably less than shown as many miles of roads have been decommissioned in the last 6 years.
[3]Includes Forest Plan designated Management Areas (MA) suitable for timber management; e.g. 7, 13, 15 & 16.
[4]MA 13 = elk and mule deer winter range emphasis where forage-cover ratios are managed thru timber management. MA 13A = elk and mule deer winter range where a variety of management tools are encouraged; not suitable for timber management.

Wildlife habitats in designated wilderness and inventoried roadless portions of the South Fork have been influenced by humans primarily by fire suppression. Other natural processes that shape habitats (insect and disease outbreaks, windstorm events producing blow-down, flooding, avalanches, etc.) have not been affected by humans to any great degree. However, in the roaded and managed portions of the South Fork, humans have more significantly influenced some of these natural processes and have had a direct role in the status, condition, and trajectory of wildlife habitats. For example, the construction of the Hungry Horse Dam/Reservoir in late 1940s/early 1950s eliminated over 23,000 acres of terrestrial wildlife habitats. A less drastic, and probably the most common form of direct human influence of wildlife habitats in the South Fork, has been forest tree harvesting activities that have been occurring over the last 60 years. Perhaps the largest threat to wildlife populations resulting from human uses of South Fork forests has been the reduction of habitat security. Increased human access into the relatively wild

landscapes of the South Fork has allowed for more efficient killing of desirable wildlife species. Consequently, some wildlife populations were depleted and a few were threatened with extinction and/or extirpation. Therefore, assuming habitats are present in sufficient amounts and distribution over time and space, perhaps the biggest issue facing wildlife populations in the South Fork, especially large mammals, is habitat security.

Over the last decade, ongoing motorized access management to improve grizzly bear habitat security has been occurring on the roaded portions of the South Fork; this has been the result of implementation of Amendment 19 (A19) to the Flathead National Forest Land and Resource Management Plan (Forest Plan) (USDA Forest Service 1995b). A19 prescribed a set of motorized access density standards to be applied to areas across the Flathead National Forest's portion of the recovery area and are known as "grizzly bear subunits." Subunits were delineated to: 1) approximate the size of an average adult-sized female grizzly bear home range size (~48 mi^2), 2) incorporate year-round seasonal habitats, and 3) be used as the area for applying/implementing A19 motorized access density standards. The net effect of implementing A19 to date has been improved habitat security for grizzly bears specifically; however, many other wildlife species such as elk, moose, and wolf have also benefited from decreased motorized access in the South Fork. Therefore, it seems reasonable to conclude that because the South Fork consists of 82% Wilderness and Inventoried Roadless Area (Table 3-15) and because there is ongoing implementation of A19 (reduced motorized access) within some of its subunits, that wildlife security is at a relatively high level at this scale of analysis.

Elk habitat and habitat for other species that may be affected by the proposed Firefighter Project will be discussed below after the screening process for which of the Flathead National Forest's Management Indicator Species will be brought forward into the effects analysis.

Information Sources

Site-specific wildlife habitat information for proposed management actions was collected from on-site visits during the fall season of 2007; previous site visits/familiarity in preparation of the Firefighter Mountain Winter Range Project Environmental Assessment (USDA Forest Service 1990a) and a paper by Vore et al. (2007) also aided in understanding the ecology of the Firefighter Mountain area. For most proposed treatment sites, field visits were made and information collected as to habitat values and suitability for various wildlife species. Existing stand examination data and aerial photo interpretations were also used for analysis. Arcview/ArcMap geographical information systems (GIS) were used to quantify various habitat characteristics and for habitat modeling.

In recent years, two Flathead National Forest land management projects within the South Fork were approved and mostly implemented. These projects include the West Side Reservoir Post-Fire Project (2004) and the Paint Emery Resource Management Project (1999). These projects each had varying levels of habitat analyses involving different portions of the South Fork. With the exception of the Paint Emery Project, no overlap of project analysis areas occurred between the projects and the proposed Firefighter Project. Information generated from the above named projects' environmental analyses of existing and proposed future conditions were used when deemed suitable and relevant to the proposed implementation of the Firefighter Project.

Wildlife Species/Habitat Selection Process for Effects Analysis

The Flathead Forest Plan lists as Management Indicator Species (MIS) all Threatened, Endangered, and Sensitive species, elk, mule deer, and white-tailed deer. However, not all wildlife MIS that occupy habitats within the South Fork would be affected by the Proposed Action (or an alternative). Therefore, to facilitate the identification of the MIS that would/could be impacted by the proposed Firefighter Project, a hierarchical synopsis of historical and current MIS distributions at the sub-basin, sub-watershed, and project area scales was determined (Table 3-16). Information in Table 3-16 was then used to help determine: a) which wildlife MIS contained habitat within the action area, and b) if an MIS and/or habitat were present, whether there was any potential for effects to the species or habitat from the proposed Firefighter Project. Therefore, two criteria were used for determining which MIS to eliminate from further analyses: 1) habitat is absent in the project analysis area; and 2) existing potentially suitable habitat for the species within the project area would not be affected by the project (Table 3-17).

The remaining MIS were then carried forward into the analysis of effects from the proposed implementation of the Firefighter Project. Indicators of effects, specific to each species, were used to determine potential effects on the species and/or habitat.

Temporal Bounds

The effects from proposed Firefighter Project management activities on wildlife are generally time-limited. For road management actions, wildlife are most benefited when they realize/detect that motorized use on roads has ceased (decommissioned/bermed roads), or are significantly curtailed (gated roads); this generally is believed to take several seasons/years to occur and lasts indefinitely with no additional wildlife response. For the timber harvest portion of the project, the greatest impacts occur when tree harvesting/habitat change takes place and then lessens through time as affected wildlife adjust to the new forest conditions. As the new treated forest conditions age through time (~40-50 years) and approach a similar structure as existed prior to treatment, effects on wildlife are essentially non-existent.

Table 3-16. Management Indicator Species (MIS) and/or Habitat Presence and Distribution in the Firefighter Project Area

Species	MIS Status[1]	Historical Presence[2]			Current Presence[2]			Wildlife/Habitat Presence Potential Related to Project Area
		SFSB	SW	PA	SFSB	SW	PA	
Grizzly Bear	T	Y	Y	Y	Y	Y	Y	Bears can be present throughout the project area during the non-denning season (April thru November); during denning, bears are in the higher elevations, generally outside the action area.
Canada Lynx	T	Y	Y	Y	Y	Y	Y	The project area contains lynx habitat.
Gray Wolf	E	Y	Y	Y	Y	Y	P	A wolf pack was detected and confirmed in the Firefighter area in 2007.
Bald Eagle	S	Y	S	S	Y	S	S	A portion of the Clayton Island bald eagle nest territory occurs along the southern shoreline of Firefighter Mountain.
Peregrine Falcon	S	Y	Unl	N	Unk	Unl	N	No known nesting sites, current or historical, are known to exist in the project area.
Flammulated Owl	S	P	Unk	Unl	P	Unk	Unl-N	Drier mixes of older aged Douglas-fir and ponderosa pine forest types do not occur within the project area.
Harlequin Duck	S	Y	Y	N	Y	Unk	N	Potential habitat exists in Emery Creek but not in or near proposed treatment sites.
Common Loon	S	Y	N	N	Y	N	N	No suitable lakes for breeding occur within the project area.
Townsend's Big-Eared Bat	S	P	Unk	Unl	P	Unk	Unl	No known caves that can function as hibernacula or maternity roosts are known in the project area.
Black-Backed Woodpecker	S	Y	P	P	Y	P	P	Historical fires and periodic, occasional beetle outbreaks would provide a forage base to support a woodpecker population.
Wolverine	S	Y	Y	P	Y	Y	P	This wide-ranging species likely occasionally visits or travels thru the project area in search of food; however, relatively little time is spent in lower elevation habitats.
Fisher	S	Y	P	P	Y	P	Unk	Mature and old-growth forests, especially when adjacent to streams are potential denning habitat conditions; potential feeding habitats (forests 80-160 years old) exist within proposed treatment sites.
Northern Leopard Frog	S	Unk	Unl	Unl	Unk	Unl	Unl	This species occurs in/near water in low elevation, non-forest habitats. Closest reports are about 20 miles to the northwest; riparian areas are protected habitats.
Boreal Toad	S	Y	P	P	Y	P	P	Breeding habitat occurs in lakes, ponds, slow streams, and ephemeral ditches.
Northern Bog Lemming	S	Unk	Unl	Unl	Unk	Unl	Unl	There is no known habitat for this species within the project area; known required habitat is protected.

Species	MIS ST[1]	Historic Presence[2]			Current Presence[2]			Wildlife/Habitat Presence Potential Related to Project Area
		SFSB	SW	PA	SFSB	SW	PA	
White-Tailed Deer	MIS	Y	Y	Y	Y	Y	Y	Year-round use occurs – not raised as an issue.
Elk and Mule Deer	MIS	Y	S	S	Y	S	S	Year-round habitats exist; one purpose of project is to improve elk habitat.
Old Growth Species	MIS	Y	Y	Y	Y	Y	N	No old growth forest habitat is proposed for treatment.
Snags & Down Wood	MIS	Y	Y	Y	Y	Y	Y	Large diameter snags exist in proposed treatment sites.

[1]**T**=Federally Threatened; **E**= Federally Endangered; **S**=Forest Service Region 1 listed as Sensitive; **MIS**= Other habitat management indicator

[2]**SFSB**=South Fork Flathead River Sub-basin; **SW**=Sub-watersheds (Emery, Dudley, Riverside, Canyon, Felix and Paint Creeks); **PA**=Firefighter Project Area vegetation treatment sites; **Y**=Yes; **N**=No; **P**=Probable (based on known habitat requirements); **Unl**=Unlikely (based on known habitat requirements); **Unk**=Unknown; **S**= Seasonal.

Table 3-17. Rationale for MIS/Habitat Exclusion from Further Effects Analysis

Species	Rationale
Bald Eagle	The larger foraging area of the Clayton Island nest territory overlaps with one unit (#56); it is approximately 3 miles from the nest. No logging activities on this unit would occur until after July 1, when potential eaglets are getting ready to fledge. The Firefighter Project is not expected to have "direct, indirect or cumulative effects/impacts" on eagles/habitat such that it would contribute to a federal re-listing.
Peregrine Falcon	No rocky outcrops with suitable ledges that could function as nesting habitat occurs in or near the Firefighter Project area, therefore, this project would have "no direct, indirect or cumulative effects/impacts" on the peregrine falcon or its habitat.
Flammulated Owl	Nesting occurs in older, open, and relatively dry mixed-species forests; these sites nearly always support ponderosa pine. Special habitat features used by this owl include large-diameter trees with relatively large cavities. Forest stands that are dry enough to meet habitat requirements do not occur within the project area; therefore, this project would have "no direct, indirect or cumulative effects/impacts" on the flammulated owl or its habitat.
Harlequin Duck	Emery Creek is the only suitable stream within the project area; however, even if other these streams contained harlequins, normal protections afforded fish bearing streams (INFISH riparian buffers) would be more than adequate to protect harlequins, therefore, this project would have "no direct, indirect or cumulative effects/impacts" on harlequin ducks or their habitat.
Common Loon	Occasionally, loons are heard on the Hungry Horse Reservoir, but there is no known nesting that occurs on it; it functions more as a staging area. No treatment sites are expected to affect common loon habitat, therefore, this project would have "no direct, indirect or cumulative effects/impacts" on common loons or their habitat.
Townsend's Big-Eared Bat	Caves, tree cavities, rock outcrops, and some human structures (buildings/mines) may provide sites for roosting, communal nurseries, or winter hibernation (Reel et al. 1989, Tuttle and Taylor 1994). These bats forage on insects high in the forest canopy near wet meadows. This project would have little to no impact on bat habitat; therefore, it would have "no direct, indirect or cumulative effects/impacts" on Townsend's big-eared bats or their habitat.
Black-Backed Woodpecker	Stand replacement type fires are beneficial for this species as population increases have been documented in post-fire forested habitats. This project would not determine whether forest fires occur in the project area, therefore, "no direct, indirect or cumulative effects/impacts" on the black-backed woodpecker or its habitat are expected.
Wolverine	Wolverines spend most of their time in higher elevation cirque basins and occasionally visit lower elevation ungulate winter ranges for potential carrion. However, this project is not expected to adversely affect any habitat components important to wolverine; therefore, this project would have "no direct, indirect or cumulative effects/impacts" effect/impact on wolverine or their habitat.
Northern Leopard Frog	This frog reproduces in slow-moving or standing water, typically supporting dense sedges or cattails, and feed in damp meadows and wet forests nearby. Leopard frogs do not use drier upland habitat. No project activities would occur in or near potentially suitable habitat; therefore this project would have "no direct, indirect or cumulative effects/impacts" on leopard frogs or their habitat.
Boreal Toad	This toad spends much of its time near water, especially during the breeding season. However, this toad will occasionally traverse terrestrial habitats to reach other breeding and/or feeding sites. It is when they are terrestrial that implementation of this project may actually trample one or more individuals, however, primary breeding riparian habitat would not be affected. Because breeding habitat would be protected, this project "may impact individuals, but is not likely to contribute to a trend towards federal listing" and it was deemed unnecessary to forward this species/habitat for further effects analysis.

Species	Rationale
Northern Bog Lemming	The bog lemming is a rare, short-tailed rodent, found in wet meadows containing standing water and extensive coverage of sedges and species such as sphagnum moss. Bog lemmings do not use drier upland habitat. No suitable habitat occurs within the proposed project area; therefore, this project would have "no direct, indirect or cumulative effects/impacts" on bog lemmings or their habitat.
Old Growth Associates	Species associated with older-aged/old-growth forest habitats are generally managed according to Amendment 21. However, no old growth forests would be considered for treatment, therefore, this project would have "no direct, indirect or cumulative effects/impacts" on old-growth associates or their habitat.
White-Tailed Deer	This resilient forest dwelling ungulate is expected to benefit from proposed habitat treatments targeted toward enhancing habitat for elk (and mule deer); therefore, this species will not be carried forward into the analysis.
Snags	Forest Plan standard related to snags and down wood would be met and is a Design Criterion (Chapter 2)

Considering information in Tables 3-16 and 3-17, the following species warrant an analysis of effects from the proposed Firefighter Project: grizzly bear, Canada lynx, gray wolf, fisher, and elk/mule deer.

While the wildlife section of this environmental assessment does not contain a separate section titled Management Indicator Species, each species that may occur within the project area, or for which habitat exists in the project area, is addressed (Table 3-16 and 3-17).

Threatened and Endangered Wildlife

Grizzly Bear (Threatened)

Ursus arctos horribilis

Analysis Area/Information Sources

Two grizzly bear subunits were used for the direct and indirect effects analysis, and the combined areas of both subunits were used for cumulative effects analysis. These analysis areas were deemed appropriate because: a) proposed project activities would occur entirely within the two subunits; b) each subunit contains year round grizzly bear habitat components making it possible to determine potential effects on both denning and non-denning seasonal habitats, and c) the subunit is the standardized area for which the Amendment 19 (A19) (see discussion below) motorized access strategy is applied.

The grizzly bear subunits used in this analysis included the Emery Firefighter and Riverside Paint subunits (Map 1-1). Of the 31 subunits contained in the South Fork, only 13 are not in Wilderness, they had an average size of approximately 47 mi^2. In addition to the above spatial scales of analyses, an assessment at the Forest and Northern Continental Divide Grizzly Bear Ecosystem (NCDE) area scales examined conditions within 73 grizzly bear subunits totaling 2,452,410 acres, and considered the Forest within the context of the larger NCDE Recovery Area (Project File).

Data used for the description and analysis of effects were from existing resource information sources, research literature, aerial photography, and field reconnaissance (Project File). The Arcview GIS was used for quantification of various habitat characteristics.

Affected Environment/Existing Condition

Subunits

All land in both subunits is National Forest System land and most of each subunit is designated as Management Situation 1, which is habitat needed for the survival and recovery of the species. Important habitat elements that tend to influence long-term habitat effectiveness within each of the subunits are displayed in a profile contained in Table 3-18.

A common habitat cover type within each of the subunits is the presence of avalanche chutes. Mace and Waller (1997) throughout their multi-year investigation into the ecology of grizzly bears in the nearby Swan Mountain range consistently found that avalanche chutes were preferred physiographic locations where bears were found in all seasons. Not only do they believe that avalanche chutes provide a variety of vegetal foods for grizzly bears, but also that visual security is often high due to the frequent presence of dense stands of alder. Both subunits contain many avalanche chutes along the westerly slopes of the Flathead Mountain range; these avalanche chutes are included in existing security core habitat.

Two of the more influential habitat issues that affect the well-being of grizzly bears occupying the analysis area, and which are common to both of the subunits, include: 1) the absence of private lands, and 2) the level of habitat security available to grizzly bears.

Habitat Security

Motorized access was recognized by the Forest Plan in 1986 as a major factor affecting grizzly bear habitat security and was confirmed by research conducted in the nearby Swan Mountains of Montana (Mace and Waller 1997). 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. Mace and Waller (1997) recommended that until effective management programs (for reducing human-caused grizzly bear mortalities) are developed for private lands, federal lands should be considered invaluable source areas (where more bears survive than die) and managed to reduce man-caused mortality. The authors suggested that this could be accomplished by establishing high-security areas that include seasonal habitats and where vehicle access is restricted. Programs that control human access to grizzly bear habitat are necessary for recovery efforts (US Fish and Wildlife Service 1993) and will become even more important as human populations grow (Mace and Waller 1997). Research supports the premise that forest roads facilitate human access into grizzly bear habitat, which directly or indirectly increases the risk of mortality to grizzly bear (US Fish and Wildlife Service 2005). It seems clear that roads affect grizzly bear habitat and grizzly bear distribution on the landscape.

A19 (USDA Forest Service 1995b) of the Flathead Forest Plan is a comprehensive programmatic strategy that addresses grizzly bear habitat security. The U.S. Fish and Wildlife Service

(USFWS) in their Biological Opinion (BO) for A19 (US Fish and Wildlife Service 1995) put forth Terms and Conditions with which the Flathead National Forest was required to comply. The requirements were to gradually achieve motorized access objectives across the Forest in grizzly bear habitat. The terms and conditions established five- and ten-year numerical motorized access density objectives. The Forest found itself unable to meet the timelines set by the USFWS BO and, therefore, re-initiated formal consultation in December 2004 and a new BO was issued in October 2005 on a revised implementation schedule for A19 that provided new Terms and Conditions. The USFWS reaffirmed its biological judgment in the BO (US Fish and Wildlife Service 2005) that "harm" of grizzly bears is likely to occur in the following conditions: when the open motorized access density (OMAD) exceeds 19% of a subunit; when the total motorized access density (TMAD) exceeds 19% of a subunit; when security core is less than 68% of a subunit. Table 2-4 in Chapter 2 displays the Amendment 19 numbers for existing, on-the-ground situation, a fully implemented Paint Emery decision, and the Firefighter Project Alternatives 2 and 3.

The Paint Emery Decision

In May of 1999, the Flathead National Forest Supervisor signed a Decision Notice for the Paint Emery Resource Management Project that allowed a wide variety of management activities to occur on the Hungry Horse Ranger District, within the same two subunits that are being affected by the Firefighter Project. Among the activities approved was the implementation of motorized access management restrictions designed to improve grizzly bear habitat security. Specifically, "All short [5-year] and long [10-year] term access density and security core objectives will be met by my decision except for the security core 10-year objectives in the Firefighter-Emery grizzly bear subunit" (USDA Forest Service 1999c). Currently, not all access management decisions have been fully implemented and neither of the subunits fully meets all A19 objectives (Table 2-4). A habitat profile of each subunit is displayed in Table 3-18; each subunit is further discussed separately.

Table 3-18. Existing Conditions within Grizzly Bear Subunits Potentially Affected by the Firefighter Project

Habitat Element	Subunits	
	Emery Firefighter	Riverside Paint
Gross Subunit Size	46,462 acres	32,152 acres
Net Subunit Size[1]	43,136 acres	27,594 acres
Proportion in Forest Service Land	100%	100%
Proportion in Private Land	0%	0%
Proportion in State Land	0%	0%
Amount of Subunit in Wilderness	10,076 acres / 23%	10,170 acres / 37%
Amount of Subunit in Inventoried Roadless Status	7,237 acres / 17%	6,717 acres / 24%
Management Situation 1	40,112 acres /93%	27,543 acres / >99%
Management Situation 2	3,024 acres / 7%	0 / 0
Management Situation 3	0 / 0	51 acres / <1%
Potential Denning Habitat	5,006 acres / 12%	5,299 acres / 19%
Potential Spring Range (< 4,900 ft)	28,496 acres/ 66%	12,164 acres/ 44%

Habitat Element	Subunits	
	Emery Firefighter	**Riverside Paint**
Past Timber Harvest	9,169 acres/ 21%	7,413 acres/ 27%
Proportion of Subunit in Older Forest Habitat[2]	47%	53%
Proportion of Subunit in Young/Middle Aged Forest[2]	24%	7%
Proportion of Subunit in Early Seral[2]	23%	32%
Proportion of Subunit in Bare Ground/Rock	6%	8%
Amendment 19[3] Existing On-the-Ground Condition (Standard is 19%-19%-68%)	20-30-38	18-31-60
Amendment 19 if Existing Decisions were Implemented	20-18-51	18-15-71
Amendment 19 Security Core Habitat (>2,500 acres)	16,581 acres	16,386 acres
Total of Security Patches <2,500 acres	6,397 acres	399 acres
Miles of Roads[4]	110 miles	68 miles
Miles of Open Road During Non-denning Season	29 miles	19 miles
Number of Recreation Sites[5]	11 sites	14 sites
Minimum Known Grizzly Bear Mortalities (1980-2006)[6]	3 mortalities	3 mortalities

[1]The reservoir portion of subunits was subtracted from gross acreage size; net subunit size was used for all calculations.
[2]Data are from GIS Structure coverage and past harvests: older forest=>150 yrs; young forest= >50-150 yrs; early seral=<50 yrs.
[3]From 2007 A19 Annual Monitoring Report; % open roads-% total roads-% security core habitat (USDA Forest Service 2004a).
[4]Includes open, gated and bermed roads; does not include roads categorized as 'historic'.
[5]Includes sites such as trailheads and dispersed/developed campgrounds.
[6]Human caused mortalities: illegal (2), legal (harvest=1; management removal=2) and unknown (1).

Population Status

The number or range of numbers, of grizzly bears that occupy the two-subunit analysis areas is not known. Unless a specific research effort is made designed to answer the population question, as was done recently by the Northern Divide Grizzly Bear Project for the NCDE (but as yet unpublished), the concept of "best guess" occurs. Therefore, the best guess for the number of grizzly bears that are residents of the area covered by this analysis (i.e. the two subunits) is 5-10 bears (see Project File for background sources).

Recreation Infrastructure

Similar to the effect of private land and/or motorized access routes in grizzly bear habitat, recreation sites often are places of avoidance for grizzly bears due to human presence. However, food/garbage and/or other human associated bear attractants can attract bears to these sites. Inadequately stored food/other attractants can allow bears attracted to a recreation site by the odors to try to get some sort of a reward. The risk that a bear takes when it comes close to humans or attempts to gain human foods is the possibility of mortality. However, if/when food storage requirements are followed, the possibility of grizzly bears receiving a reward for the risk of getting close to humans is greatly diminished. Generally, the greater the number of recreation sites the higher the probability that a bear would get attracted to one of these sites and the habituation/food conditioning process begins or continues. The number of recreation sites within each subunit is found in Table 3-18.

Subunit Descriptions

Emery Firefighter Subunit

This subunit is relatively large (Table 3-18) and contains a wide variety of habitats. It is bordered by the crest of the Flathead Mountain Range on the north/northeast and the Hungry Horse Reservoir on the south/southwest (Map 1-1). As is typical of most subunits on the Forest, this subunit is dominated by forest vegetation in different age classes, primarily as a result of past timber harvesting and fires. Historically, forest age/size class diversity was produced primarily by the natural process of fire; however, more recently (within the last 50 years) timber harvesting has been the more consistent process of change on forests in this subunit.

This subunit contains year round habitat components for grizzly bear. Potential spring range habitat was modeled as areas below 4,900 feet in elevation; this elevation zone was termed the low temperate zone by Mace and Waller (1997) and comprises approximately 66% of this subunit (Table 3-18). This amount of low elevation habitat suggests that this subunit appears to be highly valuable as spring range for grizzly bears. Additionally, approximately 12% of the subunit provides opportunities for grizzly bear denning; these areas are scattered in the upper elevations (> 5,900 feet) bordering the crest of the Great Bear Wilderness. In terms of vegetation diversity, because this subunit contains an elevational range of nearly 5,000 feet (3,600-8,400 feet), a wide variety of vegetation and forest types exist including: low elevation riparian areas, sidehill shrub fields, dry ponderosa pine/Douglas-fir, larch, sub-alpine fir/spruce, whitebark pine dominated forests, and alpine environments.

Many of the tributaries whose headwaters are in the Great Bear Wilderness portion of the subunit contain an abundance of avalanche chutes, a favored grizzly bear habitat feature. Mace and Waller (1997) found that avalanche chutes were used (by grizzly bears) in higher proportions than available during all seasons. The authors emphasized that avalanche chutes are an important habitat component, even in proximity to roads. In this subunit, all avalanche chutes are within existing grizzly bear security core habitat.

Habitat Security

When compared to A19 standards, the existing on-the-ground condition of this subunit is that it provides a relatively high level of open motorized access density habitat security and a relatively low amount of security core habitat for grizzly bears (Table 3-18). However, a May 1999 signed Decision Notice for the Paint Emery Resource Management Project would eventually bring the subunit's A19 percentages to 20-19-51 for OMAD-TMAD-Security Core, respectively. Therefore, while the existing habitat security condition is low, a current signed decision waits for funding to bring this subunit closer to meeting A19 standards and grizzly bear habitat security would be improved at that time.

Between 1980 and 2006, there were three recorded mortalities in this subunit: 1 was a subadult female that was legally harvested; 1 was an adult male that was illegally killed for parts; and 1 subadult female with a radio collar was found dead, with cause of death undetermined.

Recreation Sites

This subunit contains 11 inventoried sites where people camp, park (trailhead), or engage in other recreational activities. All of these sites are relatively primitive, dispersed sites and no developed campgrounds exist. Proper storage of food/garbage and other potential grizzly bear attractants is required of all forest users, however, it is unknown what level of adherence occurs at most of the dispersed sites in this subunit.

Riverside Paint Subunit

This average sized subunit, like Emery Firefighter, contains a wide variety of habitats. It borders the Emery Firefighter subunit on the north/northwest, is flanked on the east by the crest of the Flathead Mountain Range, and on the west by the Hungry Horse Reservoir (Map 1-1). Existing vegetation includes a variety of different forest age classes, primarily as a result of past timber harvesting (Table 3-18). However, recent prescribed burns from the Paint Emery Decision have also contributed to diversification of the landscape's vegetation diversity.

Similar to Emery Firefighter, this subunit also contains year round habitat components for grizzly bear. Low-elevation habitat comprises approximately 44% of this subunit (Table 3-18), suggesting a high amount of potential spring range for grizzly bears. Additionally, approximately 19% of the subunit provides opportunities for grizzly bear denning; these areas are scattered in the upper elevations (> 5,900 feet), bordering the crest of the Great Bear Wilderness. In terms of vegetation diversity, because this subunit contains an elevational range of nearly 5,000 feet (3,600-8,500 feet), a wide variety of vegetation and forest types exist, similar to that described for Emery Firefighter.

An abundance of avalanche chutes also exists in this subunit. As in the Emery Firefighter subunit, avalanche chutes are nestled within the Great Bear Wilderness/security core habitat portion of the subunit.

Habitat Security

When compared to A19 motorized access standards, the on-the-ground existing condition of this subunit is that it provides a moderate to high level of open motorized access density habitat security and a relatively high amount of security core habitat for grizzly bears (Table 3-18). However, a May 1999 signed Decision Notice for the Paint Emery Resource Management Project would eventually bring this subunit into compliance with A19 standards. Funding for road decommissioning is the limiting factor that prevents this subunit from providing grizzly bears the necessary level of habitat security.

Between 1980 and 2006, there have been three recorded mortalities in this subunit: 2 were yearlings at Murray Bay campground (these were management removals due to food conditioning); the other was an adult female that was illegally killed by a hunter on a "mistaken identity" reason.

Recreation Sites

This subunit contains 14 inventoried sites where people either camp or engage in other recreational activities, such as picnicking or boating. Half of these sites are dispersed camping sites and are relatively primitive. The other sites are developed to varying degrees and one (Elk Island Campground) requires boat access. Proper storage of food/garbage and other potential grizzly bear attractants is required of all Forest users, however, it is unknown what level of adherence occurs at most of the dispersed sites in this subunit, especially on Elk Island.

Environmental Consequences

In Chapter 2, there were no significant issues related to the grizzly bear. However, because the grizzly bear is a federally listed wildlife species, the potential effects of the proposed action on habitat must be assessed. Therefore, effects indicators used for assessing effects on grizzly bear included the following:

- Denning habitat
- Food production and cover
- Displacement/security
- Habitat security as related to Amendment 19

Alternative 1 (No-Action Alternative)

Direct and Indirect Effects

This alternative would have no effects on denning habitat, food production and cover, displacement/security or and habitat security as related to A19. This alternative would leave the Emery Firefighter and Riverside Paint subunits in their current condition (see Table 3-18). The environmental baseline in the Emery Firefighter subunit would continue to "harm" the grizzly bear, as per the Biological Opinion (US Fish and Wildlife Service 2005). The 1999 Paint Emery decision authorized reducing motorized access in the Riverside Paint subunit to levels that fully meet A19 standards; therefore, its baseline is in compliance. However, since there is no pre-set timetable that requires achieving A19 standards, it is not known when the on-the-ground road densities and security core would actually meet the minimum requirements of A19. The selection of this alternative would result in a 'may effect – not likely to adversely affect' biological assessment determination for the grizzly bear.

Cumulative Effects

Since there were no direct/indirect effects, there would be no cumulative effects on grizzly bear or its habitat.

Alternatives 2 & 3 (Action Alternatives)

Direct and Indirect Effects Common to Each Action Alternative

All tree harvesting and sapling-thinning activities would occur outside of the post-denning spring season (April 1 to June 30). Therefore, project implementation disturbance activities and

potential displacement of grizzly bears would occur during summer or autumn for a minimum of 2-3 years.

According to a recent USFWS Biological Opinion (2005),"Forest activities shall not result in an increase in OMAD (open motorized access density), TMAD (total motorized access density), or decrease in security core habitat without additional consultation." Informal consultation has occurred (Project File) and because both alternatives would increase both OMAD and TMAD, the allowed level of "incidental take" by the 2005 BO would be exceeded. There would be no mitigation to avoid increases in OMAD or TMAD by closing currently open roads during the proposed use of restricted roads/temporary roads/historic road templates. Therefore, in terms of effects on existing habitat security, based on current A19 conditions (i.e. % change in OMAD or TMAD), there would be an increase due to project implementation within at least one of the subunits in this analysis.

Road decommissioning would likely occur after tree harvesting activities and although the purpose is to improve habitat security, the activity itself would likely extend the amount of time that grizzly bears would be subject to disturbance and potential displacement activities. This could extend the disturbance period to four consecutive years if decommissioning occurred the year after tree and post-tree harvest activities.

Implementation of road BMPs is a connected action to this project that may occur during the spring season on open roads and may have displacement effects on bears that frequent open roadside habitats; other BMPs on restricted roads would occur after July 1 to avoid more substantive displacement effects on grizzly bears.

Denning Habitat

Potential denning habitat exists within the two subunits (Table 3-18) and bears do den in the area. However, because the relatively high elevations that grizzly bears den in (Mace and Waller 1997) and because there is no overlap between potential denning habitat and proposed land management actions, the Firefighter Project's two Action Alternatives are not likely to have any effects on grizzly bear denning habitat.

Food Production/Cover

Most sites selected for tree harvest activities contain relatively low levels of spring forage (grasses/forbs) and low to moderate levels of summer/early fall food (i.e. berry producers such as huckleberry and buffaloberry). The reason for this is the condition of proposed forested treatment sites (see Vegetation section for a thorough discussion). Therefore, as is the case when a stand-replacing wildland fire goes through forested grizzly bear habitat, the vegetation that was in the stand would be eliminated and an early successional plant community would begin to occupy the site. Typically, in good grizzly habitat, fire is generally thought of as good for habitat diversity. In a similar context, there would be an immediate net reduction in potential summer/fall bear foods because it would be likely that, through the process of tree harvesting and broadcast burning/piling-burning activities, some unknown proportion of existing berry-producing shrubs would either be set back and not produce for several years, or would be

sufficiently injured by machinery used for tree harvesting that it would kill them. However, as happens with wild fires, early seral vegetation would dominate each of the fully treated sites and this would provide potential spring forage in the form of grasses and forbs. This would likely increase spring forage production from an existing "low" to at least a moderate level. Considering the importance of spring range (i.e. bears just coming out of dens and needing forage), this perspective would suggest that while summer foods may be somewhat reduced, the Firefighter Project's two Action Alternatives would increase the amount of the equally, if not more, important potential spring range forage. Alternatives 2 and 3 differ in both the amount and types of vegetation treatments (see Chapter 2), however, both would create early seral conditions. Alternative 3 would retain a more forested condition on some sites, but would still likely produce some level of early seral vegetation production.

There would be a net reduction in the amount of forested cover because most of the proposed treatments would not leave a sufficient density of trees to provide hiding cover. However, because only one of the proposed treatment sites (Unit 43) is adjacent to an open road, this may not be an important issue/concern. Additionally, over 70% and 60% of the Emery Firefighter and Riverside Paint subunits, respectively, are in young to older aged forest conditions (Table 3-18) that currently provide security cover. Therefore, effects on the amount of grizzly bear security cover at the subunit level are expected to be minimal. Neither of the two Action Alternatives would move either of the subunits to a threshold of concern due to the amount of forest cover.

Displacement/Security

The implementation of this project would introduce mechanized noise into portions of the two subunits. It was assumed that noise from saws and heavy equipment, which would be used for felling trees and skidding/removing merchantable trees, would displace/disturb normal use of habitats by grizzly bears during the non-denning season; this includes habitat adjacent to closed roads where log hauling would occur. An estimate (Project File) of the maximum amount of grizzly bear habitat that would be disturbed from implementation of the Firefighter Project is 18% of the Emery Firefighter subunit and 3% of the Riverside Paint subunit. It is unlikely that all forest management treatments and all road decommissioning would occur simultaneously, therefore, the estimated proportions of subunits that would be disturbed are theoretical maximums. It is more likely that a much smaller amount of each subunit would have disturbance occurring at any given point in time during the expected three years of activity. Considering that over 80% of each of the subunits would be free of major disturbance activities, it is not likely that implementation activities of the Firefighter Project would adversely affect grizzly bears. Nevertheless, there is potential for displacement of grizzly bear normal use of habitats from the Firefighter Project.

Habitat Security/A19

The existing and existing with Paint Emery past access density decisions (not yet fully implemented) on-the-ground condition of the two subunits are displayed in Table 3-18. Relative to the on-the-ground conditions, neither of the subunits currently fully meets all the A19 standards of 19-19-68. However, the Paint Emery decision (USDA Forest Service 1999c)

authorized access management to fully meet A19 standards in the Riverside Paint subunit; funding has precluded full implementation of these decisions to date.

The Firefighter Project would temporarily exacerbate the existing situation because implementation of the project would require the use of currently restricted roads and the construction of approximately 4.3 miles of new temporary roads. This would temporarily increase both the open motorized access density (OMAD) and total motorized access density (TMAD) within both the Emery Firefighter (EF) and Riverside Paint (RP) subunits; there would be no effect on security core habitat. The OMAD would increase from the existing 20% and 18%, to 32% and 20% in the EF and RP subunits, respectively. TMAD would increase from the existing 30% and 31%, to 31% and 32% for the EF and RP subunits, respectively. The net effect of the implementation of the Firefighter Project is potential displacement of grizzly bears adjacent to currently restricted roads. There would also likely be some level of displacement of grizzly bears during the major activity operational periods of tree harvesting.

In the longer term, i.e. post Firefighter Project implementation, the Emery Firefighter subunit would have a decision authorizing access management actions that would bring it into compliance with A19 standards by 2015, assuming funding is available. Therefore, the expectation is that the longer-term condition of grizzly bear habitat security would be improved as a result of access management decisions made in the Firefighter Project.

Cumulative Effects

Past fires in the early 1900s produced the general forest conditions present in the analysis area; so has past and ongoing fire suppression. It is likely that in the absence of fire suppression actions, the analysis area could have been in more of a mosaic of forest age classes as opposed to the more or less single-aged class of forests that dominate the area. A diversity of forest age classes can provide a variety of potential vegetal food sources for bears and provide differing levels of hiding and thermal cover. Past, ongoing, and future fire suppression efforts would continue to affect forest age class diversity on the landscape.

The construction of the Hungry Horse Dam and resulting Hungry Horse Reservoir in the early 1950s reduced the amount of habitat and created somewhat of a movement barrier between the Swan and Flathead Mountain ranges; however, grizzly bears have been known to occasionally swim across the Reservoir. The Firefighter Project would not be additive to eliminating habitat nor creating a movement barrier. Rather, the landscape condition would, over time, become more suitable for grizzly bears as a result of increasing forest age class diversity and increasing habitat security.

Past forest management actions such as timber harvest/salvage, pre-commercial thinning, and to a lesser extent prescribed burning, has generally been favorable for grizzly bears because in the absence of the natural process of fire creating a mosaic of forest age classes, timber harvesting has been somewhat of a surrogate for creating vegetation diversity. The Firefighter Project would continue the process of creating forest vegetation diversity.

Past Forest Service road construction, and maintenance of some of these roads, has had the effect of allowing humans relatively easy access into grizzly bear habitat causing displacement and compromising security. Past use of these roads by humans facilitated more efficient killing of grizzly bears when it was legal; bears are still occasionally illegally killed near roads. However, more recently, (in the last 10 years) additional closures to motorized use in both subunits have provided better grizzly bear habitat security. The Firefighter Project would continue the trend of increasing habitat security.

Ongoing actions such as forest products gathering and noxious weed control would be unlikely to produce cumulative effects because of the relatively low level of these activities in the project area. Recreational activities have and would continue to affect grizzly bears; however, the Firefighter Project would tend to reduce the amount of motorized-dependent activities as a result of reduced motorized access.

Ongoing implementation of Paint Emery project activities would continue. Prescribed burning of approximately 2,600 acres in Emery Firefighter and 2,200 acres in Riverside Paint subunits would change habitat conditions in higher elevation sites that are expected to be beneficial for grizzly bears. Burning activities would be additive to the Firefighter Project in creating more open habitats. Additionally, continued road reclamation activities on approximately 64 miles would cause some levels of short-term potential disturbance/displacement activities but would be additive to the Firefighter Project in increasing overall habitat security.

The sum total of effects on grizzly bear habitat in the two subunits from past human habitat alterations have been mixed: some have been beneficial, but road access has been detrimental. The Firefighter Project would authorize meeting A19 standards and this would continue a trend of improving habitat security in the South Fork in general and in the Emery Firefighter/Riverside Paint subunits specifically. However, in the short-term (the duration of major project activities) access density would exceed the existing situation and would adversely affect grizzly bear habitat, likely for a minimum of three non-denning seasons. In the longer term, grizzly bear habitat security would be improved as motorized access restrictions are implemented.

Determination of Effects

The determination is that implementation of either Action Alternative in the proposed Firefighter Project "may effect—likely to adversely affect" grizzly bears or their habitat. This determination is based on the following:

- All vegetation treatments would occur within Management Situation 1, where habitat is necessary for survival and recovery of the grizzly bear.
- The Emery Firefighter and Riverside Paint subunits both contain greater than 75% Forest Service land ownership and neither currently fully meets A19 standards. Although an existing decision from the Paint Emery Resource Management Project (USDA Forest Service 1999c) authorizes access management restrictions to bring the Riverside Paint subunit into compliance with A19 standards (see Table 2-4), lack of funding has precluded full implementation of the decision and both subunits remain in an on-the-ground condition (i.e. do not meet A19 standards) that "harms" the grizzly bear (US Fish and Wildlife Service 2005).

- During implementation, the Firefighter Project would temporarily (1-3 years) increase the open and total road density in the Emery Firefighter subunit; there would also be a slight temporary increase in OMAD and TMAD in the Riverside Paint subunit. However, there would be no decrease in security core habitat in either subunit.
- There would be no project activities within the critical grizzly bear spring use period (April 1-June 30).
- The implementation of this project would introduce mechanized noise into dispersed sites throughout the project area. Noise from saws and heavy equipment that would be used for felling trees, skidding/removing merchantable trees, has the potential to displace/disturb use of the area by grizzly bears. These potential disturbance/displacement activities could last up to three grizzly bear non-denning seasons (contract term).
- Contractors, etc. involved with implementation of the project would be informed and required of the requirements of the NCDE Food Storage Order.
- Cumulatively, the Firefighter Project would in the short-term (three years) increase access density, decreasing habitat security, and would be outside the "incidental take" allowed by the US Fish and Wildlife Service (2005); but in the longer term would meet A19 grizzly bear habitat security standards.

NCDE and Forest Scale Assessment

Flathead National Forest lands comprise approximately 40% of the Northern Continental Divide Grizzly Bear Ecosystem. Flathead National Forest land ownership occurs within 73 grizzly bear subunits totaling 2,452,410 acres, and the Flathead Forest Plan's Amendment 19 (USDA 1995b) applies to 54 subunits totaling 1,662,162 acres.

Of the 19 subunits where Amendment 19 does not apply, 16 are within the Bob Marshall Wilderness where road management is not an issue. Habitat effectiveness is high in all the wilderness subunits with only a few high use trails affecting grizzly bears. The other 3 subunits are in the Stillwater River drainage where National Forest System lands comprise less than 10% of the subunits.

Amendment 19 applies to 54 subunits primarily outside the Wilderness and was developed to provide Forest Plan direction concerning levels of open roads, total roads, and secure (or core) habitat that would contribute to the recovery and conservation of grizzly bears. The standards are described in the Decision Notice for Amendment 19 (USDA Forest Service 1995b).

Fourteen subunits have National Forest System ownership of <75% and all of them met the "no net loss" standard on National Forest System lands in 1995; they all still meet it although the open, total, and core numbers for each of the subunits typically do not meet 19/19/68.
Forty subunits have National Forest System ownership >75% and 18 of them met the 19/19/68 standard in 1995 when Amendment 19 was signed. As of the end of 2005, 33 units have increased in core habitat (USDA Forest Service 2006), 7 units have stayed the same, and 2 subunits have decreased by 1% due to corporate lands update and a data base correction. Following full implementation of the Paint Emery Decision, the Riverside Paint subunit would

meet all A19 standards. If Alternative 2 or 3 were to be implemented, the Emery Firefighter subunit would meet all A19 standards following project activities.

Progress in closing and decommissioning roads has been substantial across the Forest's portion of the NCDE when considering the miles of roads that have been restricted or decommissioned since Amendment 19 was signed in 1995. Available information indicates that between 1995 and 2006, total miles of roads decommissioned was about 514 miles, open miles of road decreased about 279 miles, and seasonally open road miles decreased about 54 miles. The miles of road closed yearlong, yet still on the system, increased approximately 150.

On March 8, 2000, the Flathead National Forest requested re-initiation of formal consultation with the USFWS to consider a revised A19 implementation schedule on the Forest. This consultation process produced a BO on October 25, 2005. The USFWS concluded in the BO that the proposed extension of implementation timelines for A19 is not likely to appreciably diminish survival and recovery of grizzly bears.

Food Storage Order

Minimizing the risk of mortality due to conflict with humans and human associated foods is also an important facet of grizzly bear management. A food storage Special Order was signed on April 15, 1998 (revised in 2000) that applies to National Forest System lands within the NCDE on the Flathead, Lewis and Clark, Lolo, and Helena National Forests. The purpose of the restrictions is to minimize grizzly bear/human conflicts and thereby provide for visitor safety and recovery of the grizzly bear. The food storage order contains requirements for storage and handling of bear attractants such as human foods and garbage, livestock feed, and wildlife and livestock carcasses.

Cooperative Access Management

Amendment 19 includes an objective to "improve habitat effectiveness through cooperative management with other land ownerships, land adjustments, or other means." The Forest, in cooperation with Plum Creek Timber Company, Montana Department of Natural Resources and Conservation, and the USFWS, developed and implemented an agreement for access management and timber harvest scheduling in the intermingled ownership lands of the Swan Valley. The Swan Valley Grizzly Bear Conservation Agreement (US Fish and Wildlife Service et al. 1997) established a cooperative management plan to promote grizzly bear habitat use and security on approximately 370,000 acres.

Cooperation with Montana Fish, Wildlife and Parks

The Flathead Forest has cooperated with and helped fund a Grizzly Bear Management Specialist position with Montana Fish, Wildlife and Parks (FWP) since inception of the position in northwest Montana. The Management Specialist works on both public and private lands to correct problem situations and educate people about how to live with bears and minimize the potential for conflicts. The Management Specialist has pioneered efforts in rapid and complete cleanup of railroad grain spills, the use of aversive conditioning techniques to educate bears

(including the use of Karelian bear dogs), and the hazard and necessity of the cleanup of large and small attractants at private residences. The work may lead to an increased ability of grizzly bears to utilize habitats in areas currently having high mortality risk and low use potential.

NCDE Population

In 2004, the USGS conducted a population survey based on DNA hair snagging at sites throughout the NCDE. The results of this research have been published in a peer reviewed journal (Kendall et al. 2009). This research indicates there are a minimum of 765 bears in the Northern Continental Divide Ecosystem. Most importantly, this is a substantial increase from previous estimates and indicates that the population is growing in terms of abundance, occupied habitat, and connectivity. Their population estimate was more than double the existing estimate. This same study also concluded:

- Female grizzly bears were present in all 23 BMUs.
- The number and distribution of female grizzly bears indicated good reproductive potential.
- The occupied range of NCDE grizzly bears now extends 2.6 million acres beyond the 1993 recovery zone.
- The genetic health of NCDE grizzly bears is good, with diversity approaching levels seen in undisturbed populations in Canada and Alaska.
- The genetic structure of the NCDE population suggests there has been population growth between 1976 and 2007.
- Human development is just beginning to inhibit interbreeding between bears living north and south of the U.S. Highway 2 corridor, west of the Continental Divide.

Conclusion

Continuing progress towards meeting Amendment 19 standards and ongoing consultation with U.S. Fish and Wildlife Service would contribute to recovery and maintenance of long-term viability.

Regulatory Framework and Consistency

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 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 is in effect that requires all users of National Forest System lands within the NCDE to store food, garbage and other bear attractants in a bear-resistant manner.

The environment baseline (the existing condition) does not fully meet Amendment 19 grizzly bear habitat standards in the Emery Firefighter subunit; however, the Paint Emery decision (USDA Forest Service 1999c) authorized fully meeting Amendment 19 standards in the Riverside Paint subunit and implementation activities are ongoing. The Firefighter Project would bring the Emery Firefighter subunit into full compliance with Amendment 19 standards and provide a secure landscape habitat condition for grizzly bears that use the area.

During project activities, motorized access densities would be increased for the short term and individual grizzly bears may be adversely affected. Therefore, the Flathead National Forest is in the process of formally consulting with the U.S. Fish and Wildlife Service regarding this project. The activities proposed in the Firefighter Project have been designed to avoid or minimize potential impacts of resource competition between bears and humans during the life of the project and as implemented, would improve habitat conditions for the grizzly bear population. Management actions and design criteria for this project favor, and make this project compatible with, the needs of the grizzly bear population conservation and recovery. The Endangered Species Act determinations for grizzly bear are also based on an additional analysis at the forest scale (Project File). Both Alternatives 2 & 3 would comply with the National Forest Management Act (NFMA) direction that wildlife habitat be managed to support a diversity of plant and animal species in the plan area.

Canada Lynx (Threatened)

Lynx canandensis

Analysis Area/Information Sources

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/habitat. The lynx analysis units (LAU) approximate the size of an area used by an individual lynx and may encompass both habitat and non-habitat. Proposed Firefighter Project treatment units occurred within two LAUs (Map 3-1) and these formed the analysis area of direct/indirect effects. Because of their relatively large sizes, the combined area of both of these LAUs formed the cumulative effects analysis area. In addition, a multi-scale assessment was conducted to compare LAU-scale findings against findings at larger scales (Project File).

Data used in the analysis were from existing resource information sources, research literature, aerial photos, and field surveys of existing conditions of proposed units. The Region's Vegetation Mapping Project (R1-VMP), which is a geo-spatial database of vegetation and land cover, was used to quantify lynx habitat components (forage and potential denning). In addition, the Forest's "forest structure" coverage, which is a LANDSAT vegetation layer recoded to structure classes, was used to help determine lynx habitat components (Project File). Although this data source has not been updated since 1994, for Amendment 19 analysis, the 12-year difference was acknowledged and updates were made based on known vegetation changes due to recent fire or timber harvest. Arcview geographical information system was used for quantification of various habitat characteristics.

Affected Environment/Existing Condition

Potential lynx habitat is common across the Flathead National Forest, with 1,733,094 acres of habitat estimated through modeling; this is approximately ¾ of the Forest. Lynx habitat on the Forest is generally descried as mesic coniferous vegetation with cold, snowy winters that provide a prey base of snowshoe hares. Lynx habitat components are used to describe lynx habitat and for applying the Northern Rockies Lynx Management direction. This direction conserves important components of lynx habitat: a mosaic of early, mature, and late successional staged forests, with high levels of horizontal cover and structure. Denning habitat is found in a variety of forest conditions, they are found in small pockets scattered across an area and are generally found across the landscape; lynx denning sites are not believed to be a limiting factor (USDA Forest Service 2007c).

Winter snowshoe hare habitat is a limiting factor for lynx persistence (*Ibid*). Snowshoe hare habitat consists of forests where young trees or shrubs grown densely. Multistory forests that have trees whose limbs come down to snow level and that have an abundance of trees in the understory also provide winter snowshoe hare habitat. During the winter, hare forage is limited to twigs and stems that protrude above the snow that the hares can reach.

On March 27, 2009, the rule designating revised critical habitat became effective (Federal Register/Vol. 74, No. 36/Wednesday, February 25, 2009/Rules and Regulations). In this Federal Register Notice, the US Fish and Wildlife Service designated five units as critical habitat for the lynx based on their best assessment of areas: (1) determined to be occupied at the time of listing; (2) that contain the physical and biological features (i.e., the primary constituent element in the appropriate spatial arrangement and quantity) essential for the conservation of the species; and (3) that may require special management considerations or protection. The five areas designated as critical habitat are Unit 1 in northwestern Maine, Unit 2 in the Arrowhead region of Minnesota, Unit 3 in Montana and Idaho, Unit 4 in the North Cascades of Washington, and Unit 5 in the Greater Yellowstone Area of Wyoming, Montana, and Idaho. The Firefighter Project is contained in Unit 3.

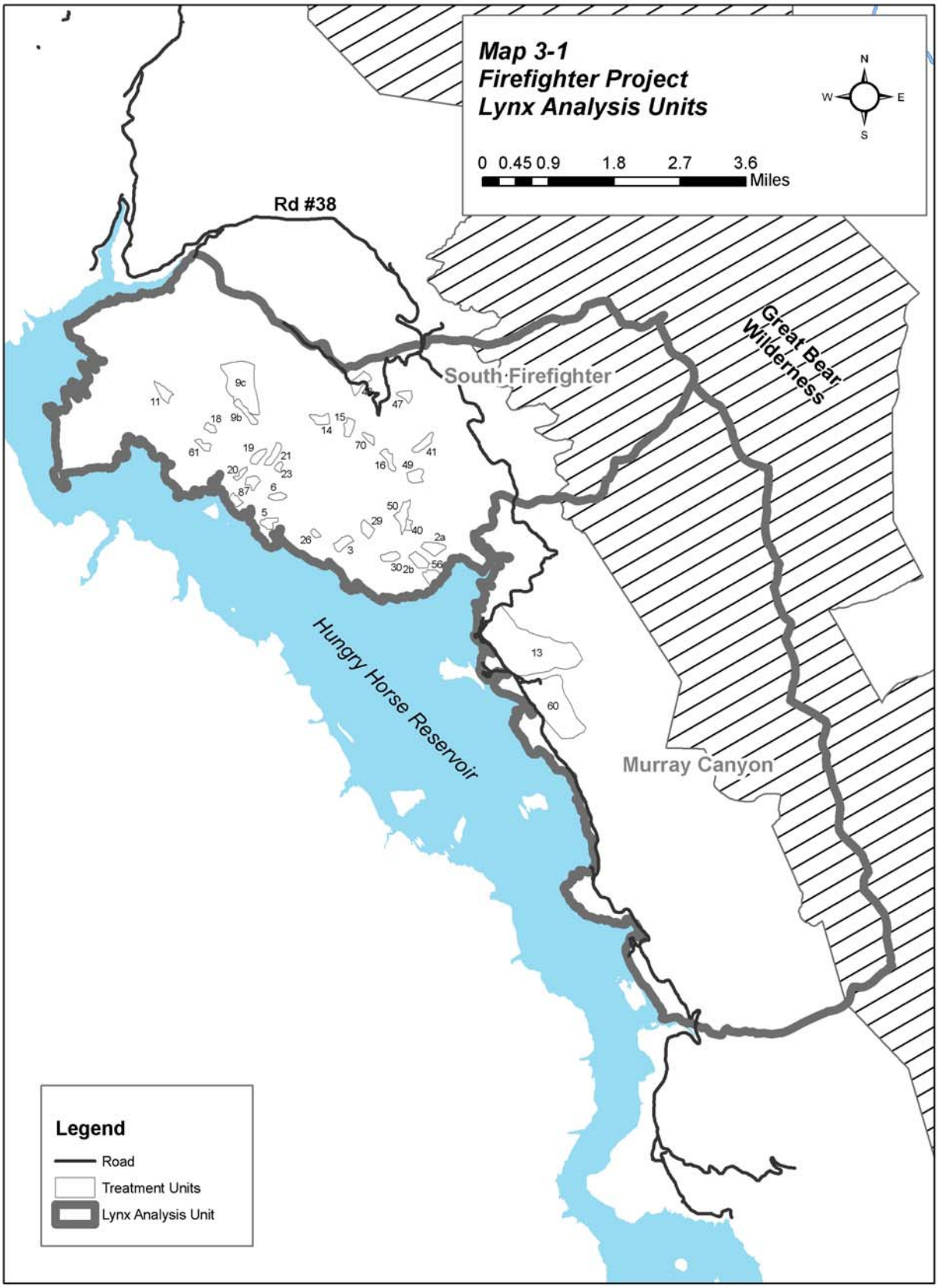
The Firefighter Project would occur within two LAUs: South Firefighter (SF) and Murray Canyon (MC) LAUs. The SF and MC LAUs contained 68% and 80% of designated critical habitat, respectively. There are no private or state owned lands in either LAU. Most of the existing condition of lynx habitat in both of the LAUs is a result of wildland fires that occurred in the early 1900s (1910 and 1926), and now consists of 80-to-nearly-100-year-old pole-sized forest stands (see Vegetation section for thorough discussion of existing forest stand conditions). In the SF LAU, approximately 3,660 acres of past timber harvesting has occurred, beginning in the early 1950s; the last forest/timber management activity was in 1996. This LAU is still dominated by pole-size and larger forest stands. In the MC LAU, approximately 3,917 acres of past timber harvesting has occurred, beginning in 1950; the last forest/timber management activity was in 2002.

The process used for modeling the different lynx habitat components can be found in the Project File and the results of this effort are shown in Table 3-19.

Table 3-19. Estimated Snowshoe Hare Habitat Components in Project LAUs.

Lynx Habitat Structure	South Firefighter		Murray Canyon	
	Acres	Percent	Acres	Percent
Stand Initiation Structural Stage *That May Provide* Snowshoe Hare Habitat During any Season	1,058	8	721	4
Stand Initiation Structural Stage *That Likely Does Not Yet Provide* Snowshoe Hare Habitat.	300	2	1,704	9
Forested Multi-Storied Structural Stage *That May Provide* Snowshoe Hare Habitat During any Season	333	2	2,029	11
Other - Vegetative Conditions That Do Not Fit Other Categories (such as stem exclusion structural stage)	11,179	79	10,473	56
Non-Lynx Habitat – Includes Water Bodies, Extensive Rock Outcrops, Dry Habitat Types, etc.[1]	1,300	9	3,666	20
Totals	14,170	100	18,593	100

[1]Misclassified non-habitat acres (harvest units misclassified as grass/for areas during initial habitat mapping for the LAUs) were reclassified as habitat (556 acres in South Firefighter and 598 acres in Murray Canyon).


Map 3-1
Firefighter Project
Lynx Analysis Units
N
W
E
S
0 0.45 0.9 1.8 2.7 3.6
Miles
Rd #38
South Firefighter
Great Bear Wilderness
Hungry Horse Reservoir
Murray Canyon
9c
11
18
9b
61
19
21
20
23
87
6
5
26
3
15
14
70
47
16
49
41
50
29
40
2a
30
2b
56
13
60
Legend
Road
Treatment Units
Lynx Analysis Unit

Environmental Consequences

Proposed vegetation treatments proposed by the Firefighter Project were used for direct and indirect effects on lynx/habitat; previously implemented and ongoing land management actions made within the two subunits were considered for potential cumulative effects.

The effects indicators for lynx and/or their habitat are:

- The effects on snowshoe hare habitat.

Though land management actions proposed by the Firefighter Project would have long lasting (i.e. decades) effects on habitat, the actual Canada lynx exposure would be three consecutive non-winter years to the following project activities:

- Forest Tree Management (i.e. the process of tree harvesting and hauling activities).
- Thinning of a Douglas-fir tree improvement test plantation, established in 1995. This is a 5-10' tall sapling stand of naturally regenerated lodgepole pine and planted Douglas-fir.
- Post tree-harvest activities including broadcast burning/pile and burn, and reforestation.
- Implementation of Best Management Practices (BMP) on roads.
- Road Decommissioning – it is unlikely that this would occur during the same three years that the other activities would occur in, and may be accomplished during one season.

The Firefighter Project was screened against the Northern Rockies Lynx Management Direction (NRLMD) (USDA Forest Service 2007c) standards and guidelines.

Alternative 1 (No-Action Alternative)

Direct, Indirect, and Cumulative Effects

Under Alternative 1, there would be no vegetation management or implementation of other aspects of the Action Alternatives within the two LAUs used for this analysis. All existing suitable lynx habitat components would undergo natural processes and continue to function as travel/hiding cover, but would not hold an adequate density of snowshoe hare to function as foraging habitat. A disturbance event (fire or tree harvesting) that changes existing stand conditions to a stand initiation structural stage would be necessary to make the area suitable as lynx habitat. However, the Firefighter Project area would continue to function as travel/hiding cover.

All applicable NRLMD standards and guidelines would be met; therefore, there would be no direct or indirect effects to lynx under this alternative. Since there would be no direct or indirect effects, there would be no cumulative effects to lynx.

Alternatives 2 & 3 (Action Alternatives)

Direct and Indirect Effects

Selective tree harvest that leaves coarse woody debris and snags at Forest Plan standard levels is predicted to be adequate to retain woody material to supply potential denning habitat features for lynx across harvest units in suitable burned lynx habitat.

All proposed vegetation treatments would occur in mapped lynx habitat. With the exception of the Douglas-fir test-tree plantation (Unit 70) and a portion of Unit 43, all proposed units are in a condition unsuitable as snowshoe hare foraging habitat, i.e. no understory of dense conifers. The portion of Unit 43 that drops below Forest Road 38B (Firefighter Lookout Road) does appear to have enough of a dense understory to function as snowshoe hare habitat. For the other proposed units (except Unit 70 and a portion of Unit 43), existing potential lynx use of the proposed units would primarily be for travel between foraging sites and possibly for denning. The Firefighter Project would temporarily convert these units into unsuitable stand initiation structural conditions and potential lynx/snowshoe hare use of these sites would be minimal to none until regenerating conifers reach the dense sapling phase. Considering that nearly all (except a portion of Unit 43 and Unit 70) proposed treatments would occur in lynx habitat suitable for purposes other than foraging or denning (726 acres of the 749 total acres in Alternative 2), and given the relative abundance of the stem exclusion forest stand structure within each of the LAUs (Table 3-19), it appears that only approximately 15 acres of Unit 43 and 8 acres in Unit 70 would affect existing lynx/snowshoe hare foraging habitat; the remaining acreage (under either alternative) would not be foraging habitat in the short term. In the longer term (10-15 years), the opening up of these dense lodgepole pine stands would facilitate both natural regeneration and planting of conifers; this would likely result in suitable lynx/snowshoe hare habitat within 10-15 years.

The Douglas-fir test-tree plantation (Unit 70) is a 5-10’ tall, 8-acre sapling stand of naturally regenerated lodgepole pine and planted Douglas-fir that is suitable as lynx/snowshoe hare foraging habitat. The proposed thinning of this site would negatively affect its ability to function as suitable habitat for lynx/snowshoe hare.

The broadcast burning and reforestation portion of the Firefighter Project would, in the short-term, have no impacts on lynx habitat, but in the longer-term (10-15 years) would produce suitable lynx/snowshoe hare foraging habitat.

Neither the BMP nor road decommissioning would have any effect on lynx/snowshoe hare habitat because these activities would occur on a road surface. In the longer term, road decommissioning would allow the road surface to be colonized by conifers and potentially become functional as lynx/snowshoe hare foraging habitat.

Since the Firefighter Project would be implemented outside of winter/snow on-the-ground conditions, there would be no snow compacting activities associated with this project. There could be some potential for temporary displacement of lynx if one happened to be in the area during project implementation activities; however, this is not expected to alter any potential breeding or foraging behavior.

Considering the above estimated potential effects on lynx/snowshoe hare habitat, including the proposed thinning of the 8-acre sapling-sized Douglas-fir test plantation, it appears negative effects on lynx habitat would be relatively minor in the short term, and effects would be positive in the longer term.

Potential Effects to Proposed Critical Habitat and Determination

The project area occurs within designated critical lynx habitat and a review of the analysis within the Firefighter Project Environmental Assessment and Biological Assessment (BA) revealed that the Firefighter Project contains the physical and biological elements (PCE) that are essential for the conservation of the species. The effects analysis was conducted to determine whether the project was consistent with the Northern Rockies Lynx Management Direction (NRLMD) standards and guidelines. Because the project was found to be consistent with the NRLMD, the determination in the BA was "may effect – not likely to adversely affect".

Alternatives 2 and 3 would reduce and remove snowshoe hare habitat on a 9-acre sapling stand; however, these actions do not cause a permanent loss or conversion of the boreal forest nor does either alternative increase traffic or speed on roads that divide critical habitat. The project's LAUs would continue to provide habitat to support a viable population of lynx by retaining its ability for the PCE to be functionally established. Current vegetative conditions at the Lynx Analysis Unit level continue to provide a variety of temporal and spatial stages capable of supporting lynx and will continue to provide a mosaic of stages post-project. Therefore, the effects from implementing the Firefighter Project would not result in the destruction or adverse modification of designated lynx critical habitat nor any of the physical/biological elements of the PCE (1 a-d, above). Through additional analysis it has also been determined that the proposed project "may effect, but is not likely to adversely affect" proposed lynx critical habitat, and further request a conference concurrence on this determination.

Cumulative Effects

Past, present/ongoing, and future federal actions have cumulatively affected lynx habitat and these will be discussed below.

Just as past fires in the early 1900s produced the general forest conditions present in the analysis area, to a certain extent so has past and ongoing fire suppression. It is likely that in the absence of fire suppression actions, the analysis area could have been in more of a mosaic of forest age classes as opposed to the more or less single-aged class of forests that dominate the area. Past, ongoing, and future fire suppression efforts would continue to affect lynx/snowshoe hare habitat by minimizing the amount of stand initiation structural phases of forest succession that occur on the landscape.

The construction of the Hungry Horse Dam and resulting Hungry Horse Reservoir in the early 1950s affected lynx habitat primarily by creating a movement barrier between the Swan and Flathead Mountain ranges. To a lesser extent, suitable habitat was affected by the Dam and Reservoir because most of the Reservoir is below 3,600 feet elevation, which is generally below

where lynx are known to live. However, the Firefighter Project would generally not be additive to this trend; rather, the landscape condition would become more suitable for lynx as a result of converting existing lynx habitat (useful for purposes such as travel) into future foraging habitat conditions.

Past forest management actions such as timber harvest/salvage, and to a lesser extent prescribed burning, have generally been favorable for lynx because in the absence of the natural process of fire creating a mosaic of forest age classes, timber harvesting has been somewhat of a surrogate for creating vegetation diversity. The Firefighter Project would continue the process of creating forest vegetation diversity and this would be expected to be favorable to lynx in the long term.

Past pre-commercial thinning of conifer plantations was not a management activity favorable to lynx. However, this occurred prior to the general understanding of the lynx's relationship to dense sapling stands of conifers. The Firefighter Project proposes to thin approximately 8 acres of a sapling stand that is currently suitable as lynx foraging habitat. This is not a favorable action for lynx; however, it is questionable as to how much of an impact 8 acres of foraging habitat would have on lynx, which tend to have relatively large home ranges.

Past Forest Service road construction, and maintenance of some of these roads, has had the effect of allowing humans relatively easy access into the area, and past use of these roads by humans may have facilitated more efficient trapping of lynx, when it was legal. More recently, (in the last 10 years) additional closures to motorized use on Forest Service roads have provided better lynx habitat security. The Firefighter Project would continue the trend of increasing lynx habitat security and would have no cumulatively adverse affects.

Ongoing actions such as forest products gathering, noxious weed control, and recreational activities are unlikely to produce cumulative effects on lynx because of the relatively low level of these activities in the project area, and because they are part of the environmental baseline for which lynx have already made habitat use adjustments.

Ongoing implementation of Paint Emery project activities would continue. Prescribed burning of approximately 2,600 acres in the Emery Firefighter subunit and 2,200 acres in the Riverside Paint subunit would change habitat conditions in higher elevation sites that would be expected to potentially function as future lynx foraging/hare habitat. Burning activities would be additive to the Firefighter Project in creating more open habitats. Additionally, continued road reclamation activities on approximately 64 miles would not likely disturb or displace any lynx in the area but would be additive to the Firefighter Project in increasing overall habitat security.

The sum total of effects on lynx/habitat from past human habitat alterations have been mixed: some have been beneficial and some have not. However, because the project and cumulative effects areas are dominated by closed-canopied forests with high security cover and habitat diversity produced by limited past timber harvests, coupled with the fact that the project would not create permanent additional road access, indicates that lynx habitat would still be viable and available. Overall, the Firefighter Project would increase the diversity of lynx habitat in the analysis area and, with the exception of an 8-acre sapling stand (Douglas-fir test plantation) and a portion of proposed Unit 43, would not reduce the amount of suitable lynx foraging habitat.

That portion of Unit 43 determined to be potential foraging habitat should not be treated. This would be cumulative to the diversification of lynx habitat that has occurred from past timber harvesting and prescribed burns.

Multi-Scale Assessment

The regional, multi-scale, lynx habitat assessment (Hillis et al. 2002) was used to compare LAU-scale findings against the findings at increasingly larger scales including the South Fork Flathead River 4th Code Hydrologic Unit, Flathead National Forest, Planning Zone (Flathead, Lolo, and Bitterroot National Forests), and Region One scales.

In summary, lynx are a disturbance-dependent species (Ruggiero et al. 2000). Disturbed forest stands that have not yet regenerated to suitable hare forage conditions, while unsuitable to lynx in the short run, are needed to provide foraging habitat in the future. Fortunately, the fires of 2001 (Moose) and 2003 (Robert and Wedge Canyon) have provided a substantial pulse of unsuitable habitat that would provide abundant foraging habitat in 5-10 years. Denning habitat appears surplus at the scales evaluated. While other factors outside of the Forest Service's control (non-target trapping mortality, high competing predator populations, global warming, etc.) may impede lynx recovery, the actions proposed in the Firefighter Project are compatible with recovering lynx to non-listed status and consistent with maintaining habitat for viable populations of lynx at the Regional scale.

Regulatory Framework and Consistency

If the portion of Unit 43 that probably functions as potential foraging habitat were eliminated from consideration for treatment, then the proposal would meet the current management direction contained in the NRLMD and Flathead Forest Plan management direction and standards; Unit 70 (Douglas-fir test plantation) is an exempted activity and therefore allowed under the NRLMD. In terms of critical habitat, the Firefighter Project under any action alternative would make temporary habitat changes but would not result in the adverse modification or destruction of designated critical habitat. The Endangered Species Act determination for lynx is also based on an additional analysis at the forest scale (Project File). Alternatives 2 & 3 would comply with the National Forest Management Act (NFMA) direction that wildlife habitat be managed to support a diversity of plant and animal species in the plan area. In addition, the analysis for Flathead National Forest's Forest Plan Amendment 21 assessed the Forest-level viability of Canada lynx (USDA Forest Service 1999a).

Gray Wolf (Endangered)

Canis lupus

Analysis Area/Information Sources

The proposed treatment units and access changes were used for direct and indirect effects; the combined area of the two grizzly bear subunits was used for cumulative effects analysis. These analysis areas were deemed appropriate because the proposed project activities would mostly occur in Forest Plan designated elk winter ranges in the Firefighter Mountain and Mount Murray

areas, and the combined area of the two subunits contains year round gray wolf habitat components.

Data used for the description and analysis of effects were from existing resource information sources, research literature, aerial photography and field reconnaissance (Project File). Arcview geographical information system was used for quantification of various habitat characteristics.

Affected Environment/Existing Condition

The project area is within habitat that was 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 Gray Wolf Recovery Area.

Gray wolf pack activity has been documented in Wilderness and non-Wilderness portions of the South Fork Flathead River drainage for many years. Most of these observations were of dispersers traveling through the area. In 2000, the Spotted Bear Pack (located approximately 30 air miles south-southeast of the Firefighter Project) was established as a result of two relocation efforts initiated by the USFWS and coordinated with the Flathead National Forest. In 2007, after reports of wolf activity, a wolf pack was suspected and verified in the Firefighter area by Montana Department of Fish, Wildlife and Parks. At the end of 2007, this pack was reported to have 2 adults and 6 pups; trapping was attempted in September (2007) but no wolves were captured (Sime et al. 2007).

Ungulates (wild and domestic) are the primary prey species for wolves and wolf distribution is generally related to ungulate density. However, other physical habitat attributes can also be used to predict wolf presence. Boyd-Heger (1997) found that wolves she studied (in the North Fork) appeared to select for landscapes with relatively low elevation, flatter terrain, and closer to water and roads at both smaller and larger scales in the central Rocky Mountains.
Elk, mule deer, white-tailed deer, and moose all occupy the Firefighter analysis area on at least a seasonal basis. White-tailed deer and moose occupy the area yearlong, while elk and mule deer tend to move to higher elevations during summer; however, some elk are resident in the Firefighter analysis area year round. Much of the project area is ungulate winter range, though the area does receive a considerable amount of snow (Vore et al. 2007).

Approximately 14% (11,105 acres) of the analysis area consists of GIS modeled potential wolf denning habitat. Recent past timber harvesting within the analysis area has diversified vegetation age classes, and this diversity generally provides foraging for ungulates during spring, summer, and fall; however, Vore et al. (2007) concluded that a previous (1990s) forest management project in the Firefighter area, aimed at enhancing winter forage, did not influence elk habitat selection 2-6 years after treatment.

Relative to habitat security, the open road density within the analysis area was 0.39 miles/per square mile. This suggests that there is an adequate level of habitat security for wolves. Over half (26 miles) of the open road miles in the Firefighter analysis area is due to the presence of the main east side road, Forest Road 38.

Environmental Consequences

In Chapter 2 of this document, there were no significant issues listed that related to the gray wolf. However, because the gray wolf is a federally listed wildlife species, the potential effects of the Action Alternatives on habitat must be assessed.

Key components of wolf habitat (U.S. Fish and Wildlife Service 1987) are: 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. Wolves can live in a wide variety of habitats as long as a sufficient amount of ungulates is present.

Potential effects to wolves would be primarily related to the potential effects of the Firefighter Project on spring denning and pup rearing activities, on ungulates (wolf prey base), and the security/mortality risk. Since potential denning and rendezvous habitats are not considered to be limiting across the Forest and implementation of major Firefighter project activities would not occur prior to July 1 throughout the life of the project, any potential effects on denning/rendezvous habitat and/or behavior appear discountable. Therefore, the effects indicator used for assessing effects on gray wolf included the following:

- Ungulate habitat and habitat security.

Alternative 1 (No-Action Alternative)

Direct, Indirect, and Cumulative Effects

This alternative would have no effect on ungulate habitat or denning/rendezvous sites and would leave the project area's biological resources in their existing condition, subject to natural processes. The project area is apparently in an adequate condition to support wolves as evidenced by the recent detection and confirmation of a wolf pack in 2007. Ongoing implementation of the 1999 Paint Emery decision that authorized reducing motorized access in the cumulative effects analysis area would continue and this would improve habitat security for gray wolves. The selection of this alternative would result in no effects to the gray wolf. Since there would be no direct/indirect effects, there would be no cumulative effects.

Alternatives 2 & 3 (Action Alternatives)

Direct and Indirect Effects

The proposed forest management/treatment units (for both alternatives) are distributed on the south to southwest shoulder of Firefighter Mountain, with a few treatments areas west of Mount Murray (Map 3-2). These treatments, unlike a stand-replacing fire, would create a group of micro-sites of early seral ungulate foraging habitats distributed across the landscape. Therefore, rather than large acreages of the Firefighter landscape being burned by wildfire with little to no cover left, as occurred during the early 1900s in the area, the Firefighter Project would create a new age class of relatively small sized forest openings/foraging habitat within a matrix of a landscape still dominated by forest cover. As is generally understood, early seral habitats, whether created by a natural process (e.g. fire) or by forest management, are considered potential

foraging areas for ungulates. Though there may be some level of disagreement as to the benefits of creating forage openings in ungulate winter range at least 2-6 years after treatment (Vore et al. 2007), there can be little disagreement that creating a series of smaller forage openings over time and maintaining an adequate level of forest cover is more beneficial than having the entire area become open at one time due to a potential (and likely sometime in the future) stand-replacing fire. Therefore, from a year-round perspective, ungulates would more likely benefit from the proposed forest treatments/forage openings proposed under the Action Alternatives, rather than be negatively impacted. Certainly, loss of forest cover during deep snow winters can be detrimental for ungulates; however, there would be a sufficient amount of cover remaining in the Firefighter area after treatment such that no over-winter mortality resulting from Firefighter Project would be expected. Alternative 3 would attempt to maintain some level of forest cover and increase understory forage production with a more open canopy. However, it is doubtful that snow intercept cover can be achieved with a more open canopy as prescribed with Alternative 3. The Action Alternatives would likely produce unusable elk winter range forage openings in treatment units because of resulting open canopies for 2-6 years post-treatment (Vore et al. 2007).

During the eight months of spring, summer, and fall the mix of new forage openings (the proposed treatments) and security cover would be expected to provide an ideal landscape setting for maintenance of ungulate populations in the Firefighter area. In addition, there would be no effect on ungulate potential calving/fawning that may occur in the analysis area in early June, because no major project activities would be allowed during this time.

There are no known dens associated with the newly discovered Firefighter Pack. However, with the relatively high level of habitat security in the Firefighter area (no year round open roads and only one seasonally open road), and no major project activities allowed prior to July 1 (annually), it is unlikely that potential denning habitat would be affected by either the logging disturbance itself or the expected vegetation condition results of proposed treatments.
In terms of habitat security, during implementation of the project after July 1, annually, for three consecutive years, wolves may not feel as secure in using the area. However, the Firefighter Project, post treatment, would improve overall habitat security for wolves through A19 related access management actions (e.g. road decommissioning) and, therefore, at some level would be beneficial for wolves because the risk of mortality would be reduced. With the exception of one seasonally open road accessing the Firefighter Lookout, all roads in the Firefighter area would be closed on a year-round basis (gate or berm) and since wolves often use roads as travel corridors (Boyd-Heger 1997), these restricted roads would allow wolves to efficiently move throughout the Firefighter area.

Other aspects of the Firefighter Project, such as implementation of best management practices on haul routes and post-harvest burning and reforestation, would have little to no and, therefore, discountable effects, on ungulates/wolves. Tables 3-20 and 3-21 display how the Firefighter Project complies with existing wolf management direction.

Cumulative Effects

Past fires in the early 1900s produced the general forest conditions present in the analysis area; so has past and ongoing fire suppression. Past, ongoing, and future fire suppression efforts would continue to affect ungulate/wolf habitat by minimizing the amount of forage openings on the landscape of the analysis area; however past and ongoing prescribed burning has replaced natural fires in creating/maintaining forage openings, to a certain extent.

The construction of the Hungry Horse Dam and resulting Hungry Horse Reservoir in the early 1950s affected wolf habitat primarily by creating a movement barrier between the Swan and Flathead Mountain ranges. The Firefighter Project would not be additive to creating movement barriers; rather, it would create a more secure habitat with fewer motorized access routes.

Past forest management activities (e.g. timber harvesting, fire suppression, post-fire salvaging, firewood cutting, recreational activities, etc.) within the cumulative effects analysis area apparently have not been detrimental to wolf recovery, as evidenced by the newly discovered Firefighter Pack. Past extensive road building and timber harvesting may have initially had negative 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 had a generally positive effect on ungulate survivability during hunting seasons. In addition, for most of the season, hunting 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 annual reductions in the wolf prey base due to hunting may not be significant.

Ongoing implementation of Paint Emery project activities would continue. Prescribed burning of approximately 4,800 acres in the analysis area would change habitat conditions in higher elevation sites that would be expected to function as future foraging high-elevation habitat for ungulates. Burning activities would be additive to the Firefighter Project in creating more open habitats across the landscape. Additionally, continued road reclamation activities on about 64 miles would not likely disturb or displace any wolves in the area, but would be additive to the Firefighter Project in increasing overall habitat security.

In terms of habitat security, the trend of the past, when road building was common, has been reversed. There would be a net decrease of both open and total road miles and an increase in roadless habitat. Cumulatively, the Firefighter Project would provide a net improvement in habitat security and reduction in mortality risk when compared to the existing situation. Other ongoing and foreseeable management actions (e.g. tree planting, gathering forest products, road maintenance, the vast array of recreational activities, etc.) in the cumulative effects analysis area would not be expected to adversely affect wolves, unless they occur near denning or rendezvous sites. Denning/rendezvous sites have yet to be discovered in the Firefighter area; however, it is likely that wolf core activity areas would be discovered in the most secure area of the Firefighter area; this area would not change and the Firefighter pack would not be expected to be adversely affected.

In general, wolf packs in the South Fork (and the Recovery Area) have benefited from the

protections provided by the Endangered Species Act. Additionally, the Forest Plan contains standards for management of gray wolf habitat. Because these standards have been consistently applied, including for this project, no adverse cumulative effects to gray wolves are expected from implementation of the Firefighter Project.

Regulatory Framework and Consistency

The gray wolf is listed as Endangered in Montana, and the Northern Rocky Mountain Wolf Recovery Plan (US Fish and Wildlife Service 1987) provides recovery goals and objectives for the gray wolf (Table 3-20). The project area lies within gray wolf Management Zone 1 as designated by the Forest Plan and is contained within the Northwest Montana Recovery Area. It contains habitat components, particularly ungulate populations, necessary to support wolves. The Forest Plan provides management direction and standards to guide project planning (Table 3-21). Alternatives 2 & 3 would comply with the National Forest Management Act (NFMA) direction that wildlife habitat be managed to support a diversity of plant and animal species in the plan area. The Endangered Species Act determination for the wolf is also based on an additional analysis at the Forest scale (Project File).

Table 3-20. Firefighter Project Consistency with the Northern Rocky Mountain Wolf Recovery Plan Direction

Direction	Pre-Treatment	During Treatment/ Post-Treatment	Compliance
Project/Activities Not Within 1 Mile of Denning or Rendezvous Areas?	None Known	None Known	Presumably Yes
Maintains or Enhances Ungulate Prey Base?	Yes	Maintains prey base	Yes
Livestock Grazing Levels (maintain or reduce)	N/A[1]	N/A	NA
Maintains Grazing Where There is a History of Livestock Depredation or Control Actions on Wolves?	N/A	N/A	NA
Introduces Grazing into New Areas Where Depredation is Possible?	N/A	N/A	NA
Concern About Increased Mortality Risk?	No	No	Yes

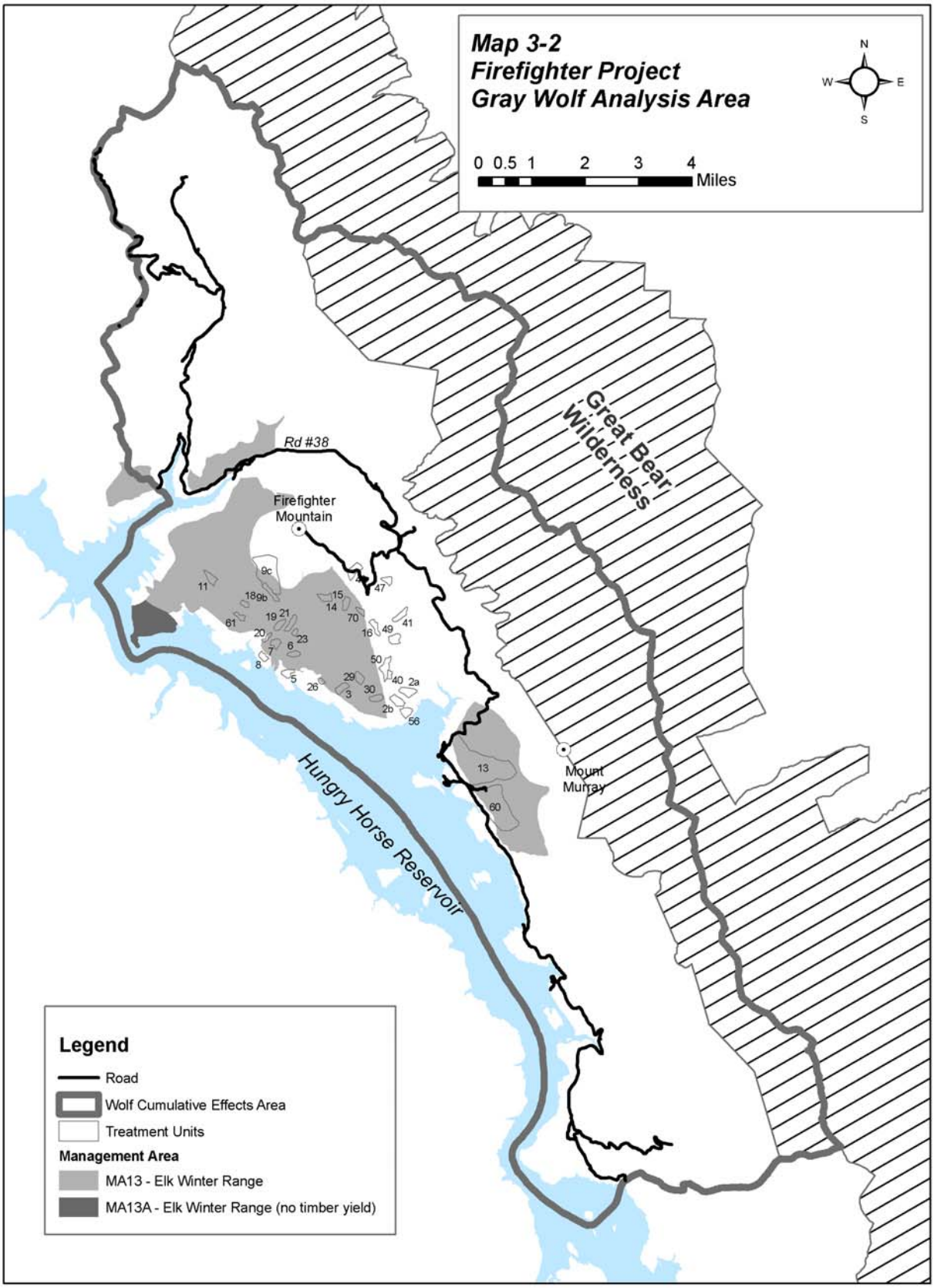
[1]Not Applicable to Project

Table 3-21. Consistency with Flathead Forest Plan Direction for Gray Wolves

Direction	Pre-Treatment	During Treatment/ Post-Treatment	Compliance
Logging activities should not be conducted in or near the following areas at certain times of the year: Within 1 mile radius of known or highly suspected dens and rendezvous sites 3/15 to 7/1.	No known dens or rendezvous sites	No change	Presumably Yes
Near ungulate calving/fawning areas 5/1 to 6/15.	No known calving/fawning areas	Major project actions avoid this time period	Yes
No Forest Plan important ungulate winter ranges 12/1 to 4/15.	Undisturbed	Undisturbed	Yes

Maintain active communications with research organizations and cooperating agencies.	Active cooperation	Active cooperation	Yes
Measures to be taken to protect, maintain, and/or improve wolf habitat and populations will be specified in project design.	N/A[1]	N/A	Yes
Monitor the application of guidelines to assure they are properly and effectively used.	N/A	N/A	Yes
Refine management situation stratification based on current habitat suitability, population, and distribution trends. Assess the status of management situation stratifications for accuracy and provide data and recommendations for updating as necessary.	No updating needed	No updating needed	Yes
Establish an active public information and education program addressing wolf management and stressing goals, objectives, and actions required to recover the populations.	Forest-wide efforts include wolf education	Forest-wide efforts include wolf education	Yes

[1]Not applicable to project


Map 3-2
Firefighter Project
Gray Wolf Analysis Area
N
W
E
S
0 0.5 1 2 3 4
Miles
Great Bear Wilderness
Rd #38
Firefighter Mountain
Mount Murray
Hungry Horse Reservoir
11
9c
18
9b
19
21
61
20
23
6
7
8
5
26
15
14
70
16
49
41
47
4
50
29
30
3
40
2a
2b
56
13
60
Legend
Road
Wolf Cumulative Effects Area
Treatment Units
Management Area
MA13 - Elk Winter Range
MA13A - Elk Winter Range (no timber yield)

Sensitive Wildlife

Introduction

Sensitive wildlife species are those species identified by the Regional Forester for which population viability is a concern. Of the 13 Sensitive wildlife species known or suspected to occur on the Flathead National Forest (http://fsweb.r1.fs.fed.us/wildlife/wwfrp/TESnew.htm 2007), only the fisher is taken through the full effects analysis process. For the other species, it was determined that there was either of a lack of habitat for the species in the Firefighter Project area or a lack of effects to their habitats (see Tables 3-16 and 3-17).

Fisher (Sensitive)

Martes pennanti

Analysis Area/Information Sources

The analysis of direct and indirect effects on the fisher and fisher habitat used the area inside proposed treatment sites within each of the alternatives. For cumulative effects, an area was delineated that encompassed streams (perennial and intermittent) that drained through the area where proposed vegetation treatments were located. Each side of streams within the area was then buffered by 300 feet, and this was defined as primary fisher habitat (Map 3-3).

Data used in the analysis were from existing information sources, aerial photos, and field surveys of proposed treatment sites. A larger-scale assessment was also conducted to address population viability concerns (Project File).

Affected Environment

The fisher has a strong affinity for forested riparian habitats (Witmer et al. 1998). Such areas are vulnerable to habitat fragmentation due to factors such as fire, timber harvest, and timber salvage (Powell and Zielinski 1994). Fishers avoid insular patches of forested habitat and may require forested riparian travelways between feeding and denning sites (Heinemeyer and Jones 1994, Witmer et al. 1998). They rarely stray far from streams or other wet sites. Areas of otherwise suitable habitat can be isolated when cover in travelways between home ranges is removed leaving gaps that are 150 feet wide or wider.

In the Northern Rockies, fishers evolved under a disturbance regime that created numerous openings in a matrix of mature forested habitats. The conversion of some percentage of older age classes to younger age classes can promote a diversity of prey species and thus have long-term benefits for fisher populations (Jones 1991). A pulse of large logs on the ground due to fire or insect epidemics can provide denning structures and cover for fisher and several prey species, but these areas would likely be avoided until the living canopy cover again exceeds 40 percent. Fishers would likely avoid stands up to 50 years old and would probably not select them until 80 to 100 years old for lodgepole pine, or 120 to 160 years old for mixed conifers (Jones 1991). Fishers are apparently tolerant of human activity, but the ease of human access into an area is correlated with fisher mortality through direct or incidental trapping (Claar et al. 1999).

Potential fisher habitat for this analysis was defined as intermediate (pole-sized and immature forests) and older forests (mature and old-growth forests) within 300 feet of perennial streams. The intermediate-sized forests conservatively approximate winter habitat, while the older forests are likely summer habitat. Of approximately 49 miles of streams in the analysis area, 29 miles are perennial. Modeling/buffering shows that approximately 2,801 acres of potential habitat exists adjacent to both intermittent and perennial streams within the analysis area. Of this, approximately 52% and 48% was along perennial and intermittent streams, respectively. This amounted to approximately 1,462 and 1,339 acres of potential fisher habitat along perennial and intermittent streams, respectively; most of this habitat was in a pole-sized or larger forested condition. With the exception of the Hungry Horse Reservoir posing a barrier across what was the South Fork Flathead River, connectivity of fisher habitat in the heavily forested Firefighter Mountain area appeared good (Map 3-3).

Environmental Consequences

No significant issues related to the fisher were identified (refer to Chapter 2). The following effects indicator was used to focus the fisher analysis and disclose relevant environmental effects:

- Number of acres of potential low to mid-elevation stream-adjacent fisher habitat; although the larger landscape is important to fishers, of special concern is stream-adjacent primary habitat.

Alternative 1 (No-Action Alternative)

Direct, Indirect, and Cumulative Effects

This alternative would have no impact on existing fisher habitat or populations. Forested stands under the No-Action Alternative would undergo natural processes, and if they escape fire and/or insect and disease outbreaks they would progress to mature and older-aged forest conditions, which could allow expansion of fisher foraging habitat further than 300 feet from riparian areas. However, in general this alternative would have no direct, indirect, or cumulative effects to fisher/habitat and would have no implications on population viability.

Alternatives 2 & 3 (Action Alternatives)

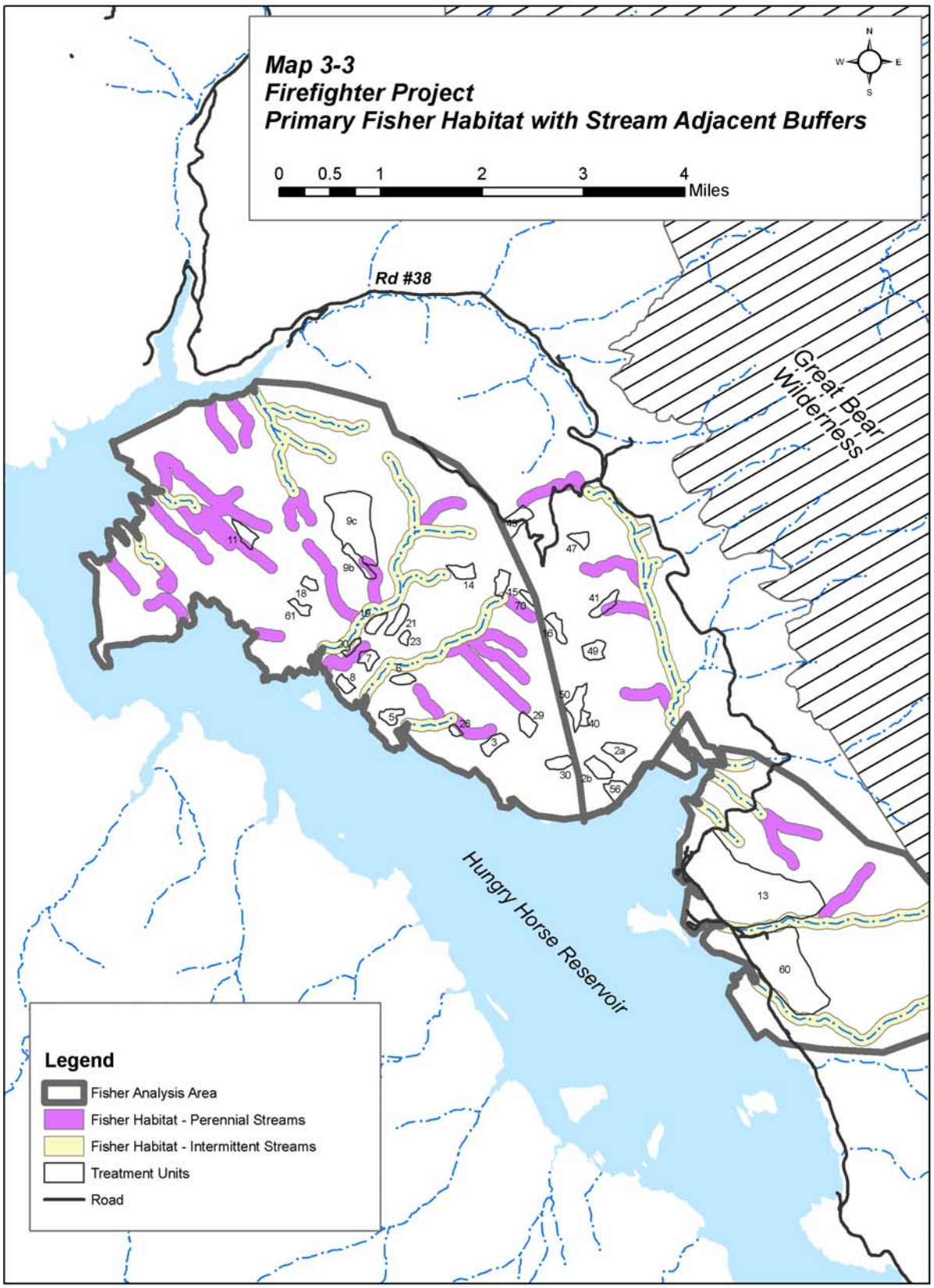
The comparison of proposed treatment units in the Action Alternatives and fisher stream-adjacent buffer showed that some units apparently would affect fisher habitat. These units for Alternative 2 are identified and determinations made as to whether they in fact would affect fisher habitat:

- Unit 11 – The southwest portion is within the intermittent stream buffer and Forest Road 896 is the boundary of the unit, so it is likely that this road has already made somewhat of a definition of the buffer; approximately 4 acres of potential fisher habitat would be affected.
- Units 9b/9c – Similarly to Unit 11, Forest Road 896 has probably already defined the buffer; approximately 11 acres of potential fisher habitat would be affected.

- Unit 15 – A small sliver of the unit intrudes on the modeled buffer, this is mostly within the mapping error; approximately 1 acre of potential fisher habitat could be affected.
- Unit 19 – A small sliver of the unit intrudes on the modeled buffer, this is mostly within the mapping error; approximately 1 acre of potential fisher habitat could be affected.
- Unit 20 – A couple of small slivers of the unit intrude on the modeled buffer, this is mostly within the mapping error; approximately 3 acres of potential fisher habitat could be affected.
- Unit 26 – A couple of small slivers of the unit intrude on the modeled buffer, this is mostly within mapping error; approximately 2 acres of potential fisher habitat could be affected.
- Unit 29 – A small sliver of the unit intrudes on the modeled buffer, this is mostly within the mapping error; approximately 0.3 acre of potential fisher habitat could be affected.
- Unit 41 – The upper portion of an intermittent stream fisher habitat buffer would be reduced as effective habitat; approximately 7 acres of potential fisher habitat would be affected.
- Unit 43 – The upper portion of an intermittent stream fisher habitat buffer would be reduced as effective habitat; approximately 0.5 acres of potential fisher habitat would be affected.
- Units 13 and 60 – These units appear to overlap fisher habitat, however, they do not because the polygons are larger areas where smaller 10-20 acre units would be treated; none are within the fisher habitat buffer.

Based on the above unit-by-unit analysis, it appears that a maximum of approximately 30 acres of primary potential fisher habitat could be affected by the Firefighter Project under Alternative 2. Under Alternative 3, the amount would be somewhat less, approximately 21 acres of fisher habitat (because Units 9c, 15, and 20 are not in this alternative). When compared to the existing approximately 2,802 acres of modeled primary fisher habitat within the analysis area, Alternatives 2 and 3 would impact 1.0% and 0.7% of this habitat, respectively. Neither of the alternatives appears to cause a significant change in primary fisher habitat potential. Potential fisher habitat away from streams (i.e. outside the primary habitat buffer) would be affected because forested stands would be targeted for opening up canopies; this would not be advantageous for fisher because all habitats used by fisher have high canopy closure (Powell and Zielinski 1994). However, based on the distribution of the proposed units across the Firefighter landscape and the remaining dominance of closed-canopied forests after project implementation, it does not appear that the Firefighter Project would affect fisher movements throughout the area.

The access management aspect of this project, under the Action Alternatives, would not be expected to affect fisher in any meaningful way. This is because 1) winter access for trapping purposes would be difficult since there is an area closure in the Firefighter Mountain area during the winter, and 2) only decommissioning of roads, where road surfaces would be allowed to get naturally reforested, would be meaningful in terms of increasing forest continuity.


Map 3-3
Firefighter Project
Primary Fisher Habitat with Stream Adjacent Buffers
N
W
E
S
0 0.5 1 2 3 4
Miles
Rd #38
Great Bear Wilderness
Hungry Horse Reservoir
Legend
Fisher Analysis Area
Fisher Habitat - Perennial Streams
Fisher Habitat - Intermittent Streams
Treatment Units
Road

Cumulative Effects

The fisher's status in the western United States is thought to be "precarious and declining" (Witmer et al. 1998), apparently due to habitat alteration and overexploitation (trapping). They identified four issues of conservation concern in the interior Columbia River basin: 1) conservation of late successional forests at mid to lower elevations; 2) maintenance of links between populations; 3) maintenance of riparian corridors for use by individuals and populations; and 4) trapping pressure and human disturbance. Past forest management activities on National Forest System lands have been varied and extensive and have had implications on fisher conservation. Intensive past timber harvesting of mature and old-growth forests at mid to low elevations caused habitat fragmentation, produced barriers to fisher movement, reduced riparian prey patches, and resulted in loss of critical maternal and natal denning habitat features such as large diameter logs and snags. The extensive road building effort of the past provided relatively easy access into fisher habitat and facilitated efficient trapping pressure on fisher populations.

Recreational activities that have and would continue to occur within the analysis area (biking, camping, hunting, etc.) do not appear to affect fishers. However, activities such as cutting of large-diameter snags for firewood, especially if they occur in riparian areas, can reduce fisher denning opportunities. Past and ongoing fire suppression actions may initially delay habitat fragmentation caused by wildland fires, however, in the longer term may actually cause more severe/larger fires to occur on the landscape; this could have the unintended consequence of increasing the amount of fragmentation and reducing the availability of large snags.

The construction of the Hungry Horse Dam/Reservoir in the early 1950s permanently eliminated potential fisher habitat and caused a major movement barrier between fisher populations on the Flathead and Swan Mountain Ranges.

Although no highways exist in the analysis area, past and ongoing maintenance/improvement of all roads, but especially the main east side road, Forest Road 38, may, at some small scale, cause roads to function as barriers to fisher movement, however, probably to no significant degree in the foreseeable future.

Considering the above brief synopsis of the factors that have cumulatively affected fisher and fisher habitat within the analysis area, the potential cumulative effects of the Firefighter Project (both Action Alternatives) include:

1. Vegetation treatments would create early seral and open forest canopies, stand conditions that fishers are known to avoid (Powell and Zielinski 1994). These specific treatment sites would likely be avoided until forest succession again produced closed canopies (50+ years).
2. The access management aspect of this project could allow for more habitat continuity in the long term due to the expected re-vegetation of decommissioned roads; other aspects of access management, such as applying BMPs, would not be expected to measurably affect fisher/fisher habitat because the existing status of the roads would not change in ways that matter to fisher.

Considering the analysis of direct, indirect, and cumulative effects, and the precarious status of fisher populations (Powell and Zielinski 1994), it is likely that implementation of Firefighter Project, under either Action Alternative, "may impact individual fisher and/or habitat" but is not likely to contribute to a trend towards federal listing or loss of viability to the population or species. This determination was deemed appropriate for the following reasons: 1) no low-elevation, mature or old-growth forests would be treated; 2) normal riparian forest buffers for the protection of streams/fish (e.g. INFISH guidelines) would help protect these important fisher habitats; 3) a relatively small amount of primary fisher habitat, some of which may be due to mapping error, but included in the analysis as a worst-case scenario, would/could be impacted.

Regulatory Framework and Consistency

Federal laws and direction applicable to sensitive species include the NFMA and Forest Service Manual 2670. Amendment 21 to the Forest Plan has standards to conduct analyses to review programs and activities, to determine their potential effect on sensitive species, and to prepare a biological evaluation. It also states, "adverse impacts to sensitive species or their habitats should be avoided. If impacts cannot be avoided, the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole would be analyzed. Project decisions would not result in loss of species viability or create significant trends towards federal listing." Future conservation strategies for each species would present direction on maintaining habitat diversity and managing for population viability, as required by the NFMA and Forest Plan Amendment 21. The USDA Forest Service is bound by federal statutes (Endangered Species Act, NFMA), regulation (USDA 9500-4), and agency policy (FSM 2670) to conserve biological diversity on National Forest System lands. A goal in Forest Plan Amendment 21 is to "ensure that Forest Service actions do not contribute to the loss of viability of native species." The proposed Firefighter Project, based on this analysis, would not be expected to contribute to loss of population viability of the fisher.

In accordance with FSM 2673.42, determinations have been made as to the degree of impact the proposed Firefighter Project may have on sensitive species (Table 3-22). These determinations are based on available information on the distribution, presence or absence from the project area, habitat requirements, and management strategies for these species, as well as the project design and location. These determinations are for the segment of the population using the Affected Area, not the entire population; they are also based on an additional analysis that assessed viability at the Forest scale (Project File). Alternatives 2 & 3 would comply with the National Forest Management Act (NFMA) direction that wildlife habitat be managed to support a diversity of plant and animal species in the plan area (refer to "Flathead National Forest Evaluation and Compliance with NFMA Requirements to Provide for Diversity of Animal Communities" in the Wildlife section of the Project File). In addition, the analysis for Forest Plan Amendment 21 assessed the Forest-level viability of sensitive wildlife species.

Table 3-22. Biological Evaluation Determinations for Sensitive Wildlife Species

Sensitive Wildlife Species	Alternatives and Determinations[1]		
	1	2	3
Bald Eagle	NI	NI	NI
Black-Backed Woodpecker	NI	NI	NI
Boreal Toad[2]	NI	MIIH	MIIH
Common Loon	NI	NI	NI
Fisher	NI	MIIH	MIIH
Flammulated Owl	NI	NI	NI
Harlequin Duck	NI	NI	NI
Northern Bog Lemming	NI	NI	NI
Northern Leopard Frog	NI	NI	NI
Peregrine Falcon	NI	NI	NI
Western Big-Eared Bat	NI	NI	NI
Wolverine	NI	NI	NI

[1]**NI** = "No Impact"; **MIIH** = "May Impact Individuals or Habitat but would not likely result in a trend toward federal listing or reduced viability for the population or species".
[2]The determination of MIIH is based on potential incidental/accidental mortality of toads that may happen to be crossing a road during project activities and not the result of impacts or changes to/adjacent to breeding habitat (wetlands/streams).

Other Species

Elk

Cervus elaphus

Introduction

Elk is listed as a big game management indicator species (MIS) in the Forest Plan. Elk seasonal habitats exist in the Firefighter Project analysis area and a part of the purpose of the project is to improve elk habitat conditions, including winter range, by continuing to create an acceptable mix of forest cover (important for snow interception and summer thermal cover) and forest openings that can function as sites of relatively high quality forage. The portion of the Firefighter Project that proposes to treat Forest Plan Management Area (MA) 13 (elk winter range) is a continuation of the Firefighter Mountain Winter Range Project (USDA Forest Service 1990a), in which approximately 163 acres of natural shrubfields were burned to rejuvenate over-browsed shrubs, and 620 acres of forested sites had the coniferous overstory removed through logging for the creation of early seral foraging sites. The number of acres targeted for forage creation was determined by a winter range activity schedule (USDA Forest Service 1990a). The Montana Department of Fish, Wildlife and Parks was involved throughout the process of developing and planning the 1990 Firefighter Mountain Winter Range Project and had the responsibility of evaluating the effectiveness of the treatments. Results of this evaluation project were recently reported by Vore et al. (2007).

The focus of this analysis is elk winter range because, although spring, summer, and fall security ranges are important and elk/elk habitat managers need to be aware of the status/conditions of those habitats if elk populations are to be maintained, elk have to survive the winter stress period in order to be able to effectively utilize these other seasonal habitats. Vore et al. (1997) used an 8,600-acre study area in their evaluation of the Firefighter Mountain Winter Range Project. This analysis involved areas designated as MA 13 (elk and mule deer winter range) and MAs 12 and 17 (riparian) nestled on the westerly slope of Firefighter Mountain (5,247 acres), and a ~1,800 acre area off the lower west slope of Mount Murray (Map 3-4). Each of these areas has had previous forest management activities and the Vegetation section of this Chapter provides that history; Vore et al. (2007) also provided a study area description that included the Firefighter Winter Range.

According to the Forest Plan, the emphasis of forest management on these elk winter ranges (MA 13) is to "provide the size, age, diversity, and distribution of cover and forage suitable for elk and mule deer winter habitat." The Firefighter Project proposes to continue the process of gradually creating a diverse array of cover and forage on the winter ranges in this analysis. The estimated size of the wintering elk population is from the Vore et al. project (2007) and they estimated approximately 100 animals split into a north and south herd, each containing approximately 50 elk.

The winter ranges in this analysis area are contained within the Montana Department of Fish, Wildlife and Parks (FWP) Bob Marshall Wilderness Complex Elk Management Unit (EMU). The FWP Statewide Elk Management Plan (2004) provides the following characteristics for this EMU: the overall goal for this EMU is to manage for mature bull elk available for viewing and hunting in a backcountry setting. Important habitat objectives include maintaining the current distribution of elk over three million acres of habitat, and improving management of critical elk winter range to benefit elk.

Analysis Area/Information Sources

The analysis of direct/indirect effects on elk winter range used each of the two affected Forest Plan designated MA 13 areas (refer to Chapter 2 for MA descriptions), the Firefighter Mountain Winter Range (FMWR) and the Mount Murray Winter Range (MMWR); inclusions of MA 12 and 17 (riparian areas) were included as winter range. The cumulative effects area is the combined areas of the FMWR, the MMWR, the 280-acre Firefighter Peninsula winter range (MA 13A), the 491-acre Hungry Horse Mountain winter range that lies north of the FMWR (MA 13), and the 300-acre Emery Hill Winter Range that lies northwest of FMWR (MA 13) (Map 3-4).

Data used in the analysis were from existing information sources, aerial photos, and field surveys of proposed treatment sites. The findings of Vore et al. (2007) were evaluated and Alternative 3 was developed because a significant issue related to the elk winter range forest canopy cover was identified (refer to Chapter 2).

Affected Environment/Existing Condition

Habitat

Firefighter Mountain Winter Range

The FMWR is approximately 5,247 acres in size, and is located on the mid to lower slope of Firefighter Mountain (Map 3-4). This winter range accumulates a substantial amount of snow during the course of the winter. Vore et al. (2007) found that snow depths >3 feet were common. Relatively few natural shrub field openings exist in the area, and relatively dense 70-80 year old coniferous forests dominate the area. Forest stands within the winter range are comprised of either lodgepole pine or lodgepole pine mixed with other conifers such as western larch, Douglas-fir, and western white pine (see Vegetation section for further details). A majority of the winter range has had some level of forest management in the past; however, besides the recent Firefighter Mountain Winter Range Project, relatively few past management activities involved regeneration type treatments. Forest stands with adequate canopy cover are functioning mostly as cover for snow interception and contain varying levels of forage (conifers, browse, and arboreal lichen). The elevational range of this winter range is 3,700-5,500 feet.

An MA 13 Activity Schedule was developed for the Firefighter Mountain Winter Range Project and was used for determining the amount of forest cover to convert to forage openings, by decade. The forest cover to forage openings ratio (excluding natural shrub fields) was estimated to be 83:17 after the implementation of the Firefighter Mountain Winter Range Project (the Forest Plan standard is for each winter range to have 30% of this area in winter thermal cover). The Activity Schedule was also used to determine the maximum amount of forest cover acreage that could be converted to forage openings for the Firefighter Project.

Mount Murray Winter Range

The MMWR is approximately 1,657 acres in size. It occurs on the lower slope of Mount Murray (Map 3-4). This winter range does not accumulate as much snow as does the FMWR. Vore et al. (2007) were not focused on this winter range as much as the FMWR, therefore it is not known how common snow depths >3 feet are in the area. The elevational range of this winter range is 3,700-5,400 feet.

An important natural shrub field exists at the upper edge of the winter range, between Murray and McInernie Creeks; this area was recently burned as part of the Paint Emery Project. However, as is the case with the FMWR, this winter range is dominated by relatively dense 70-80-year-old coniferous forests. Tree species composition of forest stands within this winter range differs from the FMWR because this one is comprised primarily of western larch in association with Douglas-fir. Approximately 36% (607 acres) of this winter range has had some level of forest management in the past; most of which occurred during the late 1950s and were labeled a “liberation” cut where overstory trees were removed to liberate the understory. Most of these ‘liberated’ forest stands contain a moderate level of shrubs that provide winter browse for elk in the understory. Approximately 155 acres of this winter range has had regeneration type cuts, primarily during the 1980s, and are now 20+ year old sapling stands.

An MA 13 Activity Schedule was developed for this winter range in conjunction with this analysis. Using the assumptions and principles of the Firefighter Mountain Winter Range Project Activity Schedule, the following is a summary of the existing situation and the proposed prorated distribution of forage opening creation over time, through timber harvesting, for the MMWR: 1) existing amount of thermal cover (snow intercept cover) = 91%; 2) existing amount of forage openings = 8%; therefore, 3) less than 100 acres every 10-20 years should be considered for forage opening creation to insure that the winter range does not fall below the 30% thermal cover/snow intercept cover. This would keep the trajectory of winter range management under the umbrella of Forest Plan guidance relative to MA 13 winter range. Of note in this winter range is that there are approximately 700 acres within and adjacent to it that are designated as other MAs (MA 7 – visual emphasis, and MA 12 – riparian buffer retention) that would not receive timber-harvesting management for the foreseeable future. These areas would likely function as snow intercept cover for the long-term, and would be added assurance that cover would not be limiting in the winter range.

Firefighter Mountain Winter Range Project Monitoring Results

Vore et al. (2007) documented elk habitat selection (winter and spring) before, during, and after implementation of the Firefighter Mountain Winter Range Project (USDA Forest Service 1990a). Their monitoring/study resulted in the overall conclusion that "Habitat treatments did not influence elk habitat selection." However, they detected that snow was a driver of habitat selection and they suggested that forest canopy cover was important to elk. Considering this, Vore et al. advised that caution should be used "...when managing forests to create forage openings on winter ranges with high snowfall."

The important work conducted by Vore et al. is a valuable source of information that will likely not soon be repeated; elk winter range management in northwest Montana should be improved as a result of this study. However, wintertime implications from this study should be drawn carefully based on several factors. Vore et al. defined the size of the Treatment Area (TA) "...as that portion of Firefighter Mountain inside a 712-m [2,336 feet] buffer (mean daily movement of cow elk in spring and early summer) around each treatment unit." Given that snow pack was found to be a driver of elk habitat selection, further study is needed with this consideration in mind during study design. In particular, the TA buffer distance would optimally reflect mean daily movement of cow elk during winter rather than during spring/early summer, which was not used or defined by Vore et al. Thus, the buffer distance and size of the TA would likely be different from that used by Vore et al. and this could influence interpretation of data.

Care should also be applied in assessing what role logging treatments played in influencing habitat selection at the TA scale. The TA (8,599 acres) was used as the basis for determining whether elk selected for or against it pre-treatment, during treatment, and post habitat treatments. Considering that: a) the logging unit treatments amounted to a sum total of approximately 620 acres or 7% of the TA; b) Vore et al. determined the mean telemetry error as 643 feet ($\pm$ 236 feet) on collared elk; and that c) units were designed so that no point within each was further than 591 feet from cover; it would seem difficult to determine whether there was/was not selection for/against treatments given the relatively small amount of habitat treated, the large telemetry error, and the small logging unit sizes.

Vore et al. determined that two small but distinct herds used the TA and they labeled them as the North and South Herds. There were no data for the South Herd pre-habitat treatments because they had not begun trapping this herd prior to the start of treatments; they found that none of the South Herd's core winter range overlapped the TA. Vore et al. found no relationship between snow and treatment area selection for this herd. However, what seems slightly confusing is that while the "South herd elk use of the treatment area was not influenced by snow because none of their core home range was located in the treatment area", Vore et al. also found that "During all years combined, 56 percent of winter (n = 27) and 73 percent of spring groups (n = 33) were located in the south half of the treatment area." This does not appear to be selection against the treatment area by the South Herd.

As for the North Herd, Vore et al. found they concentrated their habitat use in the north portion of the TA even though the actual treatment units were concentrated in the southern portion of the TA. The North Herd's core winter range was 2,585 acres in size with 53% of it in the TA. Relative to the influence of snow on the North Herd's habitat selection, Vore et al. found that when the location date snow water equivalent (LDSWE), a measure of the snow pack (see Vore et al. 2007 for explanation), was greater than 11, which occurred on 31% of all winter days during the study, elk selected against the TA. However, when LSDWE was <9 elk selected the TA; this occurred during 52% of winter days during the study. In addition, when LDSWE was between 9 and 11 there was no selection for or against the TA. This suggests that on 69% of winter days during the study that elk selected for or at least not against the TA. It seems relatively easy to understand that elk would seek the easiest places to winter during deep snow pack winters. Personal observations of elk during March and April on the Dry Park/Crossover Mountain winter ranges, (approximately 20 miles south of the FMWR, near Spotted Bear), has shown that elk normally are found on the open shrub fields above the mouth of the Hungry Horse Reservoir; however, this past winter (a deep snow pack) most of the elk observed were adjacent to the river, the lowest elevation, and not on the normal portion of the winter range where they had been observed. Therefore, it should be no surprise that some elk herds change their habitat use patterns given the amount of snow. Further it is not clear what "selecting for/against" the TA really means, especially considering how the TA was determined (see above) and how this actually reflected on whether the treatment units (i.e. logging units) were being selected for and/or against.

Vore et al. (2007) stated in their Methods section "Habitat treatments began in 1991 and were mostly completed by summer 1995 except for burning of one unit. At the end of the study, during winter 1998, treatments on natural openings were 6 years old and treated logging units ranged from 2 to 6 years old with 75 percent of units ≥ 4 years old." First, logging units are not considered totally completed until the logging residue (i.e. slash) has been treated; for the Firefighter Mountain Winter Range Project this meant some form of burning to prepare the logged sites for planting and to stimulate early successional vegetation regrowth. Typically, it requires at least a couple of growing seasons post-burning in logging units to realize vegetation regrowth. The information analyzed, from the Forest Service Activity Tracking System (FACTS), showed burning treatments occurring in May of each treatment year with only 2 logging units burned in 1993, 8 logging units in 1994, and 18 units in 1995. Only the 10 units burned in 1993/1994 would qualify as being "> 4 years old" and not the "75%" indicated by Vore et al. In addition, all of these burned units occurred in the south end of the TA, the area

that neither the North nor South Herd has as their core winter range. The logging units in the north end of the TA, where the North Herd's core winter range did overlap with logging units, were burned during 1996 and 1997, making them too young on the re-growth trajectory to be of any use to elk under most winter snow pack conditions during the study. Therefore, this brings into question whether one can conclusively state that the Firefighter Mountain Winter Range Project logging treatments "...seemingly did not benefit elk" when not enough time was allowed to lapse, especially in the north portion of the TA, to allow aging of the units to provide enough browse that elk can access. Further, Vore et al. found that in the natural openings "The forage response index decreased in response to initial treatment [burning] but returned to pretreatment levels within 4 years...Shrubs in natural openings completely regained their former stature within 5 years post-treatment." Vore et al. did make an evaluation of 10 units that developed shrub canopies >15% and found no significant difference from all other areas in pre-, during, or post-treatment time periods. Therefore, they concluded that this suggested "...snow depth, as influenced by forest canopy, was a primary driver of winter elk distribution." However, as mentioned above, with logging treatment units only comprising 7% of the TA, the telemetry error as large as it was (623 feet), the concentration of logging units in the south end of the TA (not within either North or South Herd's core winter range), no point within a logging unit further than 591 feet from cover (i.e. small sized forest openings), and the young age of logging units within the north herd's core winter range, it seems to suggest that it would be difficult to tease out elk selection patterns for or against either forest canopy cover or logging units.

Vore et al. also stated in their methods section that "We determined habitat selection at 3 analysis levels during 3 time periods: pre-treatment (1988-1991), treatment (1992-1995), and post-treatment (1996-1998)." In checking the FACTS database, 11 logging units (6 in 1996 and 5 in 1997) were burned during the "post-treatment" time period; the 5 units burned in 1997 were in the North Herd's core winter range. This apparent discrepancy may be due to Vore et al.'s not including burning/treatment of logging residue as part of the treatment period, which, if true, is a mistake because fire is what stimulates early successional vegetation to grow on a forested site. In any case, there appears to be a problem of data accuracy in terms of either what constitutes "treatment" (i.e. when is a treatment actually complete) or not having the correct information on when logging residue fuels were actually burned.

Considering all of the above, the Firefighter Project responded to the general findings of Vore et al. and created an alternative that attempts to maintain forest canopy cover to function as both snow intercept cover and provide some level of forage as the treatment prescription on elk winter range; this is reflected in Alternative 3.

Environmental Consequences

The following effects indicator was used to focus the elk habitat analysis and disclose relevant environmental effects:

- The proportion of forest canopy cover maintained on designated elk winter range areas while creating forest openings to function as potential winter and early spring foraging sites.

Alternative 1 (No-Action Alternative)

Direct and Indirect Effects

This alternative would have no impact in any way on the existing condition of forest canopy cover on elk winter ranges in the analysis area. In general, this alternative would have no direct or indirect effect to elk/habitat and no cumulative impact on population viability. Forested stands targeted for treatment in the Action Alternatives would undergo natural processes, and if they escape fire and/or insect and disease outbreaks would progress to mature and older-aged forest conditions, which would presumably function as snow intercept cover and provide some level of forage in the form of conifers and possibly arboreal lichens. However, the forest is dynamic, and over time changes in the stand conditions would occur that may affect elk habitat conditions. The Vegetation section of this document describes these changes in more detail. In brief, mortality would be expected to increase in some stands, particularly those dominated by lodgepole pine. This would be due to the increased susceptibility to mountain pine beetle over time, and the continuing loss of trees due to suppression and inter-tree competition. This would reduce overstory tree density, which would have the potential to both increase production of understory shrubs and other vegetation, as well as decrease the value of the stand for snow intercept and thermal cover.

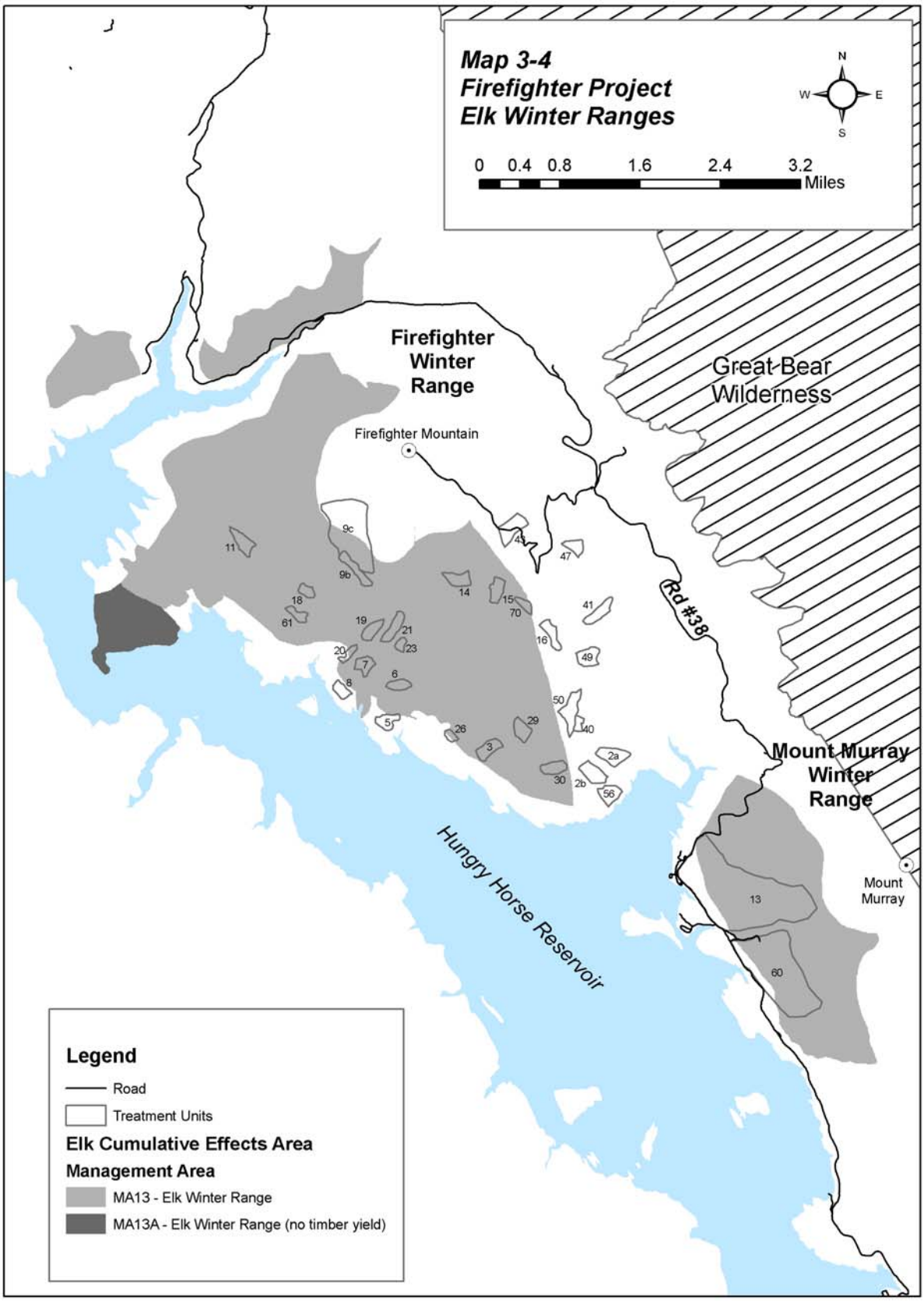
Alternatives 2 & 3 (Action Alternatives)

Direct and Indirect Effects Common to the Action Alternatives

Logging activities could continue into the general elk-hunting season and last until the end of November. This would likely have some sort of displacement effect on elk moving onto the FMWR. Depending on when snow begins to accumulate in the higher elevations, elk movements to the Firefighter Winter Range could be disrupted due to late fall logging and log hauling activities. This could result in increased elk vulnerability to hunting mortality as elk could be displaced into habitats unfamiliar to them in order to avoid the logging related disturbance areas; this effect would likely occur for three hunting seasons.

Proposed Unit 70 is an 8-acre Douglas-fir test-tree plantation that would be thinned. The effect on elk would be that the site would be disallowed from becoming a closed canopy sapling stand and would be maintained as a foraging area.

Implementation of additional motorized access restrictions designed to improve habitat security for grizzly bear (i.e. meeting Amendment 19 standards) would also benefit elk. Since there already is an area closure to motorized use during the winter on the FMWR area, elk would mostly benefit from additional motorized restrictions on adjacent spring, summer and fall ranges.


Map 3-4
Firefighter Project
Elk Winter Ranges
N
W
E
S
0 0.4 0.8 1.6 2.4 3.2
Miles
Firefighter Winter Range
Firefighter Mountain
Great Bear Wilderness
Rd #38
Mount Murray Winter Range
Mount Murray
Hungry Horse Reservoir
Legend
Road
Treatment Units
Elk Cumulative Effects Area
Management Area
MA13 - Elk Winter Range
MA13A - Elk Winter Range (no timber yield)

Alternative 2

Direct and Indirect Effects

Approximately 407 acres in 21 different units of existing forest stands currently providing some level of snow intercept cover would be converted to forest openings intended to function as foraging sites in the FMWR. Tree harvesting would be the primary means of creating these forage openings. The forest cover to forage opening ratio on this winter range would change from 83:17 to 75:25. The FMWR would continue to be dominated by forest cover; however, proposed Units 19, 21, and 29 could be eliminated to allow them to continue to function as forest cover because their position on the landscape may not be the best for elk use.

On the MMWR, approximately 100 acres in 9 different units of existing forest stands currently providing some level of snow intercept cover would be converted to forest openings intended to function as foraging sites. The forest cover to forage opening ratio on this winter range would change from 83:17 to 75:25. The MMWR would continue to be dominated by forest cover.

Both winter ranges would continue to provide forest canopy cover that would function as snow intercept cover. Vore et al. (2007) urged caution when managing forests to create forest openings on winter ranges with high snowfall. They concluded that elk seemingly did not benefit from opening the forest canopy to increase forage production during the relatively limited time period that they monitored elk response to logging units within the North Herd's core winter range. However, they did not suggest that elk were being harmed or that mortality was occurring as a result of opening up the forest canopy. Rather, their position was that maintaining forest conditions that maintains snow intercept and understory forage availability (coniferous browse and lichen) are seemingly key to maintaining higher elk densities through winter in northwest Montana. In consideration of this, it is likely that elk would not immediately (for the first few winters) benefit during winter from proposed forage openings on these two winter ranges; however, early spring grass/forb production in logged units would likely be utilized. Additionally, it is likely that as the units age and browse develops (coniferous and shrubs) that elk would use these foraging areas during winter when snow conditions (depth) do not preclude movement to these areas. Overall, both winter ranges would be changed to contain more diverse forest age class conditions that would provide wintering elk different habitat selection/use options when snow pack conditions allow.

Alternative 3

Direct and Indirect Effects

Approximately 141 acres in 9 different units of existing forest stands currently providing some level of snow intercept cover would be thinned to try to achieve a balance between retaining a level of snow intercept cover and retaining understory browse in the FMWR. However, considering the existing conditions of the selected stands, it seems unlikely that thinning of lodgepole pine dominated forest stands would be capable of retaining enough canopy cover to be capable of functioning as snow intercept cover. In order to make thinning of lodgepole pine stands economically feasible, too many trees would have to be removed such that the stand

would lose its capability of providing snow intercept. In addition, there would be a high likelihood that thinned lodgepole pine stands would be susceptible to blow down from wind events (see effects section for Forest Vegetation), which would negate the minimal potential that these stands would have for providing snow intercept function. Assuming that these thinned stands would still be capable of providing snow intercept cover, then the existing cover to forage proportions on the FMWR would remain unchanged and it would continue to be dominated by forest cover. If, however, thinned stands were not capable of performing both functions (snow intercept and understory browse) then the forest cover to forage opening ratio on this winter range would change from 83:17 to 80:20. The MMWR would be unchanged as there would be no treatments proposed for it under this alternative.

Both winter ranges would continue to be dominated by forests with sufficient canopy cover that would function as snow intercept cover. Wintering elk would be expected to continue the same patterns of winter range use, post project implementation.

Alternatives 2 & 3 (Action Alternatives)

Cumulative Effects

The FMWR and MMWR, and adjacent winter ranges, have been affected by past natural and human disturbances. The main natural disturbance affecting winter range habitat condition was fire. In the early 1900s (1910 and 1926) fires swept through the winter ranges and changed the existing older-aged forested winter ranges to early successional habitats, leaving low amounts of forest canopy cover. Human disturbances including post-fire snag removal, and during the 1960s and 1970s a variety of forest treatments (e.g. thinning and liberation cuts) were imposed on the winter ranges. More recently, the Firefighter Mountain Winter Range Project was implemented during 1992-1997 and this created forest openings within the matrix of densely stocked lodgepole pine and lodgepole pine conifer mix forest stands that dominate the winter ranges. All of these disturbances on elk winter ranges have created a condition that seemingly is favorable to elk due to the continued dominance of a closed canopied forest and a small proportion of forest openings that can/would provide forage opportunities during low snow pack winters and during early spring when snowmelt begins. The Firefighter Project would continue the gradual conversion of closed canopied forests to forest openings to provide additional foraging opportunities; all winter ranges would continue to be dominated by closed canopied forests.

Along with forest treatments, roads were constructed in or adjacent to winter ranges in the analysis area. The extent of motorized use during the winter determines the winter range habitat effectiveness; more motorized use leads to less use of portions of the winter range. Widespread use of snowmobiles has occurred within the last 20-30 years; there has been an area closure to winter motorized use in the in the Firefighter area for winter range security purposes for at least the last 10 years. The Firefighter Project would cumulatively improve winter range security through its motorized access strategy.

Many of the other normal human activities such as firewood cutting, huckleberry picking, etc. do not occur during the winter therefore, they would have no cumulative effect, in combination with the Firefighter Project, on winter range.

Vore et al. (2007) urged caution when managing forests to create forest openings on winter ranges with high snowfall. They concluded that elk seemingly did not benefit from opening the forest canopy to increase forage production during the relatively limited time period that they monitored elk response to logging units within the north elk herd's core winter range. Also, their position was that maintaining forest conditions that maintains snow intercept and understory forage availability (coniferous browse and lichen) are "seemingly" key to maintaining higher elk densities through winter in northwest Montana. However, their study was not designed to determine how snow pack influenced habitat selection. It is the contention of the Forest Service that not enough time had elapsed between treatment and elk response to truly answer the question; and questions were raised as to the accuracy of treatment data (see above) and the largeness of telemetry error, such that one was left questioning the conclusions. Vore et al. did not suggest that elk were being harmed or that mortality was occurring as a result of opening up the forest canopy. In consideration of this, it is likely that elk would not immediately (for the first few winters) benefit during winter from proposed forage openings on these two winter ranges; however, early spring grass/forb production in logged units would likely be utilized. Additionally, it is likely that as the units age and browse develops (coniferous and shrubs) that elk would use these foraging areas during winter when snow conditions (depth) do not preclude movement to these areas. Overall, both winter ranges would be changed to contain more diverse forest age class conditions that would provide wintering elk different habitat selection/use options when snow pack conditions allow.

Regulatory Framework and Consistency

Federal laws and policy/direction applicable to management indicator species such as elk include the NFMA and Forest Service Manual 2600. The Flathead Forest Plan has standards for elk summer and winter ranges. The Firefighter Project would not result in reduced population viability and it is consistent with the Forest Plan governing winter range management. The USDA Forest Service is bound by federal statutes (Endangered Species Act, National Forest Management Act), regulation (USDA 9500-4), and agency policy (FSM 2670) to conserve biological diversity on National Forest System lands. A goal in Forest Plan Amendment 21 is to "ensure that Forest Service actions do not contribute to the loss of viability of native species." The proposed Firefighter Project, based on this analysis, is not expected to contribute to loss of population viability of elk.

Brown-headed Cowbird

Molothrus ater

Introduction

Vore and Bergeron (in a 2008 letter sent by Vore and Bergeron to the Hungry Horse Ranger Station commenting on the Firefighter Project scoping letter) detected the introduction of the parasitic nesting brown-headed cowbird (BHC) during the post implementation monitoring of

the Firefighter Mountain Winter Range Project. They suggested that additional treatments could increase the occurrence and distribution of the BHC in the Firefighter Mountain area. Their concern relative to BHC is that a variety of avian birds could be adversely impacted by its parasitic nesting behavior. The BHC is analyzed here in response to this letter.

Analysis Area/Information Sources

The bounds for the analysis of direct, indirect, and cumulative effects on the BHC will be the vegetation treatment units in the Firefighter Project. Effects could continue until the logged forested sites (more open areas preferred by the BHC) return to forested stands, approximately 10-15 years.

Data used in the analysis were from existing information sources, aerial photos, and field surveys of the proposed treatment sites.

Affected Environment/Existing Condition

The BHC prefers open habitats of low or scattered trees interspersed with grasslands; they usually avoid unbroken forest. They prefer, and may require, areas of short grass or bare ground for foraging (Rothstein 1994). Open coniferous and deciduous woodlands, forest edges, brushy thickets, agricultural land, and suburban areas are all acceptable brown-headed cowbird habitat (DeGraaf et al. 1991; Hamel et al. 1982). Historically the BHC may have depended on grazing by large ungulates to create suitable feeding conditions. A common foraging technique is to follow large grazing animals, gleaning seeds and the insects stirred up by the feet of the grazer (DeGraaf et al. 1991; McHugh 1958; Lowther 1993). In the western states, the BHC is more abundant in stands surrounded by a large amount of open land (Hejl 1992). The probability that a cowbird occurs in a forest depends at least partly upon the probability that a feeding area is nearby. As areas become more forested, BHC breeding opportunities may increase, but feeding opportunities may decline. Hence, in heavily forested environments, cowbird densities are low, parasitism rates of forest birds have been recorded in the 2-4% range (Clawson et al. 1997).

Environmental Consequences

The following effects indictor was used to focus the BHC analysis and disclose relevant environmental effects:

- Presence of BHC habitat

Alternative 1 (No-Action Alternative)

Direct, Indirect, and Cumulative Effects

This alternative would have no impact on the existing condition of forested lands in the project area. None of the forested stands would be thinned or harvested; the stands would undergo natural process, and if they escape fire and/or insect and disease outbreaks, would progress to mature and older-aged forest conditions. This alternative would have no direct, indirect, or cumulative effects to the BCH or its habitat.

Alternatives 2 & 3 (Action Alternatives)

Direct, Indirect, and Cumulative Effects

Portions of the forest would be treated under the Action Alternatives, so it is possible that the Firefighter Project could create temporary conditions that could maintain BHC presence in the area. However, it is expected that this would only occur for a relatively short period of time (10-15 years) due to the ongoing nature of logged forested sites to return to forested stands; typically, a new generation of trees occurs naturally or by reforestation planting. Since the BHC is highly associated with agricultural/grassland types of settings for feeding (it is a ground gleaner, consuming weed seeds, grass seeds, waste grain, and insects), it is unlikely that the BHC would become a permanent resident in the Firefighter Mountain area. Since Vore and Bergeron, in their 2008 letter, did not quantify the density of BHC in the area, it is not possible to determine whether the Firefighter Project will increase or simply maintain the status of cowbirds in the area. However, considering the habitat requirements of the BHC, it is unlikely that an increase in cowbirds would occur because the Firefighter Mountain Winter Range Project forest openings are all in the sapling stage of reforestation; since no thinning of these regenerated stands are likely, their ability to function as foraging habitat will be precluded.

In conclusion, while the status of BHC status in the Firefighter area is unknown (Vore and Bergeron in their 2008 letter) it is unlikely that the proposed Firefighter Project would increase the occurrence of cowbirds. The existing status/presence of the BHC may be maintained with a new group of forest openings. Cumulatively, this would maintain the current level of impacts on host avian species relative to nest parasitism.