Wildlife Report for

East Otter Hazardous Fuels Reduction Project

Ashland Ranger District
Custer National Forest
USFS R-1 Northern Region
Montana

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3.1 Description of Alternatives Considered in Detail

3.1.1 Alternative 1 – No Action / Existing Condition
3.1.2 Alternative 2 – Proposed Action

3.2 Wildlife, Fisheries, and Sensitive Plants

The effects to species of concern are disclosed in the following order:

- Effects on federally listed species (black-footed ferret);
- Effects on Forest Service Region-1 Sensitive Species (Townsend's big-eared bat, pallid bat, spotted bat, fringed myotis, long-eared myotis, long-legged myotis, black-tailed prairie dog, bald eagle, burrowing owl, loggerhead strike, plains spadefoot, great plains toad, northern leopard frog, greater short-horned lizard, milksnake, and western hog-nosed snake);
- Effects to Custer National Forest Plan, Habitat Indicator Species and Key (Major Interest) Species (elk, mule deer, white-tailed deer, pronghorn, sharp-tailed grouse, western kingbird, northern oriole, yellow warbler, spotted towhee, Brewer's sparrow, golden eagle, prairie falcon, merlin); and
- Local interest (wild turkey).

Forest Plan - The Custer National Forest established a list of management indicator species (MIS) based upon NFMA regulations criteria (USFS, 1986, p. 19 and 180). The concept of MIS includes both biological indicators (those species that represent a whole group of other species that use the habitat similarly), as well as species of high interest, such as major hunted species and those listed as threatened or endangered (see Biological Assessment). Biodiversity as applied and considered in this analysis (see Glossary and references to Forest Plan) is based on a course filter (MIS) / fine filter (TES) process which includes associated habitats. The analysis assumes habitat is a surrogate for wildlife and plant populations. Several recent court decisions have supported this approach to management in regards to project analysis [Inland Empire Public lands Council v. USFS, 88 F.3d 754, 760 (9th Cir. 1996) and Idaho Sporting Congress v. Thomas 137 F. 3d 1146 (9th Cir. 1998)], for programmatic plans and the NFMA diversity provision [Northwest Forest Plan – Seattle Audubon Soc. v. Mosely, 871 F. Supp. 1291 (W.D. Wash. 1994) aff'd 80 F. 3d 1401 (9th Cir. 1996)] and recently [Lands Council v. USFS, D.C. No. CV-06-00425-EJL (9th Cir. 2008)]. Incidental observations on species have been included in the Montana Natural Heritage Program NHTracker data base or USFS FAUNA data base.

Designated Habitat - The Ranger District does not provide habitat designated as "Critical" for any federally listed species. In addition, the project area does not contain any specially designated habitats relative to federally listed or proposed species nor USFS Northern Region sensitive species (Kimbell, October 28, 2004).

Fish - Information on aquatic ecosystems was coordinated with Darin Watschke, Forest Fisheries Biologist, October 8, 2008, and incorporated into this report (Watschke, Oct. 8, 2006). Water sources are limited to isolated springs, stock ponds, and occasional seasonal wetlands. USFS inventories have not identified any fisheries in or immediately adjacent to the project area.

3.2.1 Existing Condition

Mature Forest - Compared to the available mature forest considered in the Forest Plan (USFS, 1986), post-Forest Plan activities, especially wildfires, and have removed large areas of forested habitat, including mature forest, on the Ashland Ranger District. Mature forest for wildlife habitat is believed to be a limiting factor to dependent species compared with the historic age distribution for the Ranger District. The East Otter Hazardous Fuels (East Otter) project area has had about 400 A. stand replacement from wildfire (Anderson, 2008.11.19) and harvest (Timber sale circa 1970 and 1985). About 320 A. of the 400 A. are attributed to the Schiller Fire (1988). Some areas that were grasslands in 1962 are show as forested in 2002 aerial photography (Sasse, 2008.10.28).

Forest Plan Management Areas – The project area includes Management Area B (18%), D (12%), F (>1%), G (70%), and unmapped areas of N and M within other management areas.

A portion of the project area is in Management Area (M.A.) "D" and is a multiple-use area that includes forested areas, grass/timber complexes, and rangelands. Forest Plan goals and objectives for this management area emphasize maintenance or improvement of long-term diversity and quality of habitat for selected wildlife species identified by the Ranger District as well as accommodating other resource management activities such as timber harvest, livestock grazing, and oil and gas development. The selected species for M.A. “D” for the Ashland Ranger District is the mule deer. Prescribed Fire could be used for range improvement and wildlife habitat, timber stand maintenance, fuels reduction, sanitation, and maintaining vegetation and associated wildlife habitat dependent on periodic fire.

If the responsible official determines that resource conflicts cannot be adequately mitigated, he/she will reslolve the conflicts in accordance with management area goals and if necessary in consultation with affected parties (USFS, 1986, P. 49).

The portions of MA “D” in the project area contains part of one goshawk home range and PFA, but no nest stands.

Table 3.2.1.T1. Acres by Management Area.

Management Area [1]	**Acres** [2]	**Percent**
B	785	18%
D	495	12%
F	20	>1%
G	2976	70%
N and M	Unmapped	Estimated at 1%
Totals:	4,276	100%

[1] TSMRS data.
[2] GIS data.

Mule Deer – Mule deer fawning is distributed over the landscape and specific fawning locations are unknown. Based on MDFWP surveys (Hemmer, 2008.05.19), mule deer are widely

distributed in SE Montana (including the Ashland Ranger District) and populations either stable or increasing. Mule deer harvest and hunter numbers in MDFWP Region 7 have been relatively stable over the last four years. Mule deer may utilize almost the entire Ranger District during most winters. Current winter range maps reflect historic mule deer distributions surveyed during past severe winter conditions.

Water Sources - The natural distribution of water sources has been augmented over time by water developments primarily designed to enhance water availability for permitted livestock grazing. There has been an incremental increase in areas influenced by livestock as a result of water development. Secondary range has been converted into primary range as a result of some water developments located away from springs and other natural sources. In recent years the reconstruction of stock water tanks has included ramps for wildlife access and escape; some stock water tanks are in need of maintenance and lack these wildlife ramps. Big game species have adapted to and utilize these water sources.

Roads - Road density in the project area is 2.65 mile per square mile of project area on NFS lands (Fig. 3.5.3.1.3.F1) which exceeds the density of less than 1.0 mile per square mile desired for big game and other wildlife security (Lyon and Christensen, 2002, P. 568). The roads that allow access to areas off major roads are surface with native soil materials. Access conditions generally allow hunter access during dry weather, but reduce travel and motorized hunter opportunity during wet weather to the aggregate surfaced portions of main roads. Trombulak and Frissell (2000, P. 18) point out that roads can alter animal behavior by causing changes in home ranges, movement, reproductive success, escape response, and physiological state.

3.2.2 Desired Condition

The desired condition on a coarse scale is to maintain a range of vegetation seral stages distributed across the landscape in order to provide suitable and sustainable habitat for dependent species. On a fine scale habitats are maintained for USFS sensitive species such as loggerhead shrike (woody draws) and black-tailed prairie dog (low seral grassland). Suitable mature forest habitat is maintained for MIS (goshawk). The structure of ponderosa pine forests is managed to provide for single and multi-storied structure and open and closed canopy for dependent wildlife species. Although active treatments such as thinning and prescribed burning create more open overstories and increase understory diversity at the stand level, a mix of treated and untreated areas will likely maximize heterogeneity and diversity at the landscape scale (Metlen and Fiedler, 2005).

Forested areas are generally a sea of single-storied open spaced ponderosa pine with islands of mature high crown cover to provide habitat for goshawk and hiding cover for elk and other big game species. Small islands of multi-storied pine forest are scattered across the project area. Snags and snag-replacement trees are well dispersed across the landscape spatially and temporally to provide for cavity / snag dependent wildlife over time.

Disturbances such as fire, grazing animals, and insect and disease play a role in maintaining these habitats. Big sagebrush habitat is maintained and contains an understory of mid-grass dominated species. Riparian, woody draw, aspen habitat is maintained at Proper Functioning Condition for dependent species. Woody draw and aspen habitat is maintained and contains deciduous vegetation of multiple age classes. Suitable habitat is maintained at springs and other water sources to support dependent amphibian and reptile populations.

Livestock generally graze pastures of native vegetation within allotments unevenly; these patterns provide a variety of grassland structure and wildlife habitats. High seral grasslands (high structure) and low seral (prairie dog towns) are present where suitable environmental conditions exist on the landscape.

Maintaining elk security would help achieve Montana Elk Management Plan habitat management strategies (MDFWP, 2005, P. 389) and address concerns for big game security as identified in scoping. Based on the literature (Hillis et al. 1991) it is desirable to maintain an open road density of no more than 1.0 mile per square mile (Lyon and Christensen, 2002, P. 568) so as to achieve elk security areas (0.5 miles from road open to public motor vehicle access) on at least 30 % of the Ranger District which is currently at about 12%.

Metlen and Fiedler (2006, P. 355) concludes that although active treatments create more open overstories and increase understory diversity at the stand level, a mix of treated and untreated areas will likely maximize heterogeneity and diversity at the landscape scale.
Similarly, Pillod et al. (2006, P. Abstract) management activities that consider the retention of habitat structures (such as snags, down wood, and refugia for untreated stands) could increase habitat heterogeneity and could benefit the greatest number of species in the long run.

3.2.3 Project Bounding / Cumulative Effects

Spatially, the cumulative effects analysis area boundary is the same as the project area unless otherwise stated for a particular species. Temporally, short-term effects are < 10 years and long-term 10 years or greater, unless otherwise stated for a species. The temporal period for effects is 30 years, unless otherwise stated, because it represents the approximate time for ladder fuels to reestablish in the absence of treatment in a mature single-storied ponderosa pine stand. The East Otter project area boundary for the proposed action is shown in Fig. 3.2.3

3.2.4 Analysis Considerations / Cumulative Effects

The analysis of environmental consequences is based on qualitative changes in habitat for most species and qualitative and quantitative changes for other species (e.g., goshawk and elk). According to the Council on Environmental Quality (CEQ, June 24, 2005, P. 2), "Generally agencies can conduct an adequate cumulative effects analysis by focusing on current aggregate effect of past actions without delving into the historical details of individual past actions." The effects of all the past actions have created the current affected environment / conditions, consequently specific past actions are listed generally. Past, present, and reasonably foreseeable actions were considered in this analysis (See, NEPA document Appendix, Project Activities Considered). Conservation strategies and the Forest's Monitoring Program are determined at the Forest Plan level and are outside of the scope of this project analysis. Analysis was based on the best science available.

3.3 Threatened and Endangered Species

See Sasse (2008.10.10) for Biological Assessment (black-footed ferret) for the proposed action ("No Effect" – absent) which includes coordination with the USFWS on species that were addressed in this document (Hanebury, Oct. 7, 2008) and is based on Forest et al. (1985).

3.4 USFS R-1 Sensitive Species

Sensitive Species are "Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: a. Significant, current or predicted downward trends in population numbers or density; b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution. (FSM 2670.5, P. 12, 6/23/95)" The Sensitive Species policy is applied to forest plans developed, revised, and amended under the 1982 NFMA Planning Rule, as well as projects and activities implementing such plans (USFS, July 3, 2006). The Custer Forest Plan (USFS, Oct. 1986) was developed under the 1982 NFMA Planning Rule.

The USFS Northern Region (R1) sensitive species list (Kimbell, August 28, 2004), the addition (Kimbell, March 31, 2005) and then removal (Tidwell, July 17, 2007) of the northern goshawk and black-backed woodpecker was considered in this analysis. The FS sensitive species identified as present or potentially present in the project area as well as Determination of Effects by alternative are identified in the following table and summarized below.

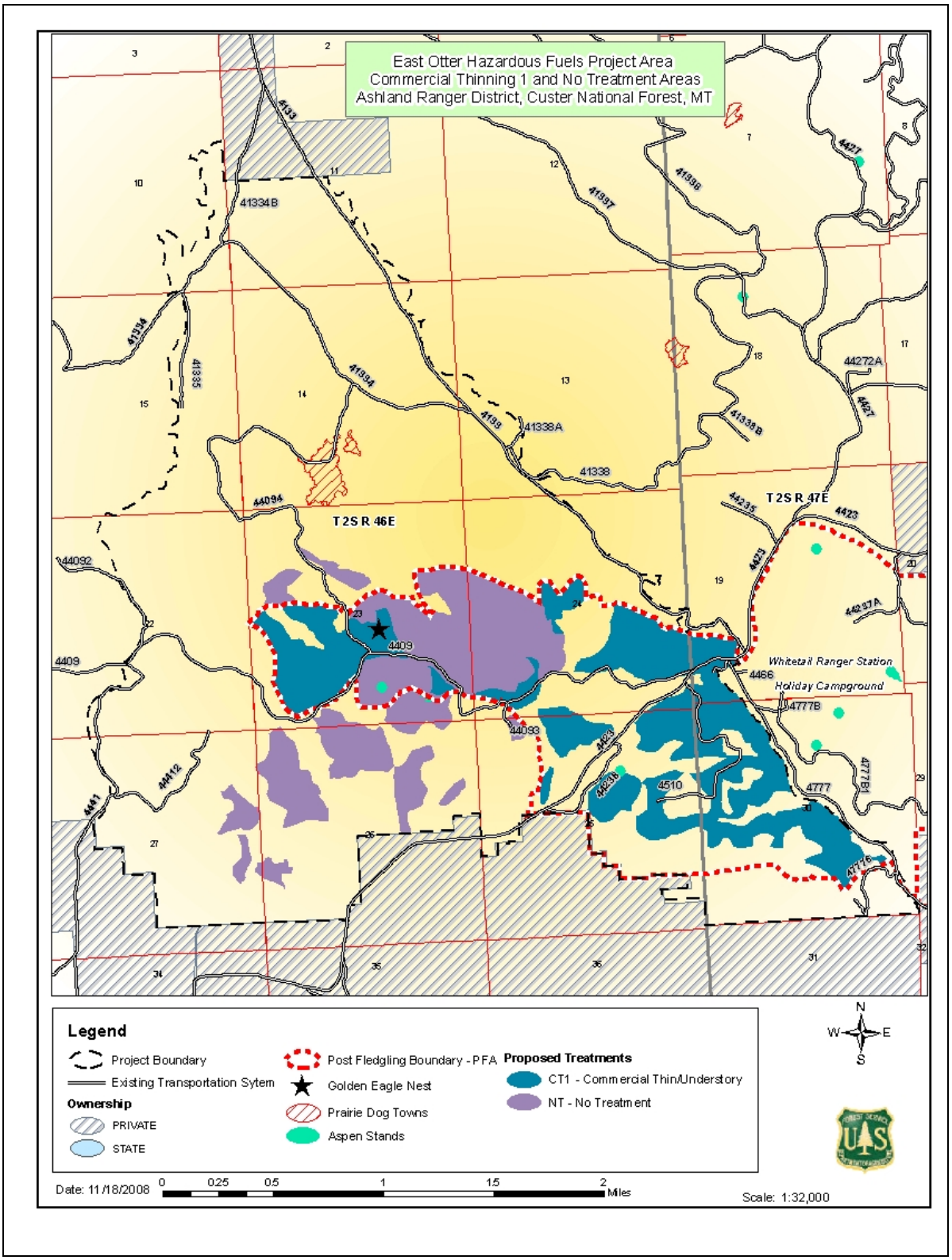


Fig. 3.2.3. Proposed CT1 thinning areas (approx. 548A.) and NT (No treatment, 250 A) within PFA for East Otter Hazardous Fuels project area, Ashland Ranger District, Custer National Forest, Montana (Gonzales, 2008.11.18).

Table 3.4.T1. USFS Northern Region Sensitive Species [1], Ashland Ranger District, Custer N. F.

Species	Status [1, 2]	Habitat [1]	Habitat Present (P) or Absent (A)	Species Present (P) or Absent (A)	Alt. 1 Existing Condition	Alt 2 Proposed Action	
Federally Listed							
Black-footed ferret *Mustela nigripes*	Federally Listed		A	A	No effect	No effect	
Mammals							
Townsend's big-eared bat *Corynorhinus townsendii*	USFS sensitive	Wet meadows, water sources, and rimrocks	P	P?	NI	MIIH	
Pallid bat *Antrozous pallidus*	USFS sensitive	Dessert areas, rock outcrops, particularly near water	P	P?	NI	MIIH	
Spotted bat *Euderma maculatum*	USFS sensitive	Rimrocks – ponderosa pine forest	P?	P?	NI	MIIH	
Fringed myotis *Myotis thysanodes*	USFS sensitive	Forest / Grassland	P	P	NI	MIIH	
Long-eared myotis *Myotis evotis*	USFS sensitive	Forest / Grassland	P	P	NI	MIIH	
Long-legged myotis *Myotis volans*	USFS sensitive	Forest / Grassland	P	P	NI	MIIH	
Black-tailed prairie dog *Cynomys ludovicianus*	USFS sensitive	Grasslands	P	P	NI	MIIH	
White-tailed prairie dog *Cynomys leucurus*	USFS sensitive	Grasslands	A	A			
Gray wolf Canis lupus	USFS sensitive	Remote mountainous areas	A	A			
Wolverine *Gulo gulo luscus*	USFS sensitive	Remote mountainous areas	A	A			
Birds [3]	USFS sensitive						
Bald eagle *Haliaeetus leucocephalus*	USFS sensitive	Rivers, Wetlands, Forests	P	P (Migrant)	NI	NI	
Peregrine falcon [2] *Falco peregrinus anatum*	USFS sensitive	Cliffs and wetlands	A	A			
Flammulated owl *Otus flammeolus*	USFS sensitive	Forest	A	A			
Burrowing owl *Athene cunicularia*	USFS sensitive	Prairie dog towns and grasslands	P	P?	NI	MIIH	
Sage grouse	USFS sensitive	Sagebrush grasslands	P?	A			

Centrocercus urophasianus							
Baird's sparrow *Ammodramus bairdii*	USFS sensitive	Grassland	P	A			
Sprague's pipit *Anthus spragueii*	USFS sensitive	Grassland	P	A?			
Blue-gray gnatcatcher *Polioptila caerulea*	USFS sensitive	Nests in shrubs	A	A			
Loggerhead shrike *Lanius ludovicianus*	USFS sensitive	Woody draws and grasslands	P	P	NI	MIIH	
Long-billed curlew *Numenius americanus*	USFS sensitive	Grasslands	?	A			
Harlequin duck *Histrionicus histrionicus*	USFS sensitive	Mountains streams	A	A			
Amphibians							
Plains spadefoot *Spea bombifrons*	USFS sensitive	Grasslands – small ponds	P	P	NI	MIIH	
Western toad (Boreal toad) *Bufo boreas*	USFS sensitive	Wetlands, grasslands, and forests	A	A			
Great plains toad *Bufo cognatus*	USFS sensitive	Grasslands – small ponds	P	P	NI	MIIH	
Northern leopard frog *Rana pipiens*	USFS sensitive	Riparian and wetlands	P	P	NI	MIIH	
Reptiles							
Greater short-horned lizard (*Phrynosoma hernandesi*)	USFS sensitive	Sandy soil areas - grasslands	P	P	NI	MIIH	
Milksnake (*Lampropeltis triangulum*)	USFS sensitive	Grasslands, rocky outcrops	P	P	NI	MIIH	
Western hog-nosed Snake (*Heterodon nasicus*	USFS sensitive	Sandy soil areas - grasslands	P	P	NI	MIIH	
Fish	USFS sensitive						
Sturgeon chub *Macrhybopsis gelida* [4]	USFS sensitive	Turbid streams	A	A			
Northern redbelly dace *Phoxinus eos*	USFS sensitive	Prairie streams	A	A			
Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri*	USFS sensitive	Cold water	A	A			

[1] Federally listed species based on consultation with the USFWS (Lou Hanebury, October 7, 2008 by Don Sasse). The species listed as sensitive on Update of the Forest Service Northern Region Sensitive Species List (Kimbell, August 28, 2004). Options in determination of impacts to sensitive species are based on Salwasser and Bosworth (1991, Aug. 17). **NI** = No impact. **WIFV*** = Will impact individuals or habitat with a consequence that the action may contribute to a trend towards federal listing or cause a loss of viability to the population of species. (***** = Trigger for a significant action as defined in NEPA.) **MIIH** = May impact individuals or habitat, but will not likely contribute to a trend towards federal listing, or cause a loss of viability to the population or

species. **BI** = Beneficial. There would be "no impact" to sensitive species determined to be absent from the project area and not included in this table. P = species present and considered in analysis; P? = The species is potentially present: A = Species absent and no further analysis will be completed.

[2] The species is listed as sensitive on the Revised Forest Service Northern Region Sensitive Species List (Kimbell, Oct. 28, 2004). Options in determination of impacts to sensitive species are based on Salwasser et al. (1995, Aug. 17). **NI** = No impact. **WIFV*** = Will impact individuals or habitat with a consequence that the action may contribute to a trend towards federal listing or cause a loss of viability to the population of species. (***** = Trigger for a significant action as defined in NEPA.) **MIIH** = May impact individuals or habitat, but will not likely contribute to a trend towards federal listing, or cause a loss of viability to the population or species. **BI** = Beneficial. There would be "no impact" to sensitive species determined to be absent from the project area and not included in this table.

[3] The northern goshawk and black-backed woodpecker were added (Kimbell, March 31, 2005) and then removed (Tidwell, July 17, 2007) from the Northern Region sensitive species list. This is to be considered information provided by the Regional Forester, and guidelines that may be applied. Note: The northern goshawk is considered as a Custer NF Management Indicator Species.

[4] Fisheries information provided by Darin Watschke, Forest Fisheries Biologist, Custer National Forest, Oct. 9, 2008 (Watschke, 2008).

3.4.1 Bats

Affected Environment – Townsend's big-eared bat, pallid bat, spotted bat, fringed myotis, long-eared myotis, and long-legged myotis (Table 3.4.T1) are present / potentially present on the Ranger District (Lenard et al, 2007; NHTracker; Maxell, 2008.05.21) and potentially in the project area. Hayes and Loeb (2007, P. 226-227) conclude that in the absence of a refined quantitative understanding of bat habitat, that four key habitat attributes play critical roles in defining niches for bats in forested ecosystems: quality and availability of roosts, water, prey, and the amount of clutter (vegetation). According to Guldin et al. (2007, P. 202) special attention needs to be focused on creating and retaining structural and legacy features such as relic trees and snags.
Roosts - These bat species could utilize snags (cavities, loose bark), foliage, or rimrocks as day or night roosts. In general, roost habitat for bats would benefit from the maintenance of a landscape that includes a diversity of riparian and woody draws in proper functioning condition (PFC), as well as a mosaic of ponderosa pine forest structure and size classes including small patches of fire / insect killed trees (snags). Some bats such as the silver-haired bat (not USFS R1 Sensitive or MIS) are known to use loose bark or crevices in trees for roosting and tree cavities for maternity aggregations (Mattson, et al., 1996, P. 247). There are rimrocks (fractures and crevices) present in, but no caves or mine adits or shafts in or adjacent to the project area that could provide roost habitat for bats.
Water - Water sources are limited and consist mainly of stock ponds and tanks as well as ephemeral streams.
Prey and Amount of Clutter – Local prey species and densities are unknown. Maintenance of prey and foraging habitat is assumed to include providing for a landscape that includes a diversity of grasslands, shrub-grasslands, riparian and woody draws in proper functioning condition (PFC), as well as a mosaic of ponderosa pine forest structure and size classes including small patches of fire / insect killed trees (snags). Currently much of the ponderosa pine forest is highly cluttered with multi-layers of trees limiting flight and with limited locations of open pine stands for prey and foraging.

Environmental Effects – Effects to bats are addressed based on the four key habitat attributes – *Roosts, Water, Prey, and Clutter.*
Roosts - Bat roost habitat can be maintained by managing for forests and grasslands in good condition in a mosaic of forest and grassland habitat, and woody draws and riparian areas in proper functioning condition. The proposed action would remove some snags through timber harvest of mature trees and through prescribed burning of some existing snags, but through implementation of prescriptions provide for relic trees / snags in the long-term. Prescribed burning would also create new snags. Ritchie et al. (2008, P. 919 and 923) found that in NE California, in the short-term increased vigor in thinned stands appeared to be offset by an increase in mortality of large trees when thinning was followed by prescribed fire. In the long-term, stands with a combination of thinning and prescribed fire had far fewer high-risk mature trees and generally lower rates of mortality after treatment.

Fewer acres would be treated with commercial harvest than would be treated through prescribed burning. Intermediate harvest (CT, CT1) tends to favor and retain the larger ponderosa pine trees (relic trees), while regeneration harvest (ROST, ROSW) tends to remove most large trees

(but not all) in the treated areas on the landscape. The proposed action would potentially improve woody draw / riparian roost habitat for bats in the long-term over the existing condition. The proposed action would have no direct or indirect impacts to rim rocks or rock fractures that may provide potential bat hibernacula. The proposed action would have essentially no impact on the bats using fractures or crevices in rimrocks because these habitats would not be directly impacted.
Water – The proposed action would maintain existing water sources similar to the existing condition.
Prey and Clutter - The proposed action would help provide for a mosaic of forest stands of varying size class as well as canopy cover and forest-stand-layers over the existing condition which contains extensive areas of "clutter" (forest vegetation layers). According to Hayes and Loeb (2007, P. 219), the impact of fire management on prey availability for bats, and on ecology of bats in general is poorly understood. In the absence of habitat requirements for specific bat species, managing for a diversity of habitats and mosaic of vegetation structures is assumed to best provide for bat species because specific habitat requirements of bat species are poorly understood.

Foraging bats species can utilize a variety of "cluttered" (multi-layered) and "uncluttered" (relatively single-storied) forest. Hayes and Loeb (2007, P. 216) point out that most bats in North America avoid extensive use of highly cluttered habitat. Lacki et al. (2007, P. 199) reviews the literature and points out that the amount of clutter or number of obstacles a bat must detect and avoid in a given area can strongly influence the use of habitats by bats. In general, maneuverable species of bats with small bodies and low wing loading are able to use habitats with higher levels of clutter than less maneuverable species of bats with large bodies and high wing loading can use. Assemblages of bats living in managed, coniferous forests in Idaho consume a wide range of prey, suggesting that guidelines for management of these habitats should consider the importance of sustaining diverse insect communities to ensure the long-term health of bat populations inhabiting these forests.

Guldin et al. (2007, P. 200) point out that thinning, improvement cuts, pruning, and prescribed fire can be used to further reduce the clutter in the understory and to open corridors through the canopy. Depending on the intensity of treatments, the silvicultural practices could be used to increase habitat by bats and create zones beneath the canopy suitable for clutter forages and intermediate clutter forages. The proposed action would provide a variety of habitats including untreated (deferred), prescribed burning only, mechanical (thinning from below, CT and CT1), as well as removal of most overstory trees (ROST, ROSW) over the existing condition.

The proposed action would maintain grassland habitats because of design criteria (maintaining big sagebrush concentrations) and focusing activities on forest habitats.

Cumulative Effects – Overall, and considering the direct, indirect, and reasonably foreseeable future actions of cumulative effects, the proposed action would have short-term negative effects (some snag removal and human disturbance), but better maintain habitat for bats than the existing condition because it provides availability of roosts (foliage, snags, rock fractures and crevices), maintains water sources, and maintains potential prey while reducing the amount of vegetation clutter in dense stands, and reducing the risk of stand replacing wildfire. The

proposed action Design Criteria are expected to insure snag management guideline are met through mechanical and prescribed burning prescriptions and along with a variety of forest vegetation structure provide for cavity and foliage roosts and over time. The proposed action is expected to maintaining a variety of forest structure across the landscape and within stands, while maintaining the process of low intensify fires, and is expected to provide for the diversity of habitats needed in the long-term for local bats utilizing forest and grassland habitats.

3.4.2 Black-tailed prairie dog and Burrowing Owls

Affected Environment - The Forest Plan identifies a goal for the acceptable acreage (300 acres) of primary suitable range occupied by prairie dogs for the Ashland Ranger District (USFS, Oct.1986, p. 20). No limits are established for prairie dog acreage on secondary and unsuitable range. The USFS was a participant in the multi-party development of a Conservation Plan for black-tailed and white-tailed prairie dogs in Montana (Montana Prairie Dog Working Group, Jan. 2002). "The goal of this conservation plan for the state of Montana is to provide for management of prairie dog populations and habitats to ensure long-term viability of prairie dogs and associated species." In 2003, there were at least 681 acres of black-tailed prairie dog (*Cynomys ludovicianus*) on NFS lands which occupy 0.16% of the 435,822 A. on the Ashland Ranger District. The project area includes one prairie dog town located in lower Funnel Draw (Figure 3.4.2.). The active colony was of 25A. in 2002 and is currently estimated at 30 A. Burrowing owls rely on prairie dog towns for habitat and are potentially present.

Environmental Effects - The proposed action is focused on forested habitats and would minimize impacts to grassland and grassland / shrub habitat. The proposed action is expected to remove some trees colonizing grassland in the short-term and maintain the habitat in the long-term slightly better than the existing condition. The prairie dogs are likely, in the absence of control action or sylvatic plague outbreaks, to expand slowly under the proposed action and existing condition. Burning or mowing of grassland has been shown to favor prairie dog colonization of treated areas (Northcott et al. 2007, P. 1). In the event of wildfire, active prairie dog towns and low vegetative condition tend to function as fuel breaks on the landscape. Any disturbed areas on suitable slopes and soils within grasslands are potential areas for new colony establishment. Proposed action design criteria and Timber Sale Contract "C" clauses (Clark, 2008.10.15) would be used to avoid heavy equipment use in prairie dogs with the exception of truck traffic over existing roads. USFS Sale Administrators are required to approve all skid trails, landings, and temporary roads and would insure that these activities would be outside of prairie dog towns. Logging related activities that are confined to existing roads within prairie dog towns would result in some short-term disturbance and potentially some direct mortality from truck traffic.

Cumulative Effects – Considering past, present and reasonably foreseeable actions of cumulative effects, the proposed action would have a slight improvement in habitat because of tree removal over the existing condition. There may be isolated mortality to individual from vehicle traffic on existing roads through prairie dog towns, but losses are not expect to impacts populations in the long-term. Burrowing owls could potentially respond positively to increases in active prairie dog town acreages. Maintenance of active prairie dog towns would contribute to the fuel break mosaic across the landscape.

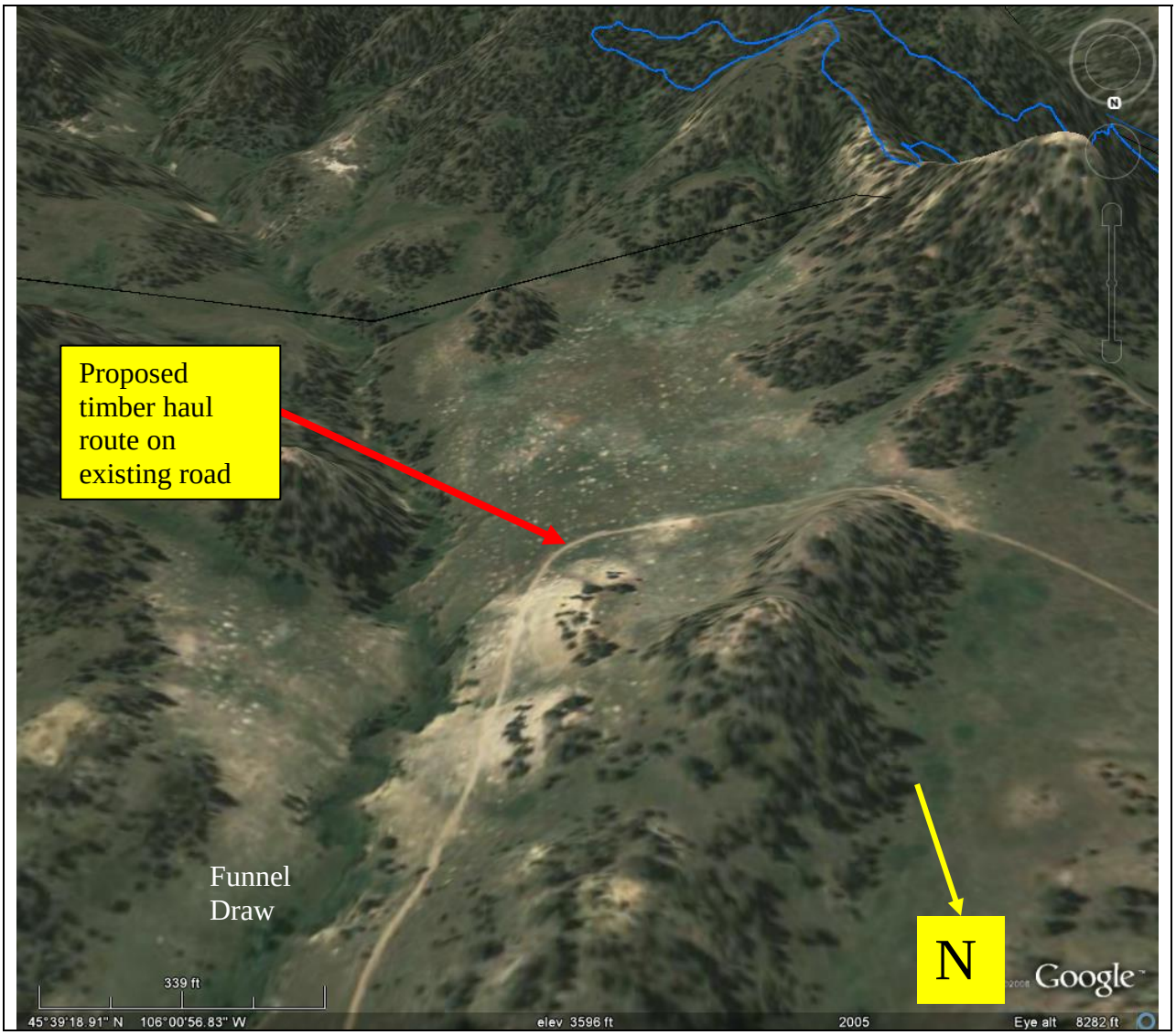


Fig. 3.4.2. The photograph shows an active black-tailed prairie dog town located in Funnel Draw and the existing road proposed for a timber haul route in the East Otter Hazardous Fuels Reduction project area, Ashland RD, Custer NF, MT. Impacts to prairie dogs can be avoided by limiting logging activities and timber haul route to the existing road and avoiding activities in the town. The photo is viewed from the north looking to the south. Proposed adjacent commercial harvest units are shown to the top-right or southwest of the prairie dog town.

3.4.3 – Bald Eagle

Affected Environment – Bald eagles migrate over the Ranger District, but there are no known or suspected winter roosts nor nest sites. The biology of this bird is described in Reel et al. (1989). Bald eagles continue to be protected by the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA).

Environmental Effects / Cumulative Effects – Considering past, present and reasonably foreseeable actions of cumulative effects, the proposed action would have no impact on the bald eagle because there are no nests, winter roosts, and during migration the species tends to use the grassland areas for foraging. The proposed action focuses on forested habitats.

3.4.3.1 – Loggerhead Shrike

Affected Environment – Loggerhead shrike breeders usually settle near isolated small trees or large shrubs within plains habitat types (Dobkin, 1992, P. B-88; Yosef, 1996, P. 5). USDA (2000, P. 94 and 96) indicates that in the Black Hills N.F. the shrike is not very abundant in forested habitats, but more abundant in brushy areas such as scattered large shrubs intermixed within open meadows or grasslands. Rumble speculated that suitable shrike habitat probably occurs where pine trees are encroaching into large prairies. Guidelines for providing for desirable habitat conditions include providing scattered trees and shrubs within grasslands (Sidle and Gillihan, 2004, P. 9). In Montana, loggerhead shrikes were found in open and gently rolling topography, often nest in thorned shrubs such as buffalo berry and hawthorn (Rauscher, 1999, P. 17). Nesting was most often in isolated trees, shrubs, shelterbelts, or copses. In the project area, woody draws appear to provide desirable nest habitat similar to shelterbelts in other areas. On the Ashland RD, observed habitat defended by loggerhead shrike most closely approximate the shrub and deciduous trees shown in Rauscher (1999, P. 33-34). Information and photographs provided by Johnson (2008.04.21) of small trees and juniper habitat were considered in this analysis.

Environmental Effects - The proposed action is expected to maintain the savannah and edge habitat (USDA 2000, P. 94 and 96) and reduce tree and shrub densities in natural openings levels below that needed for potential shrike habitat because of design criteria and prescriptions. Woody draw habitat would be enhanced and up to 10% ponderosa pine (or the existing level <10%) crown cover would be retained along woody draws. Big sagebrush stands though limited in distribution and suitability (height) for nesting, would be retained. Commercial harvest of ponderosa pine would be in forested areas where the shrike is not likely to nest.

Cumulative Effects – Considering the past, present, and reasonably foreseeable future actions of cumulative effects the proposed action would maintain and likely improve habitat (woody draws) over the existing condition for the loggerhead shrike because of the maintenance of woody draws in grasslands and retention of sufficient scattered ponderosa pine trees in grasslands.

3.4.4 - Northern Leopard Frog

Affected Environment - Historically, the northern leopard frog was widespread in Montana, but it now appears to be extinct throughout much of the western part of the state (Hendricks and Reichel. 1996, pp. 14-15). Its status is uncertain in central and northeastern Montana. It remains abundant and widespread in southeastern Montana and northwestern South Dakota. The species is present on the Ashland Ranger District (Hendricks and Reichel, 1996; Maxell, 2004).

Northern leopard frogs are found in or near water in non-forested habitats. Vegetation is typically dense, as in a cattail marsh or dense sedge-meadow. Breeding takes places in lakes, ponds (temporary and permanent), springs, and occasionally backwaters of beaver ponds in streams. Hendricks and Reichel (1996) indicate that tadpoles were large and transforming to the terrestrial stage on the Ashland Ranger District by the time of late-July surveys; adults were encountered between early June and late September in 1995. Aquatic emergent vegetation at springs and water sources is an important habitat component for this amphibian.

Environmental Effects – The proposed action would improve habitat conditions slightly in the long-term over the existing condition. Avoidance of riparian areas by heavy equipment and vegetation treatments to maintain riparian and woody draw habitat as well as removing trees along grassland edge is expected to improve habitat through the proposed action over the existing condition. In the short-term some individuals could be lost due to injury from heavy mechanical equipment or through prescribed burning through the proposed action over no loss in the existing condition.

Cumulative Effects - Considering past, present, and reasonably foreseeable future actions and existing inventories, the proposed action would have minor short-term impacts to individuals, but potentially improve habitat conditions (riparian, woody draws, grasslands) slightly in the long-term over the existing condition.

3.4.5 - Other Amphibians and Reptiles

Affected Environment - In general potential habitat for plains spadefoot and great plains toad would generally be maintained by grassland structures, riparian and woody draw condition (PFC). The greater-short-horned lizard, western hog-nosed snake, and milksnake potentially utilize these grassland habitats. These species generally use habitats other than ponderosa pine forest and have adapted to periodic low intensity fires. See Werner, et al., 2004 for species distribution and habitats use in Montana. Maxell, 2004, summarizes survey results for 2002 and 2004 and includes amphibian and reptile species distribution maps for the Ashland RD.

Environmental Effects – The proposed action would improve the habitat for these species slightly over the existing condition by using prescribed fire to remove pine trees colonizing grassland. The focus of the proposed action is on forested habitats and minimizing effects on grasslands habitats.

Cumulative Effects – Considering the past, present, and reasonably foreseeable future actions of cumulative effects the proposed action would maintain the current habitat condition for these

species over the long-term, whereas the trees could continue to colonize grasslands and reduce habitat for these species slightly under the existing condition.

3.4.6 - FS Sensitive Plants

See report by Forest Sensitive Plant Coordinator.

3.5 – Management Indicator Species

Management Indicator Species and Key (major indicator) species are listed and relative change in populations / habitats displayed in Table 3.5.T1.

Table 3.5.T1. Management Indicator Species [1] and Key (Major Interest Species) [2], Ashland Ranger District, Custer National Forest.
"0" = neutral; "-" = negative; "+" = positive.

Species	HABITAT INDICATORS [1] KEY (Major Interest) SPECIES [2]	Habitat [1]	Habitat Present (P) or Absent (A)	Species Present (P) or Absent (A) [3]	Alt. 1 Existing Condtion	Alt 2 Proposed Action	
Northern goshawk Holiday Springs CG (R1F08D04-10)	**HABITAT INDICATOR**	**Forest: old growth** Nests in mature forest containing suitable prey species.	P	P	-/+ Wildfire Risk / Habitat - See narrative	0 See narrative	
White-tailed deer – Cover / Roads	**HABITAT INDICATOR** KEY (Major Interest) SPECIES	**Forest: dog hair ponderosa pine** Riparian habitat, ponderosa pine forest, riparian.	P	P	Roads and Cover = -/0 Low / Mod. Severity Fire Mosaic = -	Roads and Cover = -/0 Low / Mod. Severity Fire Mosaic = +	
Ruffed grouse	**HABITAT INDICATOR**	**Forest: aspen**	A	A			
Western kingbird (Ashland R. D.)	**HABITAT INDICATOR**	**Forest: open savanna** Woody draws in prairie (open savanna) provide habitat.	P	P	0	+	
Lark sparrow (Sioux R. D.)	**HABITAT INDICATOR**	**Forest: open savanna** Woody draws or scattered shrubs in prairie (open savanna) provide habitat.	N/A	N/A			
Northern oriole (Bullock's oriole)	**HABITAT INDICATOR**	**Riparian: tree** Riparian areas contain deciduous trees provide habitat.	P	P	0	+	
Yellow warbler	**HABITAT INDICATOR**	**Riparian: shrub** Shrubby riparian areas provide habitat.	P	P	0	+	
Ovenbird	**HABITAT INDICATOR**	**Hardwood draw: tree**	P	P	0	+	
Rufous-sided towhee (Spotted towhee)	**HABITAT INDICATOR**	**Hardwood draw: shrub**	P	P	0	+	
Brewer's sparrow	**HABITAT INDICATOR**	**Evergreen shrubs: sagebrush**	P	P	0	0	
Sharp-tailed grouse	**HABITAT INDICATOR** KEY (Major Interest) SPECIES	**Prairie grasslands** Woody draws and grasslands**.**	P	P	0	0	
Cutthroat trout	**HABITAT INDICATOR** KEY (Major Interest) SPECIES	**Aquatic: cold water** Previously addressed - **Sensitive Species**	A	A			
Largemouth bass	**HABITAT INDICATOR**	**Aquatic warm water**	P	A			
Elk – Cover / Roads	KEY (Major Interest) SPECIES	Forest and grasslands. (potential habitat)	P	P	Roads and Cover = -/0 Low / Mod.	Roads and Cover =	

					Severity Fire Mosaic = -	-/0 Low / Mod. Severity Fire Mosaic = +	
Golden eagle	KEY (Major Interest) SPECIES	Cliffs, mature forest, and grasslands.	P	P (One Nests)	0	- short-term, + long-term	
Prairie falcon	KEY (Major Interest) SPECIES	Cliffs and grasslands.	P	P (No Nests)	0	0	
Merlin	KEY (Major Interest) SPECIES	Forest, woody draws, and grasslands.	P	P (No Nests)	0	0	
Mule deer – Cover / Roads	KEY (Major Interest) SPECIES	Ponderosa pine forest, juniper forest, woody draws and sagebrush grasslands.	P	P	Roads and Cover = -/0 Low / Mod. Severity Fire Mosaic = -	Roads and Cover = -/0 Low / Mod. Severity Fire Mosaic = +	
Bighorn sheep	KEY (Major Interest) SPECIES	Cliffs and grasslands.	A	A			
Pronghorn antelope	KEY (Major Interest) SPECIES	Grasslands.	P	P	0	0	

[1] Management Indicator Species include the categories of Habitat Indicator and Key (Major Interest) Species. Habitat Indicator species are based on the Custer Forest Plan (USFS 1986, p. 18).

[2] The Key (Major Interest) Species are based on the Custer Forest Plan (USFS, Oct. 1986, see list on p. 17 and 180 of the Forest Plan; USFS, Oct. 1986b. FEIS, p. 121. See Direction; USFS, Oct. 1986, p. 18.) Management Indicator Species include the categories of Habitat Indicator and Key (Major Interest) Species.

[3] P = species present and considered in analysis; P? = The species is potentially present; A = Species absent and no further analysis will be completed.

3.5.1 - Northern Goshawk

The northern goshawk (*Accipiter gentilis atricapillus*), here after called "goshawk," and black-backed woodpecker were added (Kimbell, March 31, 2005) and then removed (Tidwell, July 17, 2007) from the Northern Region sensitive species list. The following analysis addresses the goshawk as a Custer NF Management Indicator Species (MIS).

NGPAP – 3.2.1 – Northern Goshawk Project Analysis Process

The goshawk is identified as a MIS in the Custer National Forest Plan (USFS, Oct. 1986, P. 18). The Regional Direction (Tidwell, July 17, 2007) and accompanying Northern Goshawk, Northern Region Overview (Brewer et al., May 2007, Sec. 3.2) provides information for the following Northern Goshawk Project Analysis Process (NGPAP). The information summarizes the best available science for goshawks and leaves options open for professional judgment at the local level (Tidwell July 17, 2007, P.1).

NGPAP – 3.2.1.1 Step One – Regional Context

Several investigations have established the Regional context.

- In its 12-month status review of the species, the USFWS concluded "that the goshawk population is well distributed and stable at the broadest scale (63 FR 35183, June 29, 1998).
- It is estimated that goshawks across the Region are a part of one population (Samson 2006a).
- The species is considered globally secure, and in Montana is listed as a "Potential Species of Concern" and the population is ranked "S4" which is defined as "Uncommon but not rare (although it may be rare in parts of its range), and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern." (MNHP 2008, P. 3 and 14). In South Dakota it is ranked G5, S3B, S2N (SDNHP, 2008).
- Based on habitat and goshawk detection estimates, breeding goshawks and their habitat appear abundant and well distributed across the USFS Northern Region (Kowalski 2006, Map – Northern Goshawk Historic Active nests 2000-2005, and Map – Northern Goshawk Detection Survey 2005; Samson 2006a, Appendix 07, Map - goshawk well distributed).
- Each R1 National Forest has enough habitat to contribute to a viable regional population of goshawks (Samson 2006b).

The Regional context establishes the framework for assessing the distribution, status, and trend of goshawks Region-wide and the background for discussing goshawk viability in the final determination section at the end of this analysis.

NGPAP – 3.2.1.2 - Step Two – Forest Context

Custer Forest Plan - The goshawk is the Custer National Forest's habitat indicator species for old-growth timber (USFS, 1986, P. 18), which is defined in the glossary (USFS, Oct. 1986, p. 135-136) as follows. "Old Growth Timber - See Overmature Timber. … Overmature Timber - Individual trees or stands of trees that in general are past their maximum rate in terms of the physiological processes expressed as height, diameter and volume growth." The Plan (USFS,

Oct. 1986, p. 12) also states "E. Management Standards. The following standards apply to the National Forest … administered by the Custer National Forest. They are intended to supplement, not replace, the National and Regional policies, standards, and guidelines found in the Forest Service Manuals and Handbooks, and in the Northern Region Guide." Under "E. Management Standards" (USFS, Oct. 1986, p. 17) states "e. Habitat Indicator Species (Management Indicator Species). These are species whose population changes are believed to indicate effects of management on other species of a major biological community or on water quality. The forest will provide for the maintenance and improvement of habitats for these indicator species."

Old Growth / Mature Forest – The Timber Stand Management Record System (TSMRS) does not include ponderosa pine stands that have an average tree diameter ≥ 17" dbh on the Ashland RD (Pers. Com., Dennis Sandbak, USFS Silviculturist, Jan. 31, 2008) and that meet the definition of old growth for the Eastern Montana Zone (Green et al., 2005, P. 10). TMSRS stands are most always > 5A. The following analysis is based on mature ponderosa pine forest stands.

Custer NF – Analysis from imagery and TSMRS data from 2002 (112,187 A.) to 2008 (at least 87,005 A.) indicate mature forest declined by up to 27%, primarily due to wildfires. These data reflects on-the-ground changed conditions between 1999 (pre-2000 wildfires) and Jan. 2008. In 2002 approximately 112,187 acres of unaltered over mature forest occurs on the Beartooth RD, 16,300 on the Sioux RD and 140,700 on the Ashland RD (Whitford, Nov. 25, 2002). At least 89,005 A. (91,701 A. less up to 2696 A. potentially eliminated in Lost Creek Fire, FY 2007) were present on the Ashland RD in Jan. 2008 (Gonzales 2008.11.14, Wildlife Map – Potential goshawk habitat on Ashland RD). A total of 2,696 A. of mature forest were present within the 10,733A. Lost Wildfire Area, but data on amount of mature forest removed in the 2007 Lost Fire is not available. All acreages are approximate. All available habitat is assumed to be occupied by goshawks and it is likely that the removal of mature forest would eliminate pairs rather than displacing them to vacant habitat. Several active goshawk nests, though likely not all, have been detected on the Forest. In response to a public comment, the existing mature forest (Gonzales 2008.11.14) also provides a measure of existing interior forest. In general, interior forest would be the area approximately two mature tree heights or about 200 ft. from the edge and into the mature forest stands.

Surveys – Extensive surveys by contract and USFS personnel located only two territories in the Ekalaka Hills (Parks, Jan. 2008), each with apparent large home ranges. Evidence based on habitat and identified nest sites tends to indicate similar situation on the Ashland RD where habitat requirements are thought to exceed those listed in Reynolds et al. (1992).

Ashland RD - In terms of landscape, the Ashland RD is an island of ponderosa pine forest surrounded by range land. On the Ashland RD goshawk habitat has been reduced in terms of acres and known and potential territories since the development of the Forest Plan (USFS, 1986). Of 14 confirmed nest territories, at least five territories have been affected by wildland fire and all habitat removed in two others (Hay Creek / R1F08D04-04, Chelsea / R1F08D04-05) on the Ashland RD (Table 3.2.1.2.T1). It is assumed that the goshawk population is utilizing all available habitat. The existing habitat is distributed in patches (Gonzales, 2008.11.14, Wildlife Map – Potential goshawk habitat, Jan. 2008). USFS (2008.04.15, P. 2 - 3) in Oregon demonstrated that strategically locating fuel treatments to control fire spread could reduce fire

risk within mature / old growth stands of ponderosa pine. The methods can be directly applied toward the conservation of any wildlife species for which we know their habitat requirements in terms of forest tree species and size. These concepts have been generally considered in the design of the proposed action and application to the project area. Information and photographs provided by Johnson (2008.04.21) of goshawk habitat were considered in this analysis. At least two nest territories (Timber Creek / R1F08D04-07, Sartin Draw Spring / R1F08D04-13) were confirmed to be active on the Ashland RD in 2008 (Table 3.2.1.2.T1). Monitoring in the Holiday Springs Campground territory (R1F08D04-10) in 2008 was inconclusive – great horned owls nested successfully in one older goshawk nest, and an adult goshawk was observed flying over the E. Fk. Otter Cr road during the spring. A Regional bird inventory crew reported locating an active nest in the Lemonade Springs area (R1F08D04-06), but the data was not available at the time of this report.

Forest Inventory and Analysis (FIA) – Goshawk Habitat on Ashland RD - Forest Inventory and Analysis (FIA) provide a statistically sound representative sample to provide unbiased estimates of forest conditions for regional and forest wide assessments and planning. See Leach (2002) and Leach (2005) for information on summary statistics for variable computations. Estimates for northern goshawk habitat are summarized in Table 3.2.1.2.T2 and represents data from 46 forested FIA primary sample units (PSUs) on the Ashland RD. Of the PSUs 0%, 8.3%, and 16.1% contained vegetation elements associated with goshawk nest, PFA, and foraging habitat, respectively. While goshawk nest habitat was not detected in the FIA inventory, the habitat is known to be present on the Ashland RD. FIA PSUs altered by fire, harvest activities, or land exchange prior to 2003 were removed from the analysis. See Samson (2006a) for methods and description of vegetation characteristics used to calculate habitat estimates.

Table 3.2.1.2.T2. FIA plots or the Ashland RD based on 2003 samples. [1]

Goshawk Habitat Component	Estimate of the Means for 46 Forested PSUs	Range	Standard Error	Confidence Interval
Nest	0%	0.0 – 0.0%	0	90%
PFA	8.3%	3.8 – 13.0%	32.323	90%
Foraging	16.1	10.6 – 16.1%	22.029	90%

1 Information based on standard query for goshawk habitat from the FIA summary database (DiBenedetto, Sept. 18, 2007). On the Ashland Ranger District there were 71 FIA PSUs of which 46 were found to be with forested condition.

Table 3.2.1.2.T1. Summary of confirmed and potential goshawk nest territories, Ashland RD, Oct. 2007.

Status – Date Confirmed Active	Last Confirmed Active	Territory No.	Territory Name	Past Wildfire	Past Rx Fire	Past Timber Harvest	Comment
1985	2004	R1F08D04-01	Logging Cr.	No	No	?	Historic logging?
1985	1985	R1F08D04-02	Willie Bull Prong	Yes	No	No	Wildfire – Foraging habitat removed.
1987	1987	R1F08D04-03	Upper Hay Cr.	Yes	No	Yes	Wildfire – Habitat removed.
1987	2003	R1F08D04-04	West Dailey	Yes	No	No	Wildfire – Habitat removed
1990	1992	R1F08D04-05	Chelsea	Yes	No	Yes	Wildfire/Salvage – Habitat removed.
1991	2003	R1F08D04-06	Lemonade	Yes	No	Yes	Wildfire – Habitat removed
1990	2008	R1F08D04-07	Timber Cr.	Minimal	Yes	Yes	Timber Cr. prescribed burn
1996	2003	R1F08D04-08	N. Fk. Taylor Cr.	No	Yes	Yes	Goodspeed prescribed burn
1980	2003	R1F08D04-09	Green Creek	No	No	Yes	Whitetail Project
1995	2007	R1F08D04-10	Holiday Springs Campground	No	No	Yes	East Otter Creek Project Whitetail Project
1995	1996	R1F08D04-11	Upper Wilbur Cr.	No	No	Yes	Timber Harvest – Status Undetermined
Potential 1999	None	P-R1F08D04-A Potential (R1F08D04-12)	Soft Water Springs	No	No	No?	Threemile EIS
2003	2008	R1F08D04-13	Sartin Draw Springs	No	No	No	Minor part in Whitetail Project
2003	2004	R1F08D04-14	Surprise Spring	No	No	No	Liscom Butte Prescribed Burn
2004	2005	R1F08D04-15	Davis Prong	No	Yes	No	Red Rock prescribed burn
Potential	None	P -R1F08D04- B Potential	S. Fork Threemile Cr.	Yes	?	No	Erickson Spring Wildfire
Potential	None	P - R1F08D04- C Potential	Elk Cr. Sawmill Springs	No	No	No	Large intact stand of mature forest - Taylor-Ten Area

NGPAP – 3.2.1.3 - Step Three – Home Range and Project Context

NGPAP - 3.2.1.3.1 *Defining and Delineating the Analysis Area* – Mature forest and goshawk nest territories tend to be concentrated in the northern portion of the Ashland Ranger District which includes the project area. The project area includes portions of the Holiday Spring Campground (R1R08D04-10) goshawk nest territory (Map 3.2.1.3.1.M1). Available habitat was identified for PFA and nest stands.

Forested habitat for goshawk home range need to be larger on the Custer NF because of lower precipitation (less productive site), lower prey density (more energy expended to obtain prey), and more fragmented ponderosa pine stands (potentially less interior stand habitat) than in the southwestern US where Reynolds et al. (1992) guidelines were developed. Bassett et al. (1994, P. 45) point out that the achievable Vegetation Structural Stage (VSS) percentage, as described in Reynolds et al. 1992, should be determined by considering existing local factors that influence forest establishment and growth, expected management intensity, and tree longevity. Brewer et al. (May 2007) summarizes the best available science for goshawks and leaves options open for professional judgment at the local level (Tidwell July 17, 2007, P.1). For a definition of active territory see Brewer et al. (May 2007, glossary). Note that Brewer et al (May 2007, P. 30 and 50) considered La Sorte et al. (2004) and numerous other goshawk related literature to insure recommendations on habitat such as percent crown cover provided for goshawk habitat.

The cumulative effects boundary for this analysis is the Holiday Springs Campground (R1F08D04-10) goshawk home range potentially impacted by the proposed action (Map. 3.2.1.3.1.M1). The cumulative effects area is larger than the East Otter Fuels HFRA project boundary and encompasses one goshawk home range partly within the project boundary. The temporal period is 30 years since it represents the approximate time for ladder fuels to reestablish in the absence of treatment in a single-storied ponderosa pine stand.

Topography (slope and aspect) and site conditions appear to limit the uniform distribution of habitat in the cumulative effects area. Goshawk nest and PFA habitat is located in existing patches of mature ponderosa pine forest within the cumulative effects area. Nest territories were used to define home range (foraging, PFA, and nest stands) for the analysis area which includes areas outside of the East Otter project area (Map. 3.2.1.3.1.M1).

The cumulative effects analysis area includes the Whitetail Hazardous Fuels HFRA (Whitetail) project area and the East Otter Creek Hazardous Fuels HFRA (East Otter) project (Gonzales 2008.11.14, Potential goshawk habitat). The Holiday Springs Campground goshawk territory home range approximates 5,000 A. The East Otter project is located in the western portion of the Holiday Springs goshawk territory.

NGPAP - 3.2.1.3.2 *Analysis of Foraging Area habitat within the Analysis Area* – TSMRS data was used on NFS lands and SILC 3 on private as needed to fill in other mapping areas because R1-VMap information was not available on the east side of Montana (Berglund et al., 2007, P. 4). Based on SILC, which provides crown cover, but not size class, the distribution of suitable habitat on private lands was often fragmented from the NFS lands and approximately 1-2% of the private lands (Gonzales, Oct. 5, 2007). The following analysis was based on TSMRS data

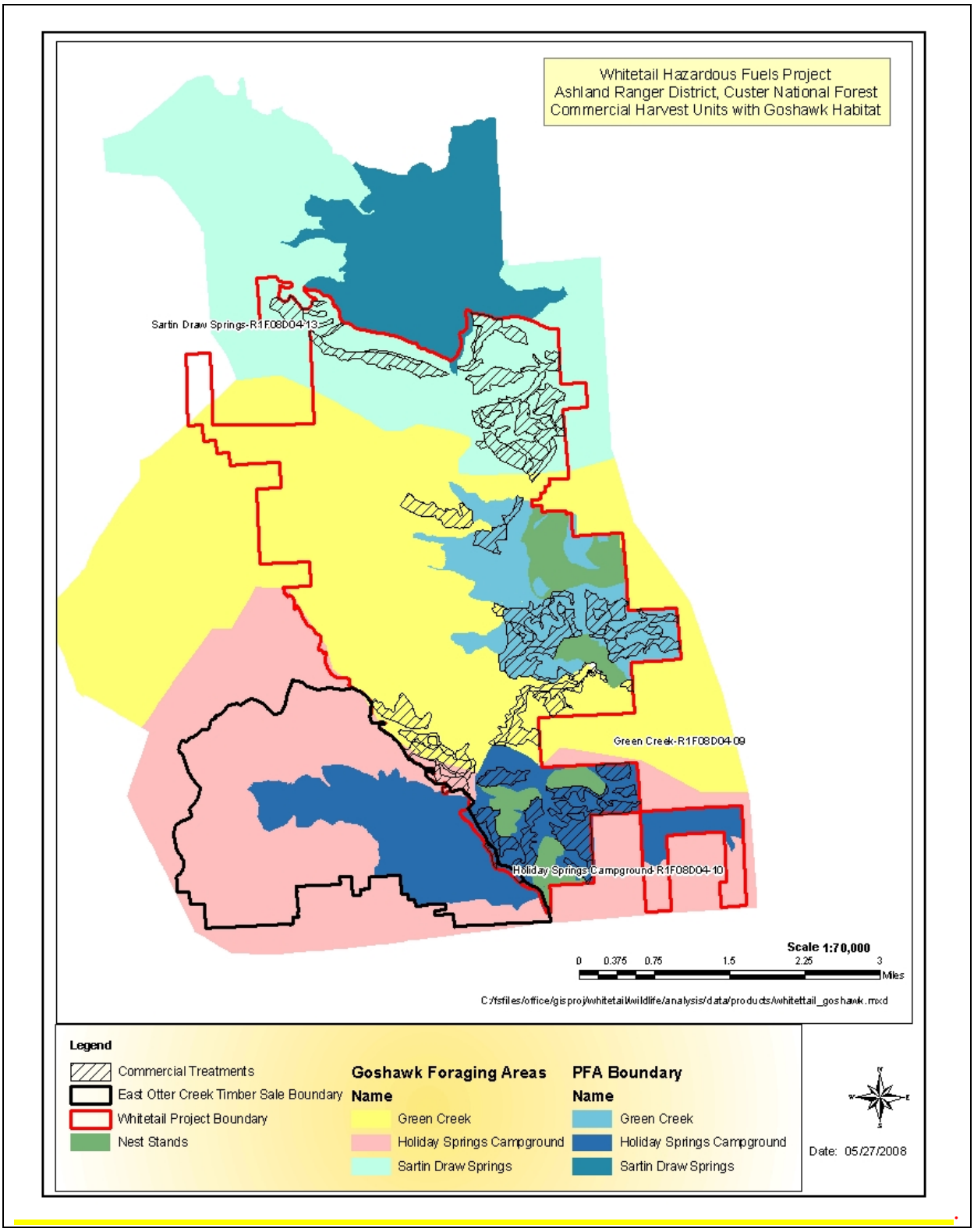
available for NFS lands.

Data from the NGPAP analysis area (Table 3.2.1.3.1.M1) was compared to Reynolds (1992) and existing percent tree size / canopy distribution (Table 3.2.1.3.1.T1).

NGPAP - 3.2.1.3.2.a_ *GIS Analysis Using VMap or SILC* – The VMAP coverage was not available for use in this analysis. TSMRS data was used where available on NFS lands and SILC3 used to cover other areas. TSMRS strata from Development Stage 7 (Old Forest) were combined into the Development State 6 (Mature Forest) since stands with an average DBH of >17 inches have not been observed in the field in the project area. See previous discussion (NGPAP – 3.2.1.2 - Step Two – Forest Context / Old Growth/Mature Forest) on why stands did not meeting the definition of old growth for Eastern Montana Zone. Development Stage Codes 5-7 (Table 3.2.1.3.1.T1. - , Column 1) were used to assess habitat based on Reynolds et al. (1992, P. 2 and 7) and Brewer (May 2007, P. 33 and 35). TSMRS stands coded as Development Stage 7 (Old Forest) could reflect photo interpretation codes. Diameter ranges used in development stages in this analysis reflect available categories in TSMRS data (Appendix A). A crosswalk between forest Development Stages for goshawk and TSMRS strata is provided (Appendix B).

NGPAP - 3.2.1.3.2.b_*Using Stand Exam Data for habitat Analysis and Updating GIS Information* – Where possible the TSMRS coverage was set to prioritize stand exam data information over photo interpretation (PI) for vegetation strata classifications.

NGPAP - 3.2.1.3.2.c *Inventory Analysis with Intensified Field Grid* – Intensified field grid data was not available



Map. 3.2.1.3.1.M1. Map of three goshawk home ranges including foraging area, PFAs, and nest habitat in and around the East Otter project area (Gonzales 2007.10.18.0744; revised Gonzales 2008.05.27).

Table NGPAP 3.2.1.3.1.T1. Foraging area diversity matrix for habitat analysis of Holiday Springs CG goshawk nest territory (R1R08D04-10).

Develop-ment Stage Code	Development Stages for Goshawks	Diameter Range (inches)	Minimum Canopy Closure %	Desired Balance for Goshawk (% of Area) [1]	Home Range Existing Acres and % [2]	Whitetail Fuels Project [3]	East Otter Fuels Proposed Action [4]	Foraging Post-treatment Acres and % for Goshawk nest Territory
0	Unclassified	N/A	N/A	N/A	14 (>1%)	0	0	14 (1%)
1	Non-Forest Openings	N/A	N/A		1,635 (38%)	0	0	1,635 (42%)
2	Grass/Forb/Seedling	0-1	None	10	65 (1%)	0	0	65 (1%)
3	Seedling/Sapling	1-5	None	10	25 (>1%)	0	0	25 (1%)
4	Young Forest	5-9	None	20 (15-25%)	108 (2%)	CT=23	0	85 (2%)
5	Mid-Aged Forest 1	9-14	50%	10 (5-15%	889 (21%)	SH = 30	ROST = 6 A ROSW = 14 Total = 20A	839 (21%)
5	Mid-Aged Forest 2	9-14	60%	10 (5-15%)	426 (10%)	Fuel Break [6] (NCBB = 1, NCBJ = 3) = 4 Total = 4	ROST = 30	392 (10%)
6	Mature Forest	14-20	50%	20 (15-25%)	1,173 (27%)		CT = 61 ROST = 261 ROSW = 16 Total = 338	835 (21%)
7	Old Forest	>20	50%	20 (15-25%)	0		0	0
	Sub-Totals (NFS lands)			100%	4,335 (100%)	57	388 [4]	3,890 (100%)
	Private				1,424			1,424
	Home Range Total A.			100%	5,759			5,304

[1] Reynolds et al. 1992, P. 27.
[2] GIS query of TSMRS data on NFS lands (Gonzales, Oct. 18, 2005, 1522). Sum of existing development stage codes 5-7 = 2,488 A. (58%). Sum of existing development code stages 6 – 7 = 1,173 A. (27%).
[3] GIS query of TSMRS data on NFS lands for Whitetail Fuels Project (Gonzales, Nov. 6, 2005, 1013) as summarized in the Wildlife Report for Whitetail Hazardous Fuels Project (Sasse, 2008.06.09, P. 27).
[4] GIS query of project area prescriptions within goshawk habitat (Gonzales, 2008.11.19). Note difference between values here and in Whitetail Fuels Project Wildlife Report (Sasse 2008.06.09, P. 27) is due to all proposed cable harvest and some tractor units being dropped from proposed East Otter Fuels Project treatment.

NGPAP - 3.2.1.3.3 *Nest Area Habitat within the Analysis Area* – Brewer et al. (May 2007) summarizes the best available science for goshawks and leaves options open for professional judgment at the local level (Tidwell July 17, 2007, P.1). Nest stands were identified based on available habitat, additional habitat acreage was identified beyond that suggested (Brewer et al. 2007) as a contingency in the event of environmental change, and because habitat is considered to be less productive (rainfall, topography) on the Ashland Ranger District than that from Reynolds et al. 1992. Habitat attributes that commonly occur in an active nest area were used to identify alternate nest stands. Some TSMRS stands could contain minor inclusions of other stand strata, and therefore contain slightly less acres of suitable goshawk habitat than the stand acres. Existing TSMRS strata were used to compare alternatives as data are not available to further refine these habitat acreages. A crosswalk between forest Development Stages for goshawk and TSMRS strata is provided (Appendix B). There are no identified goshawk nest stands within the East Otter project area; all nest stands associated with the Holiday Springs CG nest territory are within the Whitetail Hazardous Fuels HFRA project area. The Wildlife Report for Whitetail Hazardous Fuels HFRA Project is incorporated in whole by reference, and includes the existing condition including consideration of the effects of the East Otter project on the Sartin Draw Spring (R1F08D04-13), Green Creek (R1F08D04-09), and Holiday Spring Campground (R1F08D04-10) goshawk nest territories (Sasse, 2008.0609, P. 18-41). The East Otter project would have no effect on the Sartin Draw Spring and Green Creek goshawk nest territories.

NGPAP - 3.2.1.3.3.a *GIS Goshawk Nest Stand Attributes* – Table 6 in Brewer et al (May 2007, P. 35) was considered in this analysis.

NGPAP - 3.2.1.3.3.b *Stand Exam Data for Habitat Analysis and Updating GIS Information Holiday Springs Campground* - Existing acres total 250 A. which is more than the minimum recommended 240 A. for nest stands (Table 3.2.1.3.3.b.T1).

Table NGPAP 3.2.1.3.3.b.T1. Nest stand habitat analysis for Holiday Springs CG goshawk nest territory (R1R08D04-10).

Develop-ment Stage Code	Development Stages for Goshawks	Diameter Range (inches)	Minimum Canopy Closure %	Desired Balance for Goshawk (% of Area) [2]	Nest Stand Existing Acres and % [3]	East Otter Fuels HFRA Proposed Action	Nest Stand Post-treatment Acres and % for Project Area
0	Unclassified	N/A	N/A	N/A	(%)	0	(%)
1	Non-Forest Openings	N/A	N/A	0	(%)	0	(%)
2	Grass/Forb/Seedling	0-1	None	0	(%)	0	(%)
3	Seedling/Sapling	1-5	None	0	(%)	0	(%)
4	Young Forest	5-9	None	0	(%)	0	(%)
5	Mid-Aged Forest 1	9-14	50%		0 (0%)	0	0 (0%)
5	Mid-Aged Forest 2	9-14	60%		27 [4] (11%)	0	27 (11%)
6	Mature Forest	14-20	50%	50%	223 [5] (89%)	0	223 (89%)
7	Old Forest	>20	50%	50%		0	
	Total Acres			100%	250 (100%)	0	250 [6] (100%)

[1] GIS query of TSMRS data (Gonzales, Oct. 18, 2005, 1522). No timber harvest within nests stands by E. Fork Otter Project 2006.
[2] Brewer et al. 2007, P. 11 and 35, stands with >40% canopy cover.
[3] Sum of existing development stage codes 5-7 = 185 A. (100%) Sum of existing development code stages 6 – 7 = 253 A. (100%).
[4] GIS query of Whitetail Fuels HFRA project area prescriptions within goshawk habitat (Gonzales, May 6, 2008). Of 30A., 3 removed by fuel break construction in Whitetail Fuels HFRA project = balance of 27A in Development Stage 5..
[5] 68 A. from PFA added to Nest Stands for Holiday Springs CG goshawk territory (155A + 68A = 223A.) – GIS query (Gonzales, May 23, 2008).
[6] Sum of post-treatment development stage codes 5-7 = 250 A. which meets the approximately 240 A. recommended (Brewer et al, 2007, P. 39); additional potential nest acres are within the adjacent 876A. of maintained PFA areas (see Table NGPAP - 3.2.1.3.4.T1).

NGPAP - 3.2.1.3.3.c *Inventory Analysis with Intensified Grid Data* – Intensified grid data was not available for this analysis.

NGPAP - 3.2.1.3.4. PFA Habitat Analysis – Brewer et al. (May 2007) summarizes the best available science for goshawks and leaves options open for professional judgment at the local level (Tidwell July 17, 2007, P.1). PFAs were identified based on available habitat, additional habitat acreage was identified beyond than suggested (Brewer et al. 2007) as a contingency in the event of environmental change, and because habitat is considered to be less productive (rainfall, topography) on the Ashland Ranger District than that from Reynolds et al. 1992. Habitat attributes that commonly occur in active PFAs were used to identify alternate nest stands. Some TSMRS stands could contain minor inclusions of other stand strata, and therefore contain slightly less acres of suitable goshawk habitat than the stand acres. Existing TSMRS strata (Appendix A) were used to compare alternatives as data are not available to further refine these habitat acreages. A crosswalk between forest Development Stages for goshawk and TSMRS strata is provided (Appendix B).

Reynolds et al. (1992, P. 23-24) describes the desired conditions for PFAs for ponderosa pine forest type:

- *Stand Structure* - The portions of the PFA in the mature and old forest (see Development Stage Codes in Tables) have a minimum canopy of 50%. One-third of the area in the mid-aged portion has a minimum canopy cover of 60%, and the remaining two-thirds has a minimum canopy cover of 50%.
- *Snags* – At least 2 large (≥ 18 inch DBH, ≥ 30 feet tall) snags per acre throughout the PFA. These dimensions meet the minimum requirements for the majority of prey species.
- *Downed logs* – At least 3 large (≥ 12 inch diameter mid-point, ≥ 8 feet long) downed logs per acre throughout the PFA. Downed logs of this number and size are important for many prey species.
- *Live trees* - A minimum of 3-5 mature and old, live trees per acre in groups or stringer with interlocking crowns. Interlocking crowns allow squirrels to move from tree crown to tree crown.

PFA Habitat Analysis

- *Holiday Springs Campground* – Part of the PFA is within the East Otter project area and remainder in a portion of the Whitetail project area (Table NGPAP - 3.2.1.3.4.T1; Map 3.2.1.3.1.M1). The PFA totals 2,227 A., but only 1,814 A. (Development Stage Codes 5-7) are in the mid-aged to old forest stages, and 1,223 A. within the mature to old age stages (Table NGPAP - 3.2.1.3.4.T2, footnote 3). These pretreatment acres for PFA exceed the approximately 420 A. for a PFA including 1/3 > 60% canopy cover (need at least 140 A., have 400 A., Develop Stage Code 5, Mid-Aged Forest 2) and 2/3 > 50% canopy cover (need at least 280, have 1,414A. (191A. + 1223A.), Develop Stage Code 5, Mid-Aged Forest 1, and Code 6, Mature Forest). See previous paragraph NGPAP - 3.2.1.3.4., Stand Structure. Post-treatment short-term values for PFA are meet the 1/3 > 60% canopy cover (need at least 140A., retaining 170A.) and 2/3 > 50% canopy cover

(need at least 280, retaining 722A. (178A. + 544A.), of which 544A. is mature forest) per territory. After 10 years, canopy coverage on CT1 treatment in the Whitetail project area (542A.) and adjacent East Otter project area (379A.) is expected to meet PFA (approximately 420A,) minimum canopy coverage goals and provide approximately 1,813A. (170 A + 722A. + 542A. + 379A.) of PFA which would be more than four times more than that needed for a minimum territory (420A). Since the 1,813 A. figure (strata 5-7) exceeds the approximately 420 A. by 1,393A. it also provides a safe guard in potentially maintaining 10 year post-treatment acres in the event of unanticipated environmental changes to forest canopy.

Data from the project area was compared to Reynolds (1992, P. 7, Table 1) to ensure consistency with recent case law.

NGPAP - 3.2.1.3.4.a *GIS Analysis* – The PFA will be approximately 420 A. centered on the nest.

NGPAP - 3.2.1.3.4.b *R1 Geospatial Group Tool* – The tool is under developed, but not available at the time of this analysis.

NGPAP - 3.2.1.3.4.c *Stand Exam Data for Habitat Analysis and Updating GIS Information* – Data was included, where available, incidental to TSMRS queries.

NGPAP - 3.2.1.3.4.d *Inventory Analysis with Intensified Grid* – Data was not available to analyze with intensified grid.

Table NGPAP - 3.2.1.3.4.T1. PFA habitat analysis for Holiday Springs CG goshawk nest territory (R1R08D04-10).

Develop-ment Stage Code	Development Stages for Goshawks	Diameter Range (inches)	Minimum Canopy Closure %	Desired Balance for Goshawk (% of Area) [1]	PFA Existing Acres- and %	Whitetail Fuels Project [4]	East Otter Fuels Proposed Action [5]	PFA Post-treatment A. and % for Project Area
0	Unclassified	N/A	N/A	N/A	0	0	0	0
1	Non-Forest Openings	N/A	N/A	N/A	357 (16%)	0	5	352 (27%)
2	Grass/Forb/Seedling	0-1	None	10	48 (2%)	0	0	48 (4%)
3	Seedling/Sapling	1-5	None	10	0 (0%)	0	0	0
4	Young Forest	5-9	None	20 (15-25%)	8 (>1%)	0	0	8 (<1%)
5	Mid-Aged Forest 1	9-14	50%	13 (8-18%)	191 [3] (8%)	0	CT1 = 12 [5]	178 [7] (14%)
5	Mid-Aged Forest 2	9-14	60%	7 (2-12%)	400 [3] (18%)	CT1 = 117[5,6], Fuel Break[6] (NCBJ) = 3 Total = 120	CT1 = 110 [5]	170 [7] (13%)
6	Mature Forest	14-20	50%	20 (15-25%)	1,223 [3] (55%)	CT1 = 259 [5, 6, 8]	CT1 =420 [5]	544 [7, 8] (42%)
7	Old Forest	>20	50%	20 (15-25%)	0 [3]	0	0	0
	PFA Total Acres			100%	2,227 (100%)	379	547	1,300 (100%)

[1] See Brewer et al. (May 2007, P. 14) for Reynolds 1992 recommendations for comparison. Of the area in the mid-aged portion has a minimum canopy cover of 60%, and the remaining two-thirds has a minimum canopy cover of 50% (Reynolds 1991, P. 23).

[2] GIS query of TSMRS data (Gonzales, Oct. 18, 2005, 1522) as modified to reflect treatment units dropped or modified Whitetail Fuels Project, Jan. 14, 2008.

[3] Sum of existing development stage codes 5-7 = 1,814 A. Sum of existing development code stages 6 – 7 = 1,223 A.

[4] East Otter project area acres based on GIS query (Gonzales, 2008.11.19). Note difference between values here and in Whitetail Fuels Project Wildlife Report (Sasse 2008.06.09, P. 34) is due to all proposed cable harvest and some tractor units being dropped from proposed treatment.

[5] CT1 = Initial canopy goal of 30-40% with 10 year recovery goal of 40-60%.

[6] GIS query of project area prescriptions within goshawk habitat (Gonzales, May 6, 2008).

[7] Sum of post-treatment development stage codes 5-7 = 892 A. which exceeds the approximately 420 A. recommended (Brewer et al, 2007, P. 38). After 10 years, PFA habitat is expected to return to a total of 1,810A. [892A. (CE Post treatment) +376A. (CT1 Whitetail) +542A. (CT1 E. Otter)]. and meet by 4X an approximately 420A. recommended.

[8] 68 A. subtracted from PFA and added to Nest Stands for goshawk territory. PFA, (1291A - 68A = 1223A, and 327 – 68 = 259A) – GIS query, Whitetail Fuels Project (Gonzales, May 23, 2008).

NGPAP – 3.2.1.4 - Step Four – Treatment Context

NGPAP - 3.2.1.4.a *Treatment acres in foraging area, potential nesting areas, and in recently occupied PFAs* – The treatment units for the proposed action are listed in Table 2 of Chapter 2 of the NEPA document. Portions of the Holiday Springs PFA are affected in the short-term by the CT1 treatment of the proposed action. In the PFA where the canopy goal is ≥50%, harvesting of CT1 would reduce canopy cover to an average of 35% (range = 30 – 40%) in the short-term (<10 years), but based on the silvicultural prescription is expected to result in an average of 50% (range = 40-60%) canopy cover in the long-term (>10 years). Other treatments, because of prescription constraints, including prescribed fire are expected to result in a minimal change in the overstory canopy. ROST and ROSW harvest would be located in goshawk foraging areas and outside of the nest and PFA areas.

NGPAP - 3.2.1.4.b *Nest Habitat in the Foraging Area* – Habitat would be maintained in the Holiday Springs nest stands; nest habitat is within the Whitetail Fuels project area, but outside of the East Otter project area. As part of the Whitetail project, maintenance would include using chainsaws to selectively remove understory ladder fuels (green trees < 7 dbh) and prescribed burning while maintaining the mature forest overstory (Whitetail treatment codes = NCBB, NCBJ). It is important to maintain adequate forest canopy in mature forest in goshawk nest and PFA. Substantial reductions in the mature forest canopy in nest stands can reduce vegetative protection for nests and potentially decrease survival of eggs and young. Changes in the structure and composition of forested habitats, especially changes that result in reduced forest canopy, could favor habitat needs of competitors, thereby potentially decreasing relative habitat availability to goshawks (Squires and Kennedy 2006) as cited in Brewer, et al., 2007, P. 17.

NGPAP - 3.2.1.4.c *Nest Area / No Activity Buffer for Known Occupied sites that will be Protected* – Timber sale contract "C" clauses would provide for a no activity buffer around nest trees consistent with R1 guidance. Non-commercial mechanical slashing treatments would follow these "C" clause dates for avoidance of disturbance. Prescribed burning is of short duration, localized, and typically occurs before nest activity in the spring or after nesting activity in the late fall.

NGPAP - 3.2.1.4.d *Activity Timing within PFAs* – Allow no ground disturbing activities inside known occupied PFAs from 15 April through 15 August to protect the goshawk pair and young from disturbance during the breeding season until fledglings are capable of sustained flight. After August 15, treatment- related activities could commence within the PFA, but outside the nest area. Nest sites are assumed to be active in the absence of survey information. See definition of Occupied or Recently Occupied (Brewer et al., May 2007, P. 44).

NGPAP - 3.2.1.4.e *Direct, Indirect, and Cumulative Effects* – Reference the 8 questions to be answered under this heading. The list of direct, indirect, and cumulative effects considered are referenced and addressed in the NEPA document (EA, Table 6).

- *Is there a potential for project activities to disturb or displace goshawks during the nesting period?* Application of timber sale contract "C" clauses would avoid disturbance at known nests. Known nest sites are located outside of the project area. Disturbance could result if undetected nests are used by goshawk outside of identified nest stands. Design criteria address action to take if an active nest is detected.
- *Will the project increase / decrease the amount and suitability of nesting, PFA, or foraging area habitat?* The East Otter project area includes a portion of the Holiday Springs Campground goshawk nest territory. ***Nest stands*** are absent in the East Otter project area because all nest stands are located within the Whitetail project area portion of the territory. Within the Whitetail project area nest stands (NCNS) would be maintained because overstory trees are maintained. Small diameter non-commercial understory trees would be selectively slashed (cut with chainsaws) followed by prescribed burning to reduce wildfire risk to the overstory canopy. In the Whitetail project area approximately 3 acres of fuel break construction along the edge of the existing 253A.would result in 250 A. of remaining nest habitat which would meet the 240 A. minimum recommended for nest stands (Table 3.2.1.3.3.1.T2). ***PFA stands*** with a suggested goal of >50% canopy (Brewer et al., 2007, P.11 and 13 -14) would be commercially treated (CT1). The CT1 treatment for *PFA* areas in the East Otter project area was also applied to PFA areas in the Whitetail project area. The resulting thinning from below and canopy cover reduction to an average of 35% (range = 30-40%) by timber harvest in the short-term, is expected to result in a 10 year goal of recovery to an average of 50% (40-60%) in the long-term resulting in generally single-storied stands with reduce wildfire risk to the overstory canopy in the long-term. More than adequate PFA habitat would be maintained. Post-treatment PFA acres show 892 A (Table NGPAP-3.2.1.3.4.T1, footnote 4) cumulatively remaining untreated which is more than adequate to meet the 420A recommended (Brewer, May 2007, P. 38). ***Foraging habitat*** would be maintained and is expected to provide habitat for the goshawk, though some would be modified by the East Otter and Whitetail proposed projects. Some forage habitat would be modified by the proposed East Otter project, but the majority of foraging is expected to provide adequate goshawk habitat (Table NGPAP 3.2.1.3.1.T1). Hunter et al. (2007, P. 72) points out that fuel treatment can be strategically placed across landscapes so the historical heterogeneity of forest structure can also be recreated. The proposed action would help to move toward a landscape mosaic of forest structure that is expected to help maintain goshawk habitat.
- *Will the action provide for adequate amounts of nesting habitat to support the estimated number of breeding pairs?* Holiday Springs Campground – the proposed action provides for 250 A. and would meet the 240A. nest habitat minimum. .
- *Will the project fragment suitable nest areas?* Non-commerical treatements (mechanical precommerical slashing and prescribed burning) are expected to maintain habitat. Holiday Springs Campground – The post-treatment acres would continue to meet the recommended 240A. (Brewer et al., May 2007, P. 19). The net 250 A. of nest stands would meet the 240A. minimum (Brewer et al,

2007, P. 19). There is a low risk of minor areas 1-2 A. of overstory trees being scorched by prescribed burning in nest stands. Note that Brewer et al (May 2007, P. 30 and 50) referenced extensively in this report, considered La Sorte et al. (2004) and numerous other goshawk related literature to insure recommendations on habitat, such as fragmentation, provided for sufficient goshawk habitat.

- *If so, is there a potential for increasing the risk of predation or competition from more open-forested species?* Unknown. Note that Brewer et al (May 2007, P. 30 and 50), referenced extensively in this report, considered La Sorte et al. (2004) and numerous other goshawk related literature to insure recommendations on habitat, such as modifications to forest habitat, provided for goshawk habitat.
- *Will the project increase habitat diversity for prey populations in the PFA and foraging areas?* It is assumed that following the Regional Direction (Tidwell, July 17, 2007) and accompanying Northern Goshawk, Northern Region Overview (Brewer et al., May 2007) will provide habitat, including required prey habitat, for the goshawk. The proposed action would increase forest size class diversity between stands and mosaic of grassland / forest and woody draws / riparian and likely improve diversity of prey. Drennan (2006, P. 217) reviews the literature on goshawk food habits and goshawk prey species habitats. He points out that because goshawk prey species occur in a wide range of habitats, forest managers should consider maintaining habitat components essential for goshawk nesting and foraging while maintaining habitat elements of preferred prey in areas that many not meet criteria of documented habitats characteristics for goshawks. This approach suggests managing for a mosaic of habitat types across the landscape that provides habitat that meets the requirements of goshawk prey species and goshawks The practice of managing landscapes in a more holistic manner, considering areas beyond the traditionally recognized limits of a species, will benefit not only goshawks but their prey species as well. Smucker et al. (2005, P. 1535 and 1547) point out the need to prescribe and allow for a range of fire severities, including so called “catastrophic” fires, if we want to meet the habitat needs of all species. On the Ashland RD so called “catastrophic” fires have been more frequent than desired relative to low to moderate intensity fires which have been limited.

  Wiens et al. (2006, P. 406) points out that a comparison of predictions of models of survival demonstrated that food availability was the primary factor limiting juvenile goshawk survival. Their finding indicates that forest management prescriptions designed to support abundant prey populations while providing forest structural conditions that allow goshawks to access their prey within breeding areas should benefit juvenile survival. The proposed action incorporates prescriptions to achieve stand structures that provide for goshawk prey and goshawks.

  <u>Red Squirrel</u> - Fisher and Bradbury (2006, P. 41) review red squirrel ecology. Red squirrels are conifer specialists, feeding on seeds contained in cones and requiring cones for overwinter survival. The squirrel middens are located on territories that are relatively permanent. Squirrels without a permanent territory

containing mature conifer tree, and thus a reliable source of over-wintering food have a low probability of survival. Harvesting practices that remove the majority of in-stand forest structure are shown to have a negative impact on red squirrel populations. Holloway and Malcolm (2006) found that partial timber harvest (shelterwood) in spruce and hardwood forests in Ontario, Canada, can result in declines in red squirrel populations. They suggest that the interspersion of large harvested and unharvested blocks on the landscape may be important to ensure the persistence of red squirrels. Red squirrel habitat on the Ashland RD is assumed at a minimum to be mature ponderosa pine forest with an average crown cover of > 40% (Gonzales, 2008.11.14, Map of potential goshawk habitat, Ashland RD; see Table NGPAP 3.2.1.3.1.T1 on goshawk foraging habitat acres). Some patches of habitat with less than 40% crown cover may also contain mature trees with interlocking crowns suitable for red squirrel habitat. The assumption is based on field observations and recorded locations of incidental observations of red squirrels on the Ashland RD. The proposed action would based on design criteria: mechanically treat (log) some areas (ROST, ROSW, CT) removing overstory trees and based on design criteria retain 3-5 tree clumps with interlocking crowns; maintain adequate habitat for red squirrels while also retaining other areas of suitable habitat (untreated / unlogged areas; maintain goshawk nest stands / CT1 areas); provide for irregular tree spacing (best and largest trees retained), and continue to potentially provide for red squirrel habitat in the goshawk nest territory across the landscape. The ST, SW, and CT areas would result in irregular tree spacing because prescriptions are based on selecting the best trees rather than on a fixed spacing interval and on retaining a clump of 3 to 5 mature trees / A. with interlocking crowns. Based on design criteria (EA, Table 4, WL-1), management for mature trees with interlocking crown cover in nest, PFA, and foraging areas would provide for red squirrel habitat (Reynolds et al. 1992, P. 3).

- *Have or will past, present, and reasonably foreseeable activities affect the amount and suitability of goshawk nesting and foraging habitat?* ***Past*** - Commercial mechanical treatment / logging (USFS, 1985.12.12, Green Creek Timber Sale) and wildfire (Schiller Wildfire, 1988) areas have occurred in Holiday Springs Campground goshawk nest territory. The Green Creek Timber Sale removed trees in the East Otter as well as the Whitetail project area. The Schiller wildfire was limited to the west (East Otter) portion of the Holiday Springs Campground territory. ***Present*** - The Whitetail project is ongoing, NEPA is completed, and the area is being prepared for commercial timber harvest; treatments are projected to maintain goshawk habitat (Sasse, 2008.06.09). Similarly, the East Otter Project is projected to result in long-term habitat improvement from non-commercial mechanical / prescribed burning on the western portion of the Holiday Springs Campground territory. Present conditions in the eastern portion of the territory from the ongoing Whitetail project were previously described and are displayed in a map (Gonzales, 2008.11.14, Potential Goshawk Habitat Map, Ashland RD). Monitoring in the Whitetail project area indicated that high wind and about 24 inches of snow in about March 2008 resulted in little overall change in the

overstory canopy in Holiday Springs Campground goshawk PFA and nest stands and habitat remains suitable (Sasse 2008.05.28). Similarly, monitoring of forest structure in the East Otter project area (Sasse, 2008.11.05) indicated general blow down / snapped-tops of trees at approximately 1 to 4 percent reduction in existing canopy from the storms in spring and fall 2008. ***Reasonably foreseeable*** – Future activities could include wildfires, blown-down trees, mechanical treatment, prescribed burning, and mineral activities, but site specific locations are speculative and unknown. Recreation (hunting) and permitted livestock grazing are expected to continue in the future as under the present condition. Reconstruction of the Otter Creek road is foreseeable and would result in minimal tree removal along the existing road and a short-term period of disturbance from road construction equipment.

- *How do project and cumulative affects relate to available habitats across the Forest and Region?* Each R1 National Forest has enough habitat to contribute to a viable regional population of goshawks (Samson 2006b). Section NGPAD 3.2.1.2, *Custer NF*, of this report has displayed the present estimated mature forest habitat on the Ashland RD. Wildfires are reasonably foreseeable, but not site specific. The Whitetail Hazardous Fuels HFRA project was considered in the analysis of the East Otter proposed action. It is assumed that any reasonably foreseeable proposed action will meet the best science such as that contained in the Northern Region goshawk information (Tidwell July 17, 2007; Brewer et al., May 2007) and provide for habitat over time. Mature forest habitat is expected to be adequate to maintain the existing goshawk nest territories.

NGPAP – 3.2.1.5 - Step Five – Conclusions

Overview - The proposed action would generally improve goshawk habitat by reducing the risk of stand-replacing wildfire through removal of ladder fuels in combination with commercial mechanical treatment (logging), pre-commercial thinning (slashing), and prescribed burning over the existing condition.

- *Forest Plan / MIS* – NFMA is implemented through the Custer Forest Plan. Maintaining habitat for viable populations of MIS includes providing habitat for the goshawk over the long-term. The proposed action vegetation treatments are designed to meet regional information (Brewer et al. May 2007) for goshawk habitat and provide for habitat over the long-term and reduce the fire risk over the existing condition.
- The proposed action includes several treatments designed to enhance PFA habitat in the long-term and includes CT1 harvest by thinning from below. Non-commercial mechanical / prescribed fire treatments in foraging, PFA, and nest habitat (Whitetail Fuels Project) are also designed to thin from below and result in reduced ladder fuels over the existing condition.
- *Disturbance / Timber Sale* - Under the proposed action, Timber Sale contract "C" clauses would help minimize disturbance to goshawks from logging associated activities.

- *Public Access / Roads* – In the East Otter project, road improvement in terms of widths, surfacing, and extension of existing roads, and commercial use of temporary roads for logging, in goshawk PFA habitat could potentially increase human activity associated roads open to the public for motor vehicle access. Disturbance from temporary roads would be of limited temporal and spatial extent. The reasonably foreseeable DEIS Ashland RD Travel Management Plan, Alt. B (USFS, Sept. 2008), would help restrict public motor vehicle travel on select routed and potentially reduce long-term disturbance in the project area. The Plan and would reduce potential travel on roads within or adjacent to most of the identified nest stands (Whitetail Project), some areas of the PFA (Whitetail and East Otter projects), and potentially help to avoid future disturbance to goshawks and other wildlife. See further discussion on road under discussion of Big Game in this report. The period to avoid disturbance would be primarily during the period of April 15 through August 15 for PFAs (Brewer et al. 2007, P. 39); the breeding season is defined as March 1 – Sept. 30 (Brewer et al. 2007, P. 41).
- *Power River Co. Fire Plan* - The Powder River County Fire Plan identified USFS TSMRS mature forest stands with greater than 70% canopy cover within FS Priority 1 Area as a priority for treatment. Many of these stands are also goshawk habitat. The Power River County Fire Plan also focuses on the NFS lands within 1.5 miles of the private boundary which include essentially all of the project area and much of the Ranger District. Providing adequate habitat to meet (Brewer et al., May 2007) and treating the areas outside of identified goshawk habitat can help achieve both Powder River County Fire plan and goshawk habitat goals.
- *Patches of Mature Forest* – The project area contains more mature forest habitat than would be expected on the average for the Ranger District (Gonzales 2008.11.14, Map – Potential Goshawk Habitat, Jan. 2008). In view of past wildfires and land management activities, the goshawk habitat with in the project area will need to be maintained periodically to maintain mostly single-storied stands in order to avoid a potential reduction of nest territories from wildfires on the Ranger District in the long-term. Ritchie et al. (2008, P. 919 and 923) found that in NE California, in the short-term increased vigor in thinned stands appeared to be offset by an increase in mortality of large trees when thinning was followed by prescribed fire. In the long-term, stands with a combination of thinning and prescribed fire had far fewer high-risk mature trees and generally lower rates of mortality after treatment.
- *Weather* - Weather that is adverse to goshawk nesting and fledging is foreseeable, but not temporally nor site specific. Weather, more than any other factor is through to affect egg and nestling survival as well as territory occupancy (Bechard et al. 2006, Keane et al. 2006, Squires and Kennedy 2006). The proposed action includes provisions to help maintain suitable habitat and ameliorate potential adverse weather effects.
- *Fragmentation* - The proposed action would help maintain existing goshawk PFAs and nest stands in the cumulative effects area and follows information provided by the Northern Regional (Brewer et al. May 2007) over the existing condtion. The proposed action would help insure continued goshawk territorial

occupancy in the long-term and maintaining population viability compared with a higher risk to stand replacing wildfires and associated with loss of territories and associated fragmentation at the landscape level under the existing condition. The proposed action incorporates landscape level strategies by treating areas to reduce fuels adjacent to mature forest patches to spatially isolate mature forest patches from adjacent contiguous fuel and fire risk. These strategies are described for PNW dry forests (Hessberg et al., Sept. 2005, P. 6 and 8). The intended result is spatially isolated patches of dense forest meeting the habitat needs of the goshawk, embedded in a matrix of more fire-tolerant forest and more fire resilient landscapes.

Monitoring Past Goshawk Habitat Treatment - Treatments to maintain or improve goshawk habitat by mechanical and prescribed fire on the Custer NF have been based Reynolds et al. (1992), meet past regional direction, and meet current information (Brewer et al. 2007). While there have been no statistical measurements of pre- to post-treatment stand conditions and respective goshawk use and nest productivity at treated stands on the Ranger District, informal review indicates generally positive changes in habitat. Field review of mechanical slashing and prescribed fire treatment appears to mimic described conditions and prescriptions designed to thin from below appear to generally create more open habitat while maintaining most of the overstory. In the Ekalaka Hills on the Sioux RD, two goshawk territories remained active in 2007 during ongoing timber sale harvest (Parks, Jan. 2008); attempts at monitoring in 2008 were inconclusive. The Ekalaka project which is in ponderosa pine forest is approximately 50% complete as of Jan. 2008, and designed to commercially thin stands from below to maintain goshawk habitat in the long-term similar to that in the ongoing Whitetail Project and proposed action for the East Otter Project.

Cumulative Effects - Considering the past, present, and reasonably foreseeable future action of cumulative effects the proposed action would generally improve goshawk foraging, nest, and PFA habitat in the long-term because it helps maintain adequate existing habitat for known nesting pairs of goshawks and it follows regional information. See Tidwell, (July 17, 2007) and accompanying Northern Goshawk, Northern Region Overview (Brewer et al., May 2007). The proposed action is designed to help provide for habitat over the long term and reduce low to moderate intensity wildfire risks over the existing condition. Past timber harvest in the project areas last occurred circa 1985. The proposed action would treating woody fuels at a landscape level to achieve a sea of open pine canopy with islands of mature forest with high-crown cover (goshawk habitat) and would help maintain goshawk (nest, PFA, foraging) and other wildlife habitat over the long-term compared to the existing condition.

3.5.1.5 - Western Kingbird – MIS Open Savannah

Affected Environment – According to Gamble and Bergin (1996, P. 4-5, P. 15) the western kingbird used a variety of open habitats and is most common along the edge of ponderosa pine forest and management includes providing for isolated trees in open areas including those along riparian areas

Environmental Effects – The Proposed Action would maintain a distribution of isolated ponderosa pine trees within grassland because these areas would not be part of commercial mechanical harvest. Prescribed burning would be focused on forest stands of > 10% crown cover and would likely not kill pole size or greater isolated pine trees because of limited flame length and bark thickness. The Proposed Action may result in some commercial harvest (ROST, ROSW) in pine forest adjacent to grasslands may provide for some limited habitat over the existing condition. The Proposed Action would provide for scattered mature pine along riparian and woody draw areas.

Cumulative Effects – Considering the past, present, and reasonably foreseeable future actions of cumulative effects the Proposed Action would maintain and likely improve habitat over the existing condition for western kingbird because it would maintain savannah habitat.

3.5.1.6 - Northern Oriole (Bullock's oriole) and Yellow Warbler = MIS Riparian Ovenbird and Rufous-sided Towhee (Spotted Towhee) - MIS Hardwood draws

Affected Environment – These species are potentially present where suitable habitat exists. The northern oriole nests in mature deciduous trees and the yellow warbler in shrubs within riparian areas. According to Van Horn and Donovan (1994, P. 16) the ovenbird requires larger contiguous forest tracks within the breeding range. Existing deciduous woody draws are typically linear and contain limited interior areas away from the forest edge. According to Greenlaw (1996, P. 1 and 23) the spotted towhee is a familiar bird of thickets and other scrubby or seral habitats. Special attention should be directed toward maintaining or improving dense woody thickets such as riparian woodlands. In the project area riparian / woody draw / aspen areas are estimated to cover less than 1% of the landscape. Conifer over-shading of these areas is primarily associated with pine forests and minimal to nonexistent within the grassland setting. Most existing aspen stands are decadent and declining due to competition with and over-shading by ponderosa pine trees.

Environmental Effects – The proposed action would selectively remove conifers over-shading woody draws and riparian areas while retaining less than 10% pine crown cover, primarily mature trees, for habitat diversity. Pine would be completely removed from within, and to restore, aspen stands. Limited prescribed burning would occur within these areas because these habitats tend to be moist and difficult to burn during normal burning prescription periods. The proposed action would better maintain these habitats because of selective conifer removal than would the existing condition.

Cumulative Effects – Considering the past, present, and reasonably foreseeable future actions of cumulative effects the proposed action would maintain and likely improve habitat, especially adjacent to ponderosa pine forest, over the existing condition for the northern oriole, yellow warbler, ovenbird, and rufous-sided towhee compared to the existing condition. The habitat improvement would occur because of the selected removal of extensive areas over-shading conifer trees, but retention of scattered mature pines along these drainages.

3.5.1.7 - Brewer's Sparrow - MIS – Evergreen shrubs (Sagebrush grassland)

Affected Environment **–** Brewer's sparrow is the dominant avian species associated with sagebrush habitats in the area of eastern Montana (Dobkin, 1992, P. 119). Brewer's sparrow is present on the Ranger District and potentially based on limited sagebrush habitat in the project area. According to Rotenberry et al. (1999, P. 10 and 17) Brewer's sparrow nests are often located in denser shrubs, primarily big sagebrush. Habitat management includes protection and restoration of native shrub land (Dobkin, 1992, P. B-119). In the project area sagebrush grasslands are limited in distribution and any big sagebrush concentrations would tend to be located away from ponderosa pine forest stands. Silver sage is typically widely scattered along drainages. Information and photographs provided by Johnson (2008.04.21) of sagebrush habitat were considered in this analysis.

Environmental Effects – The proposed action includes design criteria to avoid prescribed burning of concentrations of big sagebrush > 1 acre. The acreage size is designed to be inclusive of most Brewer's sparrow territory size of 0.5 hectares (Rotenberry et al., 1999, P. 8). According to Dobkins (1992, P. A-28), the complete removal of standing shrub community by fire or other means, followed by complete replacement with grasses results in a species-poor, sparsely nesting community of breeding birds. In contrast where fire produces a spatially the homogeneous mosaic of burned and unburned patches, the breeding avifauna appears to be little affected.

The proposed action would through non-commercial mechanical treatment removal some small pine trees in grasslands and possibly some sagebrush-grasslands adjacent to forested stands. The proposed action is designed to minimize burning of big sagebrush grassland by avoiding any concentrations and limit fire to scattered plants and silver sagebrush adjacent to pine forest and produce a spatially homogeneous mosaic of burned and unburned patches over the existing condition. The habitat potential for big sagebrush in the project area is limited. One stand of about 1 A. of big sagebrush has been identified within a drainage, and a second grassland drainage has yet to be inventoried. Concentrations of big sagebrush, which regenerates slowly from seed, would be avoided compared to silver sage which may be prescribed burned, and which sprouts backs after low intensity prescribed fire. Low intensity fires, and minimal ground disturbance associated with prescribed fire, tend to perpetuate native perennial grasses and minimize expansion of annual grasses over the long-term.

Cumulative Effects – Considering the past, present, and reasonably foreseeable future actions of cumulative effects the proposed action would maintain and likely improve habitat over the existing condition for Brewer's sparrow. The proposed action through prescribed burning would likely result in a spatially heterogeneous mosaic of burned (small trees adjacent to pine forest) and unburned patches (big sagebrush) of grasslands, and have minimal affects on avifauna (Dobkin, 1992, P. A-28) over the existing condition. The proposed action would through prescribed burning result in more diverse size and age class mosaic of silver-sage over the existing condition.

3.5.1.8 - Sharp-tailed Grouse – MIS Grasslands

Affected Environment – Sharp-tailed grouse utilize grassland for year-round habitat. Grassland structure is currently a mosaic of short and higher structure as a result of grazing animals and water distribution. There are no identified or suspected leks within the project area.

Environmental Effects – The proposed action would remove limited areas of grassland structure in the short-term through prescribed burning within any one year over the existing condition. Portions of grasslands burned will likely be adjacent to stands of ponderosa pine forest. Mechanical treatment of pine in forest stands is expected to have no direct and minimal indirect (disturbance) impact on sharp-tailed grouse.

Cumulative Effects – Considering the past, present, and reasonably foreseeable future actions of cumulative effects the proposed action would maintain and likely improve habitat over the existing condition for sharp-tailed grouse because fuels treatments would focus on forest habitats, prescribed burning would have short-term effect on grasslands and limited area influenced in any one year over the existing condition.

3.5.1.9 - Pronghorn Antelope – Key Species - Grasslands

Affected Environment **–** Pronghorn may potentially use the grassland and shrub-grassland areas in the NW portions of the project area, though because of limited open grasslands the area is less suitable than more expansive grassland areas on other portions of the Ashland RD.

Environmental Effects – The proposed action would have minimal impacts to grasslands and shrub-grasslands compared to the existing condition because the emphasis is on fuel reduction in forested habitats. Design criteria would minimize impacts to big sagebrush grasslands, which are important for pronghorn.

Cumulative Effects – Considering the past, present, and reasonably foreseeable future actions of cumulative effects the proposed action would maintain and likely improve habitat over the existing condition for pronghorn antelope because prescribed burning would be of limited scope in grasslands and by design criteria avoid areas concentrations of big sagebrush.

3.5.2 - Black-backed Woodpecker (not MIS or USFS Sensitive)

Affected Environment **–** USFS Regional information (Tidwell, July 17, 2007) and black-backed woodpecker information (Bonn et al. July 13, 2007) was considered. Hutto (1995) was considered in Bonn et al. (July 13, 2007, P. 37). There are no large areas of fire killed trees to consider in the project area; past lighting caused wildfires are generally limited to less than five acres.

Environmental Effects – Prescribed burning will likely kill ponderosa pine trees of minor acreage and create some scattered marginal habitat for black-backed woodpeckers beyond the currently condition, primarily outside of goshawk nest and PFA habitat.

Cumulative Effects – Considering the past, present, and reasonably foreseeable future actions of cumulative effects the proposed action would maintain and likely have a minor improvement in habitat over the existing condition for this woodpecker.

3.5.3 - Big Game (Elk, Black Bear, Mountain Lion, Mule and White-tailed Deer)

3.5.3.1 - Affected Environment – Hunting is the primary recreation use on the Ashland RD. In this analysis elk and their habitat are used as a surrogate for big game habitat including MIS (mule and white-tailed deer) and local interest (black bear, mountain lion) species because elk habitat requirements (cover and roads) are believed to encompass these species. Deer fawning and elk calving are distributed over the landscape; specific fawning and calving locations are unknown. According to Black et al. (1976, P. 19), if elk hiding cover requirements are meet, they will be exceeded for deer, as deer are much smaller. There is no MIS management plan or Forest Plan standards specific for mule and white-tailed deer. Elk are addressed in the Forest Plan: USFS, Oct. 1986, P. 18, f., Key /Major Interest Wildlife Species; P. 19, 4, Key Species; P. 180, C. Major Interest. Further the Forest Plan states that Key species and habitats … will be managed in cooperation with state and Federal Agencies. Forest activities with potential for an impact on key wildlife species or key habitats will have wildlife considerations made early in the project analysis process. Christensen et al. (1993) describes considerations for Forest Plan updates and revisions. Biologists feel it is desirable to maintain high quality elk habitat to retain elk on NFS lands where animals are available to the public and to minimize conflicts on private lands (see Elk Plan Habitat Management Strategies in trailing paragraph). The elk herd is non-migratory. A limited elevation range of 1,467 ft. (4,407 ft. at Home Creek Butte and 2,940 ft. at Ashland Ranger Station) contributes to relatively low snow depths permitting elk travel across the area as compared to mountainous areas. Elk were present in minimal numbers and not considered in detail for the Ashland RD in the Forest Plan (USFS, Oct. 1986). In 1992 the first elk general hunting season was begun with a quota of 4 either sex animals. The elk herd has been increasing in distribution and numbers (Hemmer, 2008.05.18) since 1992. The combination of increased distribution, increased observations, high recruitment, and low levels of harvest of elk all indicate an increasing elk population (Hemmer, 2008.05.18). The 2007 estimated minimum population is 500 head in Hunting District (HD) 704 which includes Ashland RD. Essentially the entire Ranger District is currently thought to be

used by elk. Information and photographs provided by Johnson (2008.04.21) of hiding cover and non hiding were considered in this analysis.

In the project area, the amount of forage is assumed not to be a limiting factor because approximately 33% (1,398A. / 4,276A.) is grassland. Forage is typically available in grasslands and pine forests (low crown cover) on southerly slopes because snow tends to melt or be reduced to a shallow depth within a few weeks. The cumulative effects boundary for elk (including mule and white-tailed deer) in this analysis is the Ranger District. Short-term is defined as 0-9 and long-term as ≥10 years.

The Montana Final Elk Management Plan (MDFWP, January, 2005) addresses broad goals for the state. The Habitats Management Strategies for HD704 and relative to the project include (MDFWP, January, 2005, P. 389):

- Special emphasis will be placed on strategies that encourage elk to use forage on public lands more than private lands.
- Identify important wildlife habitats potentially impacted by prescribed burning and work with the BLM, USFS, and private landowners to ensure that planned prescribed fires benefit elk and elk habitat.
- Maximize security for elk by continuing to coordinate with BLM, USFS, and private landowners to implement a cooperative road management program designed to curtail off-road travel and designate walk-in hunting areas.

3.5.3.1.1 - Forested Cover - The project area contains a relatively high amount of forested area which provides elk hiding cover. Approximately 64% (3,122A.) of the project area (about 4,276 A.) is forested cover (Table 3.5.3.2.2.T1) which is higher than would be expected on the average for the Ranger District. Major wildfires have occurred frequently since 1988 and have removed large areas of elk hiding cover outside of, but with minimal influence within the project area. Currently the forested area along roads in the project area, especially on major ridges, essentially screens the down slope habitat from the view of people. Some areas that were grasslands in 1962 are show as forested in 2002 aerial photography (Sasse, 2008.10.28).

Table 3.5.3.1.1.T1 - Forested cover for elk in the East Otter Cr. Fuels project area. [1]

Category	Current	Cover Remaining after Timber Harvest Project Implementation
Forested Cover	2,765 A. [1]	2,496 A. [2]
Percent Forested Cover in Project Area	64%	56%

[1] Calculations based on TSMRS strata: 122-124, 222–224, 132–134, 142–144 and 232–234 (Project Silviculture Report). Percent calculation 2,765A. forested cover/4,276 A. project area.
[2] Calculations based on proposed action (Ch.2, Table 2.1) – cover removed from ROST (259 A.), ROSW (30 A.) and stand replacing prescribed burning outside goshawk nest and PFA habitat (97 A. X maximum of 15% = 15A.), special cuts woody draws/aspen SCNC (8A.), plus estimated non-site specific within other treated A. (50A.) for a total of 362A., 2765 – 362 = approximately 2,400A. / 4,276 A. = 56%.

Elk hiding cover is provided by vegetation capable of essentially hiding an adult elk from view of a human at a distance of equal or greater than 200 feet (Lyon and Christensen,

1992, P. 4). Security areas are any area that will hold elk during periods of stress because of geography, topography, vegetation, or a combination of those features (Lyon and Christensen, 1992, P. 5).

The existing ponderosa pine trees along roads on major divides, such as Beaver-E. Fk Otter Creek, screen down slope stands from human view for most of the route and aid in maintaining elk security. Down slope stands viewed from the few vista point locations along divides also provide good forest hiding cover for elk. Similarly, trees along interior road provide good screening as well as hiding cover.

The issue of thermal cover for big game (elk, black bear, mountain lion, mule and white-tailed deer) was considered indirectly through the general evaluation of cover. All forest from pole through mature size class is potential thermal cover for these species. The concept of thermal cover while an emphasis area in wildlife analysis in the early 1980's, (Black et al., 1976) is today viewed as less important or even inconsequential for elk (USFS, 2008.02.01, P. 2). Thermal cover will not be further discussed. The Custer Forest Plan does not have a standard for any type of cover for elk or other big game on the Ashland RD. The Custer Forest Plan (USFS, 1986, P. 129) defines Hiding Cover – trees of sufficient size and density to conceal animals from view at 300 feet. In this case animals refer to deer, as elk were not present in sufficient numbers to be considered as MIS on the Ashland RD in the Forest Plan (1986). Note that the Forest Plan definition of hiding cover (300 feet) is more liberal than the currently widely accepted and more conservative value used for elk (200 feet based on Lyon and Christensen, 1992, P. 4) in this analysis.

3.5.3 .1. 2 - Roads - Lyon and Christensen (2002, pp. 265 – 271) review the literature and provided the following summary on elk and roads. Of all the factors relating to logging, the construction of roads and subsequent vehicle traffic on those roads has proved to be the most significant modification to elk habitat. **The common recommendation from virtually all studies to this problem is to create the fewest possible roads, and to use standards that minimize roads width, cuts and fills as initial criteria of road design and location.** Reductions in habitat effectiveness cannot be prevented if forest roads remain open to any level of motorized traffic. Stubblefield et al. (2006, P. 1060) identify portions of the non-road dissected habitat as a landscape-scale attribute of elk centers of activities in the central Black Hills of South Dakota. The above information is interpreted here to mean road improvement to existing roads that result in increased travel seasonally or during wet weather would have a similar result approaching that of new roads.

Existing road conditions limit some motor vehicle access. Roads surfaced with aggregate are limited in the project area (e.g., Beaver Creek, E. Fork Otter Cr.). Most other roads are surfaced with native materials and are difficult to drive when wet and often badly rutted. Many roads surfaced with native soil materials are passable in dry conditions, but often impassible when wet except with 4X4 vehicles or 4-wheel ATVs. Road conditions are often wet or snow covered during the general big game hunting season. Several travel routes are 2-track roads accessible in dry weather or when the ground is frozen.

Effects from human activity on roads open to motor vehicle travel essentially occurs year-long (Table 3.5.3.1.2.T1). The Ranger District and project area potentially receive use by recreational visitors almost year long through a variety of hunting (rifle and archery), shooting, and trapping seasons. Therefore, year-long motor vehicle travel restrictions are the most effective in providing for security areas.

Existing Road Closures - The Ashland Ranger District does not have a Travel Plan. Gates and soil berms have been used to close several post-timber sale roads in the past. One unlocked gate (T2S, R46E, S. 24, SESE) is present that was installed in the Green Creek Timber sale (USFS, 1985.12.12) and has periodically been closed and limiting public motor vehicle traffic over the approximately 20 years.

Roaded and Unroaded Hunter Opportunity – Hillis et al. (1991) is used here to follow best science and as a measurement tool to describe effects and thresholds for the purpose of comparing alternatives in this analysis. Hillis et al (1991, P. 38) recommend at least 30% of an analysis unit provide for elk security. Elk security levels below 30% could result in a shift of animals to other areas such as adjacent public lands. The movement of elk from NFS lands reduces hunter opportunity and recreation use for the public and could result in resource conflicts on private lands. Elk security areas are over 0.5 miles from roads open to motor vehicle travel (Hillis et al, 1991, P. 38). In this analysis security areas may include hiding cover in the form of forest or topographic breaks. Approximately 12% of the of NFS lands on Ranger District (Gonzales, 2008.05.27) would be in unroaded hunter opportunity based on a GIS buffer out 0.5 miles out from road locations shown on the preliminary existing road map GIS layer. In the project area approximately 0% of the NFS lands are currently within the Unroaded Hunter opportunity (Table 3.5.3.1.2.T2). The proximity of the East Otter project area to the intersection of the Beaver Creek, Cook mountain divide road, and E. Fk. Otter Creek road contribute to the absence of unroaded hunter opportunity. This analysis for the project area assumes no existing road travel restrictions

Table 3.5.3.1.2.T1. Recreation and other annual activities typically occurring on the Ashland Ranger District, Custer National Forest, Montana. Note the almost continuous human activity line throughout the year.

Season	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Turkey - Hunting												
Deer – Archery Hunt												
Deer – Rifle Hunt												
Elk – Archery												
Elk – Rifle												
Black Bear - Hunting												
Grouse - Hunting												
Bobcat – Trap / Hunt												
Mt. Lion - Hunting												
Prairie Dog - Shooting												
Cattle Grazing												

Table 3.5.3.1.2.T2. Road and unroaded hunter opportunity for the project area. [1]

Hunter Opportunity Classification	Roaded Area	Unroaded Area	Total
Current	4,249A. (100%)	27A. (0%)	4,276A. (100%)
Proposed Action	4,249A. (100%)	27A. (0%)	4,276A. (100%)

[1] Calculations based on 27A. of unroaded area in the project area East Otter HFRA project area and a 0.5 mile buffer on roads open public motor vehicle travel (Gonzales, Oct. 23, 2008).

Table 3.5.3.1.2.T3. Road density for East Otter HFRA proposed project area based on DEIS Ashland Ranger District Travel Plan. [1]

Hunter Opportunity Classification	Roaded Area	Unroaded Area	Total
DEIS Preferred Alternative - Ashland RD Travel Plan	3,798A. (89%)	478A. (11%)	4,276A. (100%)

[1] Calculations based on a 4,276 A. or 6.68 square miles of E. Fork Otter HFRA project area and a 0.5 mile buffer on roads open to public motor vehicle travel (Gonzales, Oct. 21, 2008).

Road Density – Currently there are 2.65 miles of road open for public motor vehicle travel / square mile in the project area which exceeds the 1.0 mile recommended wildlife goal (Table 3.5.3.1.2.T2; Fig. 3.5.3.1.3.F1). The Proposed Action would maintain the road density at the level of the existing condition. Canfield (et al. 1999, P. 6.12) identify management techniques that reduce human disturbance on ungulate summer range including limiting open road densities to zero in scattered key areas and less than 1 mile per section elsewhere as well as reclaiming roads that are closed and re-establishment of native vegetation to help keep travel violations to a minimum.

3.5.3.1.3 - *Elk Vulnerability* – According to Lyon and Christensen (2002, P. 575), hunter use of extensive road systems has been shown to increase the elk harvest significantly (Youmans 1991, in Lyon and Christensen, 2002) and reduce the number of days required to harvest an allowable number of animals, i.e., reduction in Recreation Visitor Days (RVDs). In the project area an increase in or improvement of the road system also contributes to shifting elk off the NFS lands to private lands where animals are often not available to the general public.

Security areas (>0.5 miles from road open to public) are currently 0.0% (27 A. / 4,276A.) of the project area and would remain unchanged under the proposed action (Table 3.5.3.1.2.T2. and Map 3.5.3.1.3.M1). According to anecdotal reports by private ranchers and USFS personnel, elk typically move to rested pastures to avoid domestic cattle, but move out of project area at the beginning of hunting season. The movement of elk may be due to factors such as hunter activities and existing habitat, including security areas, on NFS lands. USFS (1985.12.12, Appendix B-1) includes 1984 input from MDFWP (S. Knapp) that the road density is probably a major limiting factor on the small elk population in the area and that road degrade the security aspect of habitat quality.

The Preferred Alternative (Alt. B) for the DEIS Ashland Ranger District Travel Plan (USFS, Sept. 2008, P. 3-42) would result in a District-Wide and East Otter Cr. Fuels EA project area road density of 0.83 miles/sq. mile and 1.55 miles/sq. mile, respectively (Table 3.5.3.1.2.T4; Fig. 3.5.3.1.3.F1).

Table 3.5.3.1.2.T4. Road density for proposed East Otter project area based on DEIS Ashland Ranger District Travel Plan. [1]

Motor Vehicle Restriction Status	Miles of road open to public motor vehicle travel year-long	Miles of Road / Square Mile
East Otter portion of the DEIS Preferred Alternative - Ashland RD Travel Plan	10.40	1.55
DEIS Preferred Alternative - Ashland RD Travel Plan	634.79	0.83

[1] Calculations based on a 4,276 A. or 6.68 square miles of East Otter HFRA project area (Gonzales, Oct. 21, 2008).

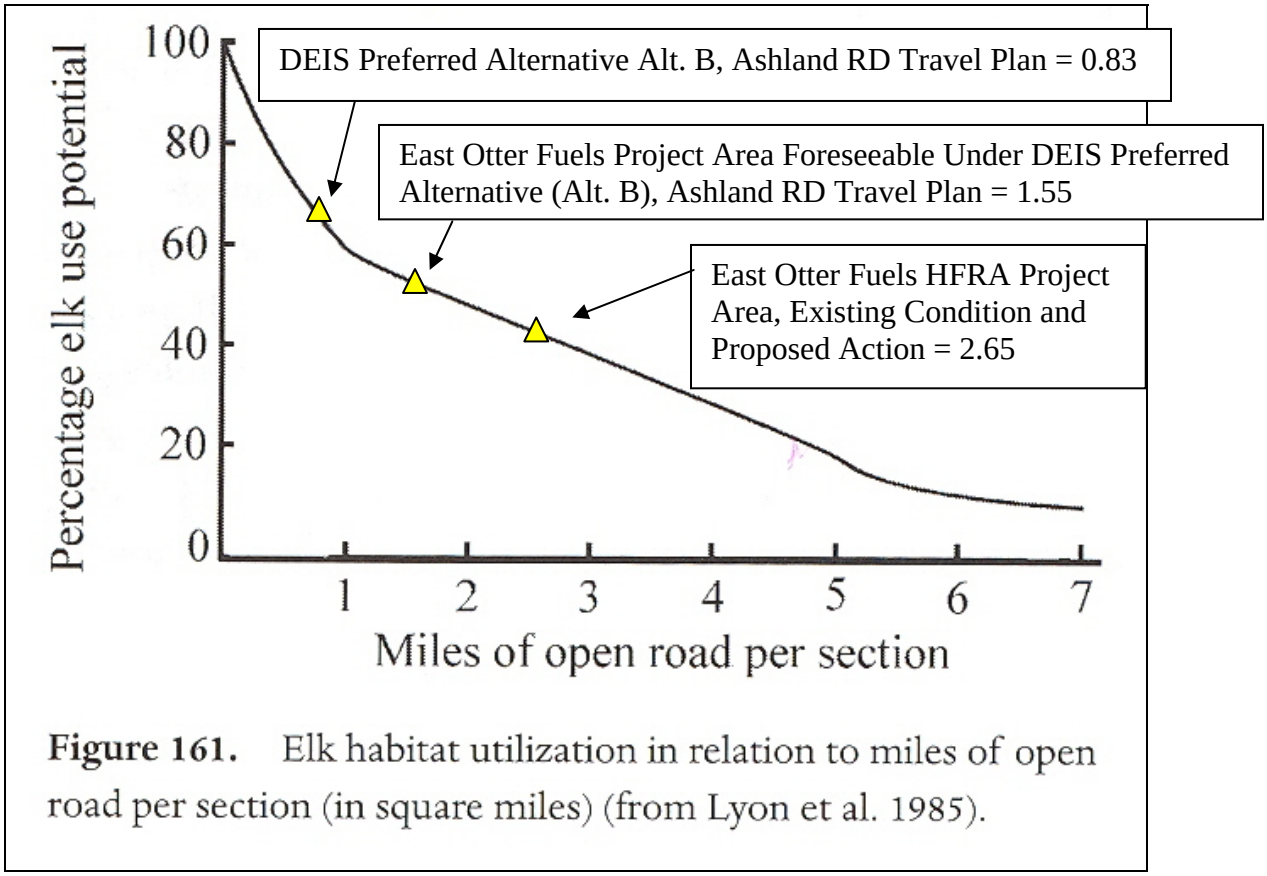


Fig. 3.5.3.1.3.F1. Elk habitat utilization in relation to miles of open road per square mile (Lyon and Christensen, 2002, P. 568).

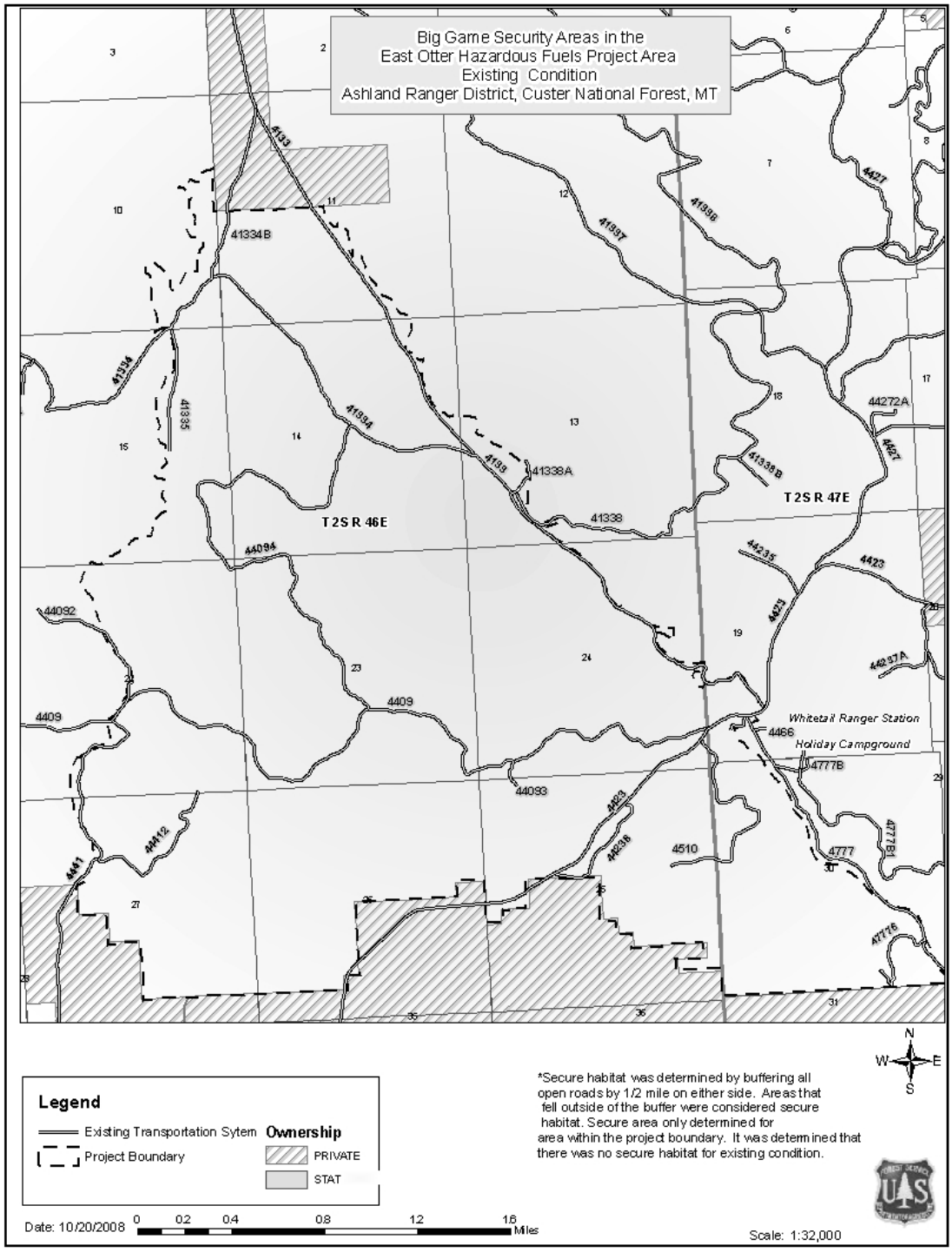


Fig. 3.5.3.1.2.M1. Big Game Security Areas for Existing Condition (0%) and Proposed Action (0%) for the East Otter project area, Ashland Ranger District, Custer National Forest, Montana (Gonzales, 2008.10.23)

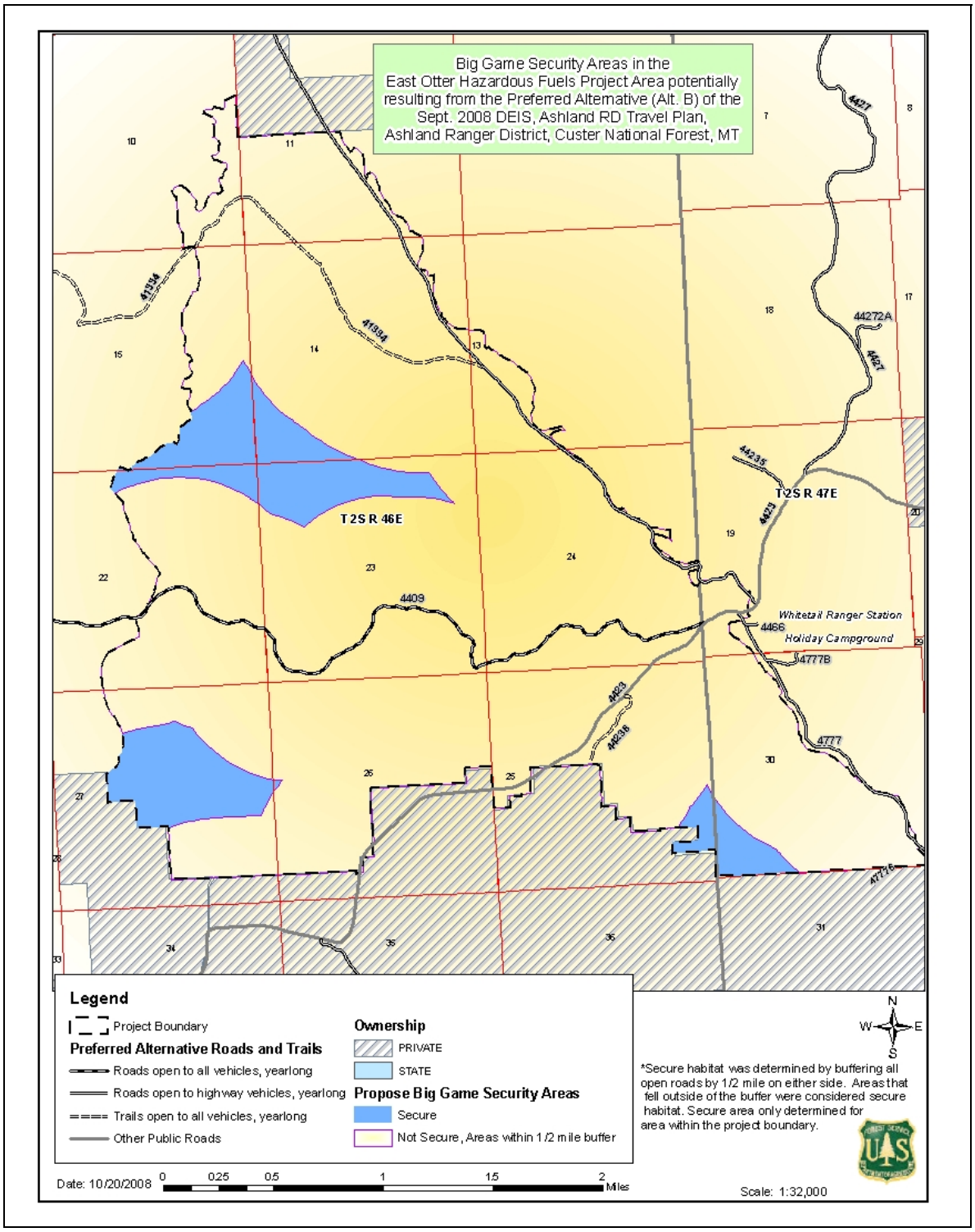


Fig. 3.5.3.1.2.M2. Big Game Security Areas (11%) of the East Otter Hazardous Fuels project area potentially resulting from the Preferred Alternative (Alt. B) of the Sept. 2008 DEIS Ashland RD Travel Plan, Ashland Ranger District, Custer National Forest, Montana (Gonzales, 2008.10.22)

3.5.3.2 - Environmental Effects

In terms of context, the ongoing Whitetail Project (Sasse, 2008.06.09) located to the west, and DEIS Ashland RD Travel Plan (USFS, Sept. 2008) covering the Ranger District, would improve overall big game habitat in the long-term compared to the existing condition. The following discussion applies to the East Otter project area.

3.5.3.2.1 Forest Cover – Cover would be removed as trees are harvested, slashed or killed by fire as part of project implementation. Areas managed to maintain and improve goshawk habitat are generally expected to also provide areas of elk hiding cover. The proposed action would restore the variability of fire and reverse changes brought about by past practices and help move toward restoration (Baker, et al. 2007, P. 251).

Timber Harvest – Under the proposed action, ROST (12 TPA) and ROSW (20-24 TPA) would remove hiding cover for elk over the existing condition. It is expected hiding cover would return in the long-term in 20-25 years when viewed from a horizontal location and at approximately 40 – 50 years when viewed from an adjacent ridge top such as the Beaver Cr. - Otter Cr. divide. Approximately 259 A. of ROST and 30 A. of ROSW harvest (EA, Table 1) would occur in the project area, essentially all of which would be concentrated in areas of mature forest that currently offers elk hiding cover.

Non-Commercial Mechanical treatment - The proposed action would thin trees along roads to achieve Fuels goals and create wider tree-free clearing zones in many areas over the existing condition of narrow corridors. The enlarged non-forest corridors along roads open to motor vehicle travel would contribute to reduced screening cover and decreased elk cover in order to reduce the risk of wildfires compared to the existing condition.

Prescribed fire – The proposed action would use prescribed fire to kill trees and result in some loss of cover within the landscape over the existing condition. Fire could cause parts of ponderosa pine trees needles to turn red, but may not necessarily result in mortality (Sieg et al. 2006). Under the proposed action post-burn conditions are expected to be more favorable to grazing animals such as elk in the short-term in terms of forage palatability over the existing condition. Omi et al. (2006, P. 25) points out that treatment of surface fuels appears to be of primary importance for reducing the intensity and severity of subsequent wildfires. Surface treatments such as prescribed burns may be effective for as long as 10 years, especially if they raise the height to canopy and increase mean tree diameter. Noss et al. (2006, P. 481) concludes that restoration and management of fire-prone forests should be precautionary and allow or mimic natural fire regimes as much as possible. The proposed action would use prescribed fire to mimic natural fire regimes. Lentile et al. (2006, P. 557) evaluated conditions in the South Dakota Black Hills and suggests that managers should consider topography and stand structure together when making strategic decisions about which stands to thin or otherwise manage to reduce the severity with which forests will burn in wildfires.

3.5.3.2.2 - Roads – Currently many existing roads are little more than wheel-track trails accessible in dry weather or when the ground is frozen. The proposed action would

"improve" some roads to facilitate timber harvest and would be expected to facilitate the post-project motor vehicle use of these roads. Lyon and Christensen (2002, P. 567) point out that roads that remain open to vehicle access constitute the single most significance negative modification of elk habitat by human activities. Trombulak and Christopher (1999, P. 18) point out that roads can alter animal behavior by causing changes in home ranges, movement, reproductive success, escape response, and physiological state.

3.5.3.2.3. Elk Vulnerability – Elk would be less available to the public if they are displaced from NFS lands to private. The MDFWP could have more difficulty in achieving harvest objectives and managing elk populations under general hunting because public hunter access is often limited and elk generally unavailable to the public on private lands.

3.5.3.2.4 - Montana Elk management Plan – This section describes how well the proposed action meets the Habitat Management Strategies identified in the Montana Elk Plan (MDFWP, January, 2005, P. 389).

- *Special emphasis will be placed on strategies that encourage elk to use forage on public lands more than private lands.* The proposed action would apply prescribed burning and reintroduce and maintain the process of fire to extensive areas of the project area thereby maintaining the forage quality / palatability over that in the existing condition. While forage is not considered limiting, forage quality would generally be improved, especially in approximately the next 8 years as plant nutrition of post-burn areas increases over the existing condition. Improved forage quality, especially in proximity to forested cover is expected to contribute to meeting this strategy. Van Dyke and Darragh (2005, P. 23) in a study of prescribed burning found that changes in elk use closely tracked changes in production and nutrition quality of plants in a study on the Custer NF in the Beartooth mountains. They concluded that increase in quantity and quality of forage was the primary cause for increased use of burned sites by elk. Elk increased use of sagebrush grassland burned sites 1 -2 years after burning, then reduced use of levels associated with pre-burn conditions over the next 3 - 10 years.

- *Identify important wildlife habitats potentially impacted by prescribed burning and work with the BLM, USFS, and private landowners to ensure that planned prescribed fires benefit elk and elk habitat.* Outside of goshawk nest stands and PFAs, under the proposed action prescribed fire could result in 0-15% of the forest being stand replaced (overstory trees killed by fire), but pockets of mortality are predicted not to exceed 15A. In these areas prescribed burning under the proposed action would maintain most hiding cover, but a mosaic of cover and small opening could result containing slightly less cover than the existing condition. Inside goshawk nest and PFAs mortality of overstory trees would be minimized for broadcast and negligible for pile and burn areas. Prescribed burning within woody draw / riparian areas would likely result in a minimal reduction in cover. As a design criterion, the treatment focus is on

forested habitats and avoidance of sizable big sagebrush stands, but not individual scattered plants which could be burned.

- *Maximize security for elk by continuing to coordinate with BLM, USFS, and private landowners to implement a cooperative road management program designed to curtail off-road travel and designate walk-in hunting areas.* The proposed action would improve the width, viewing area, and surface of the identified existing roads (see map referenced - Chapter 2), but not change from the existing 0% elk security Table 3.5.3.1.2.T2. Temporary roads and associated motor vehicle traffic would result in short-term disturbance to elk for the life of the timber sale and associated activities (approximately 5-10 years). Temporary roads would not be open to public motor vehicle travel. Obliteration of temporary roads would mitigate post-harvest human disturbance from vehicle travel on these roads, though the resulting open non-forest corridor would tend to favor walk-in hunter travel. See trailing discussion under Elk - Cumulative Effects on the DEIS Preferred Alternative (Alt. B) Ashland RD Travel Plan (USFS, Sept. 2008).

  Area of Disturbance from Implementation - Approximately 23% (969A. / 4,276A.) of the project area acreage would be treated with commercial timber harvest through a timber sale (Clark, 2008.10.15). Of the area under timber sale contract approximately 25 - 50% of the area is likely to be active and 50 - 75% inactive at one time. The proposed East Otter project timber harvest contract would likely have 4 to 5 payment units. On the Ashland RD, Timber Sale activities based on approximately the last 10 years on the Ashland RD are typically constrained by purchaser bonds and crew to one and at most two payment units at a time. Prescribed broadcast burning and non-commercial mechanical thinning typically occurs after Timber Sale contract has closed. Prescribed burning would typically be contained to 20% of the project area within any one year because of traditional funding, crew size, and coordination with maintaining forage for wildlife and permitted cattle grazing. In summary, disturbance from project implementation would be localized and not likely to occur in more than about 20% of the project area in any one year, thereby providing refugia for big game animals (Hemmer, 2008.05.19).

  USFS (March 2006, P. 2) summarizes research on the Starkey Project in Oregon where conditions are similar to the East Otter project area. Some key finds of the Starkey Project were that elk avoid roads open to motorized traffic, and their avoidance increases as the rate of traffic increases. Similarly, if roads are left open after timber harvest, elk are more vulnerable to harvest by hunters. Access management and maintenance of security cover can mitigate this effect. Wisdom et al. (2004, P. 9) showed one pass per day by any of the four off-road activities (ATV riders, mountain bikers, horseback riders, and hikers) caused increased movement rates and flight response by elk. Elk movement rates and probabilities of flight were highest during ATV riding and lowest during horseback riding and hiking.

The Preferred Alternative B in the DEIS Ashland Ranger District Travel Plan would result in about 11 % big game security areas and improve within the East Otter Project existing condition (0 %) or the Proposed Action (0 %). Potential future motor vehicle restrictions on selected roads are expected to mitigate the loss of cover from commercial and non-commercial mechanical treatment, prescribed burning, and especially increased viewing angle and seen areas along roads. The restrictions recommended by wildlife biologists would help achieve the intent of Hillis et al. (1991) of over 30% of the Ranger District over 0.5 miles from a road open to public motor vehicle travel (Fig. 3.5.3.1.2.M2, Table 3.5.3.2.4.T3).

According to Canfield et al. (1999, P. 6.14), managers of public lands have control over only a few of the potential variables that contribute to security, including retention of important vegetative cover, travel management, and enforcement of travel regulations. The proposed action would result in temporary roads for hauling logs and short-term local disturbance, but would be closed to public motor vehicle access with a net post-treatment road density essentially equal to the existing condition. The proposed action would not construct any new permanent roads.

Elk - Cumulative Effects – Considering the past, present, and reasonably foreseeable future actions of cumulative effects, the proposed action would reduce forested cover slightly in the short-term and maintain cover in the long-term, but also reduce the risk of stand consuming wildfire and habitat loss to elk over the existing condition. The Whitetail Creek Fuels Project was considered in this analysis. The proposed action would maintain forested habitat in pole to mature size class, which is considered thermal cover, and is widely, though not uniformly dispersed across the landscape in the project area. The East Otter proposed action is designed to create a mosaic of openings (ROST, ROSW), and maintain overstory canopy (goshawk nest stands), stands with relatively high crown cover (CT and CT1) and, areas of irregular terrain, irregular canopy, and structure that promote a patchwork of understory diversity, habitat conditions for elk and other big game (Mackie et al, 1998, P. 137). It is reasonably foreseeable that big game security cover under the existing condition and proposed action of 0% could change to approximately 11% within the East Otter project area and about 36% across the Ranger District based on the DEIS Preferred Alternative (Alt. B) Ashland RD Travel Plan (USFS, Sept. 2008, P. 3-42) and achieve the goal of >30% (Hillis et al. 1991, P. 38) of an analysis unit in security cover (Fig. 3.5.3.1.3.F1). Potential long-term travel restrictions would increase security areas and help to ameliorate the loss of cover along roads in and adjacent to the East Otter Cr. Fuels project area.

Mule Deer (Key Species) – Cumulative Effects - Considering the past, present (including East Otter Project), and reasonably foreseeable future actions of cumulative effects, the proposed action would reduce forested cover slightly in the short-term, but also reduce the risk of stand consuming wildfire and potential habitat loss to mule deer over the existing condition. Treatments along forested roadsides may reduce cover over the long-term in limited areas, but also potentially reduce the risk of large wildfire areas. Potential long-term travel restrictions on selected roads and increased security areas are expected

help to ameliorate the loss of cover along roads. The proposed action is designed to maintain habitat diversity for mule deer by maintaining a mosaic of stands with differing forest structure and crown cover intermixed with existing grasslands and sagebrush grassland areas. Mackie et al, (1998, P. 137) points out that forest management to optimize deer habitat and maintain or increase deer numbers on summer ranges should emphasize perpetuation or enhancement of habitat diversity. While timber harvest will remove some cover for mule deer, prescribed burning will improve habitat. Mackie et al. (1998, P. 137) points out how small openings optimize edge effect (as from prescribed fire) and minimize reductions in habitat security when loosely distributed across the landscape. Landscape vegetation treatments and staged-treatments (treating part of the project area at a time and generally over several years) are expected to minimize disturbance to mule deer in fawning areas and winter range. The reasonably foreseeable change in areas and miles of road open to public motor vehicle access and relation to elk was previously discussed and also applies to mule deer. Based on MDFWP surveys (Hemmer, 2008.05.81), mule deer are widely distributed in SE Montana (including the Ashland Ranger District) and populations either stable or increasing. Mule deer harvest and hunter numbers in MDFWP Region 7 have been relatively stable over the last four years. Mule deer may utilize almost the entire Ranger District during most winters. Current winter range maps reflect historic mule deer distributions surveyed during past severe winter conditions. The proposed action is expected to provide for areas of refugia (non-disturbance) on winter range. Timber Sale payment units would constrain project activities to less than half and most likely one-fourth of the project area at any one time. Prescribed burning would typically occur during the spring in the absence of snow and therefore provide for areas of refugia (non-disturbance) for deer on winter range as well as the remainder of the year.

White-tailed deer (MIS) - Cumulative Effects - Considering the past, present (including East Otter Project), and reasonably foreseeable future actions of cumulative effects, the proposed action would reduce forested cover slightly in the short-term, but also reduce the risk of stand consuming wildfire and habitat loss to white-tailed deer over the existing condition. Reasonably foreseeable long-term travel restrictions on selected roads and increased security areas would help to ameliorate the loss of cover along roads. The proposed action would maintain habitat for white-tailed deer on the landscape. At a forest stand level, some areas may be negatively altered because of forest cover removal. Woody draws, which includes areas of riparian, would be maintained. Removing ponderosa pine ladder fuels and opening canopies is expected to slightly improve understory browse species. Most commercial harvest is on northerly or western slopes. Mackie et al (1998, P. 137) points out that for white-tailed deer cutting units in western Montana would have minimal effects on white-tailed deer if located on northerly and westerly aspects, ridgetops, and other sites more than 750 m. from riparian habitat. Landscape vegetation treatments and staged-treatments (treating part of the project area at a time and generally over several years) are expected to minimize disturbance to mule deer in fawning areas and winter range. The change in areas and miles of road open to public motor vehicle access and benefit to elk was previously discussed and also applies to white-tailed deer. Based on MDFWP surveys (Hemmer, 2008.05.81), white-tailed deer are widely distributed in SE Montana (including the Ashland Ranger District) and

populations either stable or increasing. White-tail deer harvest and hunter numbers in MDFWP Region 7 have been relatively stable over the last four years.

3.4.4 - **Wild Turkey** (Local Interest)

Affected Environment – The wild turkey is addressed here under local interest and is present throughout the project area and utilizes the available habitat. Habitats include pine forest for cover and pine seed, woody draw / riparian habitats for cover and berry / seed production, and grasslands for forbs and insects. The areas burned by low-intensity fire in recent times have been minimal. Several ponderosa pine forest stands contain dense multi-layered under stories. Lehman et al. (2007, P. 278) found that within ponderosa pine forest in the Black Hills that wild turkey selected forage sites with less understory vegetation and visual obstruction and larger-diameter ponderosa pine. Ponderosa pine seed abundance varied among years, and pine seeds were most abundant in stands of 12 – 14 inches (30-35 cm) DBH. Lehman et al. (2007, P. 289) points out that the lack of protective cover and live trees for pine seed production made stand-replacing fire areas in ponderosa pine unsuitable for winter wild turkey habitat. They further point out that high-intensity prescribed fire, or fires that damage the canopy of mature trees, will remove this habitat and should be avoided.

Environmental Effects **–** The proposed action would generally maintain large diameter trees dispersed across the project area and provide for wild turkey roost trees similar to the existing condition. The proposed action would improve wild turkey habitat by low-intensity prescribed burning which would create a mosaic of burn intensity and resulting open stands for pine seed production interspersed with patches of small trees for cover over the existing condition. The proposed Action would better maintain understory shrubs and forbs, which are expected to respond positively and increase in ground canopy cover under mechanically thinned stands of pole size to mature ponderosa pine, over the existing condition. The Proposed Action would maintain or enhance woody draws / riparian habitat and potentially increase cover and food supply for wild turkey over the existing condition.

Cumulative Effects – Considering the past, present, and reasonably foreseeable future actions of cumulative effects, the proposed action would improve wild turkey habitat over the existing condition because it reduces dense understory pine forest to open pine forest with increased pine seed production and helps maintain woody draw and associated riparian habitat.

3.4.5 – Snags / Dead-Down Logs

Affected Environment – The Custer Forest Plan did not identify a snag management standard. On the Ashland RD, fire killed snags have remained on thousands of acres of the landscape. Across the Ranger District fire-killed mature trees continue to provide habitat for dependent birds as recommended by Hutto (1995, P. 1041). On the District there have been numerous wildfires that have killed over story trees since 2000, but because of resource concerns and timber harvest economics, no salvage sales have occurred since 1989 Schiller and Chelsea Salvage Sales. The Schiller wildfire is adjacent to the west side of the East Otter project area. Compared to other areas on the Ashland RD, the East Otter project area has had negligible wildfires. Approximately 400

A. have burned from 8 wildfires in the East Otter Hazardous Fuels project area from 1980-2007 (Anderson, B., Nov. 19, 2008). In this project area the regional snag management recommendations (USFS, Jan. 2000, P. 6, VRU Cluster 1) are address as part of project design criteria WL-7 and silvicultural prescriptions. FIA data for 2003 indicates current densities for snags ≥ 12 inches dbh are below 2 snags per acre for the Ranger District (Table. 3.4.5.1). Site specific snag densities and sizes are not available for the project area.

Flicker - The Northern flicker (common flicker) is wide spread across the eastern Montana area and adjacent states (Peterson et al., 1993, P. 45) and is a cavity excavator (USDA, 1977, P. C-58). The flicker is regularly detected, and the primary cavity excavator on the Ashland Ranger District and in the project area.

FIA - Snag densities based on FIA samples in 1997 (Sandbak, 2008.02.25) are available for the Custer NF (Table. 3.4.5.T1) and Ashland RD (Table. 3.4.5.T2). Snag densities ≥ 10.0 inches dbh are 7.4 / A. for the Custer NF and 1.6 for the Ashland RD. Snag densities > 20 inches dbh are 0.4/ A. for the Custer NF and 0.1 / A. for the Ashland RD. Data indicates large diameter snags ≥ 20 inches dbh are relatively rare on the landscape on the Ashland RD. The 2008 snag densities are believed to be higher than the 1997 FIA data shows because post-1997 wildfires occurred over about 30% of the ponderosa pine forest and there was essentially no commercial harvest of these fire-killed trees. Because large diameter green trees > 20 inches dbh remain rare it is likely that large diameter snags of this size also remain relatively rare on the landscape. Based on my observations, isolated large snags ≥ 20 inches are often used as cone cache sites by red squirrels and tend to occur as remnants within stands of smaller diameter ponderosa pine forest.

Snags Well Distributed - Potential snags within forest stands are well distributed across the project area (Gonzales, 2008.11.14, Wildlife Map – Potential goshawk habitat, Jan. 2008). The map shows the spatial distribution of potential trees for snag replacement is indicated by the post-wildfire stands shown in existing mature forest with >40% crown cover. Insect and disease damage (tree mortality) based on 2004 (Meyer, 2005, P. 9), 2007 aerial surveys (Arzy, 2008.05.16) and written report for 2007 (Gibson, 2008, P. 14) show a relatively low, but typical level of annual tree mortality (snag recruitment) across the landscape including the project area. Removal of these trees from salvage sales is essentially non-existent on the Ashland RD because of the isolated locations, low timber volume, and short period before merchantable value is lost (<1 year) to wood deterioration (blue staining fungus).

Snag Replacement - Snag-dependent wildlife needs a continuous supply of snags over time (Bull et al., 1997, P. 29) and across the landscape. To provide a continuum of supply of snags habitat, future snags must be planned for by leaving green trees of appropriate size to eventually become snags in management stands.

Snags / Logging - Holloway and Malcolm (2006, P. 1743) in spruce and hardwood forest in Ontario, Canada, showed a reduction in snags following timber harvest (shelterwood).

While logging impacts natural snag densities, impacts from applied prescriptions in harvesting spruce and hardwood forests in Canada are not directly comparable to results of prescriptions in the ponderosa pine forest in the project area. Harris et al. (1999, P. a) also found that stands lacking a history of timber harvest had significantly higher snag abundance than those with a history of timber harvest. They also felt that estimates for larger dbh classes of snags could be used as rough target for landscapes. In the ponderosa pine forest in East Otter project area, snag densities in commercially harvested stands would likely be reduced over existing levels, but are expected based on an snags / acre average to meet R1 Regional guidelines for snags / acre over the landscape because prescriptions provide for snag recruitment and management. Though, providing for an average of two snags > 20" / A. is unlikely because of limitations on green tree size. The interspersion of large harvested and unharvested areas on the landscape (Holloway and Malcolm, 2006, P. 1744) is expected to help insure snag habitat is maintained over the landscape.

Environmental Effects – The flicker is the primary cavity excavator on the Ranger District and in the project area. The proposed action would on the average maintain 2 snags / acre that are greater than or equal to 12" diameter (dbh) (Thomas et al., 1979, P. 69), greater than 75 feet from roads and/or private property, and are not a safety hazard during project implementation. While snag densities for FIA plots in 2003 show densities are below 2 snags per acre (Table. 3.4.5.1.), ongoing insect and disease along with wildfires may have increased snag densities slightly. Prescriptions would be designed to insure sufficient snags and green trees for snag recruitment, are retained and distributed over the landscape over time to maintain habitat for cavity dependent species. Prescriptions are designed to leave the largest snags, where safety permits, and green trees for snag replacement on the landscape.

The proposed action includes intermediate treatment (CT, CT1, and prescribed burning) that tend to promote large diameter snags because "thinning from below" is inherent in these prescriptions. In general, small understory trees are removed and larger overstory trees retained. In regeneration treatments (ROST and ROSW) mature trees would be reduced, and many snags felled to meet safety guidelines. Some snags would remain and seed-trees or shelter wood trees would be retained to provide for snag replacement over time. CT units would generally retain more snags as well as mature trees for potential snag replacement than ROST or ROSW. Non-commercial treatments including mechanical and prescribed burning would tend to retain large live trees during the mechanical phase and consume and create several snags during the prescribed burning phase. Prescribed burning would help maintain the process of, and snag recruitment from, fire in the project area.

The loss of large-diameter snags and over wood, which are important habitat elements for many wildlife and invertebrates species, could take decades to recover and thus represent some of the most important habitat elements to conserve during fuel reduction treatments (Pillod et al. 2006, P. Abstract). Areas within the height of one mature tree height from the edge of roads (<1% of project area) would essentially be managed as snag free zones, though the majority of forested areas would provide for snag and cavity dependent wildlife. Areas managed for mature high-crown cover forest for dependent species, such

as the goshawk, could retain higher snag densities because of a larger number of green trees from which to recruit snags. Prescribed burning could help in overwinter survival of cavity-dependent birds. Bateman and O'Connell (2006, P. 290) state that forest management that results in a mosaic of burned and unburned stands, as well as heterogeneity with these stands, could promote the overwinter survival of cavity-nesting birds. According to Farris and Zack (2005, P. 183 and P. 191), generally snags created by bark beetles and/or fire decay fastest, and experience the greatest foraging and nesting use by woodpeckers. Larger snags tend to last longer than smaller diameter ones. Snags are an ephemeral resource on the landscape (e.g., half of all ponderosa snags could fall within 8 years of death). In the project area, low to moderate intensity fires, especially prescribed fire at an approximately 15-20 year frequency, would help to create snags over time and provide for cavity dependent wildlife habitat where suitable live trees > 12 inches are present. Low intensity fire would likely create patches of snags across the landscape favoring the territorial distribution of woodpeckers (Bull et al. 1997, P. 28). Recommendations on the management of coarse woody debris (Graham et al. 1994) were considered, thought the pine types are primarily for southwestern Montana and different from the project area, and where appropriate have been integrated into the silviculture prescriptions.

A commenter cited Holloway and Malcolm (2006) implying results of a study in Ontario, Canada where intermediate harvest in spruce and hardwood forest lead to direct snag losses of up to at least 58%, could also be expected in ponderosa pine forest in the project area. The analogy is unlikely, with the exception of ROST and ROSW units, given the design criteria for snag management, mature tree distribution in the Proposed Action. The ROST and ROSW treatment areas would reduce snag densities, but future snags could be recruited from the remaining ROST and ROSW trees and are expected to meet 2 snags / A.

Cumulative Effects – Considering the past, present and reasonably foreseeable future actions of cumulative effects the proposed action would remove some existing snags because of timber harvest activities and prescribed burning. These losses in snags are expected to be offset by the creation of new snags from green trees by prescribed burning (2,860 A. within 1-NC, 2-NC1, 3-NC-2, 4-PCT and areas of prescribed burning without manual pretreatment). The prescriptions from intermediate (CT, CT1, SC) harvest (969A.) and jackpot and prescribed burning (2,850A.) are designed to maintain the largest overstory trees and provide a source for snag recruitment. In regeneration (ROST, ROSW) harvest areas (337A.) mature trees for potential snag recruitment are maintained as ROST and ROSW trees. Some limited blow-down of snags and green trees across the landscape is foreseeable, but the site-specific locations are unknown. The proposed action and existing condition are expected to meet USFS R1 Regional snag management snag density (2 / A.) recommendations (USFS, Jan. 2000, P. 6, VRU Cluster 1). Snags would be > 20" dbh where green trees > 20" exist, but otherwise > 12" dbh based on habitat requirements of the flicker. The proposed action would: provide for snag and cavity dependent species because of design criteria to insure snag size and densities are maintained across the landscape over time; areas of prescribed burning (snag recruitment); and natural environmental factors (low level of endemic insect and disease, periodic wind/snow leading to snapped-topped trees).

Table. 3.4.5.T1. Snags per acre on the Custer NF for all Ranger Districts based on FIA samples, 1997 (Sandbak, 2008.02.25).

Snags per Acre by Diameter Class					
Custer Forest	**Snags per Acre**	**90% Confidence Interval - Lower Bound**	**90% Confidence Interval - Upper Bound**	**Total Number PSUs**	**Number Forested PSUs**
5.0-9.9"	20.6	10.6	32.9	195	105
10.0-14.9"	5.2	2.7	8.2	195	105
15.0-19.9"	1.8	0.9	2.9	195	105
20.0-24.9"	0.4	0.2	0.7	195	105
25.0"+	0.0	0.0	0.1	195	105

Total Snags Greater or Equal to Specified Diameter					
Custer Forest	**Snags per Acre**	**90% Confidence Interval - Lower Bound**	**90% Confidence Interval - Upper Bound**	**Total Number PSUs**	**Number Forested PSUs**
5"+	28.1	16.2	42.4	195	105
10"+	7.4	4.3	11.1	195	105
15"+	2.2	1.2	3.5	195	105
20"+	0.4	0.2	0.7	195	105
25"+	0.0	0.0	0.1	195	105

Table. 3.4.5.T2. Snags per acre on the Ashland Ranger District based on FIA samples, 1997(Sandbak, 2008.02.25).

Snags per Acre by Diameter Class					
Custer Forest District 4	**Snags per Acre**	**90% Confidence Interval - Lower Bound**	**90% Confidence Interval - Upper Bound**	**Total Number PSUs**	**Number Forested PSUs**
5.0-9.9"	2.1	0.0	5.2	71	46
10.0-14.9"	1.2	0.0	2.8	71	46
15.0-19.9"	0.3	0.0	0.9	71	46
20.0-24.9"	0.1	0.0	0.3	71	46
25.0"+	0.0	0.0	0.0	71	46

Total Snags Greater or Equal to Specified Diameter					
Custer Forest District 4	**Snags per Acre**	**90% Confidence Interval - Lower Bound**	**90% Confidence Interval - Upper Bound**	**Total Number PSUs**	**Number Forested PSUs**
5"+	3.7	0.6	7.7	71	46
10"+	1.6	0.1	3.6	71	46
15"+	0.4	0.0	1.0	71	46
20"+	0.1	0.0	0.3	71	46
25"+	0.0	0.0	0.0	71	46

3.6 - Golden Eagle, Prairie Falcon, Merlin (CNF - Key Species)

Affected Environment – There is one known golden eagle nest site (Fig. 3.2.3). Golden eagles are protected by the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). The nest was identified in 2003 and is in a ponderosa pine tree. A small patch of trees adjacent to the nest tree were snapped during high winds during fall, 2008, but the nest tree remains intact and the nest functional (Sasse, 2008.11.05).

There are no known prairie falcons (cliffs) or merlin (old magpie nests) nests in the project area, but the species may forage across the project area. The existing condition provides for a mosaic of forest and grassland vegetation for potential nesting and prey species.

Environmental Effects – The proposed action would protect the existing golden eagle nest and potentially improve habitat within the forest stand. The proposed action would treat the stand of ponderosa pine under the CT1 prescription which removes smaller understory trees to change from multi-storied to a single-story stand and generally maintains mature overstory trees over the existing condition. The proposed action would likely improve the vegetation mosaic, including maintaining a prairie dog town, for potential golden eagle foraging in the area similar to the existing condition.

The proposed action would maintain potential prairie falcon nest sites (cliffs), improve potential merlin nest sites (pine and woody draws) compared to the existing condition. The proposed action would improve foraging habitat for prairie falcon (grasslands, shrub lands) and merlin (grasslands and forest edge) and prey habitat over the existing condition.

Cumulative Effects – Considering the past, present and reasonably foreseeable future action of cumulative effects the proposed action would maintain the prey habitat and existing and potential nest sites similar to the existing condition.

3.7 - Connectivity and Fragmentation

Affected Environment - Landscape connectivity is the degree to which sites are contiguous, and fragmentation the degree to which sites are separated. The degrees to which habitats within landscapes are connected or fragmented will be perceived differently by species. The project area contains a mosaic of ponderosa pine forest, green ash woody draws, aspen, grasslands, and sagebrush-grasslands that is by nature fragmented. A mosaic of forest structure exists across the project area and includes single-storied and multi-storied stands within young and mature stands. Existing stands of mature forest with high-crown cover are limited by topography, site, and past activities and therefore provide relatively limited habitat for dependent wildlife species (Gonzales, 2008.11.14, Potential goshawk habitat map). In the project area, fire activities on the landscape have been minimal (about 400 A.) in the last approximately 20 years.

Environmental Effects - Grassland areas could be effected in short-term, but would be maintained in the long-term through selective prescribe burning and treatment of minor areas of colonizing trees. Some mature stands would be removed through harvest (ROST, ROSW) and other areas altered though commercial thinning from below. The proposed action would help maintain mature stands with high crown cover within goshawk nest and PFA areas. Irregular spacing of mature trees in the overstory would generally occur because prescriptions are based on selecting and retaining the best trees rather than maintaining a fixed spacing. Groups of 3 plus mature trees with interlocking crowns would be maintained in nest, PFA, and foraging habitat (Reynolds et al. 1992, P. 3). Adequate goshawk nest, PFA, and foraging areas would be maintained (Tidwell, July 17, 2007; Brewer, et al., May 2006). Habitat loss has a much larger effect than habitat fragmentation on the distribution and abundance of grassland birds (Fahrig, 2002, p. 346) and is assumed to have a similar effect in the forest environments in the project area. The proposed action is designed to reduce the risk of habitat loss from stand-replacing wildfires over the existing condition. The East Otter proposed action would maintain connections to adjacent forested areas, including Whitetail project area, though slightly less than the existing condition. The island of pine forest covering the Ashland RD would be maintained as would any larger-scale existing biological corridors.

Cumulative Effects – Considering the past, present and reasonably foreseeable future action of cumulative effects the proposed action would generally maintain the existing mature ponderosa pine stands within goshawk nest and PFA habitat while maintaining about the same existing woody draw and grassland distribution compared to the existing condition. Outside of goshawk nest and PFA stands, some mature forest would be removed through harvest (ROST, ROSW) and increase local fragmentation in the short-term while maintaining about the same level across the landscape over the long-term as forests stands grow. Habitat connectivity between the project area and adjacent areas would be maintained.

3.8 - SUMMARY AND CONCLUSION

Overview – The proposed action would treat approximately 89% of the 4,276 A. in the project area (EA Chap. 2, Table 1) and would tend to change or begin the change of areas of ponderosa pine forest with ladder fuels (understory tree layers) toward single story stands. Approximately 7% (289 A.) of mature forest in the project area would be converted (ROST, ROSW) to seedlings/ saplings within about 10 years resulting in less elk and other wildlife cover. Approximately 12% (548 A.) would be thinned from below (CT1) to remove ladder fuels and generally maintain overstory trees for goshawk habitat and about 2% (62A.) outside of PFAs thinned (CT) to a more open canopy cover and increased potential browse and forage. Releasing green ash by removing the overtopping and competing ponderosa pine trees would occur on >1% (8 A.). The proposed action includes pre-commercially / manually treating and jackpot burned about 18% (788A.- (1-NC, 2-NC1, 3-NC2, 4-PCT) and apply prescribed fire (NCBB, NCBJ, NCNS, and RXB) to about 47% (2,124A.) of the project area to maintain the process of fire and improve elk forage quality. The cumulative effects of the Whitetail Hazardous Fuels HFRA Project were considered in this analysis.

Vegetation - The proposed action would move toward a landscape mosaic of single-storied and multi-storied forest stands that would reduce, but not eliminate, the risk of high-intensity stand replacing wildfire and potential change in wildlife habitat. Overall, the proposed action is projected to result in smaller areas of higher intensity wildfire because of the mosaic of resulting ladder fuel / no ladder fuel and the average tree size between stands is less than the existing condition. Frequent low-intensity mixed-severity fires are desirable to maintain wildlife habitat and the proposed action would generally begin the process of restoring this type of fire frequency and intensity over the existing condition. In general, the proposed action would result in some short-term disturbance and temporary reduction in habitat, but maintain or improve habitat over the long-term for most species considered in the analysis over the existing condition.

Threatened, Endangered, and Sensitive - The proposed project would have no effect on the federally endangered black-footed ferret because the species is absent from project area (Sasse, 2007.11.01, Biological Assessment). USFS Northern Region Sensitive Species are discussed and determinations of impacts to species disclosed (Sasse, 2008.12.03, Sec. 3.4 and Table 3.4.T1). The proposed action would have no impact on the bald eagle and plains spadefoot toad. The proposed action could impact individuals or habitat, but will not likely contribute to a trend towards federal listing, or cause a loss of viability to the population or species for the Townsend's big-eared bat, pallid bat, spotted bat, fringed myotis, long-eared myotis, long-legged myotis, black-tailed prairie dog, burrowing owl, loggerhead shrike, great plains toad, northern leopard frog, greater short-horned lizard, milksnake, or western hog-nosed snake.

Management Indicator Species (MIS) - MIS were considered and relative (+ / -) change in species / habitat summarized (Sasse, 2008.12.03, Sec. 3.5 and Table 3.5.T1).

Goshawk (MIS) – The project area contains parts one goshawk nest territory of the 14 identified on the Ashland RD. Design criteria and Timber Sale Contract "C" clauses would minimize disturbance to breeding / nesting goshawks at known or detected nests. The proposed action would help maintain goshawk habitat over the long-term and reduce, but not eliminate the risk of habitat loss to stand-consuming wildfire. The proposed action would meet habitat levels identified in regional goshawk information (Tidwell, July 17, 2007; Brewer, et al., May 2006). Over 240 A. of nest stands and over 420 A. of PFA habitat would be maintained per active nest territory within the cumulative effect analysis area outside of areas thinned mechanically with commercial harvest. Foraging habitat would be maintained through mechanical treatments and prescribed burning that would help provide for areas of single-storied mature pine, snag habitat, and clumps of 3-5 trees per acre with interlocking tree crowns (EA Design Criteria WL-1). Habitat connectivity between the project area and adjacent areas would be maintained.

Big Game (Elk , Mule deer, White-tailed deer, Black Bear, Mountain Lion) - The proposed treatments would also help reduce the risk and potential size of stand replacing wildfires on the landscape and resulting change in big game cover over the existing condition. Timber harvest would result in a short-term and long-term reduction of hiding

cover through the proposed action compared to the existing condition. Prescribed burning would have a minor reduction in cover, but improve forage and browse quality and quantity over the existing condition.

Hunter Opportunity – Hillis et al (1991, P. 38) recommend at least 30% of an analysis unit provide for elk security. Elk security levels below 30% could result in a shift of animals to other areas such as adjacent private lands. The movement of elk from NFS lands reduces hunter opportunity and recreation use for the public and could result in resource conflicts on private lands. Elk security is based on areas over 0.5 miles from roads open to motor vehicle travel (Hillis et al, 1991, P. 38). The proposed action (0%) would maintain the existing 0% unroaded hunter opportunity. The Preferred Alternative in the DEIS Ashland Ranger District Travel Plan would result in about 11% big game security areas and improve over the existing condition (0%) in the East Otter Cr. Project and result in approximately 36% unroaded hunter opportunity across the Ranger District.

The East Otter Fuels HFRA project proposed action would help maintain big game security (reduced risk from stand-replacing wildfire) and is intended to help increase the chance of elk staying on public lands and available for recreationists and avoid conflicts on private lands. The proposed action would accomplish this because it is designed to minimize new road construction, reconditioning and reconstruction, and limit the spatial and temporal impact of temporary roads to those needed for project activities. Temporary roads would not be open to public motor vehicle travel. Temporary roads would be restored to contour and therefore not contribute to a long-term increase in pubic motor vehicle access.

Wild Turkey (Local Interest Species) – The proposed action would improve wild turkey habitat by increasing pine seed production, understory shrubs and forbs, and riparian woody draw vegetation over the existing condition. As part of the proposed action, silvicultural prescriptions include provisions for selective non-commercial slashing of over-shading ponderosa pine trees and maintenance of woody draws over the existing condition.

Conclusions - Fuels treatment that meets the needs / habitat objectives of USFS sensitive, MIS, Key, local interest wildlife, and the Montana State Elk Plan would maintain and enhance wildlife habitat. The proposed action would result in a trade-off between fuel treatments to reduce wildfire risk and loss of some existing big game screening cover over the existing condition. While improving existing roads to all-weather year-long travel could reduce big game security areas, these effects are minimized through limited improvement to existing and avoidance of creating new system roads. The proposed action would help avoid or minimize impacts to wildlife and habitat and at a landscape level and help move toward a sea of open canopy ponderosa pine around islands of mature forest with higher percent crown canopy stands (goshawk) and move toward the Wildlife Desired Conditions.

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APPENDIX A

TSMRS STRATUM DEFINITIONS

CUSTER NATIONAL FOREST STRATA CODES

ASHLAND AND SIOUX RANGER DISTRICT DEFINITIONS

Non-forested	Non-productive Species
Code	Code
900 - water	300 - aspen
910 - scoria/sandstone	310 - juniper
920 - dry grasslands	320 - cottonwood
930 - wet grasslands	330 - mixed/other
940 - sagebrush/sumac	
950 - special use	
960 - baresoil	

Tentatively Suitable >10% Crown Cover			1/Tentatively Unsuitable >10% Crown Cover		
	Code	Crown Cover		Code	Crown Cover
Seedling/Sapling -	101	nonstocked	Seedling/Sapling –	201	nonstocked
	111	<10%		211	<10%
	112	10 - 39%		212	10 - 39%
	113	40 - 69%		213	40 - 69%
	114	70%+		214	70%+
Poletimber	- 121	<10%	Poletimber	- 221	<10%
	- 122	10 - 39%		- 222	10 - 39%
	- 123	40 - 69%		- 223	40 - 69%
	- 124	70%+		- 224	70%+
Sawtimber	- 131	<10%	Sawtimber	- 231	<10%
	- 132	10 - 39%		- 232	10 - 39%
	- 133	40 - 69%		- 233	40 - 69%
	- 134	70%+		- 234	70%+
2/Two-storied	- 141	<10%	2/Two-Storied	- 241	<10%
	- 142	10 - 39%		- 242	10 - 39%
	- 143	40 - 69%		- 243	40 - 69%
	- 144	70%+		- 244	70%+

1/Tentatively unsuitable - sites that are usually slower to regenerate, not capable of producing forest products and they take longer than 5 years to restock.

2/Two-storied - 10% to 30% sawtimber overstory, code for crown cover on understory.

APPENDIX B
CROSSWALK BETWEEN STRATA AND DEVELOPMENT STAGE FOR GOSHAWK PFA ANALYSIS – 10.19.2006

Development Stage Code	Development Stage Name	Sioux and Ashland Strata Codes	Beartooth Strata Codes
0	Unclassified	All 300's	KR's, J's, CW's, PF's
1	Nonforest Openings	All 900's	00069-00090
2	Grass/Forb/Seedling	101*, 111, 112, 201*, 211, 212	DF31, DF32, LP31, LP32, SAF31, SAF32, PP31, PP32, LPDF31, LPDF32, DF71, DF72, LP71, LP72, SAF71, SAF72, PP71, PP72, LPDF71, LPDF72, QA21, WB21
3	Seedling/Sapling	113, 114, 213, 214	DF33, DF34, LP33, LP34, SAF33, SAF34, PP33, PP34, LPDF33, LPDF34, DF73, DF74, LP73, LP74, SAF73, SAF74, PP73, PP74, LPDF73, LPDF74, QA22, WB22
4	Young Forest	121-124, 221-224	DF21, DF22, DF23, DF24, LP21, LP22, LP23, LP24, SAF21, SAF22, SAF23, SAF24, PP21, PP22, PP23, PP24, LPDF21, LPDF22, LPDF23, LPDF24, DF61, DF62, DF63, DF64, LP61, LP62, LP63, LP64, SAF61, SAF62, SAF63, SAF64, PP61, PP62, PP63, PP64, LPDF61, LPDF62, LPDF63, LPDF64. Under consider for dropping - QA11, QA12, WB11, WB12.
5	Mid Aged Forest 1 ≤ 50% CC Mid Aged Forest 2 ≥ 50% CC	131-133, 141-143, 231-233, 241-243	DF11, DF12, DF13, LP11, LP12, LP13, SAF11, SAF12, SAF13, PP11, PP12, PP13, LPDF11, LPDF12, LPDF13, DF51, DF52, DF53, LP51, LP52, LP53, SAF51, SAF52, SAF53, PP51, PP52, PP53, LPDF51, LPDF52, LPDF53. Under consider for dropping - QA11, QA12, WB11, WB12.
6	Mature Forest	134, 144, 234, 244	DF14, LP14, SAF14, PP14, LPDF14, DF54, LP54, SAF54, PP51, PP52, PP53, PP54, LPDF54. Under consider for dropping - QA11, QA12, WB11, WB12.
7	Old Forest ≥ 70% CC	131-134, 141-144,	DF11, DF12, DF13, DF14, LP11, LP12, LP13, LP14, SAF11, SAF12,

CROSSWALK BETWEEN STRATA AND DEVELOPMENT STAGE FOR GOSHAWK PFA ANALYSIS – 10.19.2006

		231-234, 241-244	SAF13, SAF14, PP11, PP12, PP13, PP14, LPDF11, LPDF12, LPDF13, LPDF14, DF51, DF52, DF53, DF54, LP51, LP52, LP53, LP54, SAF51, SAF52, SAF53, SAF54, PP51, PP52, PP53, PP54, LPDF51, LPDF52, LPDF53, LPDF54. Under consider for dropping - QA11, QA12, WB11, WB12.

For the Beartooth the quaking aspen (QA) and whitebark pine (WB) is coded as either mature or immature and only grouped into two cover classes poor stocking (10 to 39%) and medium to well stocked (40 to 100%).

Possible Codes: QA11, WB11 = Mature; poor stocking 10 to 39%
QA12, WB12 = Mature; medium to well stocked 40 to 100%
QA21, WB21 = Immature; poor stocking 10 to 39%
QA22, WB22 = Immature; medium to well stocked 40 to 100%