D. Wildlife

1. Existing Condition

Within the landscape FWP manages wildlife populations. USFS manages wildlife habitat on national forest lands while state, county and private entities manage habitat on those jurisdictions. The landscape provides habitat for a wide variety of wildlife. The diversity of species found in the landscape are associated with intermountain grasslands and sagebrush grasslands; aspen communities; Douglas fir, lodgepole pine, subalpine fir forests; high elevation habitats including whitebark pine, talus and subalpine meadows; and riparian habitats characterized by mountain streams, Engelmann spruce bottoms, and willow/alder communities.

Habitat Trends

Past resource use and exclusion of fire for over a century has altered some wildlife habitat, especially in fire-adapted forest habitats. These changes have benefited some species and been detrimental to others. Fire suppression has affected the largest area of habitat by virtually eliminating this disturbance process and the diversity of successional stages of vegetation that fire provides. The FRCC discussion in section IIC-1 and figure IIC-6 suggest that half of the lodgepole pine, Douglas fir, and subalpine fir forest types have missed one to two fire cycles. The resulting forest condition is more storied than under a natural fire regime.

Another factor complicating existing habitat diversity in the landscape is the historic clear cutting undertaken to provide timber to mines and smelters in Butte and Anaconda. The forest stand size class distribution discussion in section IIC-2 provides evidence that effects of widespread clear cutting around the turn of the 20th century are still seen in the forest size class distribution. A disproportionally high percentage of the forest habitat is now in a pole size class (figures IIC-11, IIC-12, IIC-13). It also appears that the seedling/sapling size class of lodgepole pine and Douglas fir as well as the mature size class of the subalpine fir forest type are underrepresented. The SIMPLLE modeling presented in this forest vegetation discussion suggests that mature lodgepole pine and Douglas fir forest types are also underrepresented; however, the historic vegetation studies do not support that these mature classes are lacking.

Snags are an important habitat component for a multitude of wildlife species, particularly woodpeckers. Snags provide nesting habitat and foraging substrate at all stages of their life cycle from recently dead hard snags to soft snags in advanced decomposition. Snags provide large dead and down material to the forest floor that also provides habitat for invertebrates that provide food for both black bears and grizzly bears. The Upper Clark Fork Landscape contains the lowest number of large snags (estimated to average 2.2 snags greater than 10 inches per acre) on the BHDL because of heavy logging that occurred during the heyday of Butte copper mining (Bush and Leach, 2003). Bush and Leach (2003) estimate that the Clark Fork-Flints Landscape, which includes the EDLV, contains an average of 6.3 snags greater than 10 inches per acre.

We can deduce from the forest vegetation analysis that those animal species needing early seral vegetation, burnt forest, and snag habitat have likely reduced in numbers from natural conditions within the landscape. At the regional scale, the recently burnt forest and snag habitat is not limited for those species with adequate dispersal capability. The analysis of potential black-

backed woodpecker habitat described under the R1 Sensitive Species discussion below suggests that recently burnt forest habitat is not limited for woodpeckers. This is additionally true for snag habitat at the regional scale, which was found to be adequate BDNF forest-wide in the draft EIS for the forest plan revision (USDA, 2005).

Old growth forests are distinguished by old trees and structural characteristics developed over time. They are an important part of forest biodiversity providing specialized wildlife habitats, and aesthetic and recreational values. While there are wildlife species present on the BDNF with a preference for old growth during portions of their life cycles or with a preference for mature forests with complex structure, there have been no old growth obligate species identified on the BDNF lands within the landscape.

Aspen communities are in decline because of shading and wildfire suppression as well as browsing by livestock and to a lesser degree wildlife. In some cases aspen sprouts and saplings are almost nonexistent. Aspen stands are especially important for neotropical migratory bird species. Proactive management of aspen communities will require emphasis from fire, timber, and grazing management in order to maintain aspen habitat in a healthy state.

The National Fire Plan calls for more application of prescribed fire across the landscape. The desirability of prescribed burning in some habitats is controversial with a number of stakeholders. This controversy will lead to challenges in habitat management for big game and for sagebrush communities. It remains to be seen if prescribed fire can be used on a large enough scale that it will adequately mimic natural fire disturbance processes and create a natural diversity of forest vegetation. For the time being, we will likely see continued use of prescribed fire where it is less controversial as well as uncontrolled severe wildfires where fuel conditions make fire difficult to control.

Riparian areas of the landscape have in many cases been degraded. Many factors contribute to this problem, including browsing pressure from livestock, historic reduction in beaver numbers, and shading by conifers due to fire suppression.

Photo: Amphibian in riparian area of Reese Anderson Creek.

The sagebrush community is incurring encroachment from conifers with a corresponding reduction in sagebrush shrublands. However, fire suppression has had the opposite effect of increasing mature sagebrush. GAP analysis (Redmond et al, 1998) indicates that there are approximately 6,900 acres of sagebrush community in the landscape, most of which is located at the grassland-conifer forest interface near the tops of the Tertiary benches and on southerly

aspects of the mountain stream drainages. Sage grouse, dependent on sagebrush habitat, is in decline throughout the interior West. The species is on the Northern Region sensitive species list (2004). However, sage grouse habitat, current distribution, and early nesting/brood rearing areas are not present within the landscape as identified by FWP and the Montana Natural Heritage Program (NHP). Pronghorn have been identified as sagebrush dependent in other landscapes on the BDNF (BDNF, 1999). Reduction in mature sagebrush in the landscape may adversely affect winter foraging for pronghorn.

A major concern to habitat loss is the conversion of former private agricultural lands to subdivisions or commercial development. The subdivision of former ranch lands has been most aggressive in other areas of Montana, however in the future this trend may be expected to spread to the Deer Lodge Valley. Loss of ranch lands to dense development has implications for winter habitat needs for big game. Currently, there is an opportunity for private and public agency entities such as land trusts, RMEF, and Montana FWP to secure conservation easements on private lands before they are subdivided and sold.

Big Game

Ungulates habitating the landscape include elk, mule deer, white-tailed deer, moose, and pronghorn antelope. The habitat use and species distribution maps shown in the figures in the following big game discussion are intended for broad-scale (1:250,000 and up) planning and landscape analysis and are not intended to be used to plan site specific projects.

Elk

Elk is a premier wildlife species for hunters in addition to people who enjoy viewing wildlife. Spring calving, summer, fall, and winter elk range occur on BDNF lands within the landscape.

The landscape is almost entirely within FWP deer/elk/lion hunting district (HD) 215 which is within the Deer Lodge elk management unit (EMU). Elk population and habitat objectives described here at the HD and EMU scale are adapted from FWP (2004).

Summer range for elk in the Deer Lodge EMU occurs mostly on public lands. Fall use areas may also occur on public lands. However, significant elk use of private lands occurs in the fall as elk seek refuge from hunters. Distribution of the elk population throughout this EMU shifts with varying severity of winters and human activities. For example, elk appear to have shifted their winter use from traditional winter range areas in HD 318 (Berkin Flats) to HD 215 where they are not disturbed by snowmobile use but where they also are causing damage on private lands. Additionally, elk numbers in the northern portion of HD 215 have increased to levels observed in the early 1990's, resulting in more landowner complaints. FWP habitat objectives use first week of general hunting season bull harvest numbers as an indication of habitat effectiveness, as bull harvest is a reflection of bull elk vulnerability. In the Deer Lodge EMU the objective is to maintain elk security so that the elk harvest is distributed throughout the hunting season, with no more than 40% of the harvested bulls taken during the first week of the general season. Elk security is a concern in some portions of HD 215 and low bull numbers reflect this.

Population objectives for individual HDs reflect approximate current conditions. These objectives have been acceptable to the hunting public as well as landowners within the EMU

with exceptions for local game damage situations where additional pressure is applied to local groups of elk. The population goals for the entire EMU are to maintain the number of elk counted during post-season aerial surveys within 20% of 2,100 elk and to maintain bull to cow ratios observed during post-season aerial surveys above a minimum of 10 bulls:100 cows. Elk populations specific to HD 215 are managed to provide a long-term sustainable harvest and a stable population of 1000 elk observed during yearly winter/spring aerial surveys.

Typically, about 2,000 animals representing 8 reasonably distinct elk herd units are counted in the Deer Lodge EMU. The numbers of elk observed declined approximately 10% from an average of 1,845 elk in the EMU during 1993-1996 to an average of 1,663 during 1997-2000, and increased to 1,879 in 2003. 2004 population estimates were 1,749 elk, all of these years populations were at or near the population goal. This is a density of approximately 1.8 observed elk per square mile of elk habitat.

In March of 2006, 953 elk were observed in HD 215 (FWP, 2006). The five-year average for HD 215 is 768 elk. Elk populations in the district are stable overall with declines and increases in localized areas. Portions of the EMU are experiencing local abundance and game damage complaints, largely the result of private land refugia where hunting is not allowed. The overall bull to cow ratio in HD 215 was reported in 2004 as 5:100, half of the population objective. Bull numbers in HD 215 from 2006 are only slightly higher at 6 bulls observed for every 100 cows seen.

State estimated hunter days for the Deer Lodge EMU are 31,448, compared to an objective of 28,100. Total elk harvest in the EMU has declined 14% from the mid 1990s (698) to the average for the 3-year period 1999-2001 (603). However, bull harvest rates are high relative to the population size. Approximately 19% more bull elk were harvested during 1999-2001 (average of 243) than 7 years ago (average bull harvest of 198), despite a decline of 16% in number of elk observed during post-season aerial surveys during that period. In 2002, 128 bulls and 147 antlerless elk were harvested in HD 215. Harvest of bull elk by the end of the first week of the general season is exceeding the 40% maximum objective for the EMU. The average of 46% in HD 215 is the highest in the EMU indicating that bull harvest rates could be reduced in this HD to meet objectives.

Ongoing issues that may affect elk in HD 215 include the subdivision of elk habitat, extensive use of off road vehicles on public lands, snowmobile use in winter range, the invasion of weeds, reduced availability of water due to drought, timber management, forest succession, livestock grazing, and predation (FWP, 2006). Individual wolves have been reported in the EMU since the late 1980's, and pack activity has been documented since 1994. The establishment of the Spotted Dog wolf pack in the EMU may influence future elk populations, their distribution and management. Additional research is needed to assess the impacts of these variables on elk population size, composition, and distribution.

Raithel (2005) studies the causes of elk calf mortality in the Garnet Mountains north of the landscape in an area without known grizzly bears or an established wolf pack. In the Garnet study, 40% of calf mortality over the 3-year period 2002-2004 was caused by black bear, 12% by

cougar and 4% by coyote predation. The Garnet study indicates that black bear and to a lesser degree cougars are effective controls on elk populations in the absence of wolf predation.

Elk habitat mapping is provided by the Status of North American Elk Habitat Project, a cooperative effort sponsored by the Rocky Mountain Elk Foundation (RMEF) and USDA Forest Service R1 to produce comprehensive information about North American elk habitat (RMEF, 1999). Summer and winter range is depicted in figure IID-1 in appendix 1.

In the elk habitat mapping, winter range is defined as that part of the overall range where 90% of the individuals are located during the average five winters out of ten from the first heavy snow fall to spring green-up. Crucial winter range is that part of the winter range where 90% of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten. Summer range is that part of the overall distribution where 90% of the individuals are traditionally located between spring green-up and the first heavy snow fall. And crucial summer habitat is that part of the mid-June to mid-August summer range where elk concentrations are about double the surrounding elk densities. No calving areas, crucial or otherwise or migration areas were identified within the landscape by RMEF (1999).

Elk use of aspen stands is a concern given the apparent decline of aspen at regional scales. Intense herbivory of aspen by elk is at least one cause of the observed lack of aspen stand renewal (White and Feller, 2001). It has been shown that elk herbivory of aspen is affected by the presence of natural predators and human hunter pressure suggesting that current elk use of aspen may be responding to displacement or extermination of natural predators by humans (White and Feller, 2001; White et al., 1998a,b). Assessment of the effects of aspen decline on elk habitat needs should consider the presence of natural predators. This also suggests that efforts to restore aspen by prescribed fire or other mechanical treatment might be hindered in areas where elk numbers are unnaturally high or where elk foraging in aspen has increased due to lack of predation.

National forest lands within the landscape are highly popular for elk hunting with the total number of hunter recreation days amounting to approximately 24% of the total recreation use forest wide. The bulk of this use occurs over a five-week time span during general hunting season. This concentrated use affects infrastructure, travel management, and use of available habitat by elk. Hunter recreation day objectives are not managed by the BDNF. Based on Christensen et al. (1993), the primary BDNF management tool for this species is vehicle access management. This is echoed in the Montana Elk Management Plan (FWP, 2004) which advocates maintaining elk security during fall hunting season by limiting road access. Open, motorized roads and trails are the greatest consideration relating to habitat effectiveness on summer ranges. Open road density and season of use is also a primary consideration for addressing elk vulnerability, with hunting being the primary source of elk mortality (Christensen et al. 1993).

Under FP (1987) direction, elk security is assessed based on methods described in the report Coordinating Elk and Timber Management, Final Report of the Montana Cooperative Elk-Logging Study, 1970-1985 of August 1982. Elk security analysis in the landscape was

performed for each hunting recreation opportunity geographic area (HROGA) shown in figure IIE-4 in appendix 1. HROGA # 16 is entirely within the landscape; whereas #15 and #17 overlap the Jefferson RD in the Boulder River and Browns Gulch drainages. Analysis results were provided by the BDNF for HROGA #17 based on a field review undertaken in fall 2007 of road categories and seasonal travel restrictions. Analysis for HROGA #15 and 16 was performed using methods described in the guidance 'Elk Use Potential Calculations Process for GIS and Field Review (revised 3/27/08)' provided by BDNF. This method involved the use of a Microsoft Excel spreadsheet 'Route Calculations.xls' to categorize roads per appendix P of the FP (1987). In this road categorization, open passenger car roads are considered main roads and weighted 100% by length, high clearance vehicle roads are considered secondary roads and weighted 70%, and OHV, administrative, private, and roads with seasonal closures during the period October 15th-December 1st are considered primitive and weighted 5% by length. In addition, the following assumptions were made in attributing the road database:

- BDNF roads and trails database current as of 1/10/08 used to attribute road category.
- Travel map (2003 revision) used to attribute seasonal restrictions.
- Roads not shown on travel map were assumed to be managed according to area designation (e.g.: on-forest roads in a hunting season closure that are not designated open are assumed to be closed during hunting season).
- Where road features in GIS database are longer than shown on travel map, the entire feature was assumed to have the travel restrictions as that shown on the travel map.
- Where the location of seasonal closures shown on the travel map does not coincide exactly with feature endpoints in the GIS database the less restrictive management was assigned to the feature. (e.g.: where a gate is shown on the travel map in the middle of a road feature, the entire feature is attributed open, no restrictions.)
- Unknown (NA) seasonal restriction assigned to roads features which originate on private land and which cross or terminate on BDNF land. These were counted as private roads in elk security analysis and are equal in categorized weight to seasonally closed roads.
- Forest routes which cross private land with a specific road designation on the travel map were attributed accordingly.
- Road features with both terminuses on BDNF land but which cross inholdings are assumed to have the area designation seasonal restrictions shown on the travel map.

The categorized road density, hiding cover, and resulting elk effective cover are compared to FP (1987) objectives by HROGA in table IID-1. In addition to these objectives, the FP (1987) has as a standard "maintain a minimum that varies 50-100% and averages 70% elk effective cover over the Forest." (pp II-18)

This table shows that road density in HROGA #16 Spring-Emery are exceeding FP (1987) objectives. Minimum elk hiding cover meets FP (1987) objectives but is at or very near the objectives in the cases of HROGA #15 and #17. Elk effective cover meets objectives and FP (1987) standards in all cases.

Table IID-1: HROGA road density, hiding cover, and elk effective cover.

HROGA	Uncategorized road density (mi/mi^2)	Categorized road density (mi/mi^2)[1]		Hiding cover[2]		Elk effective cover	
		Existing	FP max objective	Existing	FP min objective	Existing	FP objective
15- Electric Peak	0.3	0.00	0.00	40.0%	40%	100%	100%
16- Spring-Emery	2.4	0.95	0.65	41.0%	35%	63.0%	60%
17- N. Butte - Champion Pass	2.5	1.10	1-1.5	36.5%	34%	56.4%	50%

1- Categorized road density calculated using methods described in the assessment text.
2- Hiding cover for HROGA 15 and 16 from Deerlodge Settlement Agreement 8/16/89. Hiding cover for HROGA 17 was recalculated by BDNF during the 2007 analysis.

Mule Deer

Mule deer habitat includes the grasslands and draws of the large benches, riparian areas associated with streams, as well as all forest types within the landscape. In winter, mule deer typically use open shrubland habitat and interspersed conifer-grassland habitat. Mule deer habitat mapping is provided by FWP (2004b) (figure IID-2 in appendix 1). Spring, summer, and fall range is that part of the overall range where 90% of the individuals are located between spring green-up and the first heavy snowfall. Summer range is not necessarily exclusive of winter range and in some areas winter range and summer range may overlap.

Limiting factors for mule deer populations on state and USFS lands in the landscape as identified in the FWP mapping shown in this figure include habitat succession/maturation, competition with other wild ungulates, and riparian impacts/habitat over utilization. Limiting factors on private lands include domestic livestock forage competition and riparian impacts/habitat over utilization.

As discussed under section IIC-1 Existing Condition - Vegetation, browse species important to mule deer including bitterbrush have been reported to be in degrading condition suggesting possible winter forage limitations. Bitterbrush is a highly palatable winter browse for mule deer and is also attractive to domestic livestock. In conjunction with FWP, attempts to rejuvenate a portion of the bitterbrush in the landscape using prescribed fire were conducted in 1998.

White-tailed Deer

White-tailed deer are associated with riparian areas existing on creek bottoms and the Clark Fork River in the landscape as well as mature conifer forest. Winter range includes dense canopy forest and riparian areas providing thermal cover, and open bitterbrush hillsides. FWP (1997) mapping did not identify any white-tail winter habitat within the landscape. White-tailed density current as of 1994-1995 is shown in figure IID-3 in appendix 1 (FWP, 1997). The density depicted is the white-tailed density figure is based on personal judgment of the FWP biologist and not on actual population measurements.

Moose

Moose use shrub riparian habitats which are associated with the perennial streams in the landscape. Overall, moose densities are low in the landscape (Vinkey, R. FWP, pers. comm., 2007). Moose habitat is shown in figure IID-4 in appendix 1 (FWP, 2001). Overall distribution

polygons represent general or year round moose habitat. Winter range polygons represent areas occupied by moose from roughly November 15 to March 1. The overall distribution shown in this figure has a high data quality rating and is based on repeated measurements. The winter range distribution shown has a lower data quality rating and is based on limited measurements.

Pronghorn

Pronghorn antelope are associated with the open grasslands and sagebrush shrublands of the large Tertiary benches in the EDLV. Summer habitat includes grasslands and shrublands where forbs are an important food source, as well as agricultural croplands. Winter habitat is less diverse; shrublands are preferred where sagebrush supplies critical browse. Pronghorn habitat (FWP, 2002) is shown in figure IID-5 in appendix 1. The winter pronghorn habitat shown in figure IID-5 is at a lower elevation and does not overlap with the 6,900 acres of sagebrush community shown in the GAP analysis in figure IA-3. According to FWP Wildlife Biologist Ray Vinkey, antelope use in the Deer Lodge Valley is associated with native grasslands. FWP aerial survey data from 1995-2001 of winter pronghorn use is available online from the Montana State Library http://www.nris.state.mt.us/nrdp/wildlife.htm. A more detailed analysis of these pronghorn observations would be useful to determine actual winter habitat use.

Threatened, Endangered, Sensitive Species

Threatened, endangered, and sensitive species are characterized by low populations or diminished habitat and are often poorly distributed compared to natural range. Because of their sensitivity to human activities and to changes in the landscape these species are most likely to be lost from the regional ecosystem.

ESA Listed Species

Threatened and endangered species are managed under the authority of the Endangered Species Act of 1973 (PL 93-205, as amended) and the National Forest Management Act (PL 94-588). The Endangered Species Act (ESA) requires federal agencies to ensure that all actions which they authorize, fund, or carry out are not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of their critical habitat. Additionally, for species proposed to be listed, federal land management agencies must confer with the U.S. Fish and Wildlife Service (FWS) on any action which is "likely to jeopardize the continued existence of any species that is proposed to be listed... or which results in the destruction or adverse modification of critical habitat proposed to be designated for such species" (50 CFR 402.10).

ESA listed threatened and endangered species either identified or believed to occur in the landscape are listed in table IID-2.

In addition to the wildlife species described in this section, bull trout are an ESA listed threatened species that have populations and critical habitat identified in the Bull Trout Recovery Plan (FWS, 2002) adjacent to the landscape in Warm Springs and Racetrack Creeks. Additionally, bull trout are considered incidental in the Clark Fork River within the landscape. Westslope cutthroat trout are a R1 designated sensitive species found in numerous streams in the landscape. Both of these fish species are described in section IIB-1 Existing Condition - Aquatic Habitats/Fisheries.

Table IID-2: ESA listed species occurring in the landscape.

Common Name	*Scientific Name*	FWS Status
Grizzly bear	*Ursus arctos*	Threatened
Gray wolf	*Canis lupus*	Endangered
Canada lynx	*Lynx Canadensis*	Threatened
Bull Trout	*Salvelinus confluentus*	Threatened

Grizzly Bear

Optimum grizzly bear habitat consists of large areas with diverse vegetative communities free from human disturbance. White bark pine nuts are an important fall food source. Ungulate winter ranges, which provide carrion and elk calves, are important springtime food sources. Regionally, primary threats are habitat alteration and loss, and conflicts and displacement effects due to increased motorized access. Increased access increases human-bear contacts, some of which result in destruction of bears.

In 1984, a young grizzly was shot and killed on the former Deerlodge Ranger District. During the fall of 1987, a sighting occurred in the South Fork of Basin Creek by the Forest Wildlife Biologist. At that point there were sufficient credible sightings that FWS believed that transient grizzlies consistently occurred on the Deerlodge forest and could not rule out the existence of resident bears. There were three unconfirmed sightings during the summer/fall of 1990 in the Rock Creek (Jefferson Ranger District) and Baggs Creek drainages. All of these sightings in 1990 were in or adjacent to the Electric Peak roadless area suggesting a resident bear in that area. In 1991, a member of the timber stand exam crew was treed for 3 hours in the Baggs Creek area. A follow up field visit found likely grizzly bear sign. According to FWP in 2007, there is recent evidence of grizzly bears in the Elliston and Spotted Dog areas adjacent to the landscape in the Boulder River drainage. Additionally, the Jefferson RD has identified several unconfirmed, but highly probable sightings and evidence of grizzly bears using the Thunderbolt Peak area which runs conterminously with the Electric Peak IRA of the landscape.

BDNF does not monitor grizzly bears in the landscape because this area of the BDNF is not recognized as having permanent resident bears.

Gray Wolf

Wolves are habitat generalists needing large areas isolated from human disturbance with available prey. Winter concentrations of ungulates are very likely to attract wolves.

The wolf was eliminated from Montana around the 1920's. From 1980 through present, the number of wolf sightings and confirmed packs has increased throughout the state as they have dispersed south from Canada and reproduced. In March 1994, a pair was videotaped by FWP in O'Neil Creek north of the area. During the winter of 1994-1995, tracks were common between Spring Creek and Baggs Creek and sightings confirmed wolf presence on the Cliff Mountain grazing allotment. More recently, the spotted dog wolf pack has established in the area.

Sightings and track reports during the fall and early winter have consistently indicated wolves concentrating in the Lockhart Meadows area in the Boulder River drainage east of the Orofino Creek divide. Wolves are present in the Spotted Dog area and have come into conflict with domestic livestock resulting in control actions. Wolves are likely to remain in the area though densities will vary from year to year.

The majority of the BDNF is within the Great Yellowstone and Central Idaho gray wolf recovery area which contain nonessential experimental wolf populations. However, the landscape is within the Northwest Montana recovery area where wolves are classified as endangered. Because most resident wolves on the BDNF are experimental populations, the BDNF does not have a current wolf monitoring plan. Presently, FWS and its cooperative partners conduct all wolf monitoring.

Canada Lynx

Canada lynx are typically associated with extensive tracts of dense boreal forest interspersed with rock outcrops, bogs and thickets. Lynx are found in areas with deep snow where lynx have a competitive advantage over other predators. In the western U.S., lynx is associated with lodgepole pine, subalpine fir, Engelmann spruce, and aspen cover types in subalpine fir habitat types. Cool, moist Douglas fir, grand fir, or western larch forests, where they are interspersed with subalpine forests, also provide habitat for lynx. Their primary prey is snowshoe hare but they also consume small rodents and ground dwelling birds. Mature forests with downed logs and windfalls provide cover for denning sites, escape, and protection from severe weather. Early successional stages of forests provide habitat for snowshoe hare. Fire suppression has allowed forests to mature, thereby reducing the mosaic habitat pattern needed by Canada lynx. Lynx are capable of moving extremely long distances in search of food and the range of a lynx can include 94 square miles or more.

Informal snow tracking surveys of the landscape area were conducted beginning in 1992 when tracks were recorded approximately ½ mile north of Leadville near the Cottonwood Creek divide. In 1994, two sets of tracks were located in this same vicinity on the north side of Black Mountain. Both the 1992 and 1994 track sightings were within the Electric Peak roadless area. In addition, NHP has records of lynx observation for numerous sites within the landscape, the most recent of which is from 1986.

Management of lynx on the BDNF is provided under the Northern Rockies Lynx Management Direction Record of Decision (ROD) (USDA, 2007). In order to categorize lynx habitat and use, USDA and FWS identified occupied habitat on all national forest lands in the Northern Rockies (USDA and USDI, 2006). All lynx habitat on an entire national forest is considered occupied by lynx when either there are at least two verified lynx observations or records since 1999 on the national forest (unless they are verified to be transient individuals); or there is evidence of lynx reproduction on the forest. In September 2005, the FWS issued a Recovery Plan Outline for the Contiguous United States Distinct Population Segment of Lynx (USDI FWS 2005). The document serves as an interim strategy to guide recovery efforts and inform the critical habitat designation process until a recovery plan is completed. Based on these findings, the entire BDNF was designated unoccupied, secondary habitat and therefore lynx are not currently a management concern. Secondary areas have fewer and more sporadic current and historical

records of lynx, and as a result historical abundance has been relatively low and reproduction has not been documented.

When National Forests such as the BDNF in unoccupied mapped lynx habitat are evaluating management actions they should consider the direction of the ROD, especially the direction regarding linkage habitat. However, management of the secondary unoccupied habitat with regards to lynx remains discretionary. It should be noted that the northern portion of the landscape in the Cottonwood and Baggs Creek area is adjacent to what is considered occupied secondary habitat on the Helena National Forest and the boundary between the two forests is essentially jurisdictional in considering lynx occupancy. This adjacent portion of the Helena National Forest is also identified as a linkage area for expansion of lynx populations and migration. If and when new data determines the BDNF to be occupied, based upon criteria and evidence described in the Amended Lynx Conservation Agreement between the Forest Service and the FWS (USDA FS and USDI FWS, 2006b), the ROD direction will be applied. The USFS has agreed to work with the FWS to develop and complete an acceptable protocol to survey currently unoccupied lynx habitat in secondary areas.

In forests such as the BDNF with unoccupied status, the USFS has determined that vegetation management can continue under existing forest planning. This is because the risks of most vegetation management actions, such as timber harvest, precommercial thinning and other habitat modifications including prescribed fire, are reversible since forests typically regenerate over time, with or without active restoration.

The discussion of forest vegetation size class distribution in section IIC-2 indicates how lynx foraging habitat may be affected by the existing condition of the forest vegetation. Douglas fir seedling/sapling appears to be near the RNV (figures IIC-11). However, lodgepole pine is less clear. The current percentage of seedling/sapling in lodgepole pine forest type is significantly less than the historical values estimated by Losensky (1993, 1995) but within the modeled RNV. The seedling/sapling size class is over the RNV in the subalpine fir forest type (figure IIC-13). This suggests that lynx foraging habitat is near the RNV within the landscape. Lynx foraging habitat at the forest-scale was found to be below the RNV (USDA, 2005).

Lynx denning habitat consists of more mature forest with structural complexity. The present size class distribution of the subalpine fir forest type indicates that areas of large size class stands are reduced below the RNV. However, in the lodgepole pine forest type which constitutes the majority of the forest landscape (table IIC-2), the presence of mature stands is comparable to the historic vegetation studies provided by Losensky (1993, 1995). Additionally, the FRCC data described in section IIC-1 indicates that at least half of the conifer forest in the landscape in FRCC II or III suggesting that the forested landscape is more structurally complex than it would be at RNV. This suggests that the acres of potential lynx denning habitat are not a limiting factor in the landscape.

Photo: Structurally complex mixed Douglas fir/lodgepole pine forest.

R1 Sensitive Species

Sensitive species are designated by the USFS regional office and are species for which population viability is a concern. Downward trends in population numbers or in habitat capability (either observed or predicted) are evidence of viability problems. Some sensitive species are ESA candidate species or former ESA species that are now delisted.

Only species that occur as breeding or winter season residents are considered for inclusion onto the R1 Sensitive Species List. Transient/migratory species were not considered and the list includes only species occurring on national forest lands. As such, species that could be affected from activities on FS lands, but that do not occur on FS lands are not included on the list. This situation needs to be dealt with during project evaluation as a part of a cumulative effects analysis.

The R1 Sensitive Species list was queried for those species either known or suspected to occur on the BDNF. The list of species was further refined by eliminating those species whose potential range (NHP Animal Field Guide maps) does not include the landscape and for which there are no observations on record with the NHP. This selection process eliminated greater sage-grouse, the Great Basin pocket mouse, northern bog lemming, and the pygmy rabbit from this sensitive species analysis.

Sensitive species known or suspected to occur in the landscape are listed in table IID-3. The general descriptions of R1 sensitive species that follow are adapted from the Montana Animal Field Guide a cooperative project of NHP and FWP (NHP, 2007).

Table IID-3: R1 Sensitive species known or suspected to occur on the BDNF.

Common Name	*Scientific Name*	Occurrence on BDNF
Mammals		
Fisher	*Martes pennanti*	Known
North American wolverine	*Gulo gulo*	Known
Townsend's big-eared bat	*Plecotus townsendi*	Known
Birds		
American peregrine falcon	*Falco peregrinus anatum*	Known
Bald eagle	*Haliaeetus leucocephalus*	Known
Black-backed woodpecker	*Picoides arcticus*	Known
Flammulated owl	*Otus flammeolus*	Known
Harlequin duck	*Histrionicus histrionicus*	Known
Trumpeter swan	*Cygnus buccinators*	Known
Amphibians		
Northern leopard frog	*Rana pipiens*	Suspected
Western toad	*Bufo boreas*	Known
Fish		
Westslope Cutthroat Trout	*Oncorhynchus clarkii lewisi*	Known

American Peregrine Palcon

Peregrine falcons are migratory, following prey south at the end of summer, some migrating to the southern U.S., others traveling a far as South America. They return to their fledgling sites in northern breeding areas late April to early May. In the Bozeman area, observations in the 1950's and 1960's suggested migration periods around May 5 and September 15 (Skaar, 1969). Nests typically are situated on ledges of vertical cliffs, often with a sheltering overhang. Ideal locations include undisturbed areas with a wide view, near water, and close to plentiful prey. Substitute manmade sites can include tall buildings, bridges, rock quarries, and raised platforms.

Peregrine falcons feed primarily on birds including medium-size passerines up to small waterfowl. They have occasionally been reported to prey on small mammals (e.g., bats, lemmings), lizards, fishes, or insects (by young birds). Prey is pursued from a perch or while soaring. Peregrines may hunt up to several km from nest site (Skaggs et al., 1988).

The EDLV landscape is generally lacking in the type of vertical cliff areas that are suitable nesting sites for peregrine falcons. NHP has records of peregrine observations generally surrounding, but not in the EDLV landscape, including several unconfirmed observations believed accurate to the quarter-quarter degree lat-long for an adjacent area of Deer Lodge County. Given this, there is a possibility that peregrine falcons may be seen in the landscape either in migration or hunting from nests in more suitable habitat possibly existing in the Flint Creek Range.

Bald eagle

Bald eagles were removed from the Endangered Species List in 2007 and are now a R1 Sensitive Species.

The bald eagle is a resident species in the forested, mountainous areas of Montana. Other individual birds from more northerly latitudes either winter in Montana or migrate through the state to more southerly locations. Residents generally remain in the vicinity of their breeding areas throughout the year, while some, though remaining in the state, may move to the more temperate weather of lower elevations or to other areas with higher concentrations of food (Montana Bald Eagle Working Group, 1994). This is especially true of individuals that nest at higher elevations. Congregations of migrating bald eagles may be evident in autumn along the north-south mountain chains with an associated abundance of food sources. Large concentrations of eagles have formerly been reported feeding on spawning kokanee (Oncorhynchus nerka) in Glacier National Park and at Canyon Ferry Reservoir, north of Helena, when spawning fish were abundant (Montana Bald Eagle Working Group, 1994). In the Bozeman area, birds arrive by November 20 and leave by April 25 (Skaar, 1969).

In Montana the bald eagle is primarily a species inhabiting forested areas along rivers and lakes, especially during the breeding season. Important year-round habitat includes wetlands, major water bodies, spring spawning streams, ungulate winter ranges and open water areas (Bureau of Land Management, 1986). Wintering habitat may include upland sites. Nesting sites are generally located within larger forested areas near large lakes and rivers where nests are usually built in the tallest, oldest, large diameter trees. Nesting site selection is dependent upon maximum local food availability and minimum disturbance from human activity (Montana Bald Eagle Working Group, 1994). The majority of bald eagle diet is comprised of fish. Important prey for bald eagles include waterfowl especially in the winter, salmonids, suckers, whitefish, carrion and small mammals and birds (Bureau of Land Management, 1986).

Nests are often massive structures of branches and sticks with an interior cup lined with grass, pine needles, and plant stems (Baicich and Harrison 1997). Nests may be used year after year, resulting in huge constructions, sometimes up to 12 feet in height and 8 feet in diameter. Most nests are in timber stands, with a minimum size of 1.2 hectares, with a canopy closure less than 80%. The most common nest trees are ponderosa pine, Douglas fir and cottonwood.

Breeding dates in Montana range from March to July (Montana Bird Distribution Online Database, 2003). FWP coordinates nest monitoring annually to assess nesting success. The clutch is laid in March or April and usually consists of two eggs, but may range from one to three. Incubation, performed by both sexes, lasts about 5 weeks. Mortality for the second young to hatch is high. First flight occurs at 10 to 12.5 weeks. The young are cared for by the adults at this time and may remain around the nest for several weeks after fledging. Adults may not reproduce every year.

General objectives of habitat management for bald eagles in Montana include: maintaining prey bases; maintaining forest stands currently used or suitable for nesting, roosting, and foraging; planning for future potential nesting, roosting, and foraging habitat; and minimizing disturbances from human activities in nest territories, at communal roosts, and at important feeding sites (Montana Bald Eagle Working Group, 1991). The Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group, 1994) directs management of this species in the state.

Observation from 1984 to the present of bald eagle nesting, breeding, and broods are on record with NHP. Most of the observations and all nests are reported along the Clark Fork River corridor. One of the sightings was in the lower Peterson Creek drainage and there is a recorded observation from the Middle Fork Cottonwood Creek drainage. Bald eagles have also been observed migrating through the area.

Black-backed woodpecker

The habitat of black-backed woodpeckers in Montana is early successional, burned forest of mixed conifer, lodgepole pine, Douglas fir, and spruce-fir (Hutto, 1995a, 1995b), although they are more numerous in lower elevation Douglas fir and pine forest habitats than in higher elevation subalpine spruce forest habitats (Bock and Bock, 1974). Black-backed woodpeckers will use burned over or insect infested forest stands at higher elevations (the subalpine zone) when available (USFS, 1995b). Black-backed woodpeckers are highly responsive to forest fire and other processes, such as spruce budworm/beetle outbreaks, resulting in high concentrations of wood-boring insects invading dead trees. Local and regional irruptions and range extensions have been observed in response to burns and wood-borer outbreaks (West and Spiers, 1959; Bock and Bock, 1974; Kingery, 1977; Yunick, 1985). Research over the past 75 years continues to support the species reputation for responding to bark-beetle attacks (Marshall, 1992).

Studies from the western United States on the logging of post-fire trees indicated the negative impacts of this activity on black-backed woodpeckers (Kotliar et al., 2002). The conclusion reached was that this species rarely used even partially logged post-fire forests. Therefore, when salvage logging is planned, a delay of work for at least five years after the disturbance event will benefit this species (Hutto, 1995; Dixon and Saab, 2000). This time delay is essential to provide habitat as the woodpecker's main prey items (wood-boring beetles) become less abundant after this period (Caton, 1996). Salvage operations should retain more than 104 to 123 snags per hectare (more than 42 to 50 snags per acre) that are more than 9 inches diameter at breast height (dbh) (Dixon and Saab, 2000; Wisdom et al., 2000).

As described under vegetation existing condition in section C-1 Fire, the fire history for the landscape indicates that burned acres in the landscape have been below average for much of the last century. Additionally, the prescribed ecosystem burning for range improvement in the 1990's which totaled approximately half of the acreage burned that decade was applied to treat range vegetation and did not result in appreciable snag recruitment. When assessed at the regional scale, however, the acres of recently burned forest and therefore potential black-backed woodpecker habitat appears to be within the RNV as described below.

A study performed by Caton (1996) indicates that black-backed woodpeckers find sufficient forage in burned areas for one to six years post-burn with peak woodpecker densities occurring in years three or four. Hillis et al. (2002) estimate the RNV for acres burned in potential black-backed woodpecker habitat created to be 171,000-320,000 acres per 6-year period. In their analysis, Hillis et al. (2002) isolate suitable forest types for black-backed woodpeckers that are in historical fire regime classes including mixed severity (MS2) and short and long interval stand replacement fire regimes (SR1 and SR2). Hillis et al. (2002) conclude that potential habitat for these woodpeckers was limited due to effective fire suppression until the 1988 fire season. However, their analysis indicated that during the period from 1988-2000 that severe fire activity resulted in burned acreage exceeding the habitat RNV for these woodpeckers.

To determine potential black-backed woodpecker habitat created by wildfires during the most recent 6-year period (2001-2006), R1 fire history data was intersected in GIS with data from Historical Fire Regimes for Northern Idaho, Western and Central Montana (R1 National Fire Plan Cohesive Strategy Team, 2002). The historic fire regime dataset does not include the eastern portions of the Custer NF nor the Dakota Prairie Grasslands of R1 and these areas were excluded from the analysis. The available recent fire history database includes all acres within fire perimeters and as such acreages are larger than actual due to unburned areas within the perimeter. To partially compensate for the exagerrated acres determined from the fire perimeter data the historic fire regime dataset was used to isolate only SR1 and SR2 forest types from recent burned areas. At the time the recent fire history dataset was published, 2006 fire perimeters were not attributed for the Bitterroot, Gallatin, Helena, Idaho Panhandle, Kootenai, Lolo, and Nez Perce National Forests. With the partial data for 2006, the analysis shows a minimum of 436,000 acres within the perimeter of burned areas in SR1 and SR2 forest types during 2001-2006. This large acreage burned in potential black-backed woodpecker habitat during the most recent 6-year period suggests that the habitat needs for this species are likely being met at the regional scale.

The current mountain pine beetle and western spruce budworm epidemic may suggest the potential for increased black-backed woodpecker use of the landscape. However, the Landbird Monitoring Program, as described below under Ecological and Management Indicator Species, has shown that black-backed woodpeckers are not currently showing a preference for beetle outbreaks in Western Montana (LBMP, 2006). Samson (2006) describes the connection between current forest health/disease and long-term viability of black-backed woodpeckers and suggests that the short-term viability of this species is optimistic. However, according to Samson (2006), providing for ecosystem sustainability and the long-term viability for the species will require a much larger, more widespread and active vegetation management program than evident today.

Flammulated Owl

In Montana, flammulated owls are associated with mature and old-growth xeric ponderosa pine/Douglas fir stands (Holt and Hillis, 1987; Wright et al., 1997) and in landscapes with higher proportions of suitable forest and forest with low to moderate canopy closure (Wright et al., 1997). They are absent from warm and humid pine forests and mesic ponderosa pine/Douglas fir (McCallum, 1994a; Wright et al., 1997). Information gathered from other studies throughout their range suggest the breeding habitat of flammulated owls is montane forest; usually open conifer forests containing pine, with some brush or saplings (typical of the physiognomy of pre-European settlement ponderosa pine forests). The species shows a strong preference for ponderosa pine (*Pinus ponderosa*) and Jeffrey pine (*P. jeffreyi*) throughout its range (McCallum, 1994b). They prefer mature growth with open canopy avoiding dense young stands. Flammulated owls are found in a cooler, semi-arid climate, with a high abundance of nocturnal arthropod prey and some dense foliage for roosting (McCallum 1994a). Most often they are found on ridges and upper slopes (Bull et al., 1990; Groves et al., 1997).

Flammulated owls feed on various insects (e.g., moths, beetles, grasshoppers, crickets, caterpillars) (McCallum, 1994a, 1994b). Moths (especially *Noctuidae* and *Geometridae*) and beetles are especially important (Reynolds and Linkhart, 1987; Marshall, 1957). They possibly respond to spruce budworm outbreaks (McCallum, 1994b).

Management for the maintenance of mature and old-growth xeric ponderosa pine/Douglas fir habitat types will be beneficial for flammulated owls in Montana. Numerous authors (Groves et al., 1997; Linkhart, 2001) suggest that fire suppression has been a negative influence on flammulated owl habitat. Whether enough fire can be introduced is unknown, and mechanical removal of understory, particularly in relatively large areas, may serve as an effective alternative to fire. The size of area to be restored is important, and larger is better, to slow subsequent peripheral encroachment of understory, particularly by shade tolerant tree species (Samson, 2006). While the short-term viability of flammulated owls is optimistic, providing for ecosystem sustainability and the long-term viability for the species will require a much larger, more widespread and active vegetation management program than evident today (Samson, 2006). Long term viability of this species is uncertain due to large scale changes in ecosystem function due to human management of vegetation.

Open ponderosa pine forest were likely never a significant component of the forested landscape; however, open Douglas fir stand certainly were. The discussion of forest vegetation size class distribution in section IIC-2 suggests that existing mature Douglas fir forest type is within the range of historical percentage estimated by Losensky (1993, 1995). This would suggest that the size class distribution of Douglas fir is not below the RNV for flammulated owl habitat. However, observation indicates that many of the formerly open savanna Douglas fir stands in the landscape are now multistoried which would limit suitable flammulated owl habitat in the landscape. This is supported by the FRCC data discussed in section IIC-1 which describes the conversion of formerly single storied stands to multistoried stands with fire exclusion. Comparison of the stand-level FRCC data spatially in GIS with mature Douglas fir stands suggests that an estimated 72% of the mature Douglas fir is in FRCC II and III. This suggests that present Douglas fir stands in the landscape are too dense to provide a level of flammulated owl habitat consistent with the RNV.

Harlequin Duck

In Montana, most harlequin ducks inhabit fast moving, low gradient, clear mountain streams. Overstory in Montana does not appear to affect habitat use. For example, in Glacier National Park, birds used primarily old-growth or mature forest and most birds in streams on the Rocky Mountain Front were seen in pole-sized timber (Diamond and Finnegan, 1993). Banks are most often covered with a mosaic of trees and shrubs, but the only significant positive correlation is with overhanging vegetation (Diamond and Finnegan, 1993; Ashley, 1994).

The strongest stream selection factor in Montana appears to be for stream reaches with 2+ loafing sites per 10 m (Kuchel, 1977; Diamond and Finnegan, 1993; Ashley, 1994). Broods may preferentially use backwater areas, especially shortly after hatching (Kuchel, 1977), though this is not apparent in data from other studies (Ashley, 1994). Stream width ranges from 3 m to 35 m in Montana. Harlequins in Glacier National Park used straight, curved, meandering, and braided stream reaches in proportion to their availability (Ashley, 1994).

NHP reports that the area including the landscape is used only for migration by Harlequin ducks. The absence in the landscape of fast moving, low gradient mountain streams with a width greater than 3 m (with the possible exception of several reaches of Cottonwood Creek on private lands) suggests that the likelihood of harlequin occurence within the landscape is low.

Trumpeter Swan

Trumpeter swans are the largest waterfowl in North America. Trumpeter swans breeding in Montana are non-migrants. They spend both the breeding season and the winter in southern Montana's lakes, ponds, and streams of the Red Rock Lakes National Wildlife Refuge. The Canadian subpopulation breeding in parts of British Columbia, Alberta, the Yukon, and the Northwest Territories will move south in late October to early November (Mitchell, 1994).

Fall winter migration dates for the Bozeman area are November 15 to December 15 (Skaar, 1969). The swans usually follow the Rocky Mountain Front moving further south as water freezes or food diminishes. They eventually arrive in southern Montana and winter along with the resident population. Canadian swans leave their wintering grounds in early March to early April, moving up the Rocky Mountain Front toward their breeding habitat further north (Mitchell, 1994). Northbound summer migration dates for Bozeman are February 25 to April 15 (Skaar, 1969).

Habitat requirements for breeding include room to take off (~100 m), shallow, unpolluted water with sufficient emergent vegetation and invertebrates, appropriate nest sites (i.e. muskrat lodges), and areas with little human disturbance (Mitchell, 1994).

NHP reports that the landscape is used only for migration by trumpeter swans. There is also an absence of suitable habitat in the landscape for resident trumpeter swans.

Fisher

Fishers occur primarily in dense coniferous or mixed forests, including early successional forests with dense overhead cover. Complex forest structure is the key component of fisher habitat.

Although they are primarily terrestrial, fishers are well adapted for climbing. When inactive, they occupy dens in tree hollows, under logs, or in ground or rocky crevices, or they rest in branches of conifers in the warmer months.

Powell (1993) states that forest type is probably not as important to fisher as the vegetative and structural aspects that lead to abundant and diverse prey populations and reduced fisher vulnerability to predation. Preferable forest structure can be characterized by a diversity of tree shapes and sizes, understory vegetation, snags and fallen limbs and trees, and tree limbs close to the ground (Buskirk and Powell, 1994). Optimal conditions for fishers are forest tracts of 245 acres or more, interconnected with other large areas of suitable habitat. A dense understory of young conifers, shrubs, and herbaceous cover is important in summer.

Fisher may also occupy and reproduce in managed forest landscapes and forest stands not classified as mature or late-successional, that provide some of the key habitat and structural components important to fisher (USDI FWS, 2006). However, intensive forest management does not typically require the retention of key habitat and structural components and it is unlikely that early and mid-successional forests, especially those that have resulted from prior timber harvest, will provide the same prey resources, protection from predators, and rest and den sites as more mature forests (Powell and Zielinski, 1994).

Fishers were assumed extinct in Montana by the 1930's (Foresman, 2001). Although, genetic analysis by Vinkey et al. (2006) shows that current fishers in West Central Montana are from a relic population indicating that this species was not extirpated as previously thought. Reintroduction efforts were undertaken in 1959 and 1960 in Lincoln, Granite and Missoula counties. A single fisher was reported in Peterson Creek in 1963, the only fisher observation in the landscape on record with NHP. The species is currently managed as a furbearer by the FWP with a limited harvest of 7 animals in FWP Region 2.

North American Wolverine

Wolverine is an ESA Category 2 candidate meaning that the listing of wolverines as threatened or endangered under the federal ESA may be appropriate but there is insufficient evidence to support a proposal to list.

Wolverines are limited to alpine tundra, and boreal and primarily coniferous mountain forests in the western mountains, especially large wilderness areas. Banci (1986) reported "habitat requirements appear to be large, isolated tracts of wilderness supporting a diverse prey base, rather than specific plant associations or topography." However, dispersing individuals have been found far outside of usual habitats. They are usually in areas with snow on the ground in winter. Riparian areas may be important winter habitat. Seasonally wolverines range within a large home range and dispersal movements of more than 300 kilometers are known (Magoun, 1985; Gardner et al., 1986).

When inactive, wolverines occupy dens in caves, rock crevices, under fallen trees, in thickets, or similar sites. In Montana, Hornocker and Hash (1981) found most wolverine use in medium to scattered timber, while areas of dense, young timber were used least. Wolverines avoided clearcuts and burns, crossing them rapidly and directly when they were entered at all. Hash

(1987) reported wolverines in the Northern Rocky Mountain region were associated with fir, pine, and larch. Wolverines are primarily terrestrial but may climb trees. Wolverines are opportunistic and feed on a wide variety of roots, berries, small mammals, birds' eggs and young, fledglings, and fish (Hatler, 1989). They may attack moose, caribou, and deer hampered by deep snow.

Wolverines are classified as a furbearer in Montana. Trapping regulations allow for one wolverine to be taken per person each season.

During February 1995 a wolverine was observed east of the Electric Peak Roadless Area (USFS, 1995b) in the Boulder River drainage which is adjacent to the landscape. A wolverine was legally harvested from this same area during winter 1998 based on current NHP data.

Townsend's Big-eared Bat

Townsend's big-eared bat uses caves and abandoned mines for maternity roosts and hibernacula (Worthington, 1991; Hendricks et al., 1996; Hendricks, 2000; Hendricks et al., 2000; Foresman, 2001; Hendricks and Kampwerth, 2001). Use of buildings in late summer has also been reported (Swenson and Shanks, 1979). Habitats in the vicinity of roosts include Douglas fir and lodgepole pine forests, ponderosa pine woodlands, Utah juniper-sagebrush scrub, and cottonwood bottomland. NHP reports that little information on migration is available for Townsend's big-eared bats and no demographic data or estimates of population size are available for any population in Montana, nor have any predators been documented.

Townsend's big-eared bats feed on various nocturnal flying insects near the foliage of trees and shrubs, but appears to specialize primarily on small moths (Kunz and Martin, 1982); other insects in the diet include lacewings, beetles, true flies, and wasps. There are reports of gleaning insects from foliage, but most are captured in the air, often near foliage.

Lewis and Clark Caverns near Cardwell, Montana is used for a winter hibernaculum and a breeding/nursery colony. Males and non-reproducing females disperse from the caverns in the summer and may be using parts of the BDNF. The maternity colony at Lewis and Clark Caverns has persisted for over a century, even though it is exposed daily to tour groups.
FWP has identified vandalism to maternity colonies and hibernacula and degradation and loss of native riparian vegetation as conservation concerns for this species. FWP conservation strategies include identification of maternity colonies and hibernacula and closure to recreationists and reducing levels of human activities around known bat roosts through road management, signs, and public education

During the last decade, mine surveys prior to closure have been undertaken by land management agencies to determine the potential of abandoned mines as bat habitat. In some cases bat-friendly gates were installed at known Townsend's big-eared bat roosts, and the roosts have continued to be used after gate installation (Hendricks, 1999; Hendricks and Kampwerth, 2001). Some caves in the Pryor Mountains and Little Rocky Mountains with documented use by Townsend's big-eared bat are protected with bat-friendly gates (Worthington, 1991; Hendricks et al., 2000). Abandoned mines should be surveyed for Townsend's big-eared bats or other bat species prior to any reclamation activity. Surveys should follow protocols in the conservation

assessment and conservation strategy of Pierson et al. (1999). Installation of bat-friendly gates should be considered as a protective measure for all Townsend's big-eared bat roosts. Other land management activity (cave management, pesticide spraying, timber harvest, other vegetation conversion) at or near known roosts should also be conducted according to the best management practices outlined in the conservation assessment and strategy.

Surveys were conducted on the Deerlodge National Forest during the summers of 1991 and 1992 by NHP. Additionally, MBMG surveyed bat occurrence in association with abandoned mine surveys starting in 1992. Despite these surveys, NHP does not have recorded observation within the landscape. The Cliff Mountain Allotment EA (USFS, 1995b) mentions that sound detectors picked up calls from what were very possibly Townsend's big-eared bats but does not identify where.

Northern Leopard Frog

Habitats used by northern leopard frog in Montana include low elevation and valley bottom ponds, spillway ponds, beaver ponds, stock reservoirs, lakes, creeks, and pools in intermittent streams, warm water springs, potholes, and marshes (Brunson and Demaree, 1951; Mosimann and Rabb, 1952; Black, 1969; Miller, 1978; Dood, 1980; Reichel, 1995; Hendricks and Reichel, 1996; Hendricks, 1999). There is no evidence that this species in Montana has ever occupied high elevation wetlands, in contrast to Wyoming and Colorado (Baxter and Stone, 1985; Hammerson, 1999).

Northern leopard frogs require a mosaic of habitats to meet annual requirements of all life stages. Generally, separate sites are used for breeding and overwintering, but this may occur in the same pond in some cases. In summer, adults and juveniles commonly feed in open or semi-open wet meadows and fields with shorter vegetation, usually near the margins of waterbodies, and seek cover underwater. Taller, denser vegetation seems to be avoided. During winter, northern leopard frogs usually are found inactive underwater on the bottom of deeper streams and ponds or springs that do not freeze to the bottom and are well oxygenated, sometimes under bottom rubble and debris, in water as deep as 85 centimeters (Baxter and Stone, 1982; Nussbaum et al., 1983; Russell and Bauer, 1993; Hammerson, 1999). In Wyoming and the Pacific Northwest, adults emerge in March or April (Nussbaum et al., 1983; Baxter and Stone, 1985; Russell and Bauer, 1993) when water temperatures exceed 10 degrees C. In Montana, the active period of adults is reported to extend from mid-March to early October (Brunson and Demaree, 1951; Roedel and Hendricks, 1998; Hendricks, 1999). In all cases, activity begins when ice melts.

NHP mapping indicates that valley locations in the landscape are within the area of recent decline or extirpation of the northern leopard frog. To protect this species, breeding sites west of the Continental Divide should be protected from livestock, and organic and chemical (pesticide and herbicide) contamination. Game fish and bullfrogs should not be introduced to these sites. Care should be taken to avoid introducing parasites and fungal, bacterial, and viral pathogens when monitoring these sites (see suggestions in Maxell, 2000; Maxell et al., 2003). NHP records of observations west of the divide are mostly limited to valley bottoms. In addition, northern leopard frog suitable habitat does not include the higher elevations indicating it is likely absent from national forest lands within the landscape.

Western (Boreal) Toad

Habitats used by boreal toads in Montana include low elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, and marshes, to high elevation ponds, fens, and tarns at or near treeline (Rodgers and Jellison, 1942; Brunson and Demaree, 1951; Miller, 1978; Marnell, 1997; Werner et al., 1998; Boundy, 2001). Forest cover in or near encounter sites is often unreported, but toads have been noted in open-canopy ponderosa pine woodlands and closed-canopy dry conifer forest in Sanders County, Montana (Boundy, 2001), willow wetland thickets and aspen stands bordering Engelmann spruce stands in Beaverhead County (Jean et al., 2002), and mixed ponderosa pine/cottonwood/willow sites or Douglas-fir/ponderosa pine forest in Ravalli and Missoula counties (P. Hendricks personal observation).

Forest cover around occupied montane wetlands may include aspen, Douglas-fir, lodgepole pine, Engelmann spruce, and subalpine fir; in local situations it may also be found in ponderosa pine forest. Boreal toads also occur in urban settings, sometimes congregating under streetlights at night to feed on insects (Hammerson, 1999; P. Hendricks personal observation). Normally they remain fairly close to ponds, lakes, reservoirs, and slow-moving rivers and streams during the day, but may range widely at night. Eggs and larvae develop in still, shallow areas of ponds, lakes, or reservoirs or in pools of slow-moving streams, often where there is sparse emergent vegetation. Adult and juvenile boreal toads dig burrows in loose soil or use burrows of small mammals, or occupy shallow shelters under logs or rocks. At least some toads hibernate in terrestrial burrows or cavities, apparently where conditions prevent freezing (Nussbaum et al., 1983; Koch and Peterson, 1995; Hammerson, 1999).

No migration information is available specific to Montana. Out of state it is it known that the boreal toad migrates between aquatic breeding and terrestrial nonbreeding habitats. In Colorado, movements of 900 meters (with 95 meters change in elevation) to 4 kilometers have been reported (Hammerson, 1999), and radio-tracked females in Idaho have been observed to move up to 2.4 kilometers from breeding ponds (Koch and Peterson, 1995). Movement patterns are highly variable, with some individuals remaining in the same location for several days, then moving 50 meters or more on several consecutive nights.

Predators of adult toads include raccoon, domestic dog, coyote, red fox, short-tailed weasel, mink, marten, badger, black bear, Northern Pygmy Owl, Black-billed Magpie, Common Raven, American Crow, Steller's Jay, Gray Jay, American Robin, Loggerhead Shrike, and Northern Shrike (Salt, 1979; Olson, 1989; Corn, 1993; Brothers, 1994; Koch and Peterson, 1995; Hammerson, 1999; Jones et al., 1999). Predators of toad tadpoles include Mallard, Spotted Sandpiper, western terrestrial garter snake, tiger salamander, wood frog tadpoles, and diving beetle larvae.

Generally, boreal toads are active during the day and night; juveniles are largely diurnal while adults tend to be nocturnal except in spring (Maxell, 2000). The active period typically begins in April or May and extends to September or October, depending on elevation and latitude (Russell and Bauer, 1993; Koch and Peterson, 1995; Hammerson 1999). In Montana, records extend from late April to early October (Rodgers and Jellison, 1942; Brunson and Demaree 1951, Black and Brunson, 1971; Hendricks and Reichel, 1996; Boundy, 2001).

Numerous surveys since the early 1990's indicate that this species has experienced regional population declines in Montana. Boreal toads were documented to breed at only 2-5% of more than 2000 standing water bodies surveyed since 1997, and where breeding was documented, fewer than 10 breeding females contributed in a given year (Maxell, 2000; Maxell et al., 2003). Thus, range-wide declines for this species in the western United States are also reflected in the Montana results.

Because the reasons for declines in Montana remain obscure, it is difficult to suggest management techniques to reverse the trend. Nevertheless, the following management practices should reduce immediate impacts. Reduced access by livestock to known breeding sites within grazing allotments will prevent undue trampling mortality (Bartelt, 1998). Separating livestock from breeding sites can be accomplished by constructing partial or complete livestock exclosure fencing at breeding ponds and other sites. Use of fertilizers, herbicides, and pesticides within at least a 100 meters buffer zone of breeding sites should be avoided. Stocking predatory game fish at sites currently lacking them should be avoided, even though there is evidence that some species of trout do not prey on boreal toad tadpoles and eggs (Jones et al., 1999). If chemical poisoning will be used to remove undesirable fish from waterbodies used by boreal toads a survey for toads should be conducted to prevent unnecessary mortality to any life stages. If toads are present, they can be removed by dipnet and held in captivity (under appropriate conditions) until the effects of the treatment dissipate, then returned to the site. Finally, known breeding sites should not be drained or altered, and water bodies where alteration is planned should first be surveyed for use by toads.

NHP has several recorded observations from 2001 of western toads associated with wetlands along the Clark Fork River within the landscape. NHP also has one recorded observation from 2003 associated with a small impoundment on one of the smaller draws in the sloping Tertiary benches of the East Valley.

Management Indicator Species

When Forest Service regulations were developed to implement the National Forest Management Act (NFMA), the concept of Management Indicators (MI) was incorporated into the direction. National Forests use MI and Management Indicator Species (MIS) as a tool for identifying specialized habitats, formulating habitat objectives and establishing standards and guidelines to provide for a diversity of wildlife, fish, and plant habitats. The MIS approach is designed to function as a means to provide some insight into effects of management direction on plant and animal communities. The concept of MI is to identify a few species that represent many other species and provide a basis to evaluate management by the effects on the species and their habitats. MIS are selected at the forest level to include where appropriate: endangered and threatened plant and animal species identified on State and Federal lists for the planning area; species with special habitat needs that may be influenced significantly by planned management programs; species commonly hunted, fished, or trapped; non-game species of special interest; and additional plant and animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality. BDNF MIS are shown in table IID-4.

Table IID-4: BDNF management indicator species.

Representative Habitat	MIS
Riparian Shrub	Belted Kingfisher/Willow Flycatcher
Riparian Tree	Northern Water Shrew/Warbling Vireo
Riparian Wet Meadow	Western Jumping Mouse
Riparian Marshland	Blue-winged Teal
Lodgepole Pine	Hairy Woodpecker
Mountain Grassland	Mountain Vole
Evergreen Shrub	Sage Thrasher
Old Growth Habitat	Northern Goshawk/Northern Three Toed Woodpecker/ Pileated Woodpecker
Pool Habitat	Cutthroat Trout

The Deerlodge Forest five year evaluation and monitoring report, 1994, discusses in detail MIS monitoring and its drawbacks. Problems include that no baseline populations were established in the FP (1987). Additionally, the scientific literature shows it has been difficult to establish a cause and effect relationship between habitat and MIS population levels. In response to this, the BDNF no longer explicitly monitors the individual MIS listed in the FP (1987). Instead, in 1994 R1 initiated a region-wide landbird monitoring program so that managers might better understand the habitat relationships of landbirds that breed in the northern Rocky Mountains and, in the future, might be able to assess longer term landbird population trends. The program was initiated to help the USFS meet its legal mandate under the NFMA to monitor populations of MIS as a mechanism to maintain viable populations of native vertebrates. The Landbird Monitoring Program (LBMP) has run point count bird surveys in Montana and North Idaho since 1994.

The current policy of the BDNF is to attempt to minimize potential negative effects to MIS through project alternative development, mitigation measures or habitat improvement projects.

MIS Discussion

The general descriptions of MIS that follow are adapted from the Montana Animal Field Guide a cooperative project of NHP and FWP (NHP, 2007). Where available, observations on record with NHP are described for each MIS.

Riparian Shrub:

Belted Kingfisher

Belted kingfisher breed as far north as northern Canada and Alaska and winter as far south as Central American and the Caribbean islands. They are found throughout the year from southern Canada and coastal Alaska throughout much of the United States (Fry, 1992). Most individuals migrate; though members of this species are capable of withstanding North American winter temperatures provided that open water is available (Hamas, 1994). In the Bozeman area, migration periods are from March 20 to April 10 and October 1 to November 1 (Lenard et al., 2003).

Belted kingfishers inhabit streams, rivers, ponds, and lakes in which prey are clearly visible, preferring waterbodies that are not overgrown with vegetation. The availability of suitable

nesting sites, which require earthen banks where nesting burrows can be excavated, appears critical for the distribution and local abundance of this species. (Hamas, 1994). The belted kingfisher diet consists mainly of fish with other food sources when available including insects, amphibians, reptiles, young birds, small mammals, and berries. (Hamas, 1994).

NHP records include repeated observations of an overwintering bird from the Clark Fork River floodplain south of Deer Lodge from January and February of 2000. Suitable nesting habitat is not likely to be found on BDNF lands within the landscape given the scarcity of earthen stream banks above the lower Tertiary benches of the East Valley. However, it is possible that resident belted kingfishers hunt on fish-bearing streams higher in the landscape.

Willow Flycatcher

Willow flycatchers summer breeding grounds include moist, shrubby areas in the northern U.S. often associated with nearby waterbodies (Sedgwick, 2000). Willow flycatchers are migratory, with winter habitat in Central and South America. The Bozeman area migration period is May 30 to June 10 with no discernible movement in fall (Lenard et al., 2003).

Willow flycatcher nesting areas include the outer edge of shrubs and small trees near water. The willow flycatcher food source includes insects with some berries in the fall.

NHP records include indirect evidence of willow flycatcher breeding from Dry Cottonwood Creek from 1991. Additional observations are on record with NHP from Warm Springs Ponds in the Deer Lodge valley bottom just north of the landscape.

Riparian Tree:

Northern Water Shrew

Northern water shrews habitat includes streamside areas in coniferous forests, particularly in or under overhanging banks or crevices with good cover (Conaway, 1952). This species has been shown to use a variety of stream sizes from fast moving mountain streams to seasonal streams and small seeps (Kinsella, 1967) and may be found above timberline (Hoffmann and Pattie, 1968). Food sources include aquatic insect larvae, some vegetable matter, oligochaetes, other shrews, arachnids, and small fish (Conaway, 1952). NHP does not have records of northern water shrew observations for the landscape.

Warbling Vireo

Warbling vireo overall habitat structure consists of large trees with semi-open canopy with a strong association with mature mixed deciduous woodlands especially along streams, ponds, marshes, and lakes. These birds are also found in upland areas away from water. Other habitats include urban parks and gardens, orchards, fencerows, campgrounds; deciduous patches in pine forests, mixed hardwood forests, and rarely, pure coniferous forests (Gardali and Ballard, 2000). Territory sizes of 3.4 to 5.6 acres in Douglas fir forests in western Montana have been recorded (NHP, 2007). The warbling vireo is a migrant, wintering from southern Mexico through northern South America and summering in North America. In the Bozeman area, normal migration periods are May 22 to June 10 and August 25 to September 8 (Lenard et al., 2003). NHP has numerous recorded warbling vireo observations from 1991 to the present from areas

within and adjacent to the landscape. Warbling vireo use of forested uplands within the landscape was observed as part of the LBMP.

Riparian Wet Meadow:

Western Jumping Mouse

Western jumping mouse often inhabit tall grass along streams, with or without a brush or tree canopy. In Western Montana, habitat includes mesic forests with sparse understory herbage. In Montana, western jumping mouse inhabit elevations from valley floors to timberline as well as alpine wet sedge meadows (Hoffmann and Pattie, 1968). NHP does not have recorded observations for the jumping mouse from the landscape area.

Riparian Marsh:

Blue-winged Teal

The blue-winged teal is a small duck inhabiting shallow ponds. In the Bozeman area, they prefer the marshy borders of ponds, lakes, and irrigation ditches (Skaar, 1969). This duck nests on the ground in grassy areas, typically near water.

These ducks breed throughout much of North American and winter in the southern U.S., Central and South American. In the Bozeman area, migration occurs from April 20-May 30 and earlier and from September-October 15, with the peak May 15 and earlier. In September 1957, 300 blue-winged teal were observed on Hebgen Lake during fall migration (Skaar, 1969). At Freezeout Lake along the Rocky Mountain Front in Teton County, Montana skunk were the major cause of unsuccessful nests (NHP, 2007).

Blue-winged teal records with NHP from 1991 through 2003 include observations of adults with young at Warm Springs Ponds and other sightings at Opportunity Ponds both of which are tailings impoundments in the Deer Lodge Valley adjacent to the landscape. Due to a lack of location description, it is unclear if other observations on record with NHP in Deer Lodge County are from within the landscape.

Lodgepole Pine:

Hairy Woodpecker

The hairy woodpecker is primarily a forest bird and is widely distributed in regions where mature woodlands prevalent. This bird may also occur in small woodlots, wooded parks, cemeteries, shaded residential areas, and other urban areas with mature shade trees, but is often scarce within these habitats (Jackson et al., 2002). In burned forest near Missoula, MT these birds chose larch over Douglas fir and ponderosa pine for nesting (Harris, 1982). Hairy woodpecker will excavate aspen for nesting. Food consists of tree surface and subsurface arthropods and a diversity of fruits and seeds. In Glacier National Park, hairy woodpeckers were found feeding on an epidemic population of mountain pine beetles; of these 8 nesting pairs, one nested in lodgepole pine with the rest in aspen (NHP, 2007). Bird monitoring in the Elkhorn Mountains on the Helena NF from 2004 showed that all hairy woodpecker nests were found in aspen trees or snags and no woodpeckers were found nesting in coniferous trees (Bate, 2004). In western North America, this bird often nests in large dead stubs or in some areas in aspen with fungal decay. NHP has recorded observations of hairy woodpeckers from BDNF lands in Dry Cottonwood Creek from 2002 and 2004, both of which were monitored as part of LBMP.

Mountain Grassland:

Mountain Vole

Mountain (montane) vole habitat usually consists of dry grassland or sagebrush-grasslands but the will use wet meadows and marshes at high elevations when meadow voles are absent (Hoffmann et al., 1969; Pattie and Verbeek, 1967). Mountain voles may be found in grass and sedge dominated meadows or in aspen or sagebrush; however the greatest abundance of montane voles is in areas with higher herbaceous cover and the presence of grass is essential (Sera and Early, 2003). NHP does not have recorded observations in the landscape area.

Evergreen Shrub:

Sage Thrasher

Sage thrasher habitat includes sagebrush communities. Migration and wintering habitat may also include arid scrub, brush and thickets (Reynolds et al., 1999). Nests are typically located in sagebrush, other shrubs, or on the ground. This migratory bird typically breeds is sagebrush dominated areas of the western U.S. and winters in the southwestern U.S. and Mexico. In the Bozeman area, normal migration periods are April 25 to May 15 and July 30 to August 15 (NHP, 2007). NHP does not have recorded observations in the landscape area.

Old Growth:

Northern Goshawk

The species is generally considered a year-round resident or partial migrant in Montana as northern goshawks have been observed in transit during every month of the year (Lenard et al., 2003). Migration is apparently dependent on prey availability and is often only to lower elevations or into more open habitat types (Squires and Reynolds, 1997) which may explain the presence of northern goshawks wintering at locations in Montana east of documented breeding locations.

Goshawks in Montana tend to nest predominately in mature large-tract conifer forests with a high canopy cover (69%), relatively steep slope (21%) and little to sparse undergrowth (Kirkley 1996). These characteristics are consistent with habitats described throughout the species range (Squires and Reynolds, 1997). Hillis et al. (2002b) presents a literature review indicating that goshawks nest in a variety of structural conditions. All northern goshawk nest trees reported by Kirkley (1996) were either lodgepole pine or Douglas fir with an average dbh of 33.6 cm and average height of 21.9 meters. In another nearby study, Douglas fir, ponderosa pine and grand fir were the trees selected most often for nest building (State of Idaho HCA/CS Dev. Team, 1995). Large nest trees on the BDNF are generally imbedded within stands of pole sized lodgepole pine (Hillis et al., 2002b).

Home ranges during nesting vary from 95 to 3500 hectares depending on sex and habitat characteristics. Ranges for non-breeders are poorly known, but may be larger than those of breeders (Squires and Reynolds, 1997). Northern goshawks hunt in closed canopy habitats as well as more open landscapes. Clough (2000) provides research from the BDNF indicating that large nest trees within open stands had higher fledgling success than nests within denser stands suggesting that open stands provide better foraging. Goshawks are generalists in terms of prey selection with over 50 species of identified prey. In Yukon, Canada, an observed population

decline was attributed to increased mortality of eggs, nestlings, immature birds and adults, as well as to dispersal following a precipitous decline in number of snowshoe hares (Doyle and Smith, 1994).

NHP has records of northern goshawk nesting and breeding in Baggs Creek from 1992 as well as other reported observations from throughout the landscape in recent years. The discussion of forest vegetation size class distribution in section IIC-2 suggests that existing mature lodgepole pine and Douglas fir forest types are within the range of historical percentage estimated by Losensky (1993, 1995). Additionally, there is an overabundance of pole sized lodgepole pine in the landscape. This would suggest that the size class distribution of the major conifer forest types supports adequate goshawk nesting habitat. If, as suggested by Clough (2000), open stands provide better foraging for nests with young birds, then the current departure from historic fire regime and resulting increased stand density may affect nest productivity.

Moser and Garton (2004) found timber harvest had no effect on breeding area occupancy, nest success, or productivity 1 to 2 years after timber harvest. Penteriani and Faivre (2001) concluded northern goshawks could tolerate timber harvest as long as the cover reduction does not exceed 30% within the nest stand. Maj (1996) reports Northern Goshawk populations in R1 are increasing or stable in most forests. The Northern Goshawk was formerly a R1 designated sensitive species until removed from the list in July 2007. Long term viability of this species is uncertain due to large scale changes in ecosystem function due to human management of vegetation. Samson (2006) states that while the short-term viability of northern goshawk is optimistic, providing for ecosystem sustainability and the long-term viability for the species will require a much larger, more widespread and active vegetation management program than evident today.

Northern Three Toed Woodpecker

Northern (American) three-toed woodpeckers breed in the montane areas of Western Montana whereas winter range is more restricted to northwest Montana. This woodpecker inhabits coniferous forest, often in spruce and less frequently mixed forest and occasionally in willow thickets along streams. They are also found in high elevation aspen groves, bogs, and swamps. Three toed woodpeckers use areas where dead timber remains after fires or logging; populations have been shown to increase 3-5 years post-fire (Spahr et al., 1991). Optimal habitat includes areas with 42-52 snags per 100 acres, with snags occurring in clumps measuring 12-16 inches dbh and 20-40 feet tall and mostly with bark still present (Spahr et al., 1991). Three toed woodpecker cavity nests are usually located in dead trees but they may nest in utility poles. A study from Oregon showed that all 16 nests found were in lodgepole pine trees with heart rot (Goggans et al., 1989). Data on 3 radioed birds showed selection for nesting in mature and old-growth forest and selection against seedling, sapling and immature pole timber (Goggans et al., 1989).

Population irruptions may occur and appear to be related to food source plentitude such as forest insect epidemic (Yunich, 1985). In Glacier National Park, breeding density hit 13.5 birds per 100 acres in lodgepole pine during a pine beetle epidemic, and was likely due to the ability of birds to nest in lodgepole pine. Three-toed woodpeckers may contribute to the control of spruce

bark beetle which may be a major food source during epidemics (Spahr et al., 1991). Fire suppression and clear-cutting of lodgepole pine may produce detrimental effects on local habitat.

NHP has records of American three toed woodpecker observations from areas adjacent to the landscape including the west side of the Deer Lodge Valley and upper Browns Gulch. One of these observations was recorded as part of LBMP.

Pileated Woodpecker

Pileated woodpecker habitat consists of late successional stages of coniferous or deciduous forest, as well as younger forests that have scattered, large dead trees. (Bull and Jackson, 1995; Aubry and Raley, 2002). This woodpecker is a primary cavity excavator and selects large snags or live trees with heartwood decay for nesting and roosting. Only large diameter trees support pileated woodpecker nesting needs, generally >65 cm dbh in the Pacific Northwest (Aubry and Raley, 2002). The large cavities in trees and hard snags resulting from pileated woodpecker excavation provide habitat and foraging opportunities to other species of birds as well as small mammals. Because of this relationship, Aubry and Raley (2002) propose that the pileated woodpecker is a keystone habitat modifier in the Pacific Northwest.

Pileated woodpecker diet consists primarily of wood-dwelling ants and beetles that are extracted from down woody material and from standing live and dead trees as well as the fruit and mast of wild nuts when available. (Bull and Jackson, 1995). During beetle outbreaks, the majority of this bird's diet may come from beetles. It has additionally been shown that this is effective in reducing beetle populations through direct mortality and by negatively affecting beetle habitat in host trees (Aubry and Raley, 2002). NHP does not have recorded observations of pileated woodpecker from the landscape.

Pool Habitat:

Cutthroat trout

Westslope cutthroat trout are described in Section IIB-1 Aquatic Habitat/Fisheries.

Regional Linkages

The landscape provides habitat for wide ranging species including transient grizzly bear, wolves, neotropical migratory birds, elk, mule deer, and moose. The landscape contains few barriers to long range movements of animals. Interior forest roads do not produce physical impediments to large animal movement. However, certain species which avoid human disturbance, such as grizzly bear, may avoid roaded areas. Human developments including Interstates 90 and 15 and towns in the Deer Lodge Valley are the greatest obstacle to movement of terrestrial species. Development of private lands will present the greatest challenges to maintaining habitat linkages to public lands. Managing for lower open motorized road densities can allow large mammals to move across the forest without major disturbance from vehicles. Secure areas for elk and grizzly bears can also provide core areas, linkage, and connectivity across forest landscapes.

2. Range of Natural Variability

The range of natural variability of wildlife populations and use patterns is inextricably tied to the natural variability of vegetation, disturbance regimes, and climate. The range of natural habitat variability included a mosaic of habitat types which at the local scale were constantly adjusting

based on current climate conditions and disturbance history but at the regional scale provided a more continuous range of habitat types. Climate trends were, and continue to be, a major catalyst affecting the location and relative abundance of a specific habitat.

Other factors prior to European settlement which affected habitat patterns include fire ignition by Native Americans which may have altered the fire frequency at low elevations. In the pre-European settlement environment, snags were likely abundant due to the ubiquitous nature of fire before fire suppression measures were adopted. Periodic underburns and insect outbreaks created pockets of tree mortality that provided forage for snag dependent species as well as provided a mosaic of vegetation successional classes. Beavers may have historically been a more significant element of disturbance and change in affecting the presence and type of riparian communities, as well as the retention of runoff in this otherwise arid landscape. Riparian areas were naturally in a better functioning condition providing habitat for a large number of species. Mature forest and old growth stands likely had a high snag density and a large amount of woody debris providing structural complexity needed for some species.

3. Desired Future Condition

FP (1987)

Discussion of the desired future condition specific to wildlife in the FP (1987) is limited to habitat improvement in the Douglas fir and sagebrush/grassland zones. However, habitat management in general is tied to the desired condition for watershed and vegetation discussed in sections IIB and IIC.

By the end of the first decade, 8,700 acres in the Douglas-fir and sagebrush/grassland zones will have been burned for wildlife habitat and livestock forage improvement. This will recreate the natural openings that existed before conifer encroachment and sagebrush invasion (pp II-10). By the end of the fifth decade, 17,400 acres in the Douglas-fir and sagebrush/grassland zones will have been burned – some of it for the third time – to improve wildlife habitat and livestock forage. This burning, which will be done on a twenty-year cycle, will have created a mosaic of age classes in these vegetative zones (pp II-11).

Goals

- To maintain habitat for current wildlife populations, and to increase big game habitat capacity above 1980 levels along the east side of the Deer Lodge Valley. (pp II-1)
- To contribute to the longevity of any threatened and endangered species by conducting management activities to prevent mortality. (pp II-1)

Objectives

- Wildlife and Fish - Forest resources allocated for elk will be increased, to support an additional 800 animals over 1980 levels on winter range in five areas: Elkhorns, Fleecer, Highlands, north end of the Flint Range, and the east side of the Deer Lodge Valley. Elk habitat capability will be maintained on the remainder of the Forest. Habitat improvement will center on prescribed burning and travel management. (pp II-2)
- Wildlife and Fish - Programs to enhance or maintain wildlife values will be implemented. (pp II-2)

- Threatened and Endangered Species - The Forest will participate in any future recovery goals set for Threatened and Endangered species. Reported sightings of grizzly bears, grey wolves, bald eagles and peregrine falcons will be followed up on. Procedural and biological requirements for sensitive species will be followed and their habitat protected. (pp II-3)

FSP

Goals

- Maintain patterns of terrestrial habitats within the range of natural variability.
- Provide habitat conditions suitable for the viability of communities of wildlife species at risk (threatened, endangered, proposed and R1 Sensitive Species) that occur in the landscape.
- Provide adequate snag habitat for wildlife needs.
- Provide habitat conditions within a range of natural variability necessary to support big game populations within FWP management goals.
- Provide habitat for species in need of large continuous blocks of habitat with relatively low human disturbance and development.

Objectives

- In accordance with fire protection standards, allow naturally ignited fire, insect and disease to affect vegetation within the range of natural variability to provide habitat for cavity-dependent, fire-associated, or species needing habitat provided by early through mid-seral vegetation. Implement mechanical treatments or management burns in fire adapted habitat types where full wildfire suppression is necessary.
- Achieve FP (1987) standards for snag management.
- Meet standards and objectives for elk security and objectives for hunting recreation opportunity spectrum maximum open road density, minimum % hiding cover, and elk effective cover % in the FP (1987).
- Coordinate elk habitat management and travel planning with the Montana Statewide Elk Management Plan (FWP, 2004) goals and FWP objectives for elk management in HD 215.
- Maintain or restore elk security areas through the protection of cover and assessment of road densities and travel management.
- Shift livestock use from riparian areas to uplands to improve riparian habitats.
- Maintain big game winter ranges through vegetative treatments, livestock and travel management to reduce winter game use of off-forest, private lands.
- Undertake a definitive survey for grizzlies, lynx, and wolverine; manage the landscape as occupied by these threatened and sensitive species unless definitive survey shows otherwise.
- Coordinate with FWS to develop and complete an acceptable protocol to survey lynx occurrence and habitat in the landscape.
- Manage blocks of suitable core/denning habitat for wolverine.
- Provide core areas, linkage and connectivity for elk and grizzlies across landscapes.