APPENDIX B
BLM BUTTE FIELD OFFICE
Biological Evaluation for Special Status Fish, Wildlife, and Plant Species, and Other Species of Interest.

Project: ____UPPER BIG HOLE EAST _____

Step 1a.	Step 1b.	Step 1c.	Step 2	Step 3.	Step 4.	Step 5.	Step 5.	Step 5.	Step 6.
List of all Special Status Species that are known or suspected to occur in the UBHE Project Area.	**Current Management Status of the Species.**	**Does the species occur on this portion of the Field Office?**	**Is the species or its habitat found in the surrounding area?**	**Could this proposal have any effect?**	**Are Irreversible or Irretrievable Resources involved?**	**Alt A level of effect**	**Alt B level of effect**	**Alt C level of effect**	**Alt D level of effect**
Canada Lynx (L*ynx canadensis*)	Threatened	Y (movement corridor)	Y	N	N	NI	NI	NI	NI
Grizzly Bear (*Ursus arctos horribilus*)	Threatened	Y (movement corridor)	Y	N	N	NI	NI	NI	NI
Greater Sage Grouse (*Centrocercus urophasianus*)	Canidate	Y	Y	Y	N	NI	MIIH	MIIH	MIIH
Mammals									
Gray Wolf *(Canis lupus*)	Sensitive	Y	Y	-Y	N	NI	MIIH	MIIH	MIIH
Birds									
Brewer's sparrow *(Spizella breweri)*	Sensitive	Y	Y	Y	N	NI	MIIH	MIIH	MIIH
Flammulated Owl *(Otus flammeolus)*	Sensitive	Unknown	Unknown	Y	N	NI	MIIH	MIIH	MIIH
Great Gray Owl *(Strix nebulosa)*	Senstive	Y	Y	Y	N	NI	MIIH	MIIH	MIIH

(Cont.) List of all Special Status	Current Managemen	Does the species	Is the species or	Could this proposal	Are Irreversible	Alt A level	Alt B level	Alt C level	Alt D level

Species/Species of Interest that are known or suspected to occur in the UBHE Project Area.	**t Status of the Species.**	**occur on this portion of the Field Office?**	**its habitat found in the surroundin g area?**	**have any effect?**	**or Irretrievabl e Resources involved?**	**of effect**	**of effect**	**of effect**	**of effect**
Northern Goshawk *(Accipiter gentilis)*	Sensitive	Y	Y	Y	N	NI	MIIH	MIIH	MIIH
Three-toed Woodpecker (*Picoides tridactylus*)	Sensitive	Y	Y	Y	N	NI	MIIH	MIIH	MIIH
Amphibian/reptiles									
Boreal/Western toad *(Bufo boreas)*	Sensitive	Y	Y	Y	N	NI	MIIH	MIIH	MIIH
Fish									
Westslope cutthroat trout *(Onchorhynchus clarkii lewisi)*	Sensitive	Y	Y	Y	N	MIIH	BI	BI	BI
Special Status Plants									
Lemhi beardtongue *(Penstemon lemhiensis)*	Sensitive	Y	Y	Y	N	NI	NI	NI	NI
Sapphire Rockcress (*Arabis fecunda)*	Sensitive	Y	Y	Y	N	NI	MIIH	MIIH	MIIH
Linear leaf fleabane *(Erigeron linearis)*	Sensitive	Y	Y	Y	N	NI	MIIH	MIIH	MIIH

NI - No Imp act

BI- Beneficial Impact

MIIH - May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

***WIFV** - Will Impact Individuals or habitat with a consequence that the action may contribute to the need for federal listing or cause a loss of viability to the population or species.

* triggers formal consultation process

NARRATIVE of POTENTIAL IMPACTS

LISTED SPECIES:

Grizzly Bear

Five areas in the lower 48 states currently support grizzly bear populations; these areas are located in Montana, Wyoming, Idaho, and Washington and include: the Yellowstone Ecosystem, Northern Continental Divide Ecosystem, Cabinet-Yaak Ecosystem, Selkirk Ecosystem, and Northern Cascades Ecosystem. These areas represent less than two percent of the grizzly's former range (USDI 1993).

Grizzly bear require large areas of relatively undisturbed land with food, cover, denning habitat, solitude and space for effective habitat. The Grizzly Bear Recovery Plan (USDI 1993) identified human depredation, competitive use of habitat, and livestock grazing (mostly due to domestic sheep) as sources of conflict.

Grizzly bear habitat across the region is best described in terms of the availability of large tracts of relatively undisturbed land that provides some level of security from human depredation and competitive use of habitat by humans (including roading, logging, grazing, and recreation) (USDI 1993). Effective habitat is often described in terms of core areas which are free of motorized access during the non-denning period (IGBC 1994). Open road and total road densities are important measurements in determining core areas and understanding the extent of habitat security for grizzly bears. Many studies have found that grizzly bears will generally avoid areas with open roads. Mace and Manley (1993) found that adult grizzly bear used habitat with open road densities greater than 1 mi/sq. mi less than expected.

The UBHE project area lies between the Greater Yellowstone and Northern Continental Divide ecosystems for the grizzly bear. Grizzly bear have been documented in southwest Montana. In the late 1990s, several grizzly bear tracks were documented in the Flint Creek mountain range. In 2002, a grizzly was videotaped while feeding on two moose carcasses in the John Long Mountains. In 2005, an adult male grizzly was found dead on the east end of the Anaconda range, and in 2008, a young male grizzly was captured near Drummond, on the north end of the Flint Creek Mountain Range (USDA 2011).

Most recently, a male grizzly bear was killed on the south end of Elk Park in June 2010 and a female with yearling were seen in the Anaconda-Pintler Wilderness in September 2010. All of these sightings constitute transient bears with occupancy yet to be corroborated by USFWS.

The project area is outside of identified recovery or distribution zones for the grizzly bear but unconfirmed grizzly bear sightings occasionally do occur in the Big Hole watershed. Due to existing disturbance and development from adjacent private lands, the project area most likely does not provide quality, secure habitat for the grizzly bear. The project area does, however, provide migration and dispersal habitat.

None of the alternatives are expected to have any effects on grizzly bear habitat or individual grizzly bears. Although grizzly bears have been identified in the area, there are currently no resident grizzly bears in the project area. All action alternatives would modify habitat but grizzly bears are likely transients in the project area and modification of habitats would not be expected to affect their movement. In addition, all action alternatives would be expected to improve habitat conditions for grizzly bears by increasing the quality and diversity of forage and prey for this species. Human disturbance would increase during project implementation as well as with an increase in road density under Alternative B but this would not be expected to prevent grizzly bear movement through the project area.

All action alternatives would have a "No Effect" determination for the grizzly bear.

Lynx

Lynx are found throughout Alaska and Canada, south through the Rocky Mountains, northern Great Lakes region, and northern New England. Resident populations currently exist only in Maine, Montana, Washington, Colorado, and possibly Minnesota (Ruediger et al. 2000).

The Canada lynx was listed as "threatened" under the Endangered Species Act in March 2000. In Montana, lynx habitat is dominated by lodgepole pine, Engelmann spruce, aspen, subalpine fir and cool, wet Douglas-fir. Snowshoe hare are the primary prey of lynx, comprising 35-97 percent of the diet. Other prey species include red squirrel, grouse, flying squirrel and ground squirrels. During the cycle when hares become scarce, the proportion and importance of other prey species, especially red squirrel, increases in the diet. However, Koehler (1990) suggests that a diet of red squirrels alone might not be adequate to ensure lynx reproduction and survival of kittens.

Snowshoe hares avoid clearcuts and very young stands and areas with greater interspersion of habitats may receive greater use by hares. Snowshoe hares prefer areas with dense protective understories composed of edible shrubs and trees (Ruediger et al. 2000). Population densities and overwinter survival are positively correlated with understory density, particularly of conifers that provide winter forage, thermal cover and escape cover. Overstory trees do not appear to be necessary, but may have the benefit of reducing snow accumulation.

During summer, snowshoe hares forage on a variety of forbs, grasses, and small shrubs. During the winter, food for snowshoe hares is limited to twigs and stems that are within reach above the snow surface. Small-diameter twigs (less than 0.4" in diameter) are preferred and may be necessary to maintain body weight.

In the Rocky Mountains, most lynx occurrences (83 percent) in Montana are associated with conifer forests and most (77 percent), are within the 4,920-6,560' elevation zone (Ruediger et al. 2000). Primary vegetation that contributes to lynx habitat is lodgepole pine, subalpine fir, and Engelmann spruce (Ruediger et al. 2000). Secondary vegetation that, when interspersed within subalpine forests, may also contribute to lynx habitat, include cool, moist Douglas-fir, grand fir, western larch, and aspen forests.

Primary vegetation that provide lynx habitat in Montana west of the Continental Divide is subalpine fir forest associations, generally between 4,000 - 7,000 feet. Cover types may be mixed species composition (subalpine fir, lodgepole pine, Douglas-fir, grand fir, western larch, and hardwoods) as well as pure lodgepole pine stands. Moist Douglas-fir and moist grand fir habitat types, where they are intermixed with subalpine fir habitat types, constitute secondary vegetation that may provide habitat for lynx.

On the east side of the Continental Divide, elevation ranges of subalpine forests are higher, roughly between 5,500 - 8,000 feet. Subalpine fir forests are the primary vegetation, and intermixed Engelmann spruce and moist Douglas-fir habitat types where lodgepole pine is a major seral species are secondary vegetation that may contribute to lynx habitat.

Dry forest types (e.g., ponderosa pine, dry lodgepole pine and dry Douglas-fir) do not provide lynx habitat.

Historically, fire has been a dominant influence within lynx habitat in the northern Rocky Mountains. Stand-replacing fires maintained a landscape mosaic that provided ideal snowshoe hare and lynx habitat (Koehler 1990). Non-lethal fires, avalanches, insects, and pathogens have also been important agents of disturbance, creating more structural diversity at a smaller scale.

Habitat types within the UBHE planning area were found to be predominately dry Douglas-fir habitat types (Douglas-fir/pinegrass) with dry lodgepole pine. Although lodgepole pine stands are found in the Alder Creek area and mixed stands of lodgepole pine and Douglas-fir are found at higher elevations in the Deno Creek area, these habitats were found to be dry with a lack of adequate understory vegetation to support high concentrations of overwintering snowshoe hare. Therefore, the project area does not provide suitable foraging habitat for lynx. The area does provide habitat (cover) for lynx moving through the area.

Habitat types within the UBHE planning area were found to be predominately dry Douglas-fir habitat types (Douglas-fir/pinegrass) with dry lodgepole pine. Although lodgepole pine stands are in the Alder Creek area and mixed stands of lodgepole pine and Douglas-fir are located at higher elevations in the Deno Creek area, these habitats were found to be dry or moderately moist habitats with a lack of adequate understory vegetation to support high concentrations of overwintering snowshoe hare. The previously harvested lodgepole pine stands identified for thinning under the action alternatives do not provide the structure or understory for high concentrations of snowshoe hares. Therefore, the project area is not considered to provide suitable foraging habitat for lynx. The area does provide habitat (cover) for lynx using the area as a migration or movement corridor.

Due to the type and quality of habitats (dry forest and lack of understory structure), none of the action alternatives would negatively impact forage habitat for lynx. Forest thinning and removal of conifers from sagebrush could reduce cover for lynx moving through the area but adequate cover would remain after implementation in adjacent stands and riparian restoration would also be expected to improve movement corridors for this species.

The UBHE project would have a “No Effect” determination for the Canada lynx.

CANDIDATE SPECIES:

Sage Grouse

Sage grouse are listed as a sensitive species by both the BLM and FS and as a species of concern by FWP. Few sightings of sage grouse have occurred and the habitat within the analysis area is outside of BLM’s Preliminary Primary Habitat (BLM, 2011).

Statewide, sage grouse numbers increased from the mid-1960s through 1973 and then remained relatively stable. Numbers declined rather sharply statewide from 1991 through 1996 and increased through 2000. The greater sage grouse was added as an Endangered Species Act candidate species in March 2010.

Sage grouse is native to sagebrush steppe of western North America, and their distribution closely follows that of sagebrush, primarily big sagebrush. Important seasonal habitats include breeding habitat (leks), nesting habitat, brood-rearing habitat, and winter habitat.

Leks are traditional breeding grounds for sage grouse. Leks are usually small openings surrounded by dense sagebrush that can be used for food and cover by the breeding birds. Lek activity extends from March to May and nests are located approximately 0.2 to 6.5 miles from the lek. After breeding, female grouse search for suitable habitat to lay eggs, sometimes within several miles of the lek but occasionally farther. No leks have been identified in the project area and the nearest potential lek is in Soap Gulch south of the Highland Mountains (it was last surveyed in 2004, and unconfirmed based on Montana Fish, Wildlife and Parks data). This lek is roughly 6 miles from the nearest edge of the project area and 23 miles from the furthest boundary.

Nesting habitat provides cover for the nest and frequently has a sagebrush canopy of 15 to 31 percent. Brood-rearing habitat consists of areas that have an abundance and diversity of succulent forbs, an important food source for young sage grouse. As the summer progresses and upland vegetation dries up, grouse broods will move to moist areas that still support succulent vegetation. Winter habitat is usually relatively tall and large expanses of dense sagebrush. The importance of shrub height increases with snow depth.

Hens with broods require well sheltered areas that provide protection from predators and weather within close proximity to preferred foods. After hatching, grouse generally use areas that have open sites for feeding on forbs and insects and small areas of dense sagebrush for roosting. As broods mature, the birds move to areas still supporting succulent vegetation, such as native meadows and riparian areas. These areas support forbs and insects and birds concentrate in these areas in late summer and early fall. As these areas dry, consumption of sagebrush increases and the grouse begin to move lower toward wintering areas.

Although there are no known sage grouse leks within or immediately adjacent to the project, sage grouse have been observed during the summer in the Jimmie New and Dickie Hills areas. Roughly 3,200 acres are in the Jimmie New and Dickie Hills areas are considered "occupied sage grouse habitat" by FWP.

Although some studies have demonstrated neutral or even positive effects on sage grouse habitats from fire (Rowland 2004), others have documented population declines and long-term habitat degradation. While some short-term benefits, such as increases in annual forbs, may accrue from prescribed burning, nesting cover, in particular, may be reduced and thus become less suitable (Rowland 2004).

A study in southeastern Idaho (Nelle et al. 2000) examined characteristics of 20 burns of differing ages and sizes in mountain big sagebrush-dominated communities in relation to sage grouse habitat. Canopy cover of forbs, grasses, and shrubs was measured, along with invertebrate abundance. The authors concluded that burning conferred no benefits to sage grouse nesting or brood rearing habitat, and that long-term

negative impacts resulted from fires in nesting habitat, due to the lengthy time (>20 years) for the sagebrush canopy to recover to suitable levels for nesting.

Retrospective studies of burns (5 to 43 year old) at Hart Mountain and Steens Mountain in southeastern Oregon revealed that key components of sage grouse habitat used during the breeding period were available in burned areas ranging from 25 to 35 years old (McDowell 2000). Sagebrush cover was the only habitat component "substantially affected" in the long term by burning (McDowell 2000). During the first 2 years after prescribed burning in mountain big sagebrush at Steens Mountain, forage quality (e.g., percentages of calcium and crude protein) was generally superior in burned sites compared to control sites (McDowell 2000).

BLM SENSITIVE SPECIES:

Three-toed Woodpecker

The three-toed woodpecker is both a BLM and FS sensitive species.

Three-toed woodpeckers are non-migratory residents and primary cavity nesters associated with trees characterized by scaly or flaky bark. The decay of trees is an important ecological process that affects the development of cavity habitat for avian species and some mammals. Cavities are usually created through the excavation activities of woodpeckers. Primary cavity excavators, such as three-toed woodpeckers can penetrate through the sound layer of sapwood and excavate a nest chamber in the softened heartwood. Because woodpeckers usually excavate a new nest each year, old nest cavities are available for secondary cavity users such as owls and flying squirrel that cannot excavate their own cavities.

Three-toed woodpeckers main prey consists of bark-boring insects such as the Douglas-fir beetle and the mountain pine beetle. These woodpeckers key in on forests suffering from insect epidemics, oftentimes after fire, or any event that causes stress to host trees that attracts insects.

Three-toed woodpeckers prefer areas where fire or insects have created large stands of dead trees (>15" DBH) for nesting. Although the home range size for the three-toed woodpecker is unknown, the project area would likely support multiple nesting pairs.

Northern Goshawk

The northern goshawk is currently listed as a sensitive species on all National Forests and on all BLM lands in Montana. Montana Fish, Wildlife and Parks identifies the northern goshawk as a species of concern.

Northern goshawks are forest raptors that prefer mature to old-growth forests, although they will use a broad range of forest conditions. Both single and multi-storied stands with relatively open understories are used. Goshawks hunt from tree perches for squirrels and birds and open canopies enhance prey detection and capture. Goshawks prefer vegetation structure that permits them to approach prey unseen and to use their flight maneuverability. Forest-meadow and forest-sagebrush grassland habitats are also considered to be important foraging habitat.

Goshawks in Montana tend to nest predominately in mature coniferous forests with a high canopy cover (70 percent) and little to sparse undergrowth (Kirkley 1996). All northern goshawk nest trees reported by Kirkley (1996) were either in lodgepole pine or Douglas-fir with an average DBH of 13"and average height of 72'. Within territories, northern goshawks often shift their breeding among several alternative nests up to 1 mile apart and forested landscapes need to provide for several nest stands distributed throughout goshawk home ranges. In the Big Hole watershed and the Pioneer Mountains, goshawk nests have been found in both Douglas-fir and lodgepole pine and most of the nest sites have been located at lower elevations. Forest management should focus on long-term management of structure suitable for goshawk nesting and foraging.

Generally, northern goshawks forage during short flights alternating with brief prey searches from perches. They also hunt by flying rapidly along forest edges, across openings and through open to moderately dense vegetation. An opportunistic hunter, northern goshawks prey on a wide variety of vertebrates and, occasionally, insects. Prey is taken on the ground, in vegetation, or in the air.

Goshawks are generalists when it comes to foraging, hunting beneath the forest canopy in dense and open stands and at forest-grassland and forest-shrubland ecotones, where they take a wide variety of prey that includes forest grouse, woodpeckers, corvids, lagomorphs, and squirrels.

Home ranges during the nesting season can vary from 200 to 9,000 acres depending on sex and habitat characteristics. Home ranges of males are typically larger than those of females. Exclusive of nesting areas, home ranges of adjacent pairs are not defended and may overlap. The core area (encompasses the nest site) constitutes 32 percent of the home range.

Goshawk activity is well documented in the analysis area with occupied nests found in both the Jimmie New and Alder Creek areas.

Roughly 10,230 acres of Douglas-fir and lodgepole pine forest provide habitat for nesting and foraging goshawks in the project area.

There are five known northern goshawk territories in the project area. One nest site in the Alder Creek area has not been occupied by goshawks since 2007 and the other is currently active. One nest site in the Jimmie New area fledged 2-3 goshawk young from 2007-2010 but fledged great grey owl in 2011. The other nest site in the Jimmie New area hasn't been active in recent years. The nest in the Quartz Hill area fledged 2 young in both 2009 and 2011.

Flammulated Owl

The flammulated owl is a BLM and FS sensitive species and a FWPs species of concern.

In Montana, flammulated owls are associated with mature and old-growth xeric ponderosa pine or Douglas-fir stands and in landscapes with forest of low to moderate canopy closure (Wright et al. 1997). They prefer mature growth with open canopy avoiding dense young stands. Flammulated owls are found in cooler, semi-arid climate, with a high abundance of nocturnal arthropod prey and some dense foliage for roosting.

Breeding habitat for flammulated owls consists primarily of mid-elevation, open ponderosa pine or Douglas-fir forests. They usually occur on lower and middle southern slopes and occasionally on ridgetops. Flammulated owls consistently select habitat that combines open forest stands with large trees and snags for nesting and foraging, occasional clusters of thick understory vegetation for roosting and calling, and adjacent grassland openings that provide optimum edge habitat for foraging. Flammulated owls are apparently a neotropical migrant that arrive in April and depart by the end of October.

There are no known flammulated owls in the project area and minimal surveys conducted for flammulated owls in the Pioneers did not detect this species (USDA 1998). Habitat is likely present in the planning area but may be poor quality to the flammulated owl due to the density of forested stands. Surveys will be necessary to understand if and how flammulated owls are using the area.

Westslope Cutthroat Trout

Westslope cutthroat trout, a BLM sensitive species and a State of Montana species of special concern, inhabit streams on both sides of the Continental Divide. Its eastside distribution in Montana is largely in the Missouri River drainage (Shepard et al. 2005). Westslope cutthroat distribution and abundance has declined substantially. Describing current westslope cutthroat trout distribution is complicated by an abundance of populations with varied levels of genetic purity. Shepard et al. (2005) used specific criteria to designate conservation populations. Conservation populations are those that are genetically unaltered, or those that are hybridized or the genetic status is unknown, but have ecological, genetic and behavioral attributes of significance. Populations that occupy habitat likely to become part of a westslope cutthroat trout conservation focus were also included.

Influences from nonnative trout and other factors have resulted in severely disjointed westslope cutthroat trout distribution patterns east of the divide. While westslope cutthroat trout conservation populations are present in a reasonable number of subwatersheds and 6th-code HUCs, they have been eliminated from most mid-sized and larger streams and rivers. This leaves harsh, less productive headwater streams as their most common refuge. Even in headwaters, they are often restricted to relatively short, stream segments where fish passage barriers protect them against upstream invasion by nonnative trout.

There are four primary reasons for the decline of this species. First, habitat has been loss due to poor grazing practices, historic logging practices, mining, agriculture, residential development, and the lingering impact of forest roads. Fish have been unable to use spawning habitat due to dewatering of streams for irrigation and because of barriers created by dams and road culverts.

Second, non-native species (brook trout, lake trout, brown trout, and northern pike) out-compete juvenile cutthroat trout for food or prey on cutthroat trout. Barriers that disrupted historical migration routes for westslope cutthroat trout have sometimes served to protect them from non-native species.

A third reason for decline is hybridization with other species. Westslope cutthroat trout hybridize with rainbow trout and other non-native cutthroat trout subspecies. Many remnant genetically pure cutthroat trout populations, on both sides of the Continental Divide, are located above barriers that protect them from non-native species.

The fourth cause of decline has been overfishing. Westslope cutthroat trout are highly susceptible to angling (Behnke 1992) but it is uncertain how much of an impact this has had on the species' overall decline.

Two streams provide habitat for westslope cutthroat trout in the project area, Cat Creek and Harriet Lou Creek. Westslope cutthroat trout in both Cat Creek and Harriet Lou were found to be 90-99 percent genetically pure.

Other stream that support westslope cutthroat trout in the analysis area outside of BLM lands include Bear Creek (99-100 percent pure), Johnson Creek (90-99 percent pure), Alder Creek (hybridized), Jerry Creek (<90 percent pure), and the Big Hole River (hybridized).

Gray Wolf

In 1973, wolves were classified as "endangered" under the Endangered Species Act (ESA). The recovery plan for the gray wolf identifies three recovery areas; Central Idaho, Northwest Montana, and the Yellowstone Recovery Areas. The project area is within the Yellowstone Nonessential Experimental Population for the gray wolf where wolf populations were managed with more flexible options than an endangered or threatened population. In March 2008, however, the gray wolf was de-listed from the ESA. The BLM still considers the wolf a sensitive species.

Key components of wolf habitat include sufficient year-round big game prey base and secluded denning and rendezvous sites with minimal exposure to humans. Wolves can live in any kind of natural habitat north of 20 degrees north latitude occupied by ungulates including; forests of all types, rangelands, shrubland, steppes, agricultural lands and wetlands. Wolves do not have any particular habitat requirement except for avoiding areas with heavy human use. The gray wolf is territorial in most areas.

The number of individuals in a pack and the availability of prey determine territory size; packs dependent on migratory prey tend to have the largest territories. Daily pack movements vary and distances traveled are greater in winter than in summer. Lone wolves cover larger areas than packs and their use areas may overlap two or three pack territories (Mech 1973 and Fritts and Mech 1981).

Wolves may use den sites from year to year and certain areas may contain several den sites that are used in different years by wolves (USDI 1987). Wolf packs appear sensitive to human disturbance near den sites and may abandon the site (Ballard et al. 1987). Subsequently, most den sites are located away from roads, trails and backcountry campsites. During spring and summer, a reproductive pack's movements are centered around the den and rendezvous sites. Rendezvous sites refer to specific resting and gathering areas used by wolves during the summer and early fall and are important rearing areas for pups once they have left the den site. Several rendezvous sites are used with the first one generally located between 1-6 miles from the natal den. Rendezvous sites are used by a pack until the pups are mature enough to travel with the adults, generally early autumn.

Wolves prey primarily on large wild mammals, such as deer, elk, moose and bighorn sheep. However, wolves are opportunistic feeders eating a wide variety of food including cattle, sheep, horses, dogs, birds, small mammals, fish, plants, and fruits. Prey items often depend on availability and ease of capture. Wolves are also successful scavengers.

The project area is within occupied gray wolf habitat and gray wolf sightings are common in the Big Hole watershed. Individual wolves and entire packs in the Big Hole watershed, however, are often subject to lethal removal due to livestock depredation.
There are no known packs within the planning area but individual wolves are known to move through the area.

No denning habitat or rendezvous sites have been observed in or near the project area but wolves could use the area for hunting.

Great Gray Owl
The great gray owl is a BLM sensitive species and a FWP species of concern.

Great gray owls are the largest owl species in North America and are known to use lodgepole pine and Douglas-fir forests in Montana. Great gray owls prefer dense forests interspersed with open meadows and clearings. They forage in wet meadows, coniferous forests and meadows in mountainous areas.

Great gray owls nest in the tops of large broken-off trees, in old nests of other large birds (hawk or raven nests), or in debris platforms from dwarf mistletoe, frequently near wet meadows and/or clearings. Nests are frequently reused and the same pair often nests in the same area in successive years. Small mammals, especially rodents (i.e. voles) are the dominate prey over most of their range. Pocket gophers can also dominate the diet of great gray owl. They usually forage in open areas where scattered trees or forest margins provide suitable sites for visual searching. They also use sound to locate prey under snow cover. The average home range size for breeding adults is between 650 and 1,000 acres. Both adult and juvenile great gray owls have been observed in the Pioneer Mountains (USFS 1998) and in the planning area.

A study by Bryan and Forsman (1987) found that out of 63 nests surveys, 60 were within 0.2 mile from a meadow. All forests were in old-growth or mature stands characterized by relatively large overstory trees. Forty-four of the 63 sites had been subjected to selective logging within the previous 20 years but all sites contained some areas of fairly dense forest. Stand structure, canopy closure, tree species composition, and distance to the nearest meadow at nest sites were variable. Canopy closer was found to range from 15-70 percent. This study indicated that great gray owls are likely flexible with most nest site parameters.

The project area as well as the larger analysis area provides nesting and hunting habitat for the great gray owl. Known nesting by great gray owls has occurred in the Alder Creek and Jimmie New areas.

Boreal Toad
The boreal toad is classified as a sensitive species by both the BLM and FS and is ranked a species of concern by FWP.

Habitats used by the boreal toad include low elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, marshes and high elevation ponds.

Forest cover around occupied montane wetlands used by the boreal toad may include aspen, Douglas-fir, lodgepole pine, Engelmann spruce and subalpine fir. Normally boreal toads remain fairly close to ponds, lakes, reservoirs, and slow-moving rivers and streams during the day but

they can range widely at night. Eggs and larvae develop in still, shallow areas of ponds and lakes or in pools of slow-moving streams, often where there is sparse emergent vegetation. Adult and juvenile boreal toads dig burrows in loose soil, use burrows of small mammals or occupy shallow shelters under logs or rocks.

The diet of adult boreal toads includes; spiders, daddy longlegs, and millipeds, ants, ground beetles, snails, crayfish, and earthworms.

Generally, boreal toads are active during the day and night; juveniles are largely diurnal while adults tend to be nocturnal, except in spring. The active period typically begins in April or May and extends to September or October, depending on elevation and latitude.

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 and American robin. Predators of toad tadpoles include; mallard, spotted sandpiper, western terrestrial garter snake and diving beetle larvae.

Although the project area provides small amount of suitable habitat for breeding boreal toads, both the larger analysis area and backwater habitat along the Big Hole River certainly do. The entire analysis area also provides dispersal habitat for the boreal toad. Although the project would not alter or impact breeding habitat, the proposed units and roads could be located within an area where boreal toads may be dispersing between habitats.

Brewer's Sparrow

The Brewer's sparrow is a BLM sensitive species. Brewer's sparrows are considered to be near sagebrush obligates and are found in sagebrush dominated sites. Brewer's sparrows tend to nest in sagebrush averaging 16" high and cover (concealment) for the nest provided by sagebrush is very important. The diet of the Brewer's sparrow is predominately insect (70-80 percent) but grass seeds will also be used. Statewide, the species nests from mid-June to mid-July.

The project area provides 5,866 acres of habitat for the Brewer's sparrow habitat for this species is in decline due to conifer colonization. Roughly 1,855 acres (32 percent of available habitat) of sagebrush meadows in the project area have more than 20 percent encroachment by conifers.

Information regarding the effects of grazing on Brewer's sparrow populations is limited to descriptive or correlative data. In the northern Great Plains, Brewer's sparrow abundance in shrubsteppe was highest in lightly grazed areas and lowest in heavily grazed areas (Kantrud and Kologiski 1983). In transition zones between shrubsteppe and shortgrass prairie, abundance was highest in moderately grazed and lightly grazed areas, most likely because grazing resulted in higher shrub density (Kantrud and Kologiski 1983). In central Montana, Brewer's Sparrows occurred at higher densities and had higher nesting success on ungrazed plots than on adjacent grazed plots (Logan 2001). In southeastern Idaho, Reynolds and Trost (1980) found similar numbers of Brewer's Sparrow nests on nearby grazed and ungrazed plots.

In the Okanagan Valley of British Columbia, 86 percent of breeding territories were located in areas with >25 percent cover of native, climax vegetation (i.e., those in "fair" to "good" range condition), whereas only 14 percent occurred in areas with <25 percent cover of native, climax

vegetation (i.e., those in "poor" range condition) (Sarell and McGuinness 1996). Individual-level effects of grazing on Brewer's Sparrows appear to be poorly known, but cattle occasionally trample low-lying Brewer's Sparrow nests or dislodge them from nest shrubs.

Species of Interest

Mule Deer

In western Montana, mule deer prefer open montane habitats and sagebrush slopes. Although mule deer are commonly thought to be entirely browsers, they are actually intermediate feeders and eat about equal proportions of woody browse and herbaceous forbs (Foresman 2001). Bitterbush, mountain mahogany, chokecherry, sagebrush, serviceberry, grasses and forbs are all important to mule deer. Forbs were found to be the most important in summer with shrub browse used yearround and most important in the fall, winter (especially sagebrush) and spring. Grass is a minor item in mule deer diet although it is used in the spring. Generally in coniferous forests of western Montana, browse is used throughout the year and accounts for 50-60 percent of the total intake, with forbs accounting for 30 percent and grass 10-20 percent.

Mule deer use an area from 100-2,500 acres depending on the abundance and quality of food and cover. During the day, animals seek out rougher habitat which provides more protection from human disturbance and native predators.

Seasonal home ranges occur in some portions of Montana, including the analysis area. Where migrations occur, movement to higher elevation summer ranges begins in spring as snow melts and births approach. In autumn, snows reduce forage availability and force animals down to lower elevations.

The entire north side of the project area (Charcoal Gulch, Jimmie New and Dickie Hills) is considered winter range for mule deer by FWP, roughly 13,400 acres. The windswept sagebrush meadows provide crucial browse for wintering mule deer.

Population estimates from winter flights over the last 10 years range from a low of 74 in 2009-2010 to a high of 305 in 2003-2004. The population estimate from winter surveys in 2011 was 156 animals with the majority of deer found on the Charcoal Gulch area.

Moose

Moose are closely associated with densely forested and riparian habitats and depend upon woody vegetation, preferably in early successional stages that occur following disturbances (Foresman 2001). Moose tend to use mountain meadows, river valleys, wetlands, and clearcut areas in the summer and utilize willow flats and mature coniferous forests in the winter. They prefer feeding on forbs and aquatic or woody vegetation depending on the season. Moose are primary browsers and select willow and aspen but forbs may be heavily used during summer and fall. Grasses are seldom a primary food source. When moose use upland habitats, such as the project area, aspen becomes an important component of their habitat. Many understory shrubs associated with aspen stands are palatable and sometimes important moose browse (USDA 1985). In Montana, ideal upland moose habitat has been described as having a good distribution of aspen and associated trees and shrubs in a mosaic of age classes. Regeneration of young vigorous stands of aspen, willow and associated shrubs, usually after fires, improves moose habitat and can result in an increase in the moose population.

Black Bear
Black bears are common inhabitants of coniferous forests and can be found in dense forest, riparian areas or along open slopes. Black bears use areas with abundant down wood and dense thickets of shrubs and smaller trees adjacent to or within mature forests.

Bears are active from early spring through late autumn, most often during daylight hours (Foresman 2001). During spring, summer and early autumn black bears forage, rest or sleep under fallen logs or within dense brush stands. In October, black bears seek out den sites for the winter. Den sites may be constructed at the base of a hollow tree or under fallen logs, although rock cavities and ground dens excavated into hillsides are also used.

The black bear is omnivorous, although most of their diet is of plants (Foresman 2001). Habitat use is tied to seasonal food availability and plant phenology. Dry mountain meadows are commonly used in the early spring while snow slides, stream bottoms, and wet meadows are used in early and mid-summer. Black bears will concentrate in berry fields and whitebark pine areas in fall. A large portion of the black bear diet can consist of insects, but berries, fruits, grasses, sedges and inner bark are also used. Black bear will also feed on carrion, rodents, and occasionally, ungulates (especially young and domestic).

Pine Marten
Mesic, coniferous forests dominated by subalpine fir, Douglas fir, and lodgepole pine support the American (pine) marten in Montana, particularly stands at late successional stages. Pine marten prefer dense, mature coniferous forest or mixed forest with high overstory density. Structural complexity at ground level is important for protection, thermal cover, and providing habitat for prey species and this type of complexity (shrubs and down woody material) is more abundant in older age stands.

The physical structure of older-aged forested stands provides den sites as well as resting areas and large trees, logs, snags and rock outcroppings are most commonly used. Den sites are often in tree cavities. Red squirrel middens or tree boles are used as daily resting sites during warmer periods but as temperatures fall, martens take refuge in subnivean spaces provided by down wood.

Pine martens are active throughout the year with diurnal activity during summer months and more nocturnal activity during winter. Martens use a wide variety of prey species and plant material. In spring and summer, small mammals, birds and insects make up most of the diet. Pine martens will also eat berries and fruits as they become available in the fall. In winter, martens are adept at foraging under the snow, feeding on voles and mice. Snowshoe hares and red squirrels are also important prey during the winter.

Marten do not appear to be dependent on old growth forests in southwest Montana but they do prefer traits associated with mature timber stands, such as large diameter trees and down woody material. Fragmentation through the creation of small uniform blocks that optimize edge may fragment otherwise contiguous pine marten habitat.

Pine marten have been documented in the project area. Dense forest stands and pockets of down woody material provide habitat for the pine marten throughout the Analysis Area. Pine marten have been heavily trapped in the Pioneer Mountains (USDA 1998).

Pileated Woodpecker
Any forest type (broadleaved, coniferous, or mixed) can sustain pileated woodpeckers as long as there are trees large enough for roosting and nesting. Pileated woodpeckers are often associated with mature and old-growth forests and nest cavities are excavated in large diameter dead trees. Only large diameter trees have enough girth to contain nest sites. Nest cavity excavation is from early March to the end of May and young leave the nest in mid-July. Pileated woodpeckers eat wood-boring insects as well as other insects found in trees and dead and down wood, including long-horned beetles and, especially, carpenter ants. Fruits and nuts may also be used at times.

The pileated woodpecker is a resident species in Montana. However, they do migrate from their breeding areas to lower elevations or into streamside forests to overwinter.

Pileated woodpeckers play an important role within their ecosystems by excavating nesting and roosting cavities that are subsequently used by many other birds and by many small mammals, reptiles, amphibians, and invertebrates.

Pileated woodpeckers have been observed in the Jimmie New area of the analysis area. Large diameter snags provide suitable habitat for the pileated woodpecker throughout the Analysis Area.

Elk
The UBHE project area is within Hunting Districts 319 and 332 of the Fleecer and Elk Management Units (EMU).

Fleecer EMU
The Fleecer EMU is located southwest of Butte and encompasses the Fleecer Mountains and a portion of the Anaconda-Pintler Range. The EMU encompasses approximately 630 square miles and is moderately steep with generally good elk security cover.

About 80 percent of the unit is in public ownership, with the majority of acreage managed by the FS. The BLM manages important winter range near Wise River, Fleecer Mountain, and scattered parcels in the Big Hole watershed. The FWP-owned Fleecer and Mount Haggin Management Areas are also located in this EMU. About 20 percent of occupied elk habitat occurs on private ground and some of these areas provide important elk winter range.

There were substantial population increases from 1997-2004 in this EMU as a result of mild weather conditions not conducive to harvest, restrictive hunting seasons, secure fall habitat, and movement of elk from the Pioneers and Highlands to the Fleecer winter range in early 1997. Population estimates for the last 10 years range from a low in 2009 of 593 animals to a high of 1,601 in 2003. The population estimate from winter flights in 2011 was 818 with the majority of these animals in the Fleecer Face area. Of these 818 animals, roughly 100 were seen in the Charcoal Gulch area, 125 in the Johnson Creek area and approximately 40 in the Dickie Hills area.

Pioneer EMU

The Pioneer EMU is located west and north of Dillon and extends to the Big Hole valley. The EMU encompasses approximately 2,040 square miles and is moderately steep with generally good elk security cover. Approximately 55 percent of this EMU is within the Beaverhead-Deerlodge National Forest. The BLM administers several large blocks of land, located mostly in the Rocky Hills and in the southern portion of the East Pioneers. Elk observed on aerial flights within the entire EMU have decreased since 1992 due to liberalized hunting seasons, low calf recruitment and some overwinter mortality during the winter of 1996-1997 (MFWP 2004). Surveys of the East Pioneers (including the project area), however, did not show the same trend as the overall EMU, with between 1,000 and 1,400 elk counted annually between 1993 and 2004 and again in 2007. Aerial surveys did show a substantial decline in elk counted during 2005, 2006 and 2008.

Elk utilize the majority of vegetation types found within the project area but use is related most often with the distance between forest and nonforest communities (Skolvin 1983). This relationship is assumed to be due to elk dependence on security cover and the diversity of forage available in transitional areas. Elk are both grazers and browsers and their forage preferences vary among seasons and years and are strongly related to forage availability.

Three areas are commonly used to discuss elk habitat (habitat effectiveness, elk vulnerability and winter range). Habitat effectiveness generally refers to non-hunting, spring and summer conditions. Elk vulnerability specifically applies to elk security during the hunting season, and winter range refers to elk habitat during the winter period (Christensen et al. 1993). Winter range is often considered the limiting factor for elk population size; therefore, providing secure winter range and secure access to that range is crucial for maintaining elk populations.

Roads and trails can affect elk vulnerability during the hunting season and cause disturbance or displacement at all times of the year (on winter range, calving/nursing areas and summer range), resulting in negative influences on elk populations.

Thermal cover is often quantified as percent canopy cover and provides shelter against extreme temperatures, solar radiation, and wind (Mysterud and Ostbye 1999). Overstory cover provides benefits to elk, deer and other wildlife by moderating weather extremes including reducing snow depths and reducing wind velocities. Cover can be a forest overstory to provide protection from winter cold or summer heat, or topography such as a steep ravine. Conifer trees are superior to deciduous trees in providing winter cover and dense stands with tall crowns are superior to those stands with fewer trees and short crowns (Skovlin et al. 2002).

Thermal cover is needed to help large ungulates maintain an energy balance between fixed body temperature demand and extreme ambient temperatures (Skovlin et al. 2002). By reducing body heat loss, more energy is available for activity and reproductive processes. Conversely, elk use thermal cover in the summer months to dissipate body heat and reduce or limit water loss (Skovlin et al. 2002). This suggests that forest restoration activities could have negative effects on deer and elk by exposing them to more extreme weather. In extreme heat and cold temperatures elk and deer will minimize travel and seek areas with thermal cover to conserve energy (Skovlin et al. 2002).

The abundance and availability of winter browse interspersed with thermal cover provides ideal winter habitat for deer. Deer seek shelter at lower elevations as the snow becomes deep. When all other factors are equal, deer will respond to cold weather by moving to warmer exposures, and to the warmest sites on those exposures. Vegetative cover has a positive relationship with site temperature. With the exception of ambient temperature and atmospheric moisture, the depth of ground-surface snow can induce more response in deer than any other weather

element (Wood 2004). In addition, locations used by deer are often south and east facing shrub and open timber types and shrub-understory types. These areas typically have significantly less surface snows than other exposures in the same area (Wood 2004).

Optimal winter ranges has been found to contain thermal cover consisting of coniferous trees of at least pole-sapling stage, with 75 percent canopy cover. Optimal summer thermal cover was found to contain trees that are pole-size or larger and has 60 percent canopy cover (Hoover and Willis 1987).

Elk may be less affected by environmental extremes than the smaller mule. A study in the Bitterroot Valley, Montana, predicted elk winter bedding areas based on wind, ambient temperature, and solar radiation. Recently it has been suggested that thermal cover is not as important to elk performance as previously proposed. Cook et al. (1998) questioned the importance of thermal cover and its relation to elk condition and found no positive effect on body condition of elk during four winter and two summer experiments. Energetic benefits of thermal cover seemed inconsequential and it was suggested that forage was the primary mechanism through which habitat influences individual animal performance (Cook et al. 1998). A study of radio collared elk in the Mount St Helens blast area found elk to have used open cover types (less than 15 percent canopy cover) during the summer midday far more than in the closed canopy types (greater than 15 percent canopy cover) under all solar radiation conditions (Wood 2004). Irwin and Peek (1983) found that forests classified as both thermal and hiding cover were used by elk proportionately less than availability during the fall, and elk used lower seral stage stands that produced more forage.

While deer and elk habitat selection sometimes appear to be of thermal benefit, their habitat use patterns must ultimately be optimized in response to perceived total costs and benefits. For example, ungulates might choose habitats with low snow cover and more available forage over habitats that protect them from cold temperatures. If the thermal costs of remaining in the open were counterbalanced with opportunities for increased energy intake, then an animal's choice would not be directly based on thermal cover availability alone (Wood 2004). While thermal cover is an important consideration in mule deer and elk management, it should be evaluated relative to the broader trade-offs with a loss of forage. Under most conditions cover does not function as an independent element in determining distributional patterns of deer. Deer tend to show preference for habitats which provide food or food and cover, and rarely use areas with little forage regardless of cover characteristics.

Hiding cover is used for protection from predators and humans. Deer and elk rely on vegetation and/or topography for concealment from predators. This allows them to run effectively through dense vegetation to escape. A qualitative measure of hiding cover is sight distance, which is a function of stem density and understory forest vegetation (Skovlin 1982). Patches of hiding cover as small as 2 to 10 acres may be sufficient for social groups of deer. Optimum distribution of hiding cover across a landscape consists of continous, interconnecting zones, and scattered patches vegetative cover. In a mule deer habitat use study in the Missouri Breaks, Mackie (1970) reported maximum numbers of deer occurred in well developed coniferous stands that provided relatively high levels of hiding cover. These stands were considered the most important habitat type for bedding (Mackie 1970).