

Crossons-Longview Forest Restoration Project Environmental Assessment

Wildlife Specialist Report V4



South Platte Ranger District
Pike National Forest
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1. INTRODUCTION

The purpose of the Crossons-Longview Forest Restoration Project is to restore sustainable forest conditions that are resilient to fire, insects, and diseases, while providing for diverse wildlife habitats, recreational opportunities, and sustainable watershed conditions. The specific purposes of this project are:

- To reduce the potential of large-scale, high-intensity wildfire with uncontrollable fire behavior, such as active crown fire.
- To reduce the potential that a wildfire would negatively affect public water supplies from subsequent severe flooding and sedimentation.
- To improve forest health, vigor, and resilience to large-scale fire, insects and disease.
- To enhance wildlife habitat through the reduction of the potential for high-intensity wildfires, enhancement of shrublands and aspen habitat, and Pawnee montane skipper habitat.

This report evaluates predicted effects of the Crossons-Longview Project on United States Department of Agriculture, Forest Service (USDA Forest Service) Region 2 sensitive species and Management Indicator Species (MIS) on the Pike National Forest, South Platte Ranger District. Threatened and endangered species are discussed in a separate Biological Assessment/Biological Evaluation (BA/BE) report.

The Forest Service has established direction in Forest Service Manual 2672.4 and Region 2 FSM 2670 Supplement 2600-2013-01 to guide habitat management for proposed, endangered, threatened, and sensitive species. The National Forest Management Act of 1976 directs the USDA Forest Service to manage habitats to maintain viable populations of existing native and desired non-native vertebrate species. In accordance with 36 Code of Federal Regulations (CFR) 219.19, fish, wildlife, and plant MIS are selected as a basis for evaluating the potential effects of federal actions on the forest biota. The purpose of this report is to evaluate Region 2 sensitive species and MIS that may be affected by Alternative B - Proposed Action.

2. PROJECT DESCRIPTION

The South Platte Ranger District of the Pike and San Isabel National Forest proposes to treat 9,574 acres within the 22,729 acre Crossons-Longview Project Area to move the montane forest ecosystem towards historic conditions. The proposed actions would alter forest stand and understory conditions and would be accomplished by a combination of mechanical harvesting and hand treatment. Specific actions would be dependent on site-specific conditions and the vegetation type; however, actions would include thinning, created openings, and prescribed burning. Professional judgment would be used, within guidelines identified in the Environmental Assessment and taking into consideration the terrain and vegetative type, to determine which one or combination of treatments are most appropriate for individual treatment sites. Approximately 55

Crossons-Longview Forest Restoration Project

percent of the treatment areas are located within 0.5 miles of existing roads, with 33 percent of those areas treated by hand due to slopes between 35-60 percent. Approximately 61 percent of the treatment areas lie on slopes of 0-35 percent and would be considered appropriate for treatment with traditional harvesting equipment and commercial product removal. The treatments on slopes between 35-60 percent would likely be hand treatments. Where possible, vegetation treatments would take into consideration previously treated areas and/or past burned areas in order to increase the overall landscape benefit.

The Proposed Action does not include the establishment of any new system roads, however, approximately 10 miles of temporary roads would be used to access the proposed action treatment areas. The target vegetation areas are identified on Table 1 and Figure 1. It is expected that project activities would take approximately 10 years to treat the proposed treatment area.

Table 1. Crossons-Longview Alternative B - Proposed Treatment Areas

Vegetation Type	Area (acres)	Percentage of Total Treated Area (%)
Xeric Ponderosa pine	4,581	49%
Mesic Ponderosa pine	3,684	38%
Mixed Conifer	603	6%
Lodgepole pine	557	6%
Aspen	121	1%
Shrubs	28	<1%
Total	9,574	

Alternative C was developed in response to a concern that increasing access through the use of temporary roads would cause some negative effects. Alternative C proposes that minimal temporary roads will be built to accomplish the project's purpose and need. Temporary roads would be limited to short segments needed to accomplish the treatments, such as jump-up spurs. Relying solely on the existing road network will lessen the ability for product removal and will shift treatment methods toward more mastication and hand thinning. This alternative seeks to balance forest restoration with concerns about expanding the existing road network.

Because minimal temporary roads will be constructed, all treatment must occur off of existing roads, limiting the area that can be treated. It is assumed that all treatment will occur within 0.5 miles of existing roads, reducing the available treatment area to 6,325 acres. Table 2 presents the proposed treatment area by vegetation type for Alternative C.

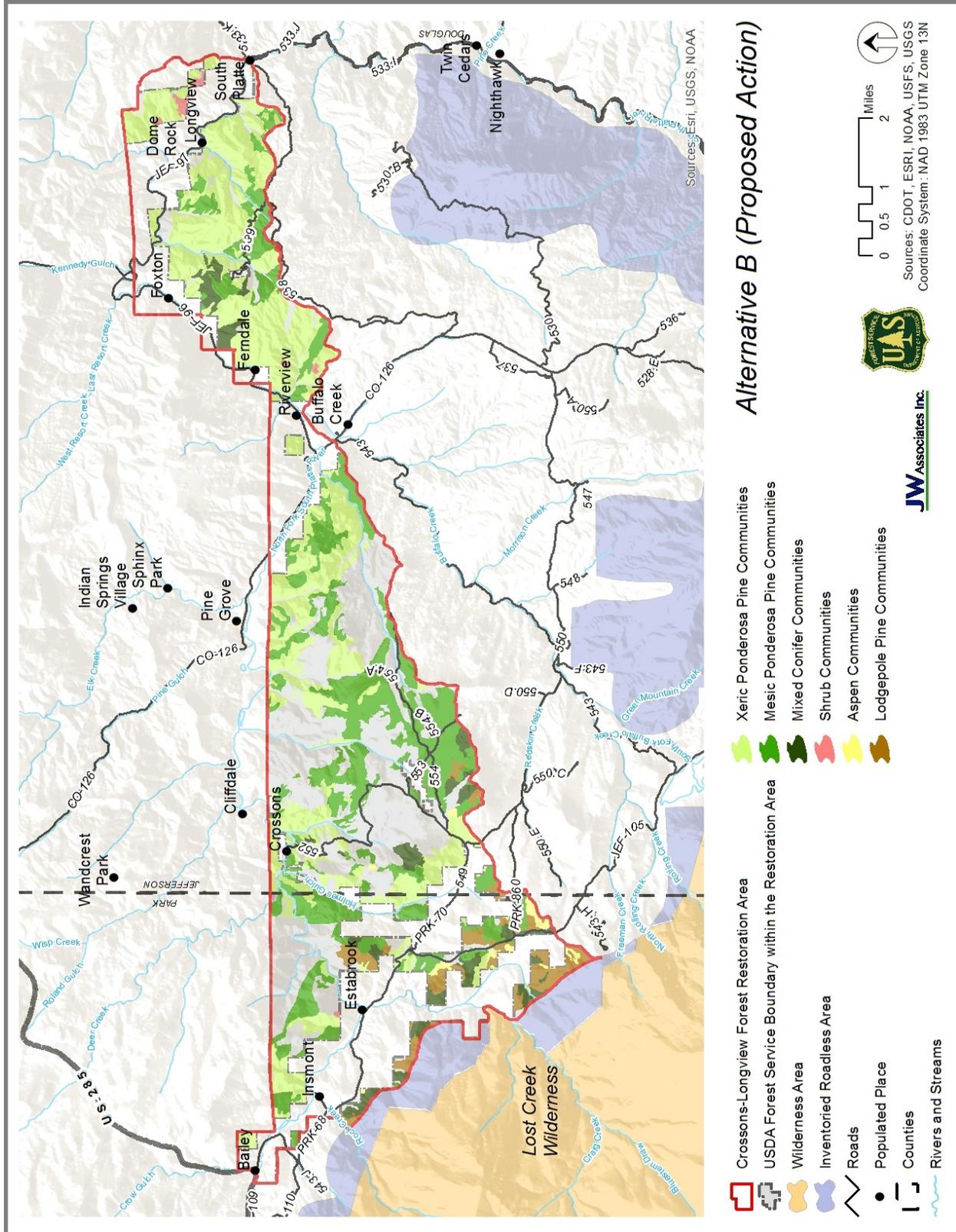


Figure 1. Crossons-Longview Treatment Area Map

Table 2. Crossons-Longview Alternative C Proposed Treatment Areas

Vegetation Type	Area (acres)	Percentage of Total Treated Area (%)
Xeric Ponderosa pine	2,919	46%
Mesic Ponderosa pine	2,500	40%
Mixed Conifer	422	7%
Lodgepole pine	354	6%
Aspen	115	1%
Shrubs	16	<1%
Total	6,326	

3. REGULATORY FRAMEWORK

This environmental analysis is tiered to:

- ◆ The 1984 Forest Plan, as amended (USDA Forest Service 1984).
- ◆ Forest Plan Amendment 30, Management Indicator Species, August 2005 (USDA Forest Service 2005). This forest plan amendment removed MIS status from those species: 1) for which population trends cannot be monitored at the National Forest/Grassland scale; and/or 2) whose population changes are not indicators of major management activities; and/or 3) that are indicators of similar land types or habitats

Other regulation and policy measures relevant to actions in the Crossons-Longview Project Area include the following:

- ◆ Migratory Bird Treaty Act of 1918 (16 US Code 703-731), which manages and protects migratory bird species through consultation with state and local governments and protection of land and water resources necessary for the conservation of migratory birds. Under the act, taking, killing, or possessing migratory birds is unlawful.
- ◆ The Bald and Golden Eagle Protection Act of 1940 (16 USC 668), amended in 1962 to include the golden eagle, prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions.
- ◆ Executive Order 12962 – Recreational Fisheries, dated June 7, 1995, which directs federal agencies to conserve, restore, and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide.
- ◆ The Region 2 Watershed Conservation Practices Handbook (Forest Service Handbook R2 Supplement 2509.25), which contains proven watershed conservation practices to protect soil, aquatic, and riparian systems. If used properly, the watershed conservation practices meet applicable federal and state laws and regulations, including state best management practices. Forest Supervisors and District Rangers are

responsible for implementing the applicable management measures and design criteria from this handbook, or acceptable alternatives that meet applicable legal and regulatory requirements.

4. ANALYSIS METHODS

Project conservation measures as described below would provide protection for sensitive species habitat in the planning area.

- ◆ Leave-tree spacing will be variable and retain the natural clumpy characteristics in the treated stand.
- ◆ Larger trees will generally be retained; trees identified as older than 150 years are to be retained.
- ◆ Existing snags will be retained where they are not a hazard.
- ◆ Resources will be monitored to ensure management objectives are achieved.
- ◆ All unclassified access routes and paths used to remove logs will be obliterated and rehabilitated within two years of treatment.
- ◆ Best management practices will be followed to limit the spread of noxious weeds in the treatment areas.
- ◆ Best management practices will be followed to limit soil erosion and maintain water quality.

In addition, conservation measures designed for specific threatened and endangered species including Mexican Spotted Owl, Pawnee Montane Skipper and Preble's Meadow Jumping Mouse as described in detail in the project Biological Assessment may provide additional protection measures for sensitive status species that utilize the same habitat as these species.

The project will include the following design features to minimize impacts to sensitive species and migratory birds:

Raptors and Migratory Birds

1. If an active raptor nest is discovered, or if a nest is suspected due to agitated behavior of a raptor, the feature or incident will be reported to the appropriate Forest Service officer. Protection measures may be implemented as determined by a Forest Service wildlife biologist.
2. Workers shall be alert for the presence of nesting birds, especially raptors, and should not fell trees with nest structures or cavities in them, even if the structures are vacated at the time.
3. The establishment of spatial and temporal restrictions for active nest sites may be adapted from guidelines outlined in the most recent version of the Colorado Parks and Wildlife recommended nest buffer zones and seasonal restrictions for raptors.
4. To the greatest extent practical, limit any mechanical treatments (logging/thinning activities) or prescribed burning from May 1st to August 15th to avoid disrupting migratory birds during the breeding season.

Northern goshawk: Surveys for goshawk nest stands will be conducted in the breeding season prior to treatment. Where nest stands are found, a 30-acre no-treatment zone will be designated, and further restrictions from the CPW recommended nest buffer zones for raptors may also be applied.

5. EXISTING CONDITIONS

This section describes the environmental baseline for each species assessed in the wildlife report. For detailed species descriptions and documentation see “Threatened, endangered, and Forest Service Sensitive Species of the Pike and San Isabel National Forests” (updated June 2012), on file at the South Platte district office (Wrigley et al. 2012). All area estimates are based on Geographic Information Systems (GIS) models of species’ habitats; these areas are presumed suitable unless field verification indicates otherwise. Alternatively, if suitable but unmapped habitat is discovered during field visits those sites must be considered occupied and managed as such. Table 3 lists the Forest Service Region 2 Sensitive Species and MIS Species along with a determination of what type of analysis is required for each species.

5.1 FOREST SERVICE REGION 2 SENSITIVE SPECIES

5.1.1 *Northern Leopard Frog*

Northern leopard frogs are found in the northern US and Canada, with additional populations in the higher elevations of the Rocky Mountains (Smith and Keinath 2007). The northern leopard frog occurs in a wide variety of habitats including creeks, lakes, ephemeral wetlands, and ponds and is found throughout most of Colorado in mountainous and plains habitats (Smith and Keinath 2007). Breeding habitat is limited to permanent water sources at least 6 inches in depth that do not freeze solid (Baxter and Stone 1985). This species probably breeds in May or June, depending on elevation (Smith and Keinath 2007). Emergent vegetation is important in providing protective cover in ponds and lakes that contain predatory fish (Smith and Keinath 2007). After maturing, sub-adult frogs migrate to suitable feeding sites that are usually adjacent uplands. These dispersal movements may be along riparian corridors or upslope areas. After breeding, adult frogs can be found feeding in upland habitats of grasslands, meadows, and pastures adjacent to breeding areas. Adult frogs are highly mobile, moving at night or when vegetation is wet. They have been found up to two miles from water (Smith and Keinath 2007). Potential risk factors include inadequate regulatory protection of smaller seasonal and semi-permanent ponds, introduced predatory fish, lack of protection at overwintering sites, water quality degradation due to chemicals, loss of migratory pathways, introduced diseases, and road-related mortality.

Nationally, their population trends are downward throughout most of their range for reasons unknown at this time. The current status of leopard frogs in Colorado is uncertain. There have been no formal surveys for this

species in the Project Area and no documented occurrences but they are known on the district (i.e., Wigwam Creek 2013), and expected elsewhere. Suitable habitat exists along the North Fork South Platte River and its tributaries.

5.1.2 American Peregrine Falcon

The peregrine falcon is a rare spring and fall migrant in western valleys, foothills, lower mountains, mountain parks, and on the eastern plains. It is a rare summer resident in foothills and lower mountains. Numbers decreased over the past century, largely due to pesticide poisoning. In 1977, it was reported that only four nesting pairs existed in Colorado. Through recent reintroduction efforts, the numbers have increased considerably, and the species now appears to be secure (Foster Wheeler Environmental Corporation 1999, USFWS 2006). Current threats to the species include the decline in habitat quality and human disturbance of nest sites during recreational activities. Breeding pairs nest on cliff ledges typically 200 feet or higher, typically in foothill and mountain cliffs from 4,500 to 9,000 in elevation. Foraging habitat consists primarily of adjacent coniferous and riparian forests. Migrants and winter residents occur mostly around reservoirs, rivers, and marshes but may also be seen in grasslands and agricultural areas (Andrews and Righter 1992). Active eyries (nest sites) are known in the Pike and San Isabel National Forest (USDA Forest Service 1984), and suitable habitat is available in the Crossons-Longview Project Area. Jefferson County's Cathedral Spires Park has a known nest site with seasonal closures.

Table 3. Forest Service Region 2 Sensitive Species and MIS Species

Species	Status	Suitable Habitat?	Analyzed in Detail?	Rationale
Invertebrates				
Hudsonian emerald (<i>Somatochlora hudsonica</i>)	SS	No	No	Project Area does not contain sufficient wetlands or springs to represent preferred habitat for this species.
Rocky Mountain capshell snail (<i>Acroloxus coloradensis</i>)	SS	No	No	Project Area does not contain high altitude lakes and ponds that represent preferred habitat for the species.
Susan’s purse-making caddisfly (<i>Ochrotrichia susanae</i>)	SS	No	No	Species is only found at two sites outside of the Project Area: Trout Creek Spring in Chaffee County and High Creek Fen in Park County.
Amphibians/Reptiles				
Boreal toad (<i>Anaxyrus boreas boreas</i>)	SS	No	No	Project Area does not contain sufficient wet habitat (i.e., marshes, wet meadows, streams) at altitudes over 8,000 feet which represents the primarily habitat for this species.
Northern Leopard Frog (<i>Lithobates pipiens</i>)	SS	Yes	Yes	See species discussion
Birds				
American peregrine-falcon (<i>Falco peregrinus anatum</i>)	SS	Yes	Yes	See species discussion
Bald eagle (<i>Haliaeetus leucocephalus</i>)	SS	Yes	Yes	See species discussion
Boreal owl (<i>Aegolius funereus</i>)	SS	No	No	Habitat includes mature spruce-fir or spruce-fir/lodgepole pine with meadows occurring in the higher mountain areas statewide from 9,500 to 11,500 ft in elevation (Wrigley et al. 2012) Project Area outside of preferred elevational range.
Brewers sparrow (<i>Spizella breweri</i>)	SS	No	No	The s.b. breweri subspecies which breeds in the western Great Plains, Rocky Mountains, Intermountain West, Columbia and Snake River Basins, and Great Basin This species is a sagebrush obligate, and closely associated with big sagebrush (<i>Artemisia tridentate</i>) (Walker 2004). The Project Area does not contain suitable habitat.
Flamulated owl (<i>Otus flammeolus</i>)	SS	Yes	Yes	See species discussion
Lewis’s woodpecker (<i>Melanerpes lewis</i>)	SS	Yes	Yes	See species discussion
Loggerhead shrike (<i>Lanius ludovicianus</i>)	SS	Yes	Yes	See species discussion
Northern goshawk (<i>Accipiter gentilis</i>)	SS	Yes	Yes	See species discussion
Northern harrier (<i>Circus cyaneus</i>)	SS	No	No	Species is found in open habitats characterized by tall and dense vegetation, and abundant residual vegetation (Dechant et al. 2002). Project Area does not contain sufficient grasslands, marshes, agricultural lands, or high-elevation alpine tundra environments and is not common in the Pike National Forest (Wrigley et al 2012).
Olive-sided flycatcher (<i>Contopus cooperi</i>)	SS	Yes	Yes	See species discussion
White-tailed ptarmigan (<i>Lagopus leucura</i>)	SS	No	No	Habitat includes alpine tundra. Project area does not contain preferred habitat.

Table 3. Forest Service Region 2 Sensitive Species and MIS Species

Species	Status	Suitable Habitat?	Analyzed in Detail?	Rationale
Mammals				
American marten (<i>Martes Americana</i>)	SS	Yes	Yes	See species discussion
Fringed myotis (<i>Myotis thysanodes</i>)	SS	Yes	Yes	See species discussion
Gunnison’s prairie dog (<i>Cynomys gunnisoni</i>)	SS	No	No	Project Area does not contain sufficient grasslands and/or montane shrub lands that represent preferred habitat for this species.
Hoary bat (<i>Lasiurus cinereus</i>)	SS	Yes	Yes	See species discussion
North American wolverine (<i>Gulo gulo luscus</i>)	SS	No	No	Project Area elevation is not likely to represent preferred habitat for species.
Rocky mountain bighorn sheep (<i>Ovis canadensis canadensis</i>)	SS	Yes	Yes	See species discussion
Townsend’s big eared bat (<i>Corynorhinus townsendii</i>)	SS	Yes	Yes	See species discussion
Abert’s squirrel (<i>Sciurus aberti</i>)	MIS	Yes	Yes	See species discussion
American elk (<i>Cervus elaphus</i>)	MIS	Yes	Yes	See species discussion
Brook trout (<i>Salvelinus fontinalis</i>)	MIS	Yes	Yes	See species discussion

5.1.3 Bald Eagle

The range of the bald eagle includes most of Canada and Alaska, all the contiguous US, and northern Mexico. Bald eagles are closely associated with water and are rarely seen far from aquatic environments. Breeding bald eagles are rare in Colorado. Although some nesting does occur, most eagles migrate in summer to northern breeding grounds but return to lower latitudes during the winter. Winter habitat for the bald eagle consists of roost trees along rivers and other large bodies of ice-free water that allow access to fish. The best available scientific and commercial data available indicates that survival rates of the bald eagle have recovered range-wide (Federal Register 2007). As a result of this recovery, the bald eagle was removed from the list of endangered and threatened wildlife, effective August 8, 2007. Continued threats to the species include contamination in the environment, habitat loss, and human built structures such as powerlines. Natural Diversity Information Source (NDIS) data indicate that the species is known to occur in Park and Jefferson counties; no information is available on abundance for Park County and casual/accidental abundance is listed for Jefferson County (NDIS 2014). No roost or nest trees have been documented in the Project Area, but bald

eagles are seen on occasion in the Project Area at all times of the year. A recently active nest is located on private land near Trout Creek, approximately 10 miles southeast of the Project Area.

5.1.4 *Flammulated Owl*

Flammulated owls are associated with mature to old growth ponderosa pine and Douglas-fir forests along the Rocky Mountains. They have also been observed in aspen stands (Reynolds and Linkhart 1992). Occupied territories are often on south-facing slopes and ridges. They are obligate cavity nesters and depend on flickers and other woodpeckers for creating nesting cavities. Their habitats have declined as a result of fire suppression and the resulting closure of understories (Foster Wheeler Environmental Corporation 1999). The species is almost entirely insectivorous, capturing insects on the ground, on vegetation, and in flight (Ehrlich et al. 1988).

The flammulated owl breeds in mountain ranges from Central America, north through the western US and into southern British Columbia. It winters from Mexico into Central America. NDIS records show that this species is known to occur but is uncommon in both Park and Jefferson Counties (NDIS 2014). Studies by Linkhart (2001) at Manitou Experiment Station in the Pikes Peak Ranger District have determined that habitat quality is determined by two primary factors – a) cavity-tree availability, in territories that had a mean of 1.5 cavity trees/acre; and b) forest type and structure, as productivity was positively correlated with territory area in ponderosa pine/Douglas-fir forests and with greater crown cover and large tree diameter (13-19” dbh). Use of the late-successional stage ponderosa pine/Douglas-fir forests likely involves habitat composition and structure and high prey availability. Older forests typically contain an abundance of snags and lightning-damaged trees with cavities for nesting. In addition, old ponderosa pine forests typically form open stands with well-developed grass and shrub understories that support arthropods used by fledged owlets and molting adults in late summer. Flammulated owls are expected to occur in the Project Area where suitable habitat exists, because they have responded to owl surveys south Forest Service Road 550, near the project area.

5.1.5 *Lewis’s Woodpecker*

Lewis’s woodpecker is a year-round resident of the foothills of southern Colorado and occurs in lowland and foothill riparian areas, agricultural areas, and urban areas with tall deciduous trees, typically at elevations between 3,500 and 7,000 feet. Lewis’s woodpeckers typically excavate nest cavities in soft ponderosa pine or cottonwood snags, although they will also re-use cavities made by other woodpecker species. They nest in large snags ranging from 12 to 45 inches diameter at breast height (dbh) (Anderson 2003). Lewis’s woodpeckers feed almost exclusively on emergent insects and specialize in flycatching in open habitats. These include open pine forests, burned areas, riparian and rural cottonwoods, and pinyon/juniper woodlands (Andrews and Righter 1992). Risks to Lewis’s woodpeckers include activities that reduce open or old growth ponderosa pine forests and snags, such as fire suppression and clearcutting (Anderson 2003). NDIS data

indicates the species is known to occur within Park and Jefferson counties, although abundance is listed as uncommon in Jefferson County and unknown for Park County (NDIS 2014). The Project Area may contain suitable habitat for the Lewis's woodpecker along the North Fork South Platte River, and within mature ponderosa pine forests with large snags. Lewis's woodpeckers are known on the district (e.g., Hayman Fire area surveys, 2014).

5.1.6 *Loggerhead Shrike*

Loggerhead shrikes require shrubby habitats in open country, and primarily inhabit open riparian areas, agricultural lands, grasslands, shrublands, and sometimes piñon-juniper woodlands. They are migrant birds, and summer residents within Colorado and are frequently found on the eastern plains, the San Luis Valley, and desert lowlands of the western slope within Colorado (Colorado Partners in Flight 2000). They feed primarily on insects, although small birds, mice, lizards, and amphibians are also a source of food. Breeding pairs are typically near isolated trees or shrubs, and nearly all breeding occurs below 8,900 feet in elevation (Andrews and Righter 1992). There are no confirmed breeding records in the Pike National Forest (Wrigley et al. 2000). Within the Project Area, limited suitable habitat is present. No agricultural or grasslands are present, and shrublands only account for 1 percent of the existing vegetation types.

5.1.7 *Northern Goshawk*

The first records of the northern goshawk distribution in the Front Range date back to 1873. Goshawks reuse the same territory year after year and sometimes reuse the same nest. Pairs typically have one or more alternate nests within the territory (Kingery 1998). Since they reuse established areas, they have been affected by historic and current logging operations. Birds are known to be sensitive to disturbance during the nesting season (Richardson and Miller 1997). The goshawk populations appear to be currently declining (Foster Wheeler Environmental Corporation 1999).

Goshawks inhabit mixed hardwood and coniferous forests in temperate and boreal regions from 7,500 to 11,000 feet in elevation; however, they are occasionally found below 7,000 feet in winter and during migration. Limited information suggests that the goshawk is a partial migrant, usually moving less than 300 miles (Kennedy 2003). Typical nest areas for goshawks in the northern Rocky Mountains are mature or late successional coniferous forests, with high canopy closure and clear forest floors on north-facing moderate slopes (Hayward and Escano 1989, Squires and Ruggiero 1996). These stands most often have high (60-90 percent) canopy closure with little understory. Territories are also frequently associated with small openings, typically less than 1 acre (Fitzgerald et al. 1994).

Post-fledging family area and the foraging area typically include a diversity of forest types and conditions including stands of young, mid-aged, mature, and late-successional trees (Reynolds et al. 1992). Prey varies but may include red squirrels, least chipmunk, rabbits, robins, juncos, and northern flying squirrels (Erickson 1987).

Snags, downed logs, and woody debris are also important components of the post-fledging family and foraging habitat. Typically, two snags per acre and three downed logs per acre are desired in the ponderosa pine forest type (Reynolds et al. 1992). Nicholoff (2003) recommends three snags per acre for goshawks. DeBlander (2002) estimated 2.7 snags per acre over 11 inches in diameter and estimated 0.3 snags per acre over 19 inches in diameter. Downed logs and woody debris are also an important component of goshawk habitat. Reynolds et al. (1992) suggests three large downed logs per acre (at least eight feet long) in ponderosa pine habitats. Nicholoff (2003) recommends five downed logs per acre at least eight feet long. Potential habitat does occur within the Project Area, particularly in both ponderosa pine and mixed conifer habitats of later successional stages with closed canopy. In addition, regular sightings are reported and there is documented nest activity in the district near the project area.

5.1.8 Olive-Sided Flycatcher

The olive-sided flycatcher is a breeding resident of Colorado, often associated with mature spruce and fir forests at elevations between 7,000 and 11,000 feet, particularly near forest openings and edges (Wrigley et al. 2012). The species breeds in mature spruce-fir, Douglas-fir, and other montane forests, and nesting sites are generally located on branches of coniferous trees. The olive-sided flycatcher diet consists of flying insects such as bees, wasps, flies, and grasshoppers; foraging typically occurs by aerial attacks on prey. The olive-sided flycatcher prefers areas with an abundance of snags, and often forages from snags or live trees which extend above the canopy which allow for better visibility and unimpeded aerial sallying (Colorado Partners in Flight 2000). The species has been documented on the Pike National Forest (Wrigley et al. 2012), and suitable nesting and foraging habitat is present within the Project Area. Fire and forest management practices that create even-aged and homogeneous stand conditions are likely to negatively affect olive-sided flycatchers.

5.1.9 American Marten

The American marten is mostly a boreal mammal, ranging across Alaska and Canada to Newfoundland and southward at increasingly high elevation along mountain ranges to California and New Mexico. Their range of habitats in Colorado is fairly broad, including tundra rockpiles and talus slopes, as well as montane woodland at elevations of 8,000 to 13,000 feet. Marten are semi-arboreal and can use trees for denning and foraging.

Optimum habitat elements appear to be mature and old growth spruce-fir communities with greater than 30 percent canopy cover, well established understory of fallen logs and stumps, and lush shrub and forb vegetation to support prey (Burnett 1981). Snags and down dead material are important components of

denning and foraging habitat. Large logs and other structures provide protection from predators, access to the subnivean (i.e., beneath the snow) space where most winter prey are captured, and protective thermal conditions, especially during winter (Buskirk and Powell 1994). Martens make little use of open clearings without overhead cover (Buskirk and Powell 1994), but may use forest edges (Simon 1980). The main threats to American martens are habitat fragmentation and timber harvest. Limited suitable habitat for the animal does occur within the Crossons-Longview Project Area, particularly in areas with mature mixed conifer forest that has not been burned or logged in the past two decades and where the structure of down dead material is present.

5.1.10 Fringed Myotis

The status and occurrence of the fringed-tailed myotis are not well known in Colorado. Fitzgerald et al. (1994) found that this species is not common in Colorado but is found in ponderosa pine woodlands, greasewood, oakbrush, and saltbush shrublands. Caves, mines, and buildings are used as both day and night roosts. This bat reportedly winters in pinyon-juniper and ponderosa pine habitats (USDA Forest Service 1984). Studies in New Mexico found this species roosting in ponderosa pine snags and live ponderosa pine trees with long vertical cracks (Chung-MacCoubrey 1996). These roosts were found in isolated ponderosa pine stands in the drainage bottoms of pinyon-juniper woodlands or at the interface of the ponderosa pine and pinyon-juniper habitats. Snags are also important for roost sites; density of 8 large snags per acre appears to be suitable habitat (Keinath 2004). NDIS data indicate that this species is known to occur but rare in Jefferson County and not known to occur in Park County (NDIS 2014). Potential foraging and roosting habitat for the fringed myotis occurs in the Project Area. The species has been documented in the Pike National Forest, and may occur in the Project Area.

5.1.11 Hoary Bat

The hoary bat likely occurs throughout Colorado from the eastern plains to elevations of 10,000 feet. They are believed to be highly migratory, although wintering sites and migration routes have not been well documented (Ellison et al. 2003). Northern migration occurs May-June, while southern migration occurs late August to early September (Fitzgerald et al. 1994). This solitary species utilizes trees as roost sites, typically 13-16 feet above the ground and often surrounded with foliage cover while still allowing a clear flight path from below. They are frequently found in Douglas-fir and ponderosa forest in Colorado, especially those near forest clearings or edges (Fitzgerald et al. 1994). They primarily feed on moths, but are also known to eat beetles, flies, grasshoppers, termites, dragonflies, and wasps. Mating is believed to occur in the fall, and the female gives birth from May through July. According to the Colorado Bat Conservation Plan, loss of roosting habitat due to timber harvest is likely the biggest threat to the species (Ellison et al. 2003). Loss of tree roosts due to

widespread stand-replacing fire is also a threat. The species is known to occur on the Pike National Forest, and is very likely within the Project Area. It is listed as common in both Park and Jefferson Counties (NDIS 2014).

5.1.12 *Rocky Mountain bighorn sheep*

Rocky Mountain bighorn sheep inhabit alpine meadows, foothills, cliffs, and rock outcrops. Their diet includes a variety of grasses, forbs, and browse (Luce et al. 1999). Summer habitat is typically at elevations of 9,000 to 10,000 feet, while winter range is located in south-facing slopes at elevations of about 7,000 feet (USDA Forest Service 2008). Near the Project Area, the herd at Waterton Canyon has been observed at elevations up to 8,000 feet. Their current distribution is confined to scattered populations in open or semi-open terrain characterized by a mix of steep or gentle slopes, broken cliffs, rock outcrops, and canyons and their adjacent river benches and mesa tops. Slope steepness appears to be a significant feature of bighorn sheep habitat. They use slopes of 36 to 80 percent in Montana and Colorado, while avoiding slopes less than 20 percent (Beecham and Collins 2007). Bighorn sheep are primarily animals of open habitats, such as alpine meadows, open grasslands, shrub steppe, talus slopes, rock outcrops, and cliffs; in some places, however, they may use areas of deciduous and conifer forests, especially where openings may have been created by clear-cuts or fire (Beecham and Collins 2007). Densely forested areas provide little forage and poor visibility and are rarely used by bighorn sheep (Beecham and Collins 2007). Merwin (2000) noted that bighorn sheep often selected areas with good visibility within suitable distance of water and escape terrain. Open forests, however, are used in some areas for foraging and thermal cover (Beecham and Collins 2007). Available sheep habitat in the area is decreasing because of vegetation in advanced succession; increases in Gambel oak habitat and the succession of pinyon-juniper forests, which have decreased the amount of available forage and visibility, and are thought to be a major factor limiting the distribution of sheep (CDOW 2005).

Colorado Division of Wildlife (CDOW) has mapped habitat areas used by bighorn sheep in the state. According to NDIS data, bighorn sheep are in fairly common in Park County and uncommon in Jefferson County (NDIS 2014). The Crossons-Longview Project Area does not contain mapped bighorn sheep habitat. A recent telemetry study has indicated that an important historic population is located in Waterton canyon below the confluence of South Platte and North Fork near the Project Area boundary. Should suitable vegetation be present in the Project Area, this population could move into the area.

5.1.13 *Townsend's big eared bat*

Townsend's big-eared bat is a western species occupying semi-desert shrublands, pinyon-juniper woodlands, and open montane forests. It is frequently associated with caves and abandoned mines for day roosts, hibernacula, or nursery colonies where females roost with young during the breeding season. They will also use tree cavities and crevices on rock cliffs for refuge. The bats are relatively sedentary. They do not move long

distances from hibernacula to summer roosts nor do they move or forage far from their day roosts (Fitzgerald et al. 1994). Harvey et al. (1999) shows that the majority of Colorado is within the expected distribution of this species, although no large colonies have been found in Colorado.

Population trends are unknown for this species, but it is suspected that they are decreasing due to the susceptibility of the species to human disturbance. There are several documented cases where this species has disappeared as a result of spelunking and other human disturbance in caves and mines (Armstrong et al. 1994). According to NDIS data, this species is uncommon in Park and Jefferson Counties (NDIS 2014). There is a known hibernaculum in the North Fork canyon on private lands. Foraging habitat is present throughout the Project Area and it is likely that there are unknown hibernacula, maternity roosts, and/or day roosts in the Project Area.

5.2 MANAGEMENT INDICATOR SPECIES

The National Forest Management Act of 1976 directs the USDA Forest Service to manage habitats to maintain viable populations of existing native and desired non-native vertebrate species. In accordance with 36 CFR 219.19, fish, wildlife, and plant MIS are selected as a basis for evaluating the potential effects of federal actions on the forest biota.

MIS are selected at the Forest-scale because their population changes are believed to indicate the effects of management activities. An evaluation of the Pike and San Isabel National Forest MIS and their habitats was conducted to identify MIS for this project-level analysis (Table 3. Forest Service Region 2 Sensitive Species and MIS Species). If an MIS or its habitat was not found in the Crossons-Longview Project Area, it was not identified for further analysis.

5.2.1 *Abert's squirrel*

The Abert's squirrel has been identified as an MIS as an ecological indicator for late succession ponderosa pine. This species is dependent on ponderosa pine-dominated stands with open understory for both nesting sites and foraging (Keith 1965, 2003). Target feed trees represent less than 10 percent of the trees in stands populated by Abert's squirrel along Colorado's Front Range, and they are chemically and physiologically different from trees not used (Allred and Gaud 1994). Tree chemistry also may affect nest-site selection. On the Pike and San Isabel National Forest, surveys show approximately 92 percent of nests were in a tree group with 75 percent having 3 or more interlocking canopy trees. Hypogenous fungi are an important part of their diet, and bone and antlers are often gnawed for their mineral content (Pederson et al. 1987). Long-term trends in Abert's squirrel populations have not been widely measured or monitored, but they can be deduced based on known changes to ponderosa pine habitat. Squirrel populations in Colorado were undoubtedly more abundant 150 years ago before ponderosa pine forests were subjected to logging, grazing, and fire suppression. Squirrel abundance and habitat capability varied spatially, depending on local forest conditions. Their populations

probably decreased sharply after European settlement, remained low as forests re-established themselves, and gradually increased to their present levels as older trees became established.

Population dynamics for the species are poorly known (Fitzgerald et al. 1994). Population estimates range from 12 to 30 animals per square kilometer in the Black Forest of El Paso County, and from 82 to 114 per square kilometer near Boulder of Boulder county. Population estimates contain spatial and temporal variation, which are attributed to normal cyclic variations in annual biomass production of pine seeds (Patton 1985, Pederson et al. 1987). Abert's squirrel relative abundance is monitored on the PSICC on about 40 plots throughout the forest in randomly selected polygons representing a range of habitat conditions. The plots are divided into 256 subplots, and during the late winter/early spring the number of subplots with Abert's feeding sign is recorded. Monitoring reports indicate a decline in squirrel sign from 2006 to 2013. Future monitoring would be needed to determine if there is an overall downward trend in the Abert's squirrel population.

Elevated Mountain Pine Beetle (*Dendroctonus ponderosae*) populations in Colorado in recent years have resulted in ponderosa pine mortality. Direct effects to Abert's squirrel populations on the Pike and San Isabel National Forest or in Colorado have not been quantified. In areas inhabited by Abert's squirrels that experience high mortality of mature ponderosa pine, squirrel populations could remain the same or decrease depending on squirrel densities prior to the pine beetle attack and the extent of ponderosa pine mortality (USDA Forest Service 2009). Within the Pike National Forest, Mountain Pine Beetle has not reached epidemic levels. Other range-wide threats to Abert's habitat include forestry treatments that reduce acreage of mature ponderosa pine and uncharacteristically large and severe wildfires in ponderosa pine. Abert's population in the planning area is not known, there is one monitoring plot with low quality habitat. Monitoring data for this plot indicates activity at or below Forest averages.

5.2.2 American elk

Elk was selected as an MIS because of the public's interest in hunting and viewing them. Elk also have specific habitat management guidelines in the 1984 Forest Plan (USDA Forest Service 1984).

Elk tend to inhabit coniferous forests associated with rugged, broken terrain or foothill ranges. During summer elk spend most of their time in high mountain meadows in the alpine or subalpine zones or in stream bottoms (Adams 1982). Studies of elk slope preferences indicate that elk use a variety of slopes, although they choose slopes in the 15- to 30-percent class most frequently (Skovlin 1982). Elk may use more open areas during spring and summer because of earlier spring green-up (Edge et al. 1987). During hot summer months, elk seek shaded, cool habitats (Leege 1984). Use of forage areas depends on proximity to cover. Use is typically concentrated to within 200 to 600 feet of cover edge. Either cover or forage may be limiting to elk, particularly on winter ranges or calving habitats (Roderick and Milner 1991). Due to the history of fire suppression and resultant

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decrease in forest openings, forage is likely to be the limiting factor in the Crossons-Longview Project Area. Open road densities greater than 1.5 miles per square mile of habitat on summer range or 1.0 mile per square mile of habitat on winter range are also considered a limiting factor (Rodrick and Milner 1991).

Global and Colorado elk populations are known to be increasing (COVERS 2001). They are intensively managed, and there are good data on population size and trends (Fitzgerald et al. 1994). Elk are expanding their range due to reintroductions, management, and habitat conversion (COVERS 2001). Elk populations have generally increased in Colorado since 1975. Elk populations are high due to limited hunting pressure and available habitat.

The structure, composition, and landscape pattern of vegetation used by elk in the Pike and San Isabel National Forests, particularly the lower montane zone, has been substantially altered from its pre-European conditions by cumulative human impacts. Before logging, grazing, and fire suppression, ponderosa pine stands along Colorado's Front Range were less dense, more open, and less vulnerable to diseases, insects, and large, intense wildfires (Foster Wheeler Environmental Corporation 1999). Additional factors that affect elk activity and population size include disturbance from human activities such as recreation, roads, and hazardous fuels reduction. The Forest Plan (USDA Forest Service 1984) provides some specific treatment guidance in big game management areas (Management Area 5B) that is unique from other habitat prescriptions.

The CDOW monitors elk at the data analysis unit (DAU) scale to assess changes in population trends. A DAU is an area an elk population uses throughout the year and is comprised of one or more game management units (GMU). All DAUs in the Pike and San Isabel National Forest are currently above the CDOW's defined long-term objectives. The Crossons-Longview Project Area is located within DAU E-39 (GMU 461) and DAU E-18 (GMU 501). Population estimates for the last 5 years are included in Table 4.

Table 4. Post Hunt Elk Population Estimates¹

Data Analysis Unit (DAU)	2013	2012	2011	2010	2009
DAU E-39	2,270	2,390	2,390	2,400	2,410
DAU E-18	2,100	2,110	2,330	2,590	2,600

In recent history, DAUs within and around the planning area have lower elk populations than surrounding area. DAU reports indicate that GMU 501 is well below what the public lands in that unit have historically supported (CPW 2007). In previous studies, much of the population of the DAU E-39 was found to be located in the

¹ Source: CPW Elk Post-hunt Population estimates 2009-2013

eastern half of the DAU, outside of the planning area on private land and Jefferson County Open Space (CPW 1987).

In the planning area, overall range for elk covers the entire planning area. Summer range encompasses the majority of the planning area at approximately 11,200 acres, winter range includes 6,100 acres and severe winter range includes 150 acres (Figure 2).

5.2.3 Brook trout

Brook trout were selected as an MIS because: 1) the public has a high concern for this species and its habitat; and 2) the public has a high interest in fishing. Brook trout were retained as MIS due to a potential role as an indicator species for aquatic habitat and because they pose a recovery threat to greenback cutthroat trout (USDA Forest Service 2005).

Brook trout are a non-native species introduced in Colorado streams sometime after European settlement. They spread quickly throughout Colorado mountain streams competing directly with the native cutthroat trout species. Brook trout have displaced native trout from most of Colorado's high mountain streams, which is one reason that greenback cutthroat trout is a federally threatened species. Optimal stream habitat for brook trout is characterized by clear, cold water, silt-free rocky substrate in riffle-run areas, well-vegetated stream banks, abundant in-stream cover, deep pools, relatively stable flow regime and stream banks, and productive aquatic insect populations (Raleigh 1982).

The CPW, USFWS, and many other land management agencies have reclaimed many streams and lakes to remove brook trout as part of an intensive effort to restore native trout species in Colorado (USFWS 1998). Brook trout do provide recreational fishing opportunities but are a minor component of the overall fishery in Colorado. Brook trout populations on the Forest tend to be located below the greenback cutthroat trout recovery areas. Because the greenback populations need to be protected from the superior competitor non-native trout species, their populations are kept at higher elevations above natural and human-made stream barriers. Brook trout surveys, combined with greenback population monitoring, provide a more thorough assessment of the relationship between some management activities and issues (USDA Forest Service 2005a).

Impacts from logging, fires, river impoundment, road and railroad construction, land clearance for agriculture and human habitation, encroachment of introduced rainbow trout (*Oncorhynchus mykiss*) and brown trout and infection with whirling disease are the primary threats to brook trout (Larson and Moore 1985, USDA Forest Service 2005b). Introduction of hatchery-reared brook trout from the northeastern US has also affected native populations.

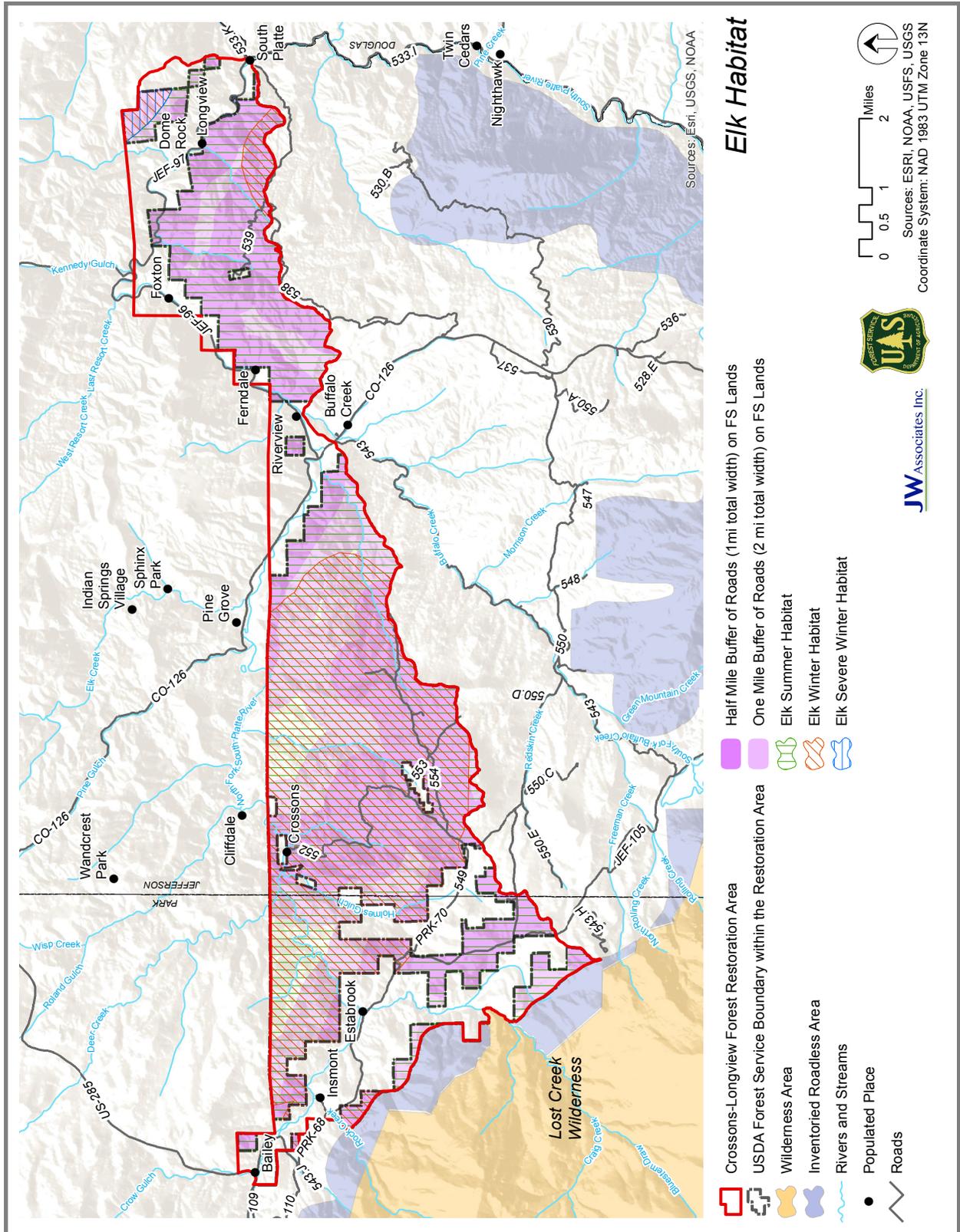


Figure 2. Elk Habitat in the Planning Area

The USDA Forest Service conducted baseline inventories of trout populations in small streams in the Pike National Forest between 2003 and 2007. Fish in 26 area streams were sampled at least twice. Where brook trout were present, their densities ranged from 51 fish per hectare to 17,582 fish per hectare and averaged 1,894 fish per hectare. Population trend statistics cannot be determined with the limited data available for the established sample sites. Waterways in the project area may provide suitable habitat, including the North Fork of the South Platte River. Water quality and habitat suitability in some area streams (i.e. Buffalo Creek and Spring Creek) has been compromised due to channel changes and sedimentation from the 1996 Buffalo Creek Fire. Riparian area restoration projects have been proposed and are underway to reestablish viable fisheries and reduce downstream sediment.

6. EFFECTS

This section describes the effects of Alternative A (No Action), Alternative B (Proposed Action) and Alternative C on wildlife of the Crossons-Longview Project Area.

6.1 ALTERNATIVE A (NO ACTION)

Alternative A (No Action) would have no direct effects, as no new actions would occur. Long-term, indirect effects would vary depending on habitat type. In general, Alternative A (No Action) would maintain existing habitat and protect biodiversity in the short-term. Long-term, the proportion of ponderosa pine cover type in the Crossons-Longview Project Area would be expected to rise, as this species continues to encroach into existing open areas and hardwood stands. Early successional habitats would continue to decline as pine stands progress toward later seral stages with higher average stand density and lower average tree size, which would reduce habitat diversity and not move the forest towards historic conditions. Natural disturbances, such as wildfire, would continue to return portions of the forest in which they occur to early successional stages.

There would be no direct effects of Alternative A (No Action) because no new actions are proposed. Indirect and cumulative effects would occur as a response to current conditions in the absence of active management, other than fire-suppression efforts. These effects are discussed below for each species. Effects for important ecosystems in the Crossons-Longview Area, as well as the species that may be affected, are described in Table 5.

Table 5. Alternative A - Direct and Indirect Effects to Habitat

Habitats Proposed for Treatment	Direct Effects of Alternative A	Indirect Effects of Alternative A	Species Potentially Impacted
Shrubland	None	In the absence of active management, Gambel's oak and mountain mahogany would continue to increase in density and height. This habitat would have a continued risk of wildfire.	Rocky Mountain bighorn sheep American elk loggerhead shrike Lewis's woodpecker fringed myotis, Townsend's Big-eared bat, hoary bat
Aspen	None	In the absence of management, pine encroachment would continue to reduce areas dominated by aspen. Health and vigor of aspen stands would continue to decline.	Flammulated Owl
Mesic and Xeric Ponderosa Pine forest	None	In the absence of active management, additional dense, late-successional stands with closed canopy and reduced shrub and herbaceous understory cover would develop. The amount of snags is likely to increase with forest succession however, average size class of snags would decrease. A greater threat of widespread insect and disease outbreak would exist and stands would have an increased risk of wildfire returning areas to earlier successional stages.	Flammulated Owl Lewis's Woodpecker Olive-sided flycatcher Perigrine Falcon Bald eagle Northern Goshawk American Marten fringed myotis, Townsend's Big-eared bat, hoary bat Abert's squirrel, American elk
Lodgepole Pine	None	In the absence of active management, additional dense, late-successional stands with high levels of understory trees would develop. Shrub and herbaceous understory cover would decrease. The amount of snags is likely to increase with forest succession, however, average size class of snags would decrease. A greater threat of widespread insect and disease outbreak would exist and stands would have an increased risk of wildfire returning areas to earlier successional stages.	Northern Goshawk Peregrine Falcon Bald Eagle Fringed myotis, Townsend's Big-eared bat, hoary bat, American elk
Mixed Conifer	None	In the absence of active management, additional dense, late-successional stands with high levels of understory trees would develop. Shrub and herbaceous understory cover would decrease. The amount of snags is likely to increase with forest succession, however, average size class of snags would decrease. A greater threat of widespread insect and disease outbreak would exist and stands would have an increased risk of wildfire returning areas to earlier successional stages.	Northern Goshawk olive-sided flycatcher Perigrine Falcon American Marten, American elk
Riparian/Aquatic	None	Water quality flows would continue to be influenced by ongoing federal/non-federal activities. Higher risk of wildfire may threaten riparian vegetation and upslope soil stability, which would negatively affect water quality.	Northern Leopard Frog Brook trout

6.1.1 Forest Service Region 2 Sensitive Species

Northern Leopard Frog

A continuation of fire suppression policies would result in increased late successional pine forest. Dense late-successional stands are more at risk of high-intensity wildfire. Should a stand-replacing fire occur, erosion from burned hillsides could increase sediment loading in Crossons-Longview Project Area creeks and other habitats that the northern leopard frog occupies, leading to a decrease in habitat as well as a risk of direct mortality.

American Peregrine Falcon

Peregrine falcons use coniferous forest and riparian foraging habitat adjacent to cliffs. Due to the variety of habitat utilized for foraging, Alternative A (No Action) is not likely to have a significant impact on foraging habitat. Assuming a continuation of fire-suppression policies, late-successional pine forest would be expected to increase. Dense late-successional stands would lead to an increased risk of wildfire. Should a high-intensity wildfire occur, nesting and foraging habitat could be reduced.

Bald Eagle

No nesting or roosting sites are known to occur within or adjacent to the Project Area, however potential roosting habitat exists in Project Area forests in later successional states, especially if adjacent to open water. As forest succession continues, increase in mature forests is anticipated. Wildfire and insect outbreaks would continue to return some areas of the forest to early successional stages. In the absence of stand-replacing fire, habitat for the bald eagle is expected to increase.

Flammulated Owl

The flammulated owl is dependent on ponderosa pine and aspen in later successional stages. Under this alternative, the continuation of fire-suppression policies is expected to maintain forest succession, leading to an increase in later successional stage area. Snags are expected to increase with increased forest density. There are increased risks from high-intensity wildfire with this alternative, which could return areas of the forest in which they occur to early successional stages. In the absence of stand-replacing fire, habitat for the flammulated owl is expected to increase.

Lewis's Woodpecker

Continuation of fire suppression policies would result in continued forest succession, ultimately reducing the open ponderosa pine forests that are preferred by the Lewis's woodpecker. Additionally, dense late-successional stands resulting from fire suppression would lead to an increased risk of high-severity wildfire. Lewis's woodpecker could be temporarily displaced by a high-severity wildfire, but are well adapted to post burn areas.

Loggerhead Shrike

Current loggerhead shrike habitat in the Project Area is limited. With continued forest succession in the absence of active management, available shrub lands and open area in the Project Area is likely to decline long-term and further reduce available shrike habitat.

Northern Goshawk

The northern goshawk requires mature forest with canopy cover greater than 40 percent and areas at least 50 acres in size for nesting habitat. Under this alternative, continued forest succession would lead to an increase in forest density. Over time, some stands would become too dense for nesting, while others would mature to provide optimal nesting conditions (Greenwald et al. 2005). Foraging habitat is more varied and may include openings, forest edges, and open canopy stands. Some open foraging habitat could decrease as forest openings are reduced due to pine encroachment. The risk of high-intensity fire would increase with this alternative. Stand-replacing fire has the potential to destroy nest trees and other habitat area. Overall, in the absence of stand-replacing fire, nesting habitat would be likely to increase, while diversity of foraging habitat would likely decrease under this alternative.

Olive-Sided Flycatcher

Olive-sided flycatcher are frequently found following disturbances such as tree fall gaps, fire, and logging. Therefore, a continuation of fire suppression policies would likely limit preferable habitat conditions for the olive-sided flycatcher in the long-term. As forest understory growth continues and a dense canopy develops, foraging areas would also decline.

American Marten

The American marten depends on dense mature and old growth stands with woody debris and greater than 50 percent cover. Under the absence of active management, forest succession would likely continue, resulting in increased canopy cover and density of the forest. This change would likely benefit marten by increasing denning and foraging habitat. Prey associated with closed forest conditions would also be likely to increase. The risk of high-intensity fire and pine beetle outbreaks would increase with this alternative. If a stand-replacing fire were to occur, some optimal habitat could be destroyed. In the absence of stand-replacing events, habitat for marten would be likely to increase under this alternative.

Fringed Myotis, Townsend's big eared bat, and Hoary Bat

These bat species rely on the availability of trees, snags, rocks, caves, or mines for roosting and on a variety of forest habitats for foraging. The continuation of forest succession and fire suppression would limit foraging opportunities by creating dense forests and increasing conifer encroachment in riparian areas. Roosting habitat in snags may increase with forest succession and the absence of active management, but availability of

large snags would likely decrease over time. There are also increased risks from wildfire outbreaks under this alternative. Wildfire at lower intensity levels could lead to an increase in snags, but current conditions favor high-intensity, stand-replacing events that would not benefit these species. In the absence of high-intensity fire, diversity of foraging habitat would be likely to decrease, and roosting habitat would likely increase.

Rocky Mountain bighorn sheep

Bighorn sheep depend on open areas of high visibility and access to escape cover for foraging. Long-term impacts under Alternative A (No Action) would include a reduction in foraging habitat as forest succession continues.

6.1.2 Management Indicator Species

Abert's squirrel

Primary habitat includes mature ponderosa pine stands in Habitat Structural Stages 4B, and 4C/5, which would most likely contain trees needed for nesting, seed and cone production, and cover if sufficient basal area and uneven age classes exist. More limited activity may occur within the 4A habitat structural stage because 4A stands comprise less basal area, less distribution of uneven age classes, and less cone production compared to structural stages 4B and 4C. Sapling stands (3A-3C) would provide additional secondary habitat such as movement corridors and cover, food from ground litter, and fungi (USDA Forest Service, 2005a). The Project Area currently provides approximately 5,073 acres of primary habitat (structural stages 4B and 5) and an additional 8,272 acres of secondary habitat (Structural stages 3A-C and 4A). Not all of this area is likely to provide suitable habitat for the squirrel based on the ground conditions. Table 6 presents this habitat by Structural Stage.

Table 6. Abert's Squirrel Habitat in Project Areas

Habitat	Habitat Quality Definition	Amount of Habitat in Project Area (acres)
Primary	Habitat Structural Stages 4B, 4C and 5	5,073
Secondary	Habitat Structural Stages 3A-C and 4A	8,272
	Total	13,345

American elk

The continuation of current fire suppression policies would increasingly limit elk foraging habitat, as the growth of seral vegetation, aspen, oak, and other desirable shrubs would not be promoted. Meadow habitat

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would also be reduced due to conifer encroachment. Cover habitat would be maintained or increase as forest succession continues, but cover habitat is not likely to be a limiting factor in the Crossons-Longview Project Area. Long-term, this alternative is likely to produce a decrease in habitat suitability.

Optimal foraging habitat for elk is generally represented by Structural Stages 1-3a in most cover types and by 1-5 in aspen. Elk Cover Habitat is generally represented by Structural Stages 3b-5. The continuation of current fire suppression policies under Alternative A would increasingly limit elk foraging habitat, as the growth of seral vegetation, aspen, oak, and other desirable shrubs would not be promoted and forest succession would move habitat into later successional stages. Current Successional Stage are shown in Table 7. Approximate Potential Elk Habitat in Project Area.

Meadow habitat would also be reduced due to conifer encroachment and forest succession. Cover habitat would be maintained or increase as forest succession continues, but cover habitat is not likely to be a limiting factor in the Crossons-Longview Project Area. Long-term, this alternative is likely to produce a decrease in habitat suitability.

Table 7. Approximate Elk Habitat in Project Area²

Habitat Type	High Quality Foraging Habitat (acres)	High Quality Cover Habitat (acres)
Summer Range	2,292	7,760
Winter Range	1,912	5,376
Severe Winter Range	72	65

Brook trout

A continuation of fire suppression policies would result in increased late successional pine forest. Dense late-successional stands are more at risk of high-intensity wildfire. Should a stand-replacing fire occur, erosion from burned hillsides could increase sediment loading in Crossons-Longview Project Area streams. Loss of riparian vegetation would also result in an increase in water temperature until shade is restored. These changes would lead to a decrease in brook trout habitat as well as a risk of direct mortality.

² Based on general Habitat Capability Model cover types-high quality forage represented by (1,2, 3A, 4A all forested cover types, 1 shrub lands and all Aspen). High Quality cover type represented by 3b-5 forested cover types) Estimates likely over-represent available habitat. Not all area may represent optimal habitat and optimal habitat may differ depending on season of use.

6.1.3 *Alternative A - Cumulative Effects*

The existing habitat conditions are the result of the past and present human and natural activities on National Forest System and private lands within the Crossons-Longview Project Area. These activities, including but not limited to recreation, wildland fires, logging, and fire suppression, have altered the natural disturbance regimes of the forest. Without additional active forest management over the next 20 years, ponderosa pine density in the Crossons-Longview Project Area would likely increase and structural diversity decrease. Such conditions would reduce habitat diversity overall. The No Action Alternative would also lead to the greatest risk of wildfire spread, which could return areas of the forest in which they occur to early successional stages. Should stand-replacing wildfire occur, increased erosion, runoff, and sediment yield could negatively impact riparian and aquatic areas.

6.1.4 *Alternative A - Population Viability*

Given the absence of direct, ground-disturbing activities, Alternative A would not affect species population trends or overall viability. In the event of a stand-replacing wildfire in the Crossons-Longview Project Area, MIS species and their habitats may be adversely affected; however, the local effects would generally not impair overall population trends and/or viability of the species. Alternative A would have no effect on or contribution to meeting Forest Plan objectives for each MIS described.

6.2 **ALTERNATIVE B (PROPOSED ACTION)**

Alternative B (Proposed Action) is designed to move the forest towards historical forest conditions and reduce wildfire hazards, while improving the health of ponderosa pine and lodgepole pine forest types. In general, there would be short-term impacts to wildlife habitat availability during treatments; however, over the long-term, there would be improved quantity, diversity, and quality of habitat and a decreased risk of habitat loss due to stand-replacing wildfire. As a result of treatment, conifer forests would be slightly reduced in the Project Area. There would be an increase in the diversity of understory plants within many conifer stands due to reduced forest canopy cover and disturbance caused by thinning and prescribed fire. In addition, removal of diseased trees may occur in limited sites. These treatments would open up these stands and reduce the risk of disease spread. Treatment of aspen stands would remove diseased trees and reduce conifer competition, thereby improving health and vigor of remaining and new aspens. Disturbance created by prescribed fire would also help stimulate the regeneration of the less shade-tolerant plant species within these stands. Effects to habitats are provided in Table 7.

6.2.1 Forest Service Region 2 Sensitive Species

Northern Leopard Frog

Under Alternative B - Proposed Action, no treatments are proposed for riparian areas. Conservation measures for northern leopard frog would provide additional protection for adjacent upland habitat. Best management practices would be followed to limit soil erosion and maintain water quality, and no water depleting activities would occur. Therefore, no impacts to the northern leopard frog or its habitat are expected to occur.

American Peregrine Falcon

Suitable habitat for the peregrine falcon is located in Cathedral Spires Park; however, no vegetation treatments would occur within the park boundaries. In areas adjacent to the Cathedral Spires Park, there is potential for short-term disturbance to foraging areas along riparian corridors and coniferous forests, but vegetation treatments would reduce the chance of a high-intensity wildfire in the long-term.

Table 8. Alternative B - Direct and Indirect Effects to Habitat

Habitats Proposed for Treatment	Direct Effects of Alternative B	Indirect Effects of Alternative B	Species Potentially Impacted
Shrubland	Tree removal and creation of openings in Gambel’s oak and mountain mahogany habitat.	Enhancement of habitat for grazers, browsers, and other shrub-dependent wildlife.	Rocky Mountain bighorn sheep American elk loggerhead shrike Lewis’s woodpecker fringed myotis, Townsend’s Big-eared bat
Aspen	Removal of competing conifers and cutting of aspen to encourage new growth. Removal of diseased aspen to propagate new suckers.	Improved health and vigor of aspen stands.	Flammulated Owl, American elk, northern goshawk
Xeric Ponderosa Pine Forest	Opening up of canopy. Creation of forest openings of 1 to 40 acres by thinning and prescribed burn.	Movement towards historical forest conditions. Reduction of dense mature habitat type and crown cover. Decreased likelihood of high-intensity wildfire or disease.	Flammulated Owl Lewis’s Woodpecker Olive-sided flycatcher Peregrine Falcon Bald eagle Northern Goshawk American Marten fringed myotis, Townsend’s Big-eared bat, hoary bat Abert’s squirrel American elk
Mesic Ponderosa Pine Forest	Opening up of canopy. Creation of forest openings of .25-20 acres by thinning and prescribed burn.	Movement towards historical forest conditions. Reduction of dense mature habitat type and crown cover. Decreased likelihood of high-intensity fire or disease.	Flammulated Owl Lewis’s Woodpecker Olive-sided flycatcher Northern Goshawk American Marten fringed myotis, Townsend’s Big-eared bat, hoary bat American elk
Lodgepole Pine	Forest openings of irregular size created, diseased trees removed.	Movement towards historical forest conditions. Decreased likelihood of high-intensity wildfire or disease.	Northern Goshawk Perigrin Falcon Bald Eagle fringed myotis, Townsend’s Big-eared bat, hoary bat, American elk
Mixed Conifer	Opening up of canopy and increased age class diversity due to creation of forest openings of 1-40 acres by thinning & prescribed fire.	Movement towards historical forest conditions. Decreased likelihood of high-intensity wildfire or disease.	Northern Goshawk olive-sided flycatcher Perigrine Falcon American Marten, American elk
Riparian/Aquatic	No direct treatment in riparian area. Potential for short-term impacts to aquatic habitat from sedimentation during treatment activities.	Decreased likelihood of high-intensity wildfire and the resultant bank erosion and sedimentation.	northern leopard frog brook trout

Bald Eagle

Undocumented bald eagle nest and roost sites may occur along the North Fork South Platte River. Proposed project activities are not likely to remove potential nest and roost trees; larger pine trees would generally be retained in mesic and xeric ponderosa pine habitats, as would trees older than 200 years. Additionally, trees along riparian corridors (where bald eagle nest and roost sites are most likely to occur) would not be removed. Therefore, impacts to bald eagles are unlikely to occur under Alternative B - Proposed Action.

Flammulated Owl

Direct effects to the flammulated owl would include limited potential for individual mortality due to tree felling or other treatments. Indirect impacts may occur due to changes in habitat, particularly in mature mixed conifer habitat, which would have reduced canopy cover and become less dense in treated areas. Approximately 3,660 acres of mature ponderosa pine and mixed conifer (Structural Stages 4B/4C and 5) are proposed for treatment. The flammulated owl appears to be a habitat specialist with low fertility (small clutch size), which is generally an adaptation to a stable environment (Hayward and Verner 1994). Therefore, the flammulated owl would be sensitive to any habitat modification. Conservation measures applied for raptors and migratory birds would limit impacts by imposing spatial and temporal restrictions around active nest sites limiting impacts.

In mature mixed conifer habitat, more open conditions would reduce the extent and intensity of a potential high-intensity fire. Changes in the distribution and size of snags (potential nest trees) would also be important. Some reductions in snags could occur, but overall existing snags would be retained per project standards. Overall, long-term impacts to flammulated owl may include a slight reduction of mature mixed conifer habitat but a corresponding increase in habitat stability due to the reduction in the extent and intensity of a potential high-intensity fire in this habitat type. Increased aspen growth and vigor may also benefit flammulated owls.

Lewis's woodpecker

Short-term impacts associated with harvesting and other treatment activities may occur, including temporary avoidance due to noise. Conservation measures applied for raptors and migratory birds would limit impacts by establishing spatial and temporal restrictions around active nest sites. Vegetation prescriptions under Alternative B - Proposed Action would encourage habitat conditions that the Lewis's woodpecker prefers including open pine forests and burned areas with abundant snags and stumps. Existing snags, which are utilized for nesting, would be retained where they are not a hazard per project design criteria. Habitat for this species would be maintained or improved in the long-term in the Project Area.

Loggerhead Shrike

Very limited suitable nesting and foraging habitat is available for the loggerhead shrike within the Project Area, and no known breeding pairs have been documented. Therefore, no adverse effects to the species are

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anticipated under Alternative B - Proposed Action. Increased shrubland may provide some benefit to shrikes by providing some additional foraging area.

Northern Goshawk

Direct impacts to northern goshawks include the limited potential for loss of unknown active nests due to tree felling or prescribed fire. However, pre-treatment surveys would be required per project conservation measures and would limit these risks. Should a nest be located a no-treatment zone of at least 30 acres would be designated with a seasonal restriction on activities within ½-mile of the nest. The most likely direct effects on goshawks would be disturbance by project activities from project noise and activity. Other long-term indirect effects include a reduction in potential goshawk nesting habitat. Moderately dense mature forest habitat (mature greater than 40 percent crown cover) contributes to nesting and some forage habitat. This habitat type would decrease in the Project Area in ponderosa pine and mixed conifer forests. However, treatment in mature successional stages with closed canopy cover (Structural Stages 4B/4C and 5) would be limited to approximately 3,660 acres. The impact on the overall habitat available in the Forest would be minor. Existing snags, which are important for post-fledging family and foraging habitat, would be retained where they are not a hazard. Coarse woody debris is also important to some goshawk prey species. These features would be retained to or above Forest Plan standards per project design criteria.

Olive-Sided Flycatcher

Short-term impacts to the Olive-sided fly catcher associated with harvesting and other treatment activities may occur, including temporary avoidance due to noise. The loss of nesting sites or individuals is possible; however, thinning efforts under Alternative B - Proposed Action would retain mature trees. Conservation measures applied for raptors and migratory birds would establish spatial and temporal restrictions for active nest sites, limiting impacts. In addition, treatment in preferred nesting habitat, in mature mixed conifer forest (Structural Stages 4B/4C and 5), would be limited to approximately 190 acres. Treatments would not occur in mature mixed conifer with a canopy closure less than 40 percent. This would reduce the potential for nest destruction. Patchy openings would be created to encourage regeneration and provide an increase in age class diversity. Additionally, standing dead trees that are not a safety hazard would be retained. These measures would improve olive-sided flycatcher in the long-term by providing more forest edge habitat, and maintaining existing snags.

American Marten

Suitable habitat for the American marten is limited within the Crossons-Longview Project Area. Forest thinning and other vegetation prescription activities under Alternative B - Proposed Action could result in a reduction of existing American marten habitat from reduced canopy cover and loss of understory and den materials.

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Mature mixed conifer (Structural Stages 4B/4C and 5) proposed for treatment include approximately 190 acres. Existing snags that are not a safety hazard would be retained thus reducing the impacts to some of the existing habitat that may be in the area. More forest edge habitat, which may be utilized by the American marten, would also be created by the proposed activities.

Fringed Myotis, Townsend's big eared bat and Hoary Bat

Suitable habitat for bat species occurs throughout the Project Area, including xeric and mesic ponderosa pine areas, as well as mixed conifer sites. Combined, these vegetation types account for an estimated 92 percent of the vegetation distribution within the Project Area. Removal of Douglas-fir and ponderosa pine could have direct impacts including a loss of roosting habitat, loss of existing roosts, and potentially the loss of individuals. Removal of ponderosa pine stands along drainage bottoms or at transition zones would have the greatest potential to impact roost sites. However, vegetation prescriptions would create openings ranging in size from 1 to 40 acres on xeric ponderosa and mixed conifer areas, and between 0.5 to 20 acres on mesic ponderosa sites. Creation of forest openings would benefit bats in the long-term by creating new forest edge habitat. In addition, under Alternative B - Proposed Action, trees identified as older than 200 years and existing snags which are not a hazard would be retained. These measures would help to maintain suitable roosting and foraging habitat within the Project Area.

Due to limited surveys, the occurrence of bats in the planning area or the existence of hibernacula or maternity roosting sites in the project area is not known. However, a known hibernaculum for Townsends Big eared bats occurs in North Fork Canyon and it is likely the project area contains unknown hibernaculum or roosting sites. Hoary bats are also likely to occur in the project area. The hoary bat is listed as common in both counties and is also likely to occur in the Project Area (NDIS 2014); both the Townsend's big eared bat and hoary bat may be impacted by proposed activities. Fringed myotis are rare or uncommon in Park and Jefferson County and is slightly less likely to be impacted by proposed activities. Activities under Alternative B - Proposed Action may affect individuals, but would not likely result in loss of viability for these species.

Rocky Mountain bighorn sheep

Direct impacts on bighorn sheep would include the limited potential for disturbance during treatments in the Project Area. Indirect effects would most likely include improvement of habitat, as treatments in shrubland habitat would enhance habitat for bighorn sheep. Treatments in conifer habitat may also increase potential habitat for this species; treatments in ponderosa pine habitat would provide openings of 1 to 40 acres in size, which would offer better forage and increase the potential for horizontal visibility. The Forest Service is working with Colorado Parks and Wildlife (CPW) to implement management actions that would enhance bighorn sheep habitat while meeting the purpose of and need for this project.

6.2.2 Management Indicator Species

Abert's squirrel

Under Alternative B - Proposed Action, disturbances or displacement of Abert's squirrels due to short-term disturbances to nesting and foraging sites could occur. Project treatment may also result in the transition from more mature structural stage (4B,C,5) to less mature structural stage in some of the Project Area, resulting in less ideal habitat for the Abert's squirrel. Table 9 presents potential treatment areas by habitat quality level. It is likely that the actual area treated would be less than the numbers shown due to topography, accessibility, and other limitations (i.e. no treatment in areas of 60 percent slope or greater and mechanical treatment only on areas with 35-60 percent slope).

Overall the long term, treatments in xeric and mesic ponderosa pine habitat would reduce the risk of stand replacing fire and move the forest towards the historical range of variability. Treatment would reduce competition for light, moisture, and nutrients, thereby accelerating the development of mature and old growth ponderosa pine stands, which would be desirable for Abert's squirrel in the long-term. Requirements for all project work would remain within Forest Plan standards to preserve squirrel stands within treatment areas would minimize impacts on the species. .

Table 9. Abert's Squirrel Habitat in Project Areas - Alternative B

Habitat	Habitat Quality Definition	Existing Habitat in Project Area (acres)	Habitat Treated in Alternative B (acres)
Primary	Habitat Structural Stages 4B, 4C and 5	5,073	4,295
Secondary	Habitat Structural Stages 3A-C and 4A	8,272	2,945
	Total	13,345	7,240

American elk

Proposed treatments could have some short-term negative impacts on elk and elk habitat due to fire, smoke, or disturbance or destruction of understory shrubs, forbs, and grasses from project-related activities. Grasses and forbs would likely return to the disturbed areas in a year or two, while shrubs and seedling/sapling trees would take several years to return. The proposed treatments are expected to have long-term beneficial impacts on elk forage quantity and quality in the Crossons-Longview Project Area. Thinning and burning would open up forested areas and allow for more forage production, while cutting small openings in aspen stands would promote its regeneration and also provide better-quality elk foraging habitat as new aspen suckers, grasses, forbs, and browse plants develop from cutting and burning treatments. While exact changes to

successional stage have not been modeled, proposed treatment within elk habitat would generally move cover from more mature structural stages to less mature structural stages optimizing habitat for elk foraging, as discussed in section 6.1.2. Elk forage quality and quantity would therefore improve over pre-project levels for the approximately 10,000 acres summer range, 5,600 acres winter range and 110 acres severe winter range proposed for treatment (Table 10). Winter and summer cover habitat has the potential to be decreased as project activities move forested habitat to earlier successional stages, but cover is not likely to be a limiting factor for elk in the project area.

No new permanent roads would be constructed in the project area, therefore no long term changes to road density would occur and road density is not anticipated to be a limiting factor in elk habitat.

Table 10. Approximate Elk Habitat in Project Area - Alternative B³

Habitat Type	High Quality Foraging Habitat (acres)		High Quality Cover Habitat (acres)	
	Existing Condition	Area Treated by Alternative B	Existing Condition	Area Treated by Alternative C
Summer	2,292	2,145	7,760	6,575
Winter Range	1,912	1,550	5,376	3,876
Severe	72	72	65	62

Brook trout

There would be no direct effects to brook trout or its habitat as a result of proposed vegetation treatments. Project activities could result in minor runoff and sedimentation increases and ash litter due to prescribed fires, as well as ground disturbance with subsequent erosion from heavy machinery and vehicles in the Crossons-Longview Project Area. However, BMPs for soils and watersheds would limit or avoid these problems. In the long-term, project treatments would reduce the risk of erosion into Crossons-Longview Project Area streams from intense wildfire or precipitation events. Treatments would likely not result in a measurable change in brook trout populations or trends.

6.2.3 Alternative B- Cumulative Effects

No other forest health or fuels treatment projects have recently occurred or are proposed in the planning area in the foreseeable future. Additional projects on Forest Service land in the South Platte District including mechanical treatment and prescribed fire treatments on up to 9,109 acres for the Harris Park Fuels

³ Based on general Habitat Capability Model cover types-high quality forage represented by (1,2, 3A, 4A all forested cover types, 1 shrub lands and all Aspen). High Quality cover type represented by 3b-5 forested cover types) Estimates likely over-represent available habitat. Not all area may represent optimal habitat and optimal habitat may differ depending on season of use.

Management Project and up to 1,107 acres in the Payne Gulch project, as well as ongoing forest treatment projects associated with the Upper South Platte Watershed Protection and Restoration Project. The Proposed Action, along with these projects could result in short term displacement of wildlife and temporary habitat change, but in the long term would contribute to lower risks of stand-replacing fires, reduced susceptibility to insect and disease epidemics, and stimulate regeneration and new growth of vegetation throughout the Project Area and the South Platte Ranger District. Motorized and non-motorized recreation would continue within and outside the project area, which would contribute to the impacts of human activity on wildlife in the project area.

Privately owned forest, agricultural, and residential lands within and adjacent to the Project Area may also provide suitable habitat. Continued fuel treatments pasture use on private lands would likely continue to affect habitat, thereby increasing the importance of habitat on NFS lands. In addition to forestry and agricultural activities, other management at the state and federal level would continue to impact MIS species. Specifically, state management of deer and elk harvest would continue to be one of the factors that affect elk and bighorn sheep populations in and around the project area. For example, Colorado Parks and Wildlife has plans to issue hunting permits for the population of big horn sheep in Waterton Canyon, adjacent to the project area.

The incremental contribution of Alternative B, enhancement of habitat throughout the Crossons-Longview Project Area, when combined with other past, present, or reasonably foreseeable future actions, would have minor long-term, but generally beneficial cumulative effects on Forest Service SS and MIS and species habitat quality in the South Platte district.

6.2.4 Alternative B- Species Viability

Abert's Squirrel

Alternative B (Proposed Action) treatments would have long-term beneficial effects on Abert's squirrel habitat suitability. Short term effects may occur to Abert's squirrel due to disturbance from treatment activities. Long term, treatments in ponderosa pine habitat would mimic natural succession and disturbance processes and would create a mosaic of habitat conditions over time. In general, Alternative B (Proposed Action) would contribute to meeting Forest Plan objectives for Abert's squirrel. Assuming standards, objectives, and guidelines are met Forest-wide, there would be adequate habitat to maintain Abert's squirrel populations across the Forest under Alternative B (Proposed Action).

American Elk

Treatments proposed in Alternative B (Proposed Action) would provide long-term improvements to foraging habitat in elk overall, summer, and winter range within the Crossons-Longview Project Area. The incorporation of small patch cuts would ensure diversity of cover types in the long term. Overall cover would be affected by

the removal of forest vegetation during mechanical treatments; however, cover is not likely to be the limiting factor in the forest. In general, Alternative B (Proposed Action) would contribute to meeting Forest Plan objectives for elk. Assuming standards, objectives, and guidelines are met Forest-wide, there would be adequate habitat to maintain elk populations across the Forest under Alternative B (Proposed Action).

Brook Trout

Alternative B (Proposed Action) is intended to reduce or eliminate the potential for a future high-intensity wildfire in the Crossons-Longview Project Area, which could ultimately have significant effects on the viability of brook trout locally. Effects to brook trout are expected to be minimal and short term. In general, Alternative B (Proposed Action) would contribute to meeting Forest Plan objectives for brook trout and to maintaining adequate habitat for brook trout populations in the Forest.

6.3 ALTERNATIVE C

Alternative C was developed in response to a concern that increasing access through the use of temporary roads would cause some negative effects. Like Alternative B (Proposed Action), Alternative C is designed to move the forest towards historical forest conditions and reduce wildlife hazards but proposes that minimal temporary roads would be built to accomplish the project's purpose and need. Alternative C impacts to wildlife would be similar to those described for Alternative B - Proposed Action.

6.3.1 Forest Service Region 2 Sensitive Species

Northern Leopard Frog

As with Alternative B - Proposed Action, the exclusion of temporary road construction in treatment application would have no impacts to the northern leopard frog or its habitat since the conservation measures proposed in Alternative B - Proposed Action would still apply.

American Peregrine Falcon

The effects of this alternative would be similar to the effects of Alternative B - Proposed Action. By not constructing temporary roads, the ability to remove fuels would be lessened and the area that could be treated would be reduced. This could reduce the area of impacts for the short-term effects discussed in Alternative B - Proposed Action, such as disturbance to foraging areas along riparian corridors.

Bald Eagle

Effects would be similar to those described under Alternative B. Impacts would be limited due to the lack of nesting sites and minimal winter use.

Flammulated Owl

The effects of this alternative would be similar to the effects of Alternative B - Proposed Action. By not constructing temporary roads, the ability to remove fuels would be lessened and the area that could be treated would be reduced. This could reduce the area of impacts for effects discussed in Alternative B - Proposed Action, including reduced density in mixed conifer habitat and potential loss of snags. However, proposed treatments in mixed conifer habitat in the planning area are limited therefore impacts would be limited under all action alternatives.

Lewis's Woodpecker

The effects of this alternative would be similar to the effects of Alternative B - Proposed Action. By not constructing temporary roads, the ability to remove fuels would be lessened and the area that could be treated would be reduced. This could reduce the area of impacts for the short-term effects discussed in Alternative B - Proposed Action, such as noise disturbance, but would increase the possibility for the long-term impacts discussed in Alternative A, including reduction of preferred open ponderosa pine forest habitat.

Loggerhead Shrike

As with Alternative B - Proposed Action, no impacts are expected to occur to the loggerhead shrike by vegetation treatments. Therefore the exclusion of temporary roads in treatment application would have no effect.

Northern Goshawk

The effects of this alternative would be similar to the effects of Alternative B - Proposed Action. By not constructing temporary roads, the ability to remove fuels would be lessened and the area that could be treated would be reduced. This could reduce the area of impacts for the short-term effects discussed in Alternative B - Proposed Action, such as potential loss of unknown active nests due to tree felling or prescribed fire. However, this alternative would increase the possibility for the long-term impacts discussed in Alternative A, including forest succession which would allow some stands to become too dense for nesting while others would mature to provide optimal nesting conditions.

Olive-Sided Flycatcher

The effects of this alternative would be similar to the effects of Alternative B - Proposed Action. By not constructing temporary roads, the ability to remove fuels would be lessened and the area that could be treated would be reduced. This could reduce the area of impacts for the short-term effects discussed in Alternative B - Proposed Action, such as noise disturbance, but would increase the possibility for the long-term impacts discussed in Alternative A, including reduced forage areas as forest understory growth continues and a dense canopy develops.

American Marten

The effects of this alternative would be similar to the effects of Alternative B - Proposed Action. By not constructing temporary roads, the ability to remove fuels would be lessened and the area that could be treated would be reduced. This could reduce the area of impacts for effects discussed in Alternative B - Proposed Action, including loss of existing habitat from reduced canopy cover and loss of understory and den materials. However, suitable marten habitat is limited within the Project Area, therefore this alternative is not expected to have significantly different impacts than Alternative B - Proposed Action.

Fringed Myotis, Townsend's big eared bat and Hoary Bat

The effects of this alternative would be similar to the effects of Alternative B - Proposed Action. By not constructing temporary roads, the disturbance to roosting and foraging habitat and direct disturbance of individuals would be reduced. However, the ability to remove fuels would be lessened and the area that could be treated would be reduced. New forest edge habitat would also be reduced by limiting the amount of openings created. As a result, the long-term improvements to habitat would be reduced.

Rocky Mountain bighorn sheep

This alternative is not expected to have significantly different impacts than Alternative B - Proposed Action. By not constructing temporary roads, the ability to remove fuels would be lessened and the area that could be treated would be reduced. This could potentially reduce the area of long-term improvements to bighorn sheep forage areas and shrubland habitat.

6.3.2 Management Indicator Species

Abert's squirrel

Total suitable habitat within ½ mile of existing roads based on mapped structural stage is displayed in Table 11. Approximate Acres of Potential Abert's Squirrel Habitat in Alternative C Treatment Area. Approximately 4,788 in this area would be considered suitable as primary habitat or used as potential other habitat by the Abert's squirrel. The effects of this alternative would be similar to the effects of Alternative B - Proposed Action. Project activities may result in some transition of mature ponderosa pine habitat to earlier structural stages that would not represent ideal optimal habitat for the species in the short term, but allowing for the forest to return to the historical range of variability and support development of mature stands with open-understory in the long term, thus increasing suitable habitat for the squirrel. By not constructing temporary roads, the ability to remove fuels will be lessened and the area that can be treated will be reduced, reducing short term disturbance as well as long term habitat improvement for Abert's squirrel.

Table 11. Abert’s Squirrel Habitat in Project Area - Alternative C

Habitat	Habitat Quality Definition	Existing Habitat in Project Area (acres)	Habitat Treated in Alternative C (acres)
Primary	Habitat Structural Stages 4B, 4C and 5	5,073	2,712
Secondary	Habitat Structural Stages 3A-C and 4A	8,272	2,076
	Total	13,345	4,788

American elk

The effects of this alternative would be similar to the effects of Alternative B - Proposed Action. By not constructing temporary roads, the ability to remove fuels will be lessened and the area that can be treated would be reduced. In total, the area proposed for treatment under Alternative C include approximately 6,200 acres of summer range and 3,000 acres of winter range. Acres of optimal foraging and cover habitat in the Alternative C treatment area are shown in Table 12. No severe winter range is proposed for treatment. This could reduce the area of impacts for the short-term effects discussed in Alternative B - Proposed Action, but would increase the possibility for the long-term impacts discussed in Alternative A.

Table 12. Approximate Elk Habitat in Project Area - Alternative C⁴

Habitat Type	High Quality Foraging Habitat (acres)		High Quality Cover Habitat (acres)	
	Existing Condition	Area Treated by Alternative C	Existing Condition	Area Treated by Alternative C
Summer	2,292	1,233	7,760	4,299
Winter Range	1,912	748	5,376	2,252
Severe	72	0	65	0

⁴ Based on general Habitat Capability Model cover types-high quality forage represented by (1,2, 3A, 4A all forested cover types, 1 shrub lands and all Aspen). High Quality cover type represented by 3b-5 forested cover types) Estimates likely over-represent available habitat. Not all area may represent optimal habitat and optimal habitat may differ depending on season of use.

Brook trout

As with Alternative B - Proposed Action, the exclusion of temporary road construction in treatment application would have no direct effects to brook trout or its habitat. The likelihood of minor runoff, sedimentation increases, and ground disturbance would be less likely under this alternative.

6.3.3 Alternative C- Cumulative Effects

Cumulative effects under Alternative C would be similar to those discussed under Alternative B. Due to the reduction in treated area under Alternative C, the contribution to overall forest health in the South Platte district would be less. Overall, the incremental contribution of Alternative B, enhancement of habitat throughout the Catamount Project Area, when combined with other past, present, or reasonably foreseeable future actions, would have minor long-term, but generally beneficial cumulative effects on Forest Service SS and MIS and species habitat quality in the South Platte district.

6.3.4 Alternative C- Species Viability

Proposed treatment activities in Alternative C would have similar effects to species viability as described under Alternative B. Contributions to meeting Forest Plan objectives for MIS species would be reduced due to reduction in overall treatment area. However, assuming standards, objectives, and guidelines are met, there would be adequate habitat to maintain MIS species populations across the Forest under Alternative C.

6.4 SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare to create and maintain conditions under which man and nature can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

As provided for by the amended Forest Plan (USFS 1984), specific standards, objectives, and guidelines would be applied during implementation of Alternative B - Proposed Action through the use of conservation measures. Adherence to these requirements would ensure that long-term productivity of the land is not impaired by short-term uses. There would be short-term impacts to vegetation, habitat, and wildlife species during vegetation treatments. However, the project goals are to increase ecological productivity in the long-term. Monitoring conducted at the Forest level would be applied to allow for adaptive management of the resources to protect long-term productivity.

6.5 UNAVOIDABLE ADVERSE EFFECTS

Under Alternative A (No Action), there would be no action; therefore, there would be no direct effects under this alternative.

Under Alternative B - Proposed Action wildlife habitat for certain species would be adversely affected to varying levels. During implementation of the treatments, noise, soil compaction, fire, and vegetation removal would reduce the amount of available habitat. Likewise, there may be a direct take in some species. Over the long-term, the diversity and functionality of the habitat would increase.

6.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time, such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line right-of-way or road.

There would be no irreversible or irretrievable commitments of resources related to fish and wildlife species or their habitats. Loss of old growth could represent an irretrievable loss of habitat, although no known old growth stands would be lost.

6.7 OTHER REQUIRED DISCLOSURES

The NEPA (40 CFR 1502.25[a]) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with other environmental review laws and executive orders.”

No waters would be impounded or diverted as part of Alternative B - Proposed Action, so coordination with USFWS under the Fish and Wildlife Coordination Act is not required. Prior to ground-disturbing activities, all appropriate consultation and any site-specific surveys deemed necessary would occur in compliance with the National Historic Preservation Act.

6.8 CONSISTENCY WITH FOREST PLAN

The Pike and San Isabel National Forests, Cimarron and Comanche National Grasslands Forest Plan (USDA Forest Service 1984) identified many goals for wildlife, including:

- ◆ Increase diversity for wildlife and habitat improvement; and
- ◆ Protect riparian areas and wetlands from degradation.

Specific Standards and Guidelines in the Forest Plan for protection of wildlife Species include the following:

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- Habitat for each species on the forest will be maintained at least at 40 percent or more of potential
- In forested areas maintain deer or elk hiding cover on 60 percent or more of the perimeter of all natural openings, all created openings, and along at least 75 percent of the edge of arterial and collector roads, and 40 percent along streams and rivers. Not more than one half of the hiding cover can be contiguous to another portion of the hiding cover along streams and rivers. In addition to hiding cover, 20 percent or more of the edge must be in thermal cover
- Allow conventional logging equipment on slopes up to 40 percent where soil surveys or site specific data are available to design erosion mitigation needs

Standards and guidelines related to habitat include the following:

- Size of openings clear-cuts 1 – 40 acres
- Retain all soft snags. Except where they are safety hazards In ponderosa pine, Douglass fir cottonwood and aspen stands, provide hard snags 12 inches DBH or larger to a density of at least 5 per 10 acres, 10 inches DBH or larger to a density of at least 9 per 10 acres, and 6 Inches DBH or larger to a density of at least 6 per 10 acres where biologically feasible
- In spruce-fire and lodge pole pine stands provide hard snags 12 Inches DBH or larger to a density of at least 2 per 10 acres. 10 Inches DBH or larger to a density of at least 12 per 10 acres. and 6 Inches DBH or larger to a density of at least 6 per 10 acres (where biologically feasible)
- Retain an average length per acre of downed logs (where biologically feasible) of the following diameters : Ponderosa Pine, Douglas fir and spruce-fir- 33 linear feet/acres, 12 Inch diameter; Aspen and Lodge pole pine 50 linear feet/acre 10 inch diameter.

The Forest Plan also established general management direction, including:

1. Manage and provide habitat for recovery of endangered and threatened species; and
2. Maintain habitat for viable populations of all existing vertebrate wildlife species.

Specific Standards and Guidelines in the Forest Plan for protection of Management Indicator Species include the following:

Provide for the habitat needs of Management Indicator Species on the National Forest

- a. Bighorn Sheep – protect lambing concentration areas from disturbance April 1-June 15 annually. Protect lambing areas from habitat modification.
- b. Elk and Mule Deer Protect calving and fawning concentration areas from habitat modification and disturbance from May 15 - June 30.
- c. Abert's Squirrel- Protect or provide for one Abert's squirrel nest tree clump (0.1 acres of 9 to 22" DBH ponderosa pine with a basal area of 180 to 220 and an interlocking canopy) per six acres on ponderosa pine sale areas.

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Alternative B - Proposed Action would work towards the above-stated goals and is consistent with objectives, standards, and guidelines provided in the Forest Plan and subsequent amendments.

Conservation Measures and monitoring requirements are incorporated into the action alternatives, to ensure compliance with the Forest Plan to avoid, minimize, rectify, reduce, eliminate, and/or compensate for adverse impacts of the proposed activity. This includes specific monitoring requirements for the avoidance of unexpected resource effects and the completion of project design and implementation as planned.

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