

Wildlife

Affected Environment

Introduction

The fauna of the oil-gas study area is determined by the floristic habitat present, temperature, and precipitation. The wildlife habitat communities in the study area include grassland, mixed shrubland, piñon-juniper mixed conifer woodlands, ponderosa and Southwestern white pine forest, spruce and fir forest, and riparian, as described in Table OG-23 and Figure OG-24 of the “Vegetation” section. Current conditions of the habitat are influenced by anthropogenic factors such as oil-gas development, wildlife and livestock grazing, as well as recent drought conditions. Common wildlife species encountered in the study area are discussed below by habitat. Most species may occur commonly in one particular habitat but are also likely to frequent adjacent habitats.

Grassland Habitat

Grasslands have a patchy distribution and typically cover small areas within a mosaic of habitats. The study area contains about 15,340 acres of this habitat. At lower elevations and up into the ponderosa pine zone, areas with mixed communities of shrubland-grassland occur, typically in swales and valley bottoms, with piñon-juniper woodland or ponderosa pine forest on surrounding slopes. At higher elevations, grasslands occur as small montane meadows surrounded by aspen or stands of mixed conifer forest.

Common passerine (perching) bird species inhabiting open grasslands in the study area include the common raven (*Corvus corax*), western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), western kingbird (*Carduelis tristis*), lark bunting (*Calamospiza melanocorys*), savannah sparrow (*Passerculus sandwichensis*), and vesper sparrow (*Pooecetes gramineus*) (USFS 2003a). Birds of prey include the golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), red-tailed hawk (*Buteo jamaicensis*), Swainson’s hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), American kestrel (*Falco sparverius*), great horned owl (*Bubo virginianus*), and burrowing owl (*Athene cunicularia*). Scaled quail (*Callipepla squamata*), although uncommon, is the most likely upland gamebird found in study area grasslands. Open grassland species may include mourning dove (*Zenaida macroura*), common poorwill (*Phalaenoptilus nuttallii*), broad-tailed hummingbird (*Selasphorus platycercus*), and black-chinned hummingbird (*Archilochus alexandri*). Waterfowl, waterbird, and shorebird use of grasslands is limited due to a lack of open water, marsh, riparian, and shoreline habitats.

A variety of small and medium size mammals (lagomorphs, rodents, and carnivores) potentially occur in study area grassland habitat. Grassland lagomorphs and small mammals likely include black-tailed jackrabbit (*Lepus californicus*), Gunnison’s prairie dog (*Cynomys gunnisoni*), spotted ground squirrel (*Spermophilus pilosoma*), 13-lined ground squirrel (*Spermophilus tridecemlineatus*), Botta’s pocket gopher (*Thomomys bottae*), northern pocket gopher (*Thomomys talpoides*), plains pocket mouse (*Perognathus flavescens*), silky pocket mouse (*Perognathus flavus*), Ord’s kangaroo rat (*Dipodomys ordii*), plains harvest mouse (*Reithrodontomys montanus*), deer mouse (*Peromyscus maniculatus*), and northern grasshopper mouse (*Onychomys leucogaster*) (Fitzgerald et al. 1994; NMDGF 2003). Common grassland carnivores in the study

area include coyote (*Canis latrans*), long-tailed weasel (*Mustela frenata*), badger (*Taxidea taxus*), and striped skunk (*Mephitis mephitis*) (Fitzgerald et al. 1994; NMDGF 2003).

Elk (*Cervus elaphus*) and mule deer (*Odocoileus hemionus*) are the primary big game species in the study area, which lies within portions of Game Management Units 5, 6, and 7. About 1,000 to 10,000 elk inhabit the study area (both migratory and residential) and elk habitat conditions are stable (USFS 2003a). Ideal elk habitat contains forested areas interspersed with meadows. However, open grasslands at low elevations may be used during winter. Resident mule deer numbers in the study area are much lower than winter populations. Open grasslands, particularly with scattered shrubs, are used to some degree during winter. Populations for both may vary seasonally as the severity of winter conditions influence migration movements south from Colorado.

Amphibians and reptiles documented in Rio Arriba and Sandoval Counties that may occur in study area grasslands include western toad (*Bufo boreas*), New Mexico whiptail (*Cnemidophorus neomexicanus*), desert grassland whiptail (*Cnemidophorus uniparens*), short-horned lizard (*Phrynosoma douglassii*), western fence lizard (*Sceloporus undulatus*), and western terrestrial garter.

Riparian Habitat

The vegetation associated with riparian areas varies based on elevation, gradient, and valley bottom. Wooded riparian areas may be composed of willow (*Salix* spp.), narrow-leaf cottonwood (*Populus angustifolia*), and alder (*Alnus*). Other riparian areas are dominated by grass and *Carex* spp. Coniferous trees (Douglas-fir, white fir, ponderosa pine) dominate in areas characterized by a high gradient and a confined valley bottom. Tamarisk (*Tamarix ramossissima*) occurs in low numbers along some drainages at the lower elevations.

Riparian and wetland areas represent a very small percentage of the study area, located along Rio Gallina, Clear Creek, Nacimiento Creek, and Cecilia Creek, as well as some intermittent streams and arroyos.

Due to the limited amount of riparian habitat, birds found in riparian areas are likely generalist and/or species that prefer shrubs. These may include black-billed magpie (*Pica pica*), Brewer's blackbird (*Euphagus cyanocephalus*), broad-tailed hummingbird, and American goldfinch (*Carduelis tristis*) (USFS 2003a). Tree cavities in forested habitat adjacent to riparian areas may attract species such as American kestrel, black-capped chickadee (*Parus atricapillus*), European starling (*Sturnus vulgaris*), and house wren (*Troglodytes aedon*).

Numerous bat species forage over riparian areas or open water, but due to the lack of perennial water and associated riparian habitat in the study area only transient occurrence is likely. Bat species that may utilize riparian habitat include long-legged myotis (*Myotis volans*), pallid bat (*Antrozous pallidus*), and long-eared myotis (*Myotis evotis*). Other small and medium size mammals (insectivores, rodents, carnivores) potentially found in riparian areas include masked shrew (*Sorex cinereus*), montane shrew (*Sorex monticolus*), western harvest mouse (*Reithrodontomys megalotis*), brush mouse (*Peromyscus boylii*), long-tailed vole (*Microtus longicaudus*), and raccoon (*Procyon lotor*) (NMDGF 2003). Elk prefer riparian areas or other shaded habitat with green forage and access to water during summer (USFS 2003a). Thus, the lack of riparian habitat limits the number of resident elk in the study area. Minimal riparian habitat along with the lack of natural surface waters increases the dependence of both elk and deer on manmade water sources in the study area.

Amphibians and reptiles documented in Rio Arriba and Sandoval Counties that potentially occur in study area riparian habitat include painted turtle (*Chrysemys picta*), striped chorus frog (*Pseudacris triseriata*), northern leopard frog (*Rana pipiens*), and lesser earless lizard (*Holbrookia maculata*) (MSB 2003).

Sagebrush/Oak Woodland Habitat

Sagebrush/oak woodland habitats exist between elevations of 5,500 to 8,000 feet in northern New Mexico (USFS 2003a). The interface between the sagebrush below 6,900 feet and the Gambel oak above 6,500 feet is typically an ecotone rather than an abrupt edge.

Common passerine bird species inhabiting sagebrush/oak woodlands in the study area include green-tailed towhee (*Pipilo chlorurus*), black-headed grosbeak (*Pheucticus melanocephalus*), blue-gray gnatcatcher (*Polioptila caerulea*), MacGillivray's warbler (*Oporornis tolmiei*), and lazuli bunting (*Passerina ciris*) (USFS 2003a). Common birds of prey of sagebrush/oak woodlands are red-tailed hawk, Cooper's hawk (*Accipiter cooperii*), common nighthawk (*Chordeiles minor*), great horned owl, northern saw-whet owl (*Aegolius acadicus*), and sharp-shinned hawk (*Accipiter striatus*). Other sagebrush/oak woodland inhabitants may include mourning dove, broad-tailed hummingbird, northern flicker (*Colaptes auratus*), and ladder-backed woodpecker (*Picoides scalaris*) (USFS 2003a).

Bat species that may utilize sagebrush/oak woodlands include fringed myotis and small-footed myotis. Small and medium size mammals (insectivores, lagomorphs, rodents) that may occur in study area sagebrush/oak woodlands include Merriam's shrew (*Sorex merriami*), desert cottontail (*Sylvilagus audubonii*), mountain cottontail (*Sylvilagus nutallii*), least chipmunk (*Tamias minimus*), Colorado chipmunk (*Tamias quadrivittatus*), golden-mantled ground squirrel (*Spermophilus lateralis*), rock squirrel (*Spermophilus variegatus*), brush mouse (*Peromyscus boylii*), canyon mouse (*Peromyscus crinitus*), northern rock mouse (*Peromyscus nasutus*), white-throated woodrat (*Neotoma albigula*), and Mexican woodrat (*Neotoma mexicana*) (Fitzgerald et al. 1994; NMDGF 2003).

Multiple carnivores utilize sagebrush/oak woodlands due to the array of small and medium sized mammalian prey and abundant cover. Among them are coyote, gray fox (*Urocyon cinereoargenteus*), ringtail (*Bassariscus astutus*), western spotted skunk (*Spilogale gracilis*), and bobcat (*Lynx rufus*) (Fitzgerald et al. 1994; NMDGF 2003).

Sagebrush/oak woodlands are utilized by a variety of big game species including elk, mule deer, and black bear (*Ursus americanus*). Sagebrush/oak woodlands are not the primary winter habitat of deer and elk in the study area. However, elk use of sagebrush/oak woodlands, particularly at the ecotone with piñon-juniper woodlands, increases during winter due to their increased dependence on browse (USFS 2003a). Mule deer use sagebrush/oak woodlands year-round to some degree, but increase their dependence in winter. Current mule deer usage of the sagebrush habitat has contributed to the degradation of this habitat type in the study area and adjacent BLM lands. Black bear are attracted to Gambel's oak in the fall when they feed heavily on acorns (NMDGF 2003).

Amphibians and reptiles documented in Rio Arriba and Sandoval Counties and potentially found in study area sagebrush/oak woodlands include Woodhouse's toad (*Bufo woodhousii*), plateau striped whiptail (*Cnemidophorus neomexicanus*), gopher snake (*Pituophis catenifer*), western rattlesnake (*Crotalus viridis*), and sagebrush lizard (*Sceloporus graciosus*) (MSB 2003).

Piñon-Juniper Habitat

With a total of about 54,700 acres, piñon-juniper woodland is the second most largely represented vegetation type in the study area. The majority of the piñon-juniper woodland occurs in the northern portion of the study area. Typical activities that affect this habitat type in New Mexico include firewood cutting, development, grazing, fire suppression and subsequent increased likelihood of catastrophic fire, and conversion to grassland (USFS 2003a).

Passerine species considered obligates or semi-obligates of this habitat include gray flycatcher (*Empidonax wrightii*), ash-throated flycatcher (*Myiarchus cinerascens*), scrub-jay (*Aphelocoma coerulescens*), piñon jay (*Gymnorhinus cyanocephalus*), juniper titmouse (*Baeolophus ridgwayi*), bushtit (*Psaltriparus minimus*), Bewick's wren (*Thryomanes bewickii*), gray vireo (*Vireo vicinior*), black-throated gray warbler (*Dendroica nigrescens*), and lark sparrow (*Chondestes grammacus*) (USFS 2003a). Merriam's turkey is a primary game bird found in the study area in this habitat type. Other piñon-juniper inhabitants include downy woodpecker (*Picoides pubescens*), hairy woodpecker (*Picoides villosus*), and Williamson's sapsucker (*Sphyrapicus thyroideus*). Birds of prey that utilize piñon-juniper are MSO, northern goshawk, great horned owl, northern pygmy owl (*Glaucidium gnoma*), golden eagle, American kestrel, sharp-shinned hawk, and Cooper's hawk (USFS 2003a).

Bat species, likely to use piñon-juniper habitat within the study area include long-eared myotis, long-legged myotis, big free-tailed bat (*Nyctinomops macrotis*), spotted bat (*Euderma maculatum*), and pallid bat.

Other small and medium size mammals (insectivores, lagomorphs, and rodents) likely to be found in study area piñon-juniper woodlands include desert shrew (*Notiosorex crawfordi*), desert cottontail, mountain cottontail, Colorado chipmunk, golden-mantled ground squirrel, rock squirrel, Botta's pocket gopher, silky pocket mouse, brush mouse, canyon mouse, northern rock mouse, piñon mouse (*Peromyscus truei*), white-throated woodrat, bushy-tailed woodrat (*Neotoma cinera*), and Mexican vole (Fitzgerald et al. 1994; NMDGF 2003). Carnivores utilizing piñon-juniper habitat are similar to those found in montane shrublands. Mountain lions are documented within the study area and likely use piñon-juniper woodlands, since they occur where mule deer are abundant (NMDGF 2003).

Amphibians and reptiles documented in Rio Arriba and Sandoval Counties and potentially found in study area piñon-juniper woodlands include southern spadefoot (*Scaphiopus multiplicatus*), many-lined skink (*Eumeces multivirgatus*), western coachwhip (*Masticophis flagellum*), and New Mexico garter snake (*Thamnophis sirtalis*) (MSB 2003).

Ponderosa Pine Habitat

Habitat in the study area above 7,000 feet is dominated by ponderosa pine forest. Before 1900, the fire interval in New Mexico ponderosa pine forests was 2 to 10 years. Frequent low-intensity fires maintained open, park-like conditions with robust understory vegetation (USFS 2003a). Since about 1900, successful fire suppression has increased the density of pine forests, suppressed the herbaceous and shrub understory, and increased the abundance of dwarf mistletoe (USFS 2003a). Current primary management activities affecting ponderosa pine in the study area include both fire suppression, which subsequently increases the risk of catastrophic fire, and grazing.

Passerines of ponderosa pine and mixed conifer forest may include American robin (*Turdus migratorius*), dark-eyed junco (*Junco hyemalis*), hermit thrush (*Catharus guttatus*), mountain

chickadee (*Parus gambeli*), pine grosbeak (*Pinicola enucleator*), pine siskin (*Carduelis pinus*), ruby-crowned kinglet (*Regulus calendula*), red-breasted nuthatch (*Sitta canadensis*), Stellar's jay (*Cyanocitta stelleri*), and yellow-rumped warbler (*Dendroica coronata*) (USFS 2003a).

Merriam's turkey and mourning doves are game birds found in the study area in this habitat type. Other avian species likely to be found include the hairy woodpecker, downy woodpecker, and Williamson's sapsucker (*Sphyrapicus thyroideus*). Common birds of prey likely found in ponderosa pine forests in the study area include red-tailed hawk, Cooper's hawk, and the great horned owl (USFS 2003a).

Bat species that are likely to use ponderosa pine forest in the study area include long-eared myotis, fringed myotis, long-legged myotis, and spotted bat.

Other small and medium sized mammals (lagomorphs and rodents) likely found in study area ponderosa pine forest include mountain cottontail, bushy-tailed woodrat, Mexican woodrat, and porcupine (*Erethizon dorsatum*) (Fitzgerald et al. 1994; NMDGF 2003). Carnivores that may occur in pine habitat in the study area include coyote, long-tailed weasel, and bobcat (Fitzgerald et al. 1994; NMDGF 2003). Ponderosa pine forest, a component of mixed conifer woodland, is the second most important habitat to wintering elk and mule deer in the study area. It is also utilized by black bear and mountain lion.

Amphibians and reptiles documented in Rio Arriba and Sandoval Counties, which may occur in coniferous forest habitat in the study area include western toad, northern leopard frog, and western rattlesnake (MSB 2003).

High Montane Forest Habitat

High montane forest occurs typically above 8,500 feet (Dick-Peddie 1993). In the study area, dominant tree species consist typically of Englemann spruce (*Picea engelmannii*) at the highest elevations, and white fir (*Abies concolor*), Rocky Mountain Douglas-fir (*Pseudotsuga menziesii*), southwestern white pine (*Pinus strobiformis*), and ponderosa pine lower on the slopes. Douglas-fir is found on north-facing slopes. Since about 1900, successful fire suppression has increased the density of pine forests in New Mexico, suppressed the herbaceous and shrub understory, and increased the abundance of dwarf mistletoe (USFS 2003a). Current primary management activities affecting mixed conifer in the study area include fire suppression, and the subsequent increased risk of catastrophic wildfire.

Passerines of mixed conifer forest may include American robin, Clark's nutcracker, dark-eyed junco, hermit thrush, mountain chickadee, pine grosbeak, pine siskin, ruby-crowned kinglet, red-breasted nuthatch, Stellar's jay, and yellow-rumped warbler (USFS 2003a). Merriam's turkey and mourning doves are game birds found in the study area in this habitat type. Other avian species likely to be found include the hairy woodpecker, downy woodpecker, and Williamson's sapsucker. Common birds of prey likely found in mixed conifer forests in the study area include red-tailed hawk, sharp-shinned hawk, Cooper's hawk, great horned owl, northern pygmy owl, and northern saw-whet owl (USFS 2003a).

Small and medium sized mammals (lagomorphs and rodents) likely found in the study area's mixed conifer forest include mountain cottontail, bushy-tailed woodrat, Mexican woodrat, and porcupine (*Erethizon dorsatum*) (Fitzgerald et al. 1994; NMDGF 2003). Carnivores that may occur in high montane forest habitat in the study area include coyote, long-tailed weasel, and bobcat (Fitzgerald et al. 1994; NMDGF 2003).

Amphibians and reptiles documented in Rio Arriba and Sandoval Counties, which may occur in coniferous forest habitat in the study area include western toad, northern leopard frog, and western rattlesnake (MSB 2003).

Fisheries

Natural waterways in the study area include both perennial and intermittent streams located in arroyos, washes, and canyons. Perennial streams in the study area support a variety of salmonid fish species, including rainbow, brown, and Rio Grande cutthroat trout. Within the study area, the primary waterways for aquatic habitat include Clear Creek, Rio Puerco del Grande, Rito le los Pinos, La Jara Creek, San Jose Creek, Cecilia Creek, and Rio Capulin. The New Mexico Department of Game and Fish (NMDGF) stocks local lakes and streams with rainbow trout. Brown trout were introduced to the state's waters in the early 1900s and, although no longer stocked, are quite common.

Environmental Consequences

Wildlife species have varying degrees of mobility throughout their range and are able to adjust to dynamic habitat conditions (both natural and anthropogenic) based on their mobility. Species with greater mobility would be generally less affected by disturbance as long as suitable habitat remains within their range. Less mobile species would be influenced more by direct habitat loss and/or habitat conversion due to their inability to relocate to more suitable habitat. Wildlife species can be classified as obligate or generalist species. Obligate species such as Grace's warbler and the sage thrasher would be affected more by habitat loss (in ponderosa pine and sagebrush habitat, respectively) than a generalist such as the American robin or coyote, both of which use a range of habitats. Analysis of the alternatives and the effect of these actions to wildlife would focus mostly on species that tend to be obligates or are less able to adapt to changing habitat conditions.

Fire suppression, livestock and wildlife grazing, erosion, and habitat fragmentation and disturbance from roads and associated traffic affect wildlife habitat in the study area. Fire suppression has resulted in a greater density of trees, which negatively affects those species preferring open, park-like conditions (e.g., the hairy woodpecker). With fire suppression, the availability of snags and tree cavities is often greatly reduced. Snags, which are particularly important to species such as the flammulated owl, are often removed through firewood collecting. Finally, catastrophic fires have a devastating impact on wildlife. This impact has long-term effects especially on those species strongly associated with old-growth forest.

Species are strongly affected by surface disturbance resulting in habitat fragmentation. In the southern Rocky Mountains in general (Knight et al. 2000), surface disturbance from road construction is a primary cause of habitat fragmentation. The impact of roads is measured not only by the total acreage of vegetation removed, but also the fragmentation of habitat into smaller, uniformly shaped areas (Reed et al. 1996), as well as by vehicle traffic. Impacts on wildlife due to road construction include mortality due to vehicle collisions, habitat fragmentation, and the disturbance from noise and human activity brought by traffic.

Most species are sensitive to harassment or human presence, which are often facilitated by road access; potential reductions in productivity, increases in energy expenditures, or displacements in population distribution or habitat use can occur (Bennett 1991, Mader 1984). Examples of such road-associated effects are human disturbance of leks (e.g., sage grouse and sharp-tailed grouse),

nests (e.g., ferruginous hawk), and dens (e.g., kit fox). Another example is elk avoidance of large areas near roads open to traffic (Lyon 1983, Rowland et al. 2000), with elk avoidance increasing with the increasing rate of traffic (Wisdom et al. 2000; Johnson et al. 2000).

Effects to wildlife are frequently a result of surface-disturbing activities, such as road construction, mineral development, livestock grazing, and OHV recreation. These activities are likely to result in direct and indirect impacts to wildlife communities in the study area. None of the alternatives would directly result in surface-disturbing activities because the decision addresses leasing only. Therefore, the analysis below will primarily focus on the indirect impacts to vegetative resources resulting from increased surface resource protections for future new leases and oil-gas development. Restrictions on surface disturbance, proposed as stipulations on new leases, such as controlled surface use (CSU), no surface occupancy (NSO), and timing limitations (TL), are measures that may have indirect beneficial affect to wildlife communities within the study area if the new leases are developed in the future.

Alternative 1—No Action

Under the No Action Alternative, wildlife would be managed under the existing authority of the current Forest Plan. With the exception of the areas identified for limited surface use, no additional leasing stipulations would restrict surface activities related to oil-gas development. Currently, about 8 percent of the study area (national forest land only) is under limited surface use leasing restrictions. The leasing itself would not result directly in any surface-disturbing activities and, thus, would not have direct impacts to wildlife communities.

The No Action Alternative would not result in any direct impacts to wildlife due to the absence of surface-disturbing activities as a direct result of the leasing decision to be made. The No Action Alternative would provide the fewest restrictions on surface disturbance through lease stipulations, resulting in the least amount of indirect surface protection for wildlife and associated habitat.

Alternative 2—Proposed Action

Under the Proposed Action, restrictions on surface disturbance would increase compared to the No Action Alternative, for a total of about 55 percent of the study area (national forest land only). The increased restrictions would be attached to some leases through NSO, CSU, or TL stipulations. These proposed stipulations would potentially reduce the overall amount of surface disturbance on new leases, a beneficial effect for wildlife that potentially would minimize habitat fragmentation and reduce disruptions caused by vehicle traffic. Under Alternative 2, restrictions on surface disturbance would be the second highest, potentially providing the second highest amount of protection to wildlife communities by limiting surface disturbance in large portions of the study area under new leases.

Alternative 3

The impacts to wildlife under Alternative 3 would be similar to those described for the Proposed Action, with slightly more extensive protection due to restrictions on surface disturbance. Under Alternative 3, implementation of increased NSO lease stipulations would result in about 60 percent of the study area (national forest land only) being under some form of reduced surface disturbance requirement for oil-gas development under new leases. Under Alternative 3,

restrictions on surface disturbance would be the highest, potentially providing the greatest protection to wildlife habitat on new leases.

Cumulative Impacts

The analysis area for cumulative effects on wildlife is the area in and adjacent to the oil-gas study area, and includes both Forest Service and non-Federal lands. In all alternatives, cumulative impacts to wildlife would stem from the combination of forest management activities, public land uses, and activities on other public and private lands.

Development of leases for oil and gas resources is a reasonably foreseeable action to be considered under the “Cumulative Impacts” section. Through consultation with industry and constraints on oil-gas development, such as topography, the Forest Service projects mineral development over the next 20 years to be about 20 new well locations and almost 3 miles of associated roads within the study area. All of the projected development would occur in the northern portion of the study area. The majority of the projected wells would occur within piñon-juniper and ponderosa pine wildlife habitat (10 and 7 wells, respectively). The remaining three wells are projected to occur within grassland wildlife habitat. Associated new roads projected to be built with the projected new wells include about 1.3 miles of road within ponderosa pine wildlife habitat, 0.8 mile of road within piñon-juniper wildlife habitat, and 0.7 mile of road within grassland wildlife habitat. All of the projected wells and associated projected roads would occur within existing leases. Therefore, neither of the action alternatives would influence the development of the projected wells or roads, unless existing leases were relinquished and re-issued under proposed lease stipulations. The potential oil-gas development would most likely occur under standard terms and conditions, providing minimal surface protection for vegetative resources. The amount of projected development is minimal and, therefore, impacts to wildlife would likely be negligible.

Other foreseeable actions that may contribute to decreased wildlife habitat fragmentation and disruption are the proposed decommissioning of 773 miles of Forest Service roads within the Cuba and Coyote Ranger Districts, currently under consideration. The road decommissioning would reduce habitat fragmentation over the long term, while 639 miles of proposed road closures would reduce motorized vehicle traffic in the region and minimize wildlife disruption. These decisions, if implemented, would more than offset the small amount of projected oil-gas development in the area.

Management Indicator Species

Affected Environment

The “Santa Fe National Forest Land and Resource Management Plan,” adopted in 1987, identified eight management indicator species (MIS), i.e., species whose population trends can point to possible effects of management activities on plant communities and seral stages (USFS 1987). Factors considered in the selection of the eight species included monitoring feasibility, migratory habits, and habitat versatility (USFS 1987). The eight MIS include one federally listed threatened species, the Mexican spotted owl, and one Forest Service Region 3 sensitive species, the Rio Grande cutthroat trout. The other species are Merriam’s turkey, hairy woodpecker, Rocky Mountain bighorn sheep, Rocky Mountain elk, piñon jay, and mourning dove (USFS 2003a). Seven of the eight MIS occur or potentially occur in the oil-gas study area. The only MIS known to be absent in the study area is the bighorn sheep. Discussions in this section on populations and

habitat trends are reported for the entire Santa Fe National Forest based on the most recent MIS status document (USFS 2003a) and are not specific to the study area.

Table OG-26 lists the seven MIS present in the study area, along with their habitat associations by vegetation cover types and total acreage of habitat in the study area.

Rocky Mountain Elk (*Cervus canadensis*)

Affected Environment

The Rocky Mountain elk is a subspecies of the elk, a species distributed over much of the western U.S., with also introduced populations in the eastern part of the country. Elk populations in the mountainous western U.S. tend to inhabit coniferous forests associated with rugged, broken terrain or foothill ranges (USFS 1993). Most forest types with adequate cover and forage are used. During the summer, elk spend most of their time in high mountain meadows in the alpine or subalpine zones or in stream bottoms (USFS 2003a). In the winter, they typically migrate to lower elevation areas (winter ranges). Elk habitat in the study area is displayed on Figure OG-26.

Habitat Trend

On the Santa Fe National Forest, forage availability is the limiting habitat component for elk. Forage availability is conditioned by the acreage of alpine and montane meadows, which itself is determined in part by encroaching canopy closure (USFS 2003a). Thus, elk tends to benefit from natural events (e.g., wildfires) or management activities leading to the creation of early-seral stage habitat, and elk habitat trend is assessed through the percentage of habitat that has been disturbed to date (11.4 percent) within the forest. On this basis, the trend for elk habitat on the forest is rated as stable: new forage areas (mostly following large wildfires but also prescribed burns, timber harvest, and thinning projects) are created at about the same rate that coniferous forests encroach upon existing meadows (USFS 2003a).

Population Trend and Viability

Elk is considered demonstrably secure globally. On the forest, elk population levels are assessed through aerial surveys conducted by the New Mexico Department of Game and Fish and by estimated hunter success rate (USFS 2003a). The elk population appears to have increased on the forest since implementation of the Forest Plan. The species is ranked as common, with an estimated number of breeding females ranging between 1,000 and 10,000 individuals. Conflicts with grazing permittees have arisen due to forage competition between elk and livestock on grazing allotments. While at the same time, activities such as forest thinning and prescribed burning has increased the availability of forage. The New Mexico Game and Fish strives to hold the elk population at its current levels, by providing a limited number of late hunting cow permits (USFS 2003a).

Table OG-26. Management indicator species and habitat occurring or potentially occurring in the study area

Management Indicator Species	Habitat Associations (Vegetation Cover Types)	Total Acreage of Habitat in the study area	Total Acreage of Habitat on the Forest
Rocky Mountain elk (<i>Cervus canadensis</i>)	Aspen Douglas-fir Englemann spruce Grassland Oak woodland Piñon-juniper woodland Ponderosa pine Rocky Mountain juniper Sagebrush Southwestern white pine White fir	194,530 (14%)	1,440,000
Merriam's turkey (<i>Meleagris gallopavo</i>)	Aspen Douglas-fir Grassland Piñon-juniper woodland Ponderosa pine White fir	180,375 (15%)	1,180,000
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	Douglas-fir White fir	36,310 (15%)	240,000
Mourning dove (<i>Zenaidura macroura</i>)	Grassland Piñon-juniper woodland Ponderosa pine Rocky Mountain juniper Sagebrush	146,704 (16%)	900,000
Hairy woodpecker (<i>Picoides villosus</i>)	Aspen Douglas-fir Englemann spruce Piñon-juniper woodland Ponderosa pine Southwestern white pine White fir	165,852 (19%)	880,000
Piñon jay (<i>Gymnorhinus cyanocephalus</i>)	Piñon-juniper woodland	53,674 (12%)	460,000
Rio Grande cutthroat trout (<i>Onchorhynchus clarki virginianus</i>)	Perennial streams	6.2 miles of occupied stream (4%)	149.7 miles of currently occupied streams

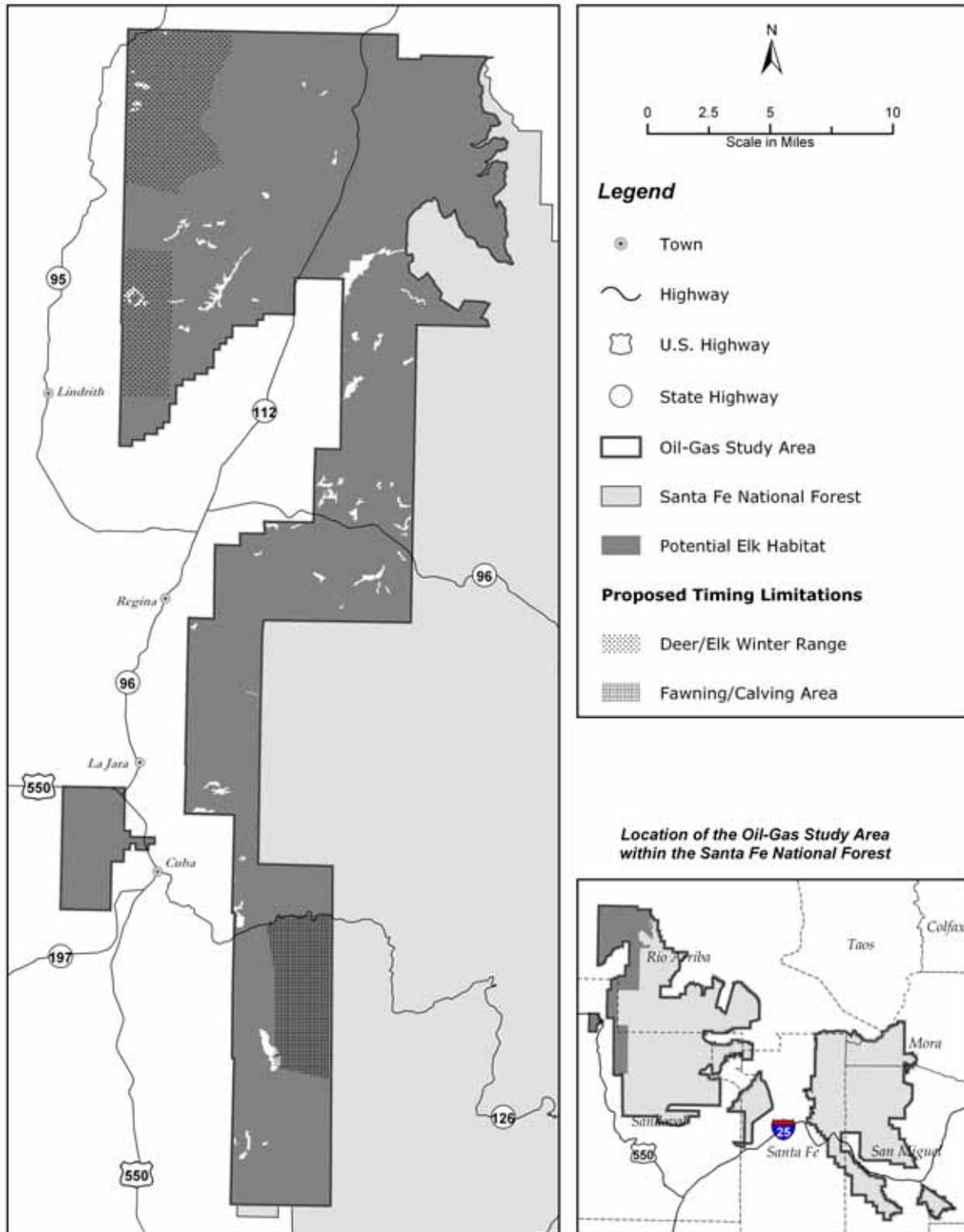


Figure OG-26. Potential habitat for Rocky Mountain elk

Environmental Consequences

The Santa Fe National Forest MIS assessment and habitat trend analysis (USFS 2003a) determined that quality elk habitat decreased from 1,624,026 acres to 1,439,497 acres since the Forest Plan (1987) was implemented. This is a downward trend of about 11 percent. Despite the reported decrease in elk habitat, elk populations are increasing on the forest and habitat for elk is considered stable (USFS 2003a). The study area contains about 194,530 acres (national forest land only) of potential Rocky Mountain elk habitat according to a recent GIS analysis of the vegetative communities.

Comparison of Alternatives—Habitat Condition and Trend

Alternative 1—No Action

The No Action Alternative would have the fewest restrictions on surface disturbance on new leases that would indirectly protect elk habitat from surface disturbance. Under Alternative 1, 16,506 acres of limited surface restrictions would continue to exist for mineral leases. The existing elk population has been increasing in the forest since implementation of the Forest Plan in 1987. Historic increases in elk habitat in the forest, and management activities under the Forest Plan for quality elk habitat would likely continue to contribute to the preservation of elk habitat under the No Action Alternative. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 1 would not impact the quantity or quality of elk habitat, nor would it affect elk populations on the Santa Fe National Forest.

Alternative 2—Proposed Action

The Proposed Action would increase restrictions on oil-gas development over the No Action Alternative through stipulations on new leases that would protect certain elk habitats from surface disturbance. The total surface restrictions (NSO, CSU, and TL lease stipulations) on oil-gas development under new leases would apply to about 55 percent of the forest land in the study area, but not on existing leases. Timing limitations (June 1 through July 31) would prohibit oil-gas drilling operations on the approximately 9,600 acres of deer fawning/elk calving area. This area currently has no oil-gas leases, no projected development based on the RFDS, or expressions of interest in oil-gas leasing. Up to 22,390 acres of winter range habitat would be protected from December 15 through March 15 should existing leases expire or be relinquished. These areas, shown on Figure OG-26, would protect elk habitat during critical periods by limiting disturbance during times of high densities and migratory periods. Under the Proposed Action, the acreage under proposed surface disturbance restrictions would potentially provide the second highest amount of protection to Rocky Mountain elk habitat and individuals under new leases. Historic increases in elk populations, stable elk habitat in the forest, management activities under the Forest Plan for quality elk habitat, and increased stipulations on new leases would help ensure Rocky Mountain elk would maintain healthy populations under the Proposed Action. Due to the lack of ground disturbance as a result of the leasing decision and because there are no expressions of interest in these areas, Alternative 2 would not directly impact the quantity or quality of elk habitat, but may provide future protection of some habitat. Furthermore, the Proposed Action would not adversely affect elk populations on the Santa Fe National Forest.

Alternative 3

The impacts to Rocky Mountain elk under Alternative 3 are similar to or slightly less than those described for the Proposed Action. More acreage of proposed lease stipulations (21 percent more NSO) that would limit surface disturbance on new leases would occur under this alternative. Overall, the acreage of proposed lease stipulations under Alternative 3 would be the highest, increasing about 52 percent from the No Action Alternative, for a total of about 60 percent of the forest land in the study area. Historic increases in elk populations, stable elk habitat in the forest, management activities under the Forest Plan for quality elk habitat, and the highest amount of proposed stipulations on new leases would likely ensure that Rocky Mountain elk populations would continue to increase under Alternative 3. Due to the lack of ground disturbance as a result of the leasing decision and because there are no expressions of interest in these areas, Alternative 3 would not directly impact the quantity or quality of elk habitat. Furthermore, Alternative 3 would not adversely affect elk populations on the Santa Fe National Forest.

Merriam's Turkey (*Meleagris gallopavo merriami*)

Affected Environment

Merriam's turkey is the most common subspecies of wild turkey and occurs in many mountain ranges of northern New Mexico (USFS 2003a). Turkey habitat on the Santa Fe National Forest includes a wide variety of vegetation types ranging from grassland to mixed coniferous forest. Turkey habitat includes almost all of the study area as displayed in Figure OG-27.

Among the species' most important habitat requirements are proximity to open water, roosting trees, and forage. The importance of open water is underscored by the fact that during the nesting season, hens typically nest within one-half mile of water. Favorite roosting trees of Merriam's turkey consist of mature or over-mature ponderosa pines with a diameter at breast height (d.b.h.) of over 14 inches, a relatively open crown, and large horizontal branches originating from the trunk at heights of 20 to 30 feet above ground. Additionally, roosting trees have excellent protection from the wind, and are often located in sites with an open ridge or rocky ledge nearby for easier access to the roost site. Turkeys forage in grasslands, brush communities, deciduous tree-brush, and ponderosa pine. They eat grasses and grasshoppers in the summer. In the fall, they rely strongly on oak supply mast and mature ponderosa pine seeds, while in the winter they forage on tall grasses. Piñon nuts are also an essential component of the turkey's diet in New Mexico (USFS 2003a).

Habitat Trend

Turkey habitat is plentiful on the Santa Fe National Forest. Forage areas appear to be more limiting than other components (i.e., cover, roosting trees, nesting) of the turkey's habitat on the forest. Grass, forbs, and mast are more abundant where the forest canopy remains open, and due largely to a human history of fire suppression, many forested areas have witnessed an increase in tree density and higher canopy closure. Thus, Merriam's turkey tends to benefit from natural events (e.g., wildfires) or management activities (e.g., prescribed burns in ponderosa pine forest), leading to the creation of early-seral stage habitat or opening of the forest canopy. The turkey habitat trend on the forest is assessed through the acreage of habitat that has been disturbed (10 percent) since development of the Forest Plan. On this basis, the trend for turkey habitat on the forest is rated as stable: new forage areas (mostly following large wildfires but also prescribed

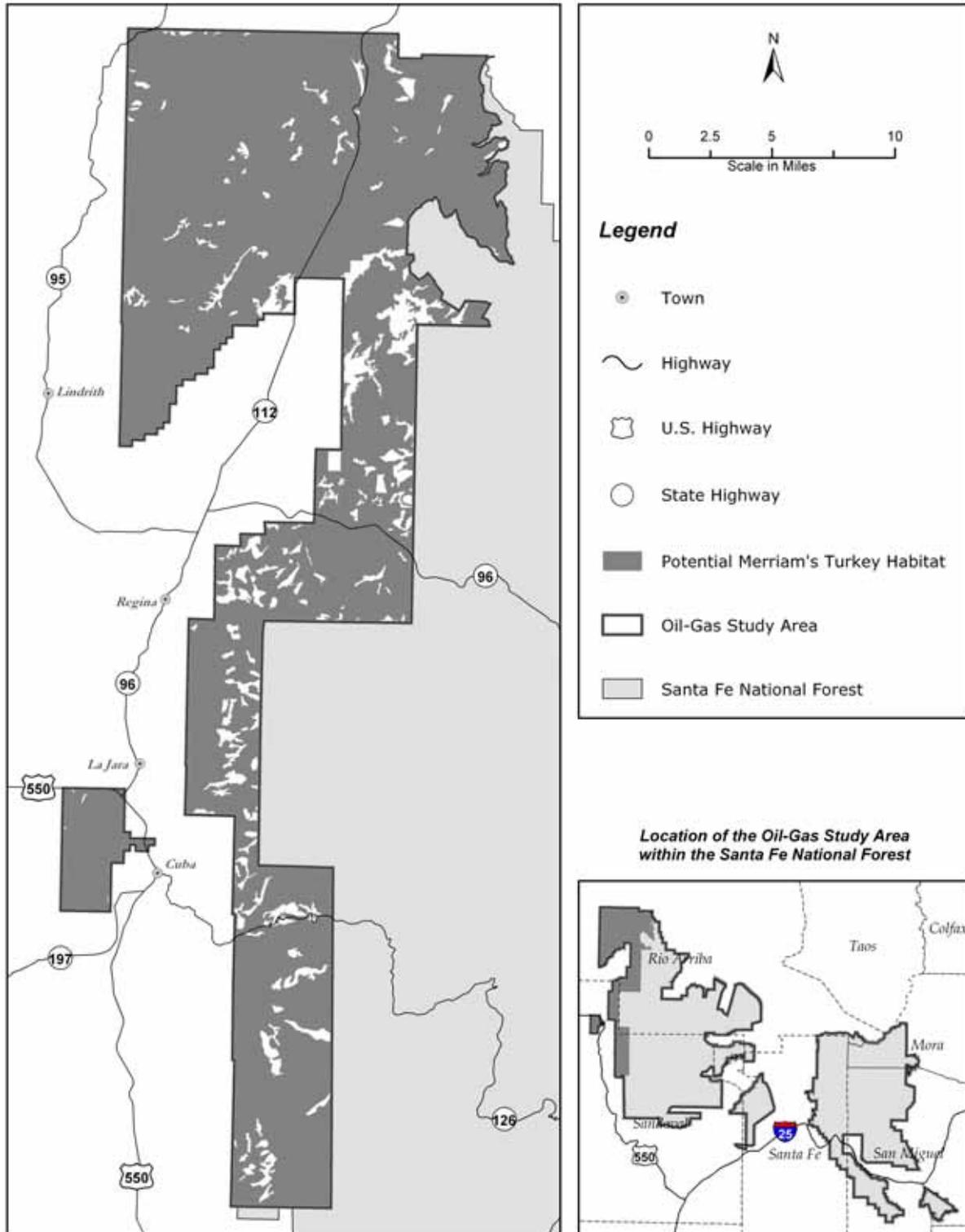


Figure OG-27. Potential habitat for Merriam's turkey

burns, timber harvest, and thinning projects) are created at about the same rate that coniferous forests encroach upon existing forage areas (USFS 2003a).

Population Trend and Viability

The wild turkey is considered demonstrably secure both globally and at the state level. Merriam's turkey occurs on all districts of the forest and it is ranked as common, with the estimated number of breeding female birds ranging between 1,000 and 10,000 individuals (USFS 2003a). The estimate is based on the amount of habitat available, hunter success rate, breeding bird surveys, and the professional judgment of forest biologists.

Environmental Consequences

The Santa Fe National Forest forest-wide MIS assessment and habitat trend analysis (2003) determined that turkey habitat affected by disturbance on the Santa Fe National Forest accounted for about 133,000 acres of quality turkey habitat since the Forest Plan was implemented in 1987. This represents about 11 percent of the estimated 1,180,000 acres of turkey habitat on the forest. Turkey habitat and turkey populations are stable to slightly increasing on the forest (USFS 2003a). The study area contains an estimated 180,375 acres (Santa Fe National Forest land only) of potential Merriam's turkey habitat according to a recent GIS analysis of the vegetative communities that comprise its habitat.

Alternative 1—No Action

The No Action Alternative would have the least oil-gas lease restrictions on surface disturbance therefore, the least protection for turkey habitat. Under the No Action Alternative, about 16,506 acres of limited surface use restrictions would continue to exist for oil-gas leases. The existing turkey population is stable to slightly increasing on the forest since Forest Plan implementation. Historic increases in turkey habitat in the forest, and management activities conducted to support quality turkey habitat would likely continue to contribute to the preservation of turkey habitat under Alternative 1. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 1 would not impact the quantity or quality of turkey habitat. Furthermore, Alternative 1 would not affect turkey populations on the Santa Fe National Forest.

Alternative 2—Proposed Action

The Proposed Action would increase restrictions on surface disturbance over the No Action Alternative through stipulations on new oil-gas leases that would protect some turkey habitat. The total surface restrictions (NSO, CSU, and TL lease stipulations) on oil-gas development under new leases would apply to about 55 percent of forest land in the study area, but not on existing leases. Under the Proposed Action, the acreage under proposed surface disturbance restrictions would provide the second highest amount of protection to Merriam's turkey habitat and individuals under new leases. In most cases, the 200-meter offset would allow for protection of roosting trees and water sources. In currently unleased and expression of interest areas, an additional level of protection for water sources would be provided by the riparian areas and wetlands CSU stipulation. Mitigation measures would also be prescribed during site-specific NEPA analysis on Applications for Permission to Drill. Historic stability to slight increases in turkey populations, stable turkey habitat in the forest, management activities under the Forest Plan for quality turkey habitat, and increased stipulations on new leases would likely ensure that

Merriam's turkey would continue the trend toward increasing under the Proposed Action. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 2 would not directly impact the quantity or quality of turkey habitat, nor would it adversely affect turkey populations on the Santa Fe National Forest.

Alternative 3

The impacts to Merriam's turkey under Alternative 3 are similar to or slightly less than those described for the Proposed Action because almost two-thirds of the study area is currently under lease. More acreage of proposed lease stipulations (21 percent more NSO) that would limit surface disturbance on new leases would occur under this alternative. Overall, the acreage of proposed lease stipulations under Alternative 3 would be the highest, increasing about 52 percent from the No Action Alternative, for a total of about 60 percent of the forest land in the study area. Under Alternative 3, surface level restrictions would be the highest, thus potentially providing the highest amount of protection to Merriam's turkey habitat and individuals. Historic stability to slight increases in turkey populations, stable turkey habitat in the forest, management activities under the Forest Plan for quality turkey habitat, and the highest amount of proposed stipulations on new leases would likely ensure that Merriam's turkey would continue to increase under Alternative 3. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 3 would not directly impact the quantity or quality of turkey habitat. Furthermore, Alternative 3 would not adversely affect turkey populations on the Santa Fe National Forest.

Mexican Spotted Owl (*Strix occidentalis lucida*)

The Mexican spotted owl (MSO) is an indicator of Douglas-fir and mixed conifer forest health and is federally listed as threatened. It is examined in greater detail in the "Threatened, Endangered, and Sensitive Species" section.

Affected Environment

Mexican spotted owls nest in mountains throughout most of New Mexico. They can be found in the San Juan, Jemez, Sangre de Cristo, Mt. Taylor, Sandia, Manzano, San Francisco, Tularosa, Mogollon, Magdalena, San Mateo, Zuni, Pinos Altos, Black, White, Sacramento, Guadalupe, and Animas Mountains (Hubbard 1978, Stacey and Hodgson 1999). All or parts of four protected activity centers (PACs), or historical nest sites, occur in the study area (USFS 2004b). At present, however, MSOs are not known to nest in the study area (USFS 2003a). MSO habitat in the study area is displayed on Figure OG-28. The study area contains about 30,940 acres (Santa Fe National Forest land only) of potential MSO habitat and 6,590 acres of federally designated critical habitat according to a recent GIS analysis of the vegetative communities.

Habitat Trend

The habitat for MSO is thought to have declined on the forest since implementation of the Forest Plan. In general, disturbances that significantly affect the overstory vegetation will have a negative effect on Mexican spotted owl habitat quality. The percentage of Douglas-fir and white fir forest types (the two vegetation types listed as encompassing all potential MSO habitat on the forest) affected by disturbances is calculated to be 19.3 percent forest wide (USFS 2003a).

Population Trend and Viability

With an estimated number of breeding pairs ranging between 10 and 100, the MSO is ranked as rare on the Santa Fe National Forest (USFS 2003a). Occupancy of historical MSO territories in the Jemez Mountains in 1998 and 1999 reached 64 and 79 percent, respectively. To date, 46 PACs have been identified on the forest, but recent occupancy is largely unknown as the survey effort has declined since the early 1990s. Nonetheless, recent surveys suggest an increase in the rate of occupancy of PACs on the forest (USFS 2003a). As a result, the population of MSOs on the forest was believed to be stable or increasing, but the trend may have been altered by recent catastrophic fires (Dome Fire in 1996, Viveash and Cerro Grande Fires in 2000) that burned through 12 of the 46 PACs, rendering some of the historical nesting habitat no longer suitable for the Mexican spotted owl (USFS 2003a). There is no known nesting pair in the study area (USFS 2003a).

The Santa Fe National Forest forest-wide MIS assessment and habitat trend analysis (USFS 2003a) determined that quality MSO habitat on the Santa Fe National Forest decreased since the Forest Plan was implemented in 1987 from 303,063 acres to 244,554 acres. This is a downward trend of about 19 percent. Despite the reported decrease in MSO habitat, owl populations are stable to slightly increasing on the forest (USFS 2003a).

Environmental Consequences

Alternative 1—No Action

The No Action Alternative would have the fewest surface disturbance restrictions to protect MSO habitat under new oil-gas leases. Under the No Action Alternative, about 16,506 acres of limited surface use restrictions would continue to exist for mineral leases. Historic management activities for quality MSO habitat would likely continue to contribute to the preservation of MSO habitat and populations under the No Action Alternative. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 1 would not impact the quantity or quality of MSO habitat. Furthermore, Alternative 1 would not adversely affect MSO populations on the Santa Fe National Forest.

Alternative 2—Proposed Action

The Proposed Action would increase restrictions on oil-gas development over the No Action Alternative through stipulations on new leases that would protect MSO Protected Activity Centers (PAC) over those currently in place to protect or mitigate impacts to Endangered Species Act listed species from surface disturbing activities. The total surface restrictions (NSO, CSU, and TL lease stipulations) on oil-gas development under new leases would apply to about 55 percent of the forest land in the study area, but not on existing leases. The added restrictions would provide greater protection from surface disturbance to individuals and potential MSO habitat within the study area than under Alternative 1. Historic stability to slight increases in MSO populations, management activities under the Forest Plan for quality MSO habitat, designated critical habitat by the USFWS, and increased surface disturbance restrictions on new leases would likely ensure the stability of Mexican spotted owl habitat under the Proposed Action. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 2 would not directly impact the quantity or quality of MSO habitat, but may provide future protection of some habitat. Furthermore, the Proposed Action would not adversely affect MSO populations on the Santa Fe National Forest.

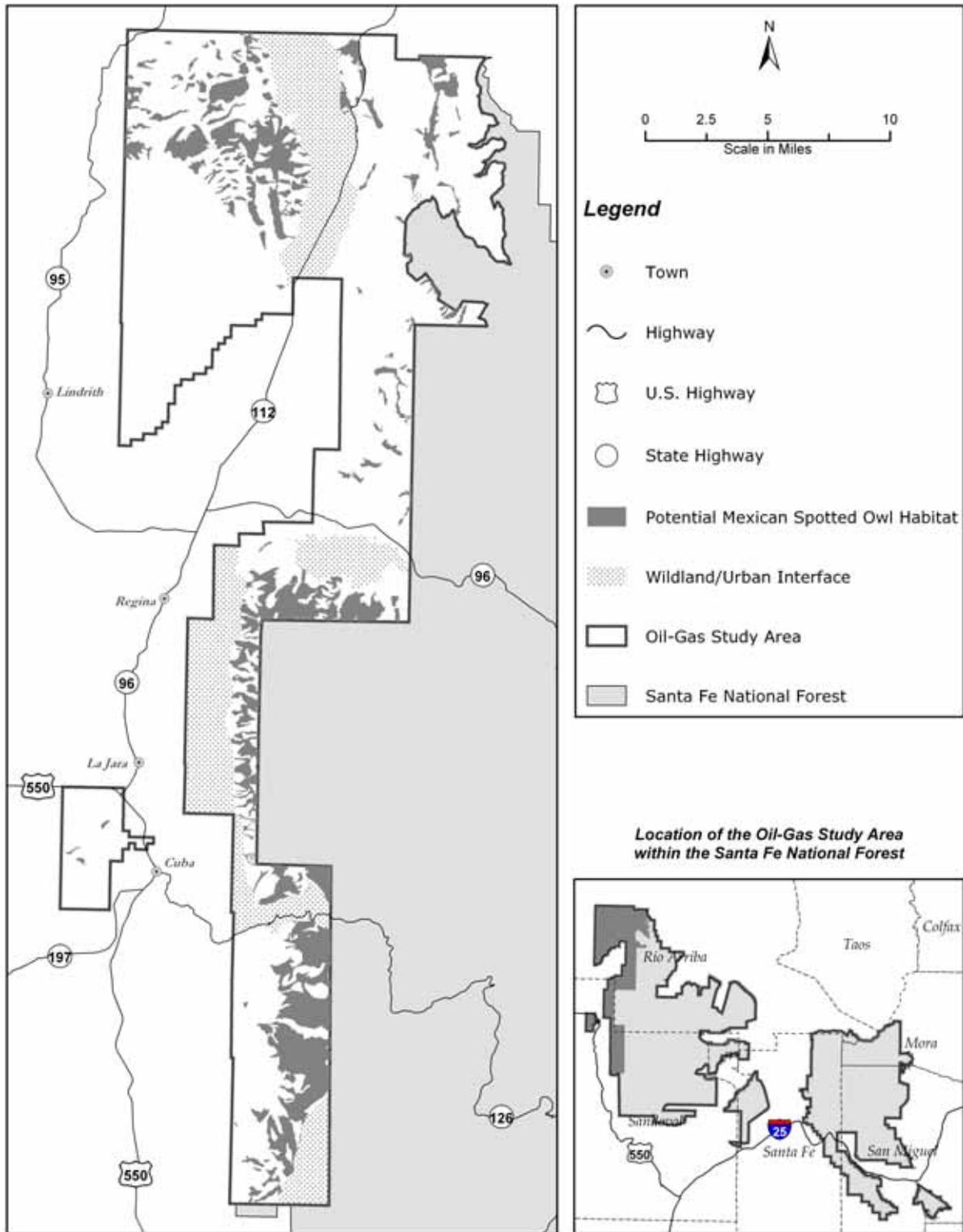


Figure OG-28. Potential habitat for Mexican spotted owl

Alternative 3

The impacts to MSO habitat and populations under Alternative 3 would be similar to or slightly less than those described for the Proposed Action. Overall, the acreage of proposed lease stipulations under Alternative 3 would be the highest, increasing about 52 percent from the No Action Alternative, for a total of about 60 percent of the forest land in the study area. Under Alternative 3, surface level restrictions would be the highest, thus potentially providing the highest amount of protection to MSO habitat and individuals. Historic stability to slight increases in MSO populations, management activities for quality MSO habitat, designated critical habitat by the USFWS, and the highest amount of proposed stipulations on new leases would likely ensure that MSOs would continue to increase under Alternative 3. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 3 would not directly impact the quantity or quality of MSO habitat, nor would it adversely affect MSO populations on the Santa Fe National Forest.

Hairy Woodpecker (*Picoides villosus*)

Affected Environment

Hairy woodpeckers are year-round residents in nearly all forest types from central Canada to the southern U.S. (Scott et al. 1977). As displayed on Figure OG-29, potential habitat for the hairy woodpecker is plentiful and well distributed across the study area. Potential habitat includes all forested vegetation types.

Although the hairy woodpecker is a forest generalist, it is an indicator species for the presence of snags and down logs (USFS 2003a). It also relies strongly on live aspen. Nests are predominantly in trees averaging 17 inches d.b.h. and about 60 feet tall. The woodpecker forages for insects mostly on tree trunks averaging 17 inches d.b.h. and greater than 30 feet in height. Down logs are also important in supporting insect populations for the hairy woodpecker.

Habitat Trend

On the forest, hairy woodpecker numbers may be more limited by nesting habitat than foraging opportunities. In general, habitat affected by wildfire or insect infestation will have more snags than the minimum required by the Forest Plan. Of the total acreage of potential woodpecker habitat in the forest, 9.8 percent has been disturbed. Based on this relatively low percentage and management efforts to maintain a minimum number of snags per acre, the habitat of the hairy woodpecker appears to be stable (USFS 2003a).

Population Trend and Viability

The hairy woodpecker is one of the most common woodpeckers in the Southwest, particularly in riparian habitats and ponderosa pine/mixed conifer forests (Hubbard 1978). The species is listed as demonstrably secure both globally and at the scale of New Mexico, while breeding bird survey (BBS) data indicate that hairy woodpecker numbers in New Mexico remained stable or increased between 1968 and 1998 (USFS 2003a).

Hairy woodpecker is ranked as abundant on the Santa Fe National Forest, with an estimated number of breeding pairs ranging from 10,000 to 100,000. This estimate is based on the amount of hairy woodpecker habitat available forest wide (estimated at more than 900,000 acres), breeding bird survey data, local studies, and the professional judgment of forest biologists. A

study conducted in northern New Mexico found hairy woodpecker densities averaging 11 to 12 breeding pairs per square kilometer in habitat generally comparable to that found on the forest. Based on that study, hairy woodpecker densities on the forest may range between 0 and 22 breeding pairs per square kilometer across mixed conifer vegetation types (USFS 2003a). The population of hairy woodpeckers on the Santa Fe National Forest is considered to be stable to increasing (USFS 2003a).

Environmental Consequences

The Santa Fe National Forest forest-wide MIS assessment and habitat trend analysis (USFS 2003a) determined that quality hairy woodpecker habitat on the Santa Fe National Forest decreased from 976,231 acres to 881,005 acres since the Forest Plan was completed in 1987. This is a downward trend of about 10 percent. In spite of the reported decrease in woodpecker habitat, populations are increasing on the forest and habitat is considered stable (USFS 2003a). The study area contains about 165,852 acres (Santa Fe National Forest land only) of potential hairy woodpecker habitat according to a recent GIS analysis of the vegetative communities.

Alternative 1—No Action

The No Action Alternative would have the fewest surface disturbance restrictions on new leases that would indirectly protect woodpecker habitat. Under Alternative 1, 16,506 acres of limited surface restrictions would continue to exist for oil-gas leases. The existing hairy woodpecker population is increasing on the forest since implementation of the Forest Plan in 1987. Historic management activities for quality woodpecker habitat would likely continue to contribute to the preservation of hairy woodpecker habitat and populations under the No Action Alternative. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 1 would not impact the quantity or quality of hairy woodpecker habitat. Furthermore, Alternative 1 would not affect hairy woodpecker populations on the Santa Fe National Forest.

Alternative 2—Proposed Action

The Proposed Action would increase restrictions on oil-gas development over the No Action Alternative through stipulations on new leases that would protect some hairy woodpecker habitat from surface disturbance. The total surface restrictions (NSO, CSU, and TL lease stipulations) on oil-gas development under new leases would apply to about 55 percent of the forest land in the study area, but not on existing leases. The added restrictions would provide more protection from surface disturbance to woodpecker populations and habitat within the study area than under Alternative 1, particularly in currently unleased and expression of interest areas. Historic increases in woodpecker populations, management activities for quality woodpecker habitat, and increased surface disturbance restrictions on new leases would likely ensure that hairy woodpeckers would continue to increase under the Proposed Action. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 2 would not directly impact the quantity or quality of hairy woodpecker habitat, but may provide future protection of some habitat. Furthermore, the Proposed Action would not adversely affect hairy woodpecker populations on the Santa Fe National Forest.

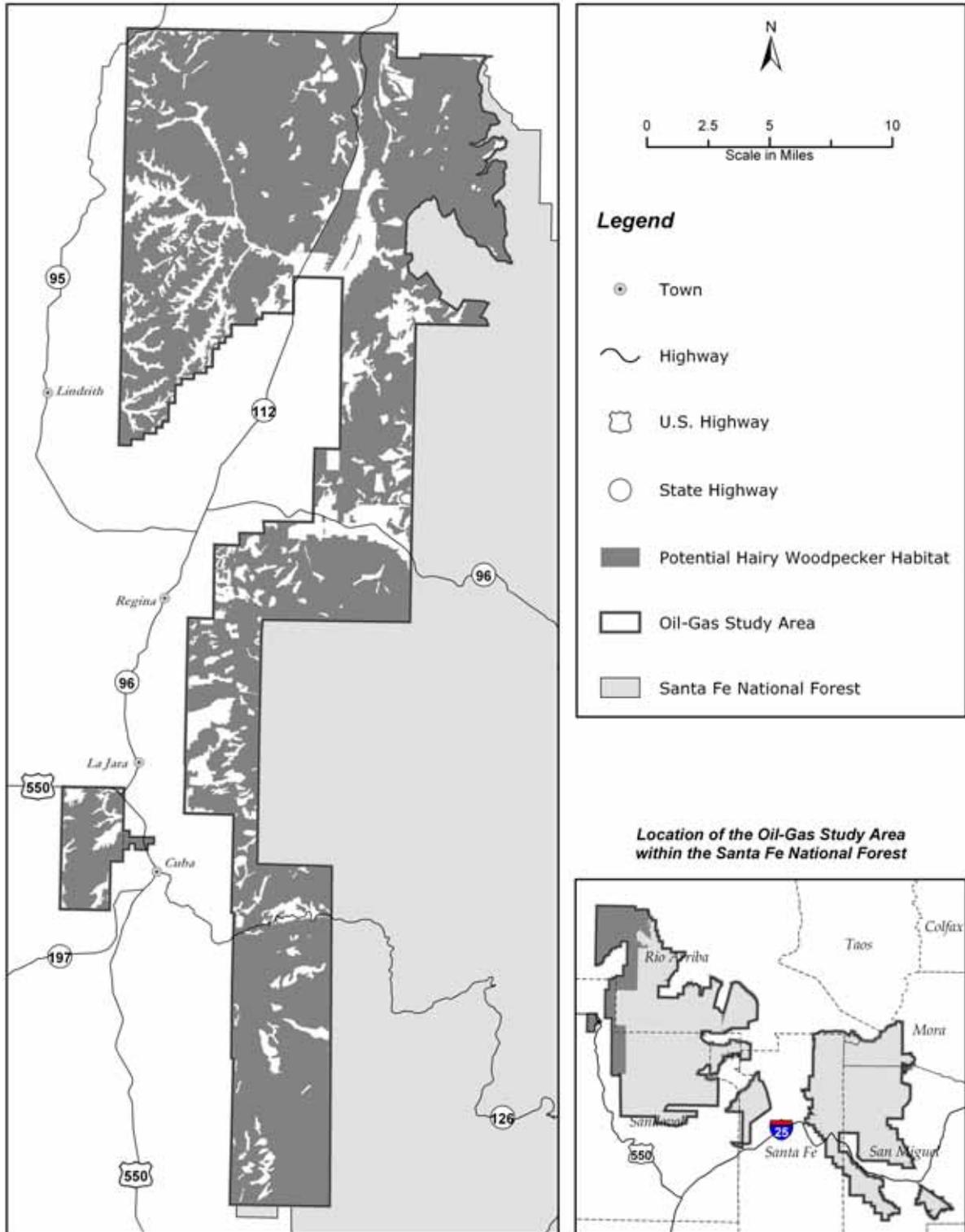


Figure OG-29. Potential habitat for hairy woodpecker

Alternative 3

Impacts to hairy woodpeckers under Alternative 3 would be similar to or slightly less than those described for the Proposed Action. More acreage of proposed lease stipulations (21 percent more NSO) that would limit surface disturbance on new leases would occur under this alternative. Overall, the acreage of proposed lease stipulations under Alternative 3 would be the highest, increasing about 52 percent from the No Action Alternative, for a total of about 60 percent of the forest land in the study area, potentially providing the highest amount of protection to woodpecker habitat and individuals. Historic increases in woodpecker populations, management activities for quality woodpecker habitat, and the highest amount of proposed stipulations on new leases would likely ensure that hairy woodpecker populations would continue to increase under Alternative 3. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 3 would not directly impact the quantity or quality of hairy woodpecker habitat, nor would it adversely affect hairy woodpecker populations on the Santa Fe National Forest either.

Mourning Dove (*Zenaida macroura*)

Affected Environment

The mourning dove ranges from southern Canada south through most of Central America (Mirarchi and Baskett 1994). It is a habitat generalist occurring in many vegetation communities including most forest types (USFS 2003a). It is also found in towns and near farms and frequents backyard feeders. Water and abundant food are essential habitat requirements.

On the forest, six vegetation types are considered suitable habitat for the mourning dove. Most nesting occurs in lower elevation vegetation types. However, the mourning dove also uses ponderosa pine, where water developments and understory burning create favorable feeding areas (USFS 2003a). Mourning dove habitat in the study area is displayed on Figure OG-30.

Habitat Trend

Of the total acreage of potential mourning dove habitat on the forest, 9.2 percent is considered affected by disturbance. In general, disturbances will result in a more open canopy, allowing for the growth of more understory that benefits the mourning dove (USFS 2003a). Mourning dove habitat is considered stable or increasing across the forest.

Population Trend and Viability

The mourning dove occurs in 43 states and is the most abundant dove species in all of North America (USFS 2003a). It is considered demonstrably secure both globally and at the scale of New Mexico. In New Mexico, mourning dove numbers remained stable or slightly declined between 1968 and 1998 (USFS 2003a). The only known threats to the mourning dove are habitat encroachment and overharvesting.

On the forest, it is ranked as common, with an estimated number of breeding pairs ranging from 1,000 to 10,000 individuals. This estimate is based on the amount of suitable habitat available to the species, hunter success statistics, BBS data, and the professional opinion of forest biologists. BBS data indicate that mourning dove numbers may have increased between 1966 and 2000 on or near the forest (USFS 2003a).

Environmental Consequences

The Santa Fe National Forest forest-wide MIS assessment and habitat trend analysis (2003) determined that quality mourning dove habitat on the Santa Fe National Forest decreased from 989,993 acres to 898,736 acres since the Forest Plan was implemented (1987). However, surface disturbance would open the canopy, allowing for the growth of more understory vegetation and improving mourning dove habitat (USFS 2003a). Despite the reported decrease in quality dove habitat, populations are stable on the forest and overall habitat is considered to be stable to increasing (USFS 2003a). The study area contains about 146,704 acres (Santa Fe National Forest land only) of potential mourning dove habitat according to a recent GIS analysis of the vegetative communities.

Alternative 1—No Action

The No Action Alternative would have the fewest surface disturbance restrictions on new leases that would indirectly protect dove habitat from surface disturbance. Under Alternative 1, 16,506 acres of limited surface use restriction management areas would continue to exist for oil-gas leases. The existing mourning dove population is stable on the forest since implementation of the Forest Plan in 1987. Historic management activities for quality dove habitat would likely continue to contribute to the preservation of mourning dove habitat and populations under the No Action Alternative. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 1 would not impact the quantity or quality of mourning dove habitat. Furthermore, Alternative 1 would not affect mourning dove populations on the Santa Fe National Forest.

Alternative 2—Proposed Action

The impacts to Merriam's turkey under Alternative 3 are similar to or slightly less than those described for the Proposed Action because almost two-thirds of the study area is currently under lease. More acreage of proposed lease stipulations (21 percent more NSO) that would limit surface disturbance on new leases would occur under this alternative. Overall, the acreage of proposed lease stipulations under Alternative 3 would be the highest, increasing about 52 percent from the No Action Alternative, for a total of about 60 percent of the forest land in the study area. Under Alternative 3, surface level restrictions would be the highest, thus potentially providing the highest amount of protection to Merriam's turkey habitat and individuals. Historic stability to slight increases in turkey populations, stable turkey habitat in the forest, management activities under the Forest Plan for quality turkey habitat, and the highest amount of proposed stipulations on new leases would likely ensure that Merriam's turkey would continue to increase under Alternative 3. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 3 would not directly impact the quantity or quality of turkey habitat. Furthermore, Alternative 3 would not adversely affect turkey populations on the Santa Fe National Forest.

Alternative 3

The impacts to mourning dove under Alternative 3 would be similar to or slightly less than those described for the Proposed Action. More acreage of proposed lease stipulations (21 percent more NSO) that would limit surface disturbance on new leases would occur under this alternative. Overall, the acreage of proposed lease stipulations under Alternative 3 would be the highest, increasing about 52 percent from the No Action Alternative, for a total of about 60 percent of the

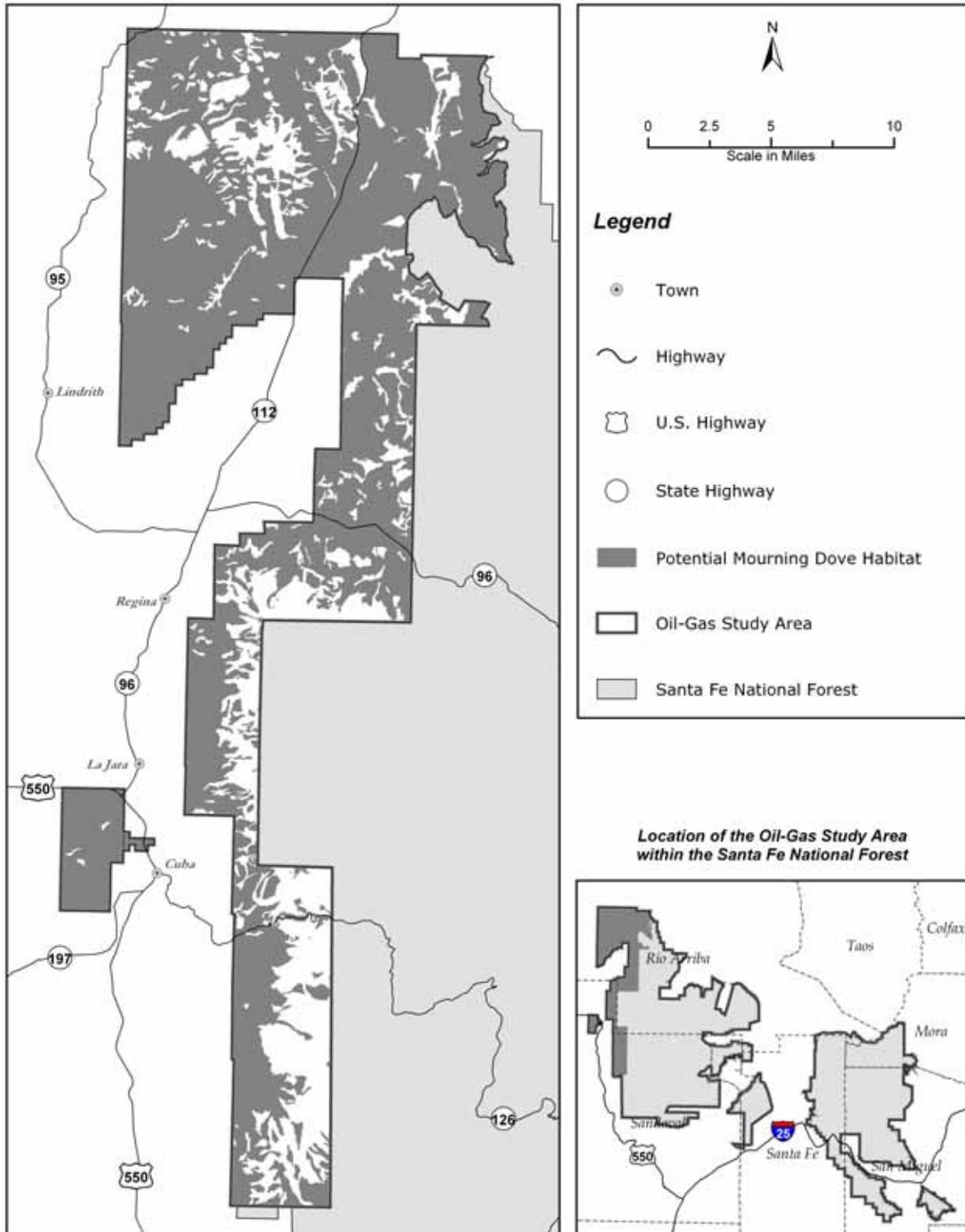


Figure OG-30. Potential habitat for the mourning dove

forest land in the study area. Historic stability in dove populations, management activities for quality dove habitat, and the highest amount of proposed stipulations on new leases would likely ensure that mourning dove populations and habitat would continue to be stable or increase under Alternative 3. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 3 would not directly impact the quantity or quality of mourning dove habitat, nor would it adversely affect mourning dove populations on the Santa Fe National Forest.

Piñon Jay (*Gymnorhinus cyanocephalus*)

Affected Environment

Piñon jay habitat in the study area is displayed on Figure OG-31. The study area contains about 146,704 acres (Santa Fe National Forest land only) of potential piñon jay habitat according to a recent GIS analysis of the vegetative communities.

Habitat Trend

The distribution of piñon jay habitat is tied to stands of piñon-juniper. Open stands for nesting and the availability of piñon nuts are especially important. Crown fires, bark beetle infestations, and disease represent disturbances of piñon-juniper woodland with potential adverse impacts on the piñon jay. However, the acreage of piñon-juniper woodland on the forest affected by disturbances since implementation of the Forest Plan is minimal (0.8 percent of the total acreage of piñon-juniper). On that basis, the habitat trend for piñon jay on the forest is considered stable (USFS 2003a).

Population Trend and Viability

The piñon jay is considered demonstrably secure both globally and at the scale of New Mexico. In New Mexico, numbers remained stable or slightly declining between 1968 and 1998 (USFS 2003a). With an estimated number of breeding pairs ranging between 1,000 and 10,000, the piñon jay is ranked as common on the Santa Fe National Forest. Despite annual variations, BBS results suggest no apparent long-term trend in piñon jay numbers on or near the forest between 1966 and 2000. Since then, severe piñon mortality occurred in various places on the forest, but additional monitoring is needed to determine whether this will affect piñon jay populations.

Environmental Consequences

The Santa Fe National Forest forest-wide MIS assessment and habitat trend analysis (2003) determined that quality piñon jay habitat on the Santa Fe National Forest decreased from 465,725 acres to 462,067 acres since the Forest Plan was implemented (1987). This is a downward trend of about 1 percent. The reported populations are stable on the forest and habitat is considered stable to slightly decreasing (USFS 2003a).

Alternative 1—No Action

The No Action Alternative would have the fewest restrictions on surface disturbance on new leases that would indirectly protect piñon jay habitat. Under Alternative 1, 16,506 acres of limited use surface restrictions would continue to exist for oil-gas leases. The existing piñon jay

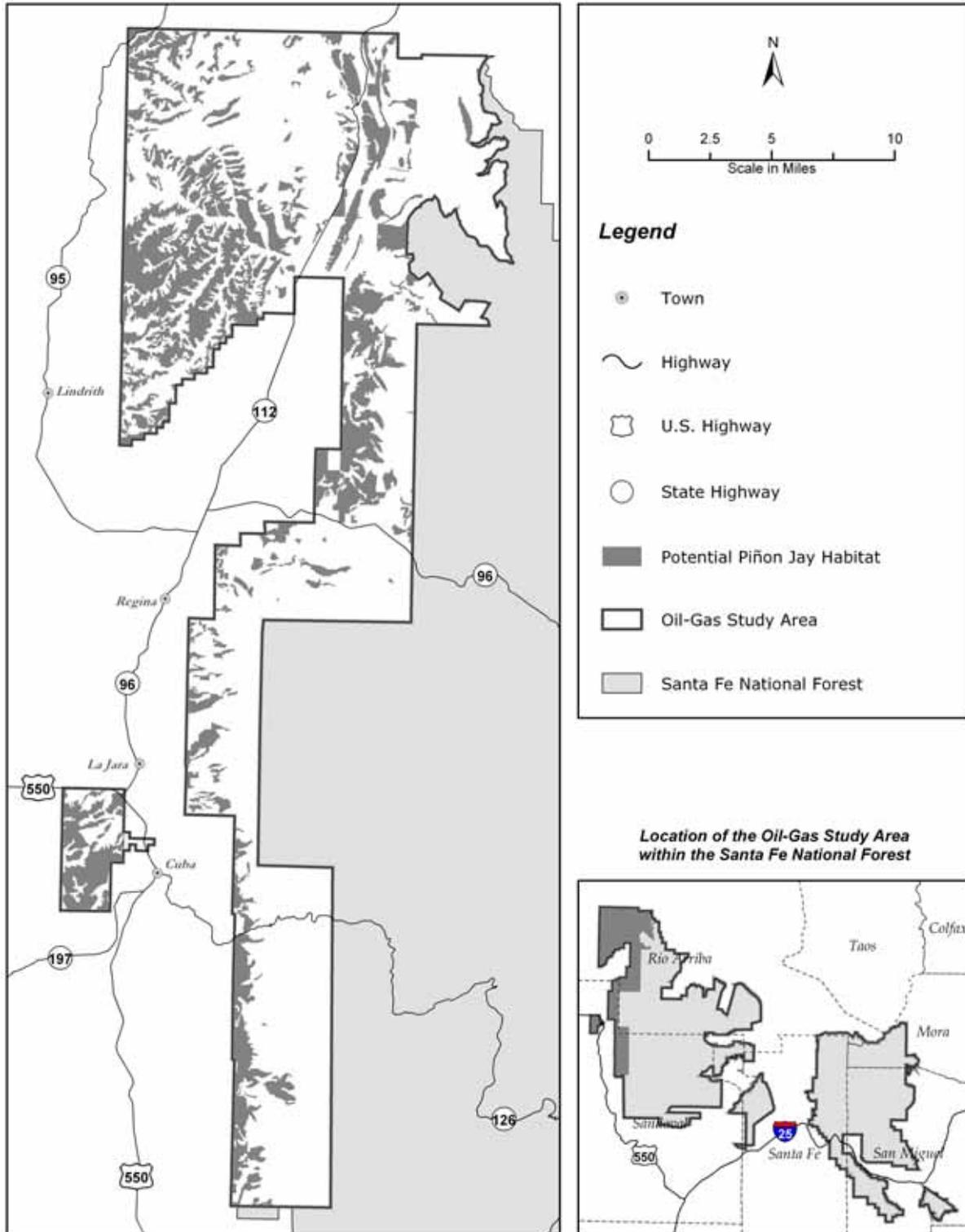


Figure OG-31. Potential habitat for the piñon jay

population is stable on the forest since implementation of the Forest Plan in 1987. Historic management activities for quality jay habitat would likely continue to contribute to the preservation of piñon jay habitat and populations under the No Action Alternative. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 1 would not impact the quantity or quality of piñon jay habitat. Furthermore, Alternative 1 would not affect piñon jay populations on the Santa Fe National Forest.

Alternative 2—Proposed Action

The Proposed Action would increase restrictions on oil-gas development over the No Action Alternative through stipulations on new leases that would protect some piñon jay habitat. The total surface restrictions (NSO, CSU, and TL lease stipulations) on oil-gas development under new leases would apply to about 55 percent of the forest land in the study area, but not on existing leases. Under the Proposed Action, restrictions on surface disturbance would be the second highest on new oil-gas leases, potentially providing the second highest amount of protection to piñon jay habitat and individuals. Development of current expressions of interest areas may have minor effects on piñon jay habitat and individuals where they overlap. Historic stability in jay populations, management activities for quality piñon jay habitat, and increased surface disturbance restrictions on new leases would likely ensure that piñon jay populations would continue to remain stable under the Proposed Action. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 2 would not directly impact the quantity or quality of piñon jay habitat. Furthermore, the Proposed Action would not adversely affect piñon jay populations on the Santa Fe National Forest.

Alternative 3

The impacts to piñon jay under Alternative 3 would be similar to or slightly less than those described for the Proposed Action. More acreage of proposed lease stipulations (21 percent more NSO) that would limit surface disturbance on new leases would occur under this alternative, potentially providing the highest amount of protection to piñon jay habitat and individuals. Overall, the acreage of proposed lease stipulations under Alternative 3 would be the highest, increasing about 52 percent from the No Action Alternative, for a total of about 60 percent of the forest land in the study area. Historic stability in piñon jay populations, management activities for quality habitat, and the highest amount of proposed stipulations on new leases would likely ensure that piñon jays would continue to remain stable under Alternative 3. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 3 would not directly impact the quantity or quality of piñon jay habitat. Furthermore, Alternative 3 would not adversely affect piñon jay populations on the Santa Fe National Forest.

Rio Grande Cutthroat Trout (*Oncorhynchus clarki virginalis*)

Affected Environment

The Rio Grande cutthroat trout prefers cold water stream habitats. Within the oil-gas study area, Rio Grande cutthroat trout currently occupy the Rio Puerco del Grande, Rito de los Piños, La Jara Creek, Rio Capulin, and Cecilia Creek, comprising 6.2 miles of occupied streams (Figure OG-32).

Habitat Trend

The habitat trend for Rio Grande cutthroat trout has remained stable since implementation of the Forest Plan. Habitat quality is overall deemed to be “less than moderate” in the study area. At higher elevations, generally characterized by reduced human access due to topography and wilderness regulations, habitat quality is moderate to excellent. At lower elevations, decreased water quality is due in part to soil compaction, road runoff, unstable banks, and delivery of pollutants such as sedimentation from nonpoint sources (USFS 2003a).

Population Trend and Viability

Rio Grande cutthroat trout is a native fish that has been eradicated from most of its historic range mainly by introduction of predatory nonnative fish species. Predation and nonnative fish have contributed to the decline of Rio Grande cutthroat trout through hybridization and competition.

Another potential threat to Rio Grande cutthroat trout is whirling disease, discovered in waters in New Mexico, including waters on the forest. The impact of whirling disease on Rio Grande cutthroat trout is at present unclear (USFS 2003a).

The population of Rio Grande cutthroat trout on the forest seems to be stable overall. This is true especially in low elevation areas and in high elevation wilderness areas. Declines have been noted in those areas where they are unprotected from brown and rainbow trout (USFS 2003a).

Environmental Consequences**Alternative 1—No Action**

Due to the low potential for oil-gas development in the areas close to Rio Grande cutthroat trout occupied streams, implementation of the No Action Alternative would not likely affect habitat or populations of Rio Grande cutthroat trout. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 1 would not impact the quantity or quality of Rio Grande cutthroat trout habitat. Furthermore, Alternative 1 would not affect Rio Grande cutthroat trout populations on the Santa Fe National Forest.

Alternative 2—Proposed Action

Under the Proposed Action, the entire 6.2 miles of occupied stream would be protected by a CSU stipulation on new oil-gas leases in riparian areas. The small amount of Rio Grande cutthroat trout habitat and the low potential for development of oil and gas in areas close to the occupied streams would be minimal due to the proposed CSU stipulation and also the 200 meter offset, both of which would be applied to the expressions of interest bordering the west side of San Pedro Parks Wilderness and San Jose Creek, La Jara Creek, and Rito de los Piños. Thus, the Proposed Action would not be likely to affect Rio Grande cutthroat trout populations or habitat. Due to the lack of ground disturbance as a result of the leasing decision, Alternative 2 would not directly impact the quantity or quality of Rio Grande cutthroat trout habitat nor the populations on the Santa Fe National Forest.

Alternative 3

The impacts to Rio Grande cutthroat trout under Alternative 3 would be the same as those described for the Proposed Action.

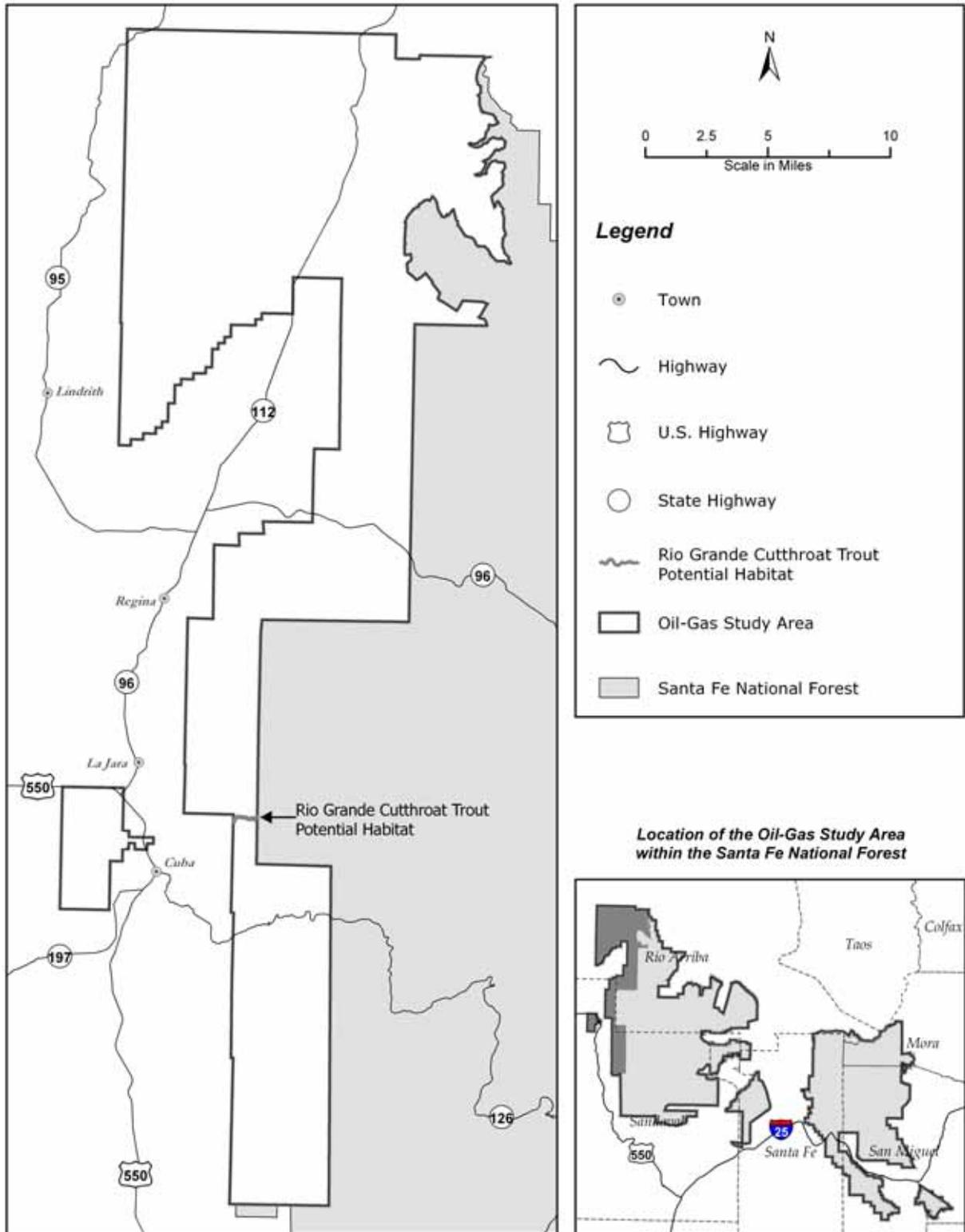


Figure OG-32. Distribution of Rio Grande cutthroat trout in the study area

Cumulative Impacts

The analysis area for cumulative effects on MIS is the area in and immediately adjacent to the study area. This boundary represents the areas where the proposed lease stipulations are most likely to interact with other activities and ground disturbance on both national forest and non-Federal lands. In all alternatives, cumulative impacts to MIS resources would derive from a combination of forest management activities, public land uses, and activities on all public and private lands.

Development of 20 new oil or gas well locations and construction of almost 3 miles of associated roads are reasonably foreseeable actions within the study area. All of the projected oil-gas development would occur in the northern portion of the study area. The majority of the projected wells would occur within piñon-juniper and ponderosa pine habitat (10 and 7 wells, respectively). This would potentially affect the following MIS due to small amounts of habitat loss from the projected development: Rocky Mountain elk, Merriam's turkey, mourning dove, hairy woodpecker, and piñon jay. The remaining three wells are projected to occur within grassland habitat, which would potentially affect the following MIS due to habitat loss: Rocky Mountain elk, Merriam's turkey, and mourning dove. Associated new roads projected to be built with the projected new wells include about 1.3 miles within ponderosa pine habitat, 0.8 mile within piñon-juniper habitat, and 0.7 mile within grassland habitat. All of the projected wells and associated roads would occur within valid existing leases under standard terms and conditions, unless an existing lease were relinquished and re-issued under new stipulations proposed under Alternative 2 or 3. Potential development would occur under standard terms and conditions, providing minimal surface protection for MIS other than that already provided through implementation of the Forest Plan and compliance with State and Federal laws.

Other foreseeable, surface-disturbing activities in the region include decommissioning of roads within the Cuba and Coyote Ranger Districts, the projects listed in Table OG-15, and other unknown construction projects on non-Federal land. In particular, projects 2, 3, 4, 6, 7, and 8 in Table OG-15 would have the greatest short-term impact on MIS that rely on forested habitat due to plans for thinning trees and prescribed fire. However, these projects should improve habitat over the long term.

The amount of projected oil-gas development is minimal and, therefore, adverse impacts to MIS habitat and populations would likely be negligible, but would be greater when considered in combination with other foreseeable actions in the region.

Migratory Birds

The Migratory Bird Treaty Act of 1918 (16 United States Code [U.S.C.] § 701-715s, as amended) provides management authority for the following section. This act established protections for migratory birds and their parts (including eggs, nests, and feathers) from take, hunting, capture, transport, sale, or purchase. Although emphasis has been placed on the status of neotropical migratory birds (birds that breed north of the Tropic of Cancer but winter in the neotropics), some species exhibit other migration patterns, for example breeding in Canada and wintering mainly in the U.S.

Two documents help identify those migratory species with a higher susceptibility to anthropogenic impacts in New Mexico, including the study area. The New Mexico Partners in Flight (NMPIF) Bird Conservation Plan (NMPIF 2001) lists two categories of birds, high priority and high responsibility species, by vegetation type. Highest priority (HP) species are those that

tend to be declining over their entire range. In contrast, high responsibility (HR) species are those with an important portion of their range in New Mexico, irrespective of their overall population status. For the latter category, any mitigation or conservation measures in the state are disproportionately important. The second document is the Birds of Conservation Concern (BCC) report issued by the U.S. Fish and Wildlife Service (USFWS 2002a), which is organized by Bird Conservation Regions. The study area lies within BCR 16, the Southern Rockies/Colorado Plateau Bird Conservation Region.

Table OG-27 includes all species listed in the Birds of Conservation Concern Report for the Southern Rockies/Colorado Plateau Bird Conservation Region (USFWS 2002a) and the high priority and high responsibility species identified by NMPIF with associated habitat types within the study area (NMPIF 2001). Species are grouped based on their potential to occur in the study area.

All USFWS Birds of Conservation Concern and NMPIF high priority species associated with each habitat type were considered for this analysis. However, only species that have habitat characteristics associated with the study area were described and analyzed below.

Table OG-27. Migratory birds considered

Species	BCC	Primary Habitat	New Mexico Partners in Flight Listing by Habitat Type					
			GBDS	PMG	PJ	PP	MC	MS
Migratory Birds with Potential Habitat in the Study Area								
Owl, Burrowing	X	Great Basin Desert Shrub, open country	HR	HR	—	—	—	—
Shrike, Loggerhead	—	Open brushy areas, w/posts, wires scattered trees	HP	—	—	—	—	—
Thrasher, Sage	—	Sagebrush, brushy slopes, mesas	HP	—	—	—	—	—
Thrasher, Bendire's	X	Open grasslands, brushy desert	HP	HP	HP	—	—	—
Sparrow, Sage	X	Sagebrush, open arid desert	HP	—	—	—	—	—
Eagle, Golden	X	Open mountains, foothills, canyons, plains	H	—	—	—	—	—
Hawk, Ferruginous	X	Piñon-juniper woodlands	—	HP	HP	—	—	—
Falcon, Peregrine	X	Open wetlands near cliffs	—	—	—	—	—	—
Falcon, Prairie	X	Canyons, open mountains, plains, prairies, deserts	—	HP	—	—	—	—
Plover, Mountain	X	Dry upland prairies, plains, semidesert	—	HP	—	—	—	—
Bunting, Lark	—	Sagebrush, plains, prairies	—	HP	—	—	—	—
Towhee, Green-tailed	—	Dry, brushy mountain slopes, open pines, sage	—	—	—	—	—	HP

Table OG-27. Migratory birds considered

Species	BCC	Primary Habitat	New Mexico Partners in Flight Listing by Habitat Type					
			GBDS	PMG	PJ	PP	MC	MS
Warbler, MacGillivray's	—	Low dense undergrowth; shady damp thickets	—	—	—	—	—	HP
Flycatcher, Gray	—	Piñon-juniper, sagebrush	—	—	HP	—	—	—
Vireo, Gray	X	Brushy mountain slopes, mesas, scrub oak	—	—	HP	—	—	—
Warbler, Black-throated Gray	X	Dry oak slopes, piñons, junipers	—	—	HP	—	—	—
Jay, Piñon	X	Piñon-juniper, ranges into sagebrush	—	—	HR	—	—	—
Goshawk, Northern	—	Northern forests, mountain woodlands	—	—	—	HP	HP	—
Owl, Mexican Spotted	—	Thickly wooded canyons, mixed conifer	—	—	—	HP	HP	—
Owl, Flammulated	X	Open pine and fir forests in mountains	—	—	—	HP	P	—
Warbler, Virginia's	X	Oak canyons, brushy slopes, piñons	—	—	P	HP	—	P
Warbler, Grace's	X	Pine-oak forests of mountains	—	—	—	HP	—	—
Sapsucker, Williamson's	X	Higher conifer forests	—	—	—	P	HP	—
Flycatcher, Olive-sided	—	Conifer forests, burns	—	—	—	—	HP	—
Flycatcher, Dusky	—	Open coniferous forest	—	—	—	—	HP	—
Woodpecker, Lewis's	X	Middle elevation riparian	—	—	—	P	—	—
USFWS Listed or Partners in Flight Priority Species with Low Potential of Occurring within Study Area								
Grouse, Gunnison Sage	X	Sagebrush, foothills, plains (not found in New Mexico)	NO HABITAT					
Godwit, Marbled	X	Migrates through central New Mexico	NO HABITAT					
Plover, Snowy	X	Barren sandy beaches and flats (southern New Mexico)	NO HABITAT					
Pipit, Sprague's	X	Rare migrant in alpine meadows	NO HABITAT					

Table OG-27. Migratory birds considered

Species	BCC	Primary Habitat	New Mexico Partners in Flight Listing by Habitat Type					
			GBDS	PMG	PJ	PP	MC	MS
Sandpiper, Solitary	X	Migrates through central and eastern New Mexico	NO HABITAT					
Thrasher, Crissal	X	Montane shrub (southern New Mexico)	P	—	—	—	—	—
Hawk, Swainson's	X	Dry open plains, prairies	—	H	—	—	—	—
Owl, Short-eared	X	Open country, marshes, tundra	H	—	—	—	—	—
Falcon, Peregrine	X	Open wetlands near cliffs	NO HABITAT					
Harrier, Northern	X	Open grasslands, marshes	—	H	—	—	—	—
Swift, Black	X	High elevation riparian, cliffs, waterfalls	NO HABITAT					
Hummingbird, Lucifer	—	Canyons in extreme southwest New Mexico	HP	—	—	—	—	—
Phalarope, Wilson's	X	Wet meadows	NO HABITAT					
Longspur, Chestnut-collared	X	Moist upland prairie	NO HABITAT					
Cuckoo, Yellow-billed	X	Woods, orchards, streamside willow/alder	NO HABITAT					
Warbler, Red-faced	—	High mountains (southwestern New Mexico, Gila National Forest)	—	HP	—	—	—	—
Pewee, Greater	—	Mountain pine-oak woodlands (Arizona, southwestern New Mexico)	—	—	HP	—	—	—
Warbler, Olive	—	High mountains (southwestern New Mexico, Gila National Forest, and southeast Arizona)	—	—	HP	—	—	—
Sparrow, Black-chinned	—	Brushy mountain slopes, open chaparral, and sage (southern New Mexico)	—	—	—	—	—	HP
Curlew, Long-billed	—	High plains, rangeland (eastern New Mexico)	—	—	—	—	—	HP
Flycatcher, Scissor-tailed	—	Semi-open country (eastern New Mexico)	—	—	—	—	—	HP
Dicksissel	—	Alfalfa fields, prairies (eastern New Mexico)	—	—	—	—	—	HP

Table OG-28. Migratory bird habitat and life history features for the Great Basin Desert Shrub habitat

NMPIF High Priority Species and FWS BCC	Important Habitat Features and Life History Considerations	Projected Changes Likely to Affect Habitat and Life History Considerations
Sage Thrasher	<ul style="list-style-type: none"> • Sagebrush obligate species, prefers sage-dominated grasslands and shrubby arid lands. • Prefers nesting substrates >70 cm with minimal bare ground present. • Nests are placed in areas of dense shrubland with a concealing vegetative canopy cover. 	development through stipulations on new leases that would protect more sagebrush habitat from surface disturbance.
Bendire’s Thrasher	<ul style="list-style-type: none"> • Prefers relatively open grassland with large scattered shrubs and/or trees (usually present; cholla, junipers, or sagebrush); may use dense vegetated washes or riparian areas. • Breeds in relatively open, degraded grasslands with a moderate to dense shrub component. • Nests are typically placed 0.7 meter to 1.5 meters in height above the ground in semidesert shrubs, cacti, or trees. 	
Sage Sparrow	<ul style="list-style-type: none"> • Prefers semiopen habitat with tall (1-2 meters), evenly spaced, large canopy shrubs of pure big sagebrush or interspersed with butterbush, saltbush, shadscale, rabbitbrush or greasewood, occasionally in sagebrush-juniper habitat. 	

Note:cm = centimeter

Sources:NMDGF 2001; NMPIF 2001; USFWS 2002b

Grassland Habitat Type

Affected Environment and Environmental Consequences

The study area contains about 15,340 acres of grassland habitat (Plains and Mesa). NMPIF high priority species associated with this habitat type are listed in Table OG-29, with brief descriptions of important habitat features and characteristics and potential impacts relevant to those important features that may result from implementation of the alternatives.

Table OG-29. Migratory bird habitat and life history features for the Plains and Mesa grassland habitat

NMPIF High Priority Species and FWS BCC	Important Habitat Features and Life History Considerations	Projected Changes Likely to Affect Habitat and Life History Considerations
Ferruginous Hawk	<ul style="list-style-type: none"> • Require close proximity to high quality grassland or irrigated agriculture land. • Prefers forest edge or mature, isolated, flat-topped junipers, with thick branches for nesting. • In northwest New Mexico; often nests on rock spires. • Highly sensitive to human disturbance. • Prey mainly consists of small to medium size mammals. 	<p>No Action Alternative</p> <ul style="list-style-type: none"> • Contains the fewest restrictions (16,506 acres of limited surface use) on surface disturbance on new leases that would indirectly protect grassland habitat from surface disturbance. <p>Proposed Action</p> <ul style="list-style-type: none"> • Increased restrictions (107,936 acres NSO, CSU, and TL) on oil-gas development through stipulations on new leases that would protect more grassland habitat. <p>Alternative 3</p> <ul style="list-style-type: none"> • Highest amount of restrictions (117,821 acres NSO, CSU, and TL) on oil-gas development through stipulations on new leases that would protect more grassland habitat from surface disturbance.
Prairie Falcon	<ul style="list-style-type: none"> • Prefers open grasslands and shrub-grassland. • Ledges and cavities in cliffs or bluffs are common nest sites. • Nesting sites are highly limiting. • Ground squirrels are an important breeding food source. • Horned larks and meadowlarks are important nonbreeding food sources. 	
Mountain Plover	<ul style="list-style-type: none"> • See “Threatened, Endangered, and Sensitive Species” section. 	
Bendire’s Thrasher	<ul style="list-style-type: none"> • See Table OG-27. 	
Lark Bunting	<ul style="list-style-type: none"> • Primarily found in short-grass grasslands, occasionally in sagebrush shrublands and weedy agricultural areas. • Prefers dense grass about 13 cm in height. • Less than 15 percent bare ground is optimal and > 60 percent bare ground is not useable. • Territory size is about 1-2 acres with a larger patch size due to species socialization. • Nesting occurs on the ground in areas with 10-30 percent cover of shrubs and mid-grasses to protect from solar radiation. • Grasshoppers are the staple diet. 	

Note:cm = centimeter

Sources:NMDGF 2001; NMPIF 2001; USFWS 2002b

Piñon-Juniper Habitat Type

Affected Environment and Environmental Consequences

The study area contains about 54,706 acres of piñon-juniper woodland habitat. NMPIF high priority species associated with this habitat type are listed in Table OG-30, with brief descriptions of important habitat features and characteristics and potential impacts relevant to those important features that may result from implementation of the alternatives.

Table OG-30. Migratory bird habitat and life history features for the piñon-juniper habitat

NMPIF High Priority Species	Important Habitat Features and Life History Considerations	Effects
Ferruginous Hawk	See Table OG-28.	<p>No Action Alternative</p> <ul style="list-style-type: none"> • Contains the fewest restrictions (16,506 acres of limited surface use) on surface disturbance on new leases that would indirectly protect piñon-juniper habitat from surface disturbance. <p>Proposed Action</p> <ul style="list-style-type: none"> • Increased restrictions (107,936 acres NSO, CSU, and TL) on oil-gas development through stipulations on new leases that would protect more piñon-juniper habitat. <p>Alternative 3</p> <ul style="list-style-type: none"> • Highest amount of restrictions (117,821 acres NSO, CSU, and TL) on oil-gas development through stipulations on new leases that would protect more piñon-juniper habitat from surface disturbance.
Gray Flycatcher	<ul style="list-style-type: none"> • Prefers open piñon-juniper forest, often with interspersed ponderosa. • Shrub cover cannot be too dense; prefers about 60 percent. • Logging and fire may create new habitat after several years. 	
Gray Vireo	<ul style="list-style-type: none"> • Study area may or may not be within the distribution area of this species; often found in clusters, with other areas of apparently good habitat unoccupied. • Prefers open piñon-juniper woodland or juniper savanna with a shrub component (35-45 percent cover). • In northwest New Mexico; found in broad-bottomed, flat or gently sloped canyons, in areas with rock outcroppings near ridgetops. • Antelope bitterbrush, mountain mahogany, Utah serviceberry and big sagebrush are shrubs found in northwest areas, with large amounts of bare ground between herbaceous plants forming ground cover. • Feeds on the ground and up to 16 feet. • No water required. 	
Bendire’s Thrasher	See Table OG-27.	
Black-Throated Gray Warbler	<ul style="list-style-type: none"> • Prefers large stands of piñon-dominated woodland. • Often found in dense forests with a canopy. • Understory can be variable. • Uses edges: tree/shrub or tree/grass. • Current breeding bird survey trends for the western U.S. show this species increasing slightly. 	

Table OG-30. Migratory bird habitat and life history features for the piñon-juniper habitat

NMPIF High Priority Species	Important Habitat Features and Life History Considerations	Effects
Piñon Jay	<ul style="list-style-type: none"> • Inhabits piñon-juniper woodlands, ponderosa pine, and lodgepole pine forests at middle elevations (5,000 to 7,500 feet). • Population may be regulated by the size of the pine seed crops. • Nests in piñons 3 to 18 feet high and ponderosa pines 5 to 78 feet high. 	

Sources: NMDGF 2001; NMPIF 2001; USFWS 2002b

Ponderosa Pine Habitat Type

Affected Environment and Environmental Consequences

The study area contains about 73,764 acres of ponderosa pine habitat. NMPIF high priority species associated with this habitat type are listed in Table OG-31, with brief descriptions of important habitat features and characteristics and potential impacts relevant to those important features that may result from implementation of the alternatives.

Table OG-31. Migratory bird habitat and life history features for the ponderosa pine habitat

NMPIF High Priority Species	Important Habitat Features and Life History Considerations	Effects	
Northern Goshawk	See "Threatened, Endangered, and Sensitive Species" section.	<p>No Action Alternative</p> <ul style="list-style-type: none"> • Contains the fewest restrictions (16,506 acres of limited surface use) on surface disturbance on new leases that would indirectly protect ponderosa pine habitat from surface disturbance. 	
Mexican Spotted Owl	See "Threatened, Endangered, and Sensitive Species" section.		
Flammulated Owl	<ul style="list-style-type: none"> • Secondary cavity nester. • Most closely associated with open ponderosa pine forest, but may use Douglas-fir, white fir, blue spruce, aspen or larger scrub oaks, piñon-juniper canyons and clearings. • Nest holes are made mostly by flickers or sapsuckers. • Almost exclusively insectivorous. • U.S. populations are highly migratory. 	<p>Proposed Action</p> <ul style="list-style-type: none"> • Increased restrictions (107,936 acres NSO, CSU, and TL) on oil-gas development through stipulations on new leases that would protect more ponderosa pine habitat. 	
Olive Warbler	<ul style="list-style-type: none"> • Prefers open ponderosa or Chihuahua pine and Douglas-fir forests with oak understory. • Nests range from 9 to 21 meters in height above the ground. • Foraging occurs primarily in pines, occasionally in oaks. 		<p>Alternative 3</p> <ul style="list-style-type: none"> • Highest amount of restrictions (117,821 acres NSO, CSU, and TL) on oil-gas development

Table OG-31. Migratory bird habitat and life history features for the ponderosa pine habitat

NMPIF High Priority Species	Important Habitat Features and Life History Considerations	Effects
Virginia’s Warbler	<ul style="list-style-type: none"> • Mostly ponderosa pine forest; always open with well-developed herbaceous or dense woody understory as a special requirement. • Nests built on the ground, in a depression or at base of a shrub, concealed by dead leaves or overhanging foliage or grasses, but especially Gambel’s oak. • Percentage of dead trees is negatively correlated with nesting area. 	through stipulations on new leases that would protect more ponderosa pine habitat from surface disturbance.
Grace’s Warbler	<ul style="list-style-type: none"> • Ponderosa pine forest: sometimes with a scrub oak component, considered a mature pine obligate; preference given to robust, mature or old growth forest. • Feeds in the upper portions of robust pines on branches, nests found in trees from 20 to 60 feet (6 to 18 meters) above the ground. • Over time and a large landscape, an optimal goal is: 45 to 60 percent mature ponderosa pine savanna; 15 to 25 percent open meadow; 25 to 35 percent uneven-aged ponderosa pine and other trees, with an oak understory; and 5 to 10 percent aspen forest. 	

Sources: NMDGF 2001; NMPIF 2001; USFWS 2002b

Mixed Conifer Habitat Type

Affected Environment and Environmental Consequences

The study area contains about 37,137 acres of mixed-conifer habitat. NMPIF high priority species associated with this habitat type are listed in Table OG-32, with brief descriptions of important habitat features and characteristics and potential impacts relevant to those important features that may result from implementation of any of the alternatives.

Table OG-32. Migratory bird habitat and life history features for the mixed conifer habitat

NMPIF High Priority Species	Important Habitat Features and Life History Considerations	Effects
Northern Goshawk	See “Threatened, Endangered, and Sensitive Species” section.	<p>No Action Alternative</p> <ul style="list-style-type: none"> • Contains the fewest restrictions (16,506 acres of limited surface use) on surface disturbance on new leases that would indirectly protect mixed conifer habitat from surface disturbance.
Mexican Spotted Owl	See “Threatened, Endangered, and Sensitive Species” section.	
Williamson’s Sapsucker	<ul style="list-style-type: none"> • Specializes in sap and phloem; breeders switch to a diet of ants during the nestling season, especially carpenter and wood ants. 	

Table OG-32. Migratory bird habitat and life history features for the mixed conifer habitat

NMPIF High Priority Species	Important Habitat Features and Life History Considerations	Effects
	<ul style="list-style-type: none"> • Wounded or scarred live conifers most frequently used for feeding. • Availability of suitable nesting sites critical component, preferring snags or cavities in live aspen; aspen snags are preferred over conifer snags. • Prefers conifers infected with the fungus <i>Fomes igniarius</i>, or aspens with heart rot. • Prefers drainage bottoms to ridgetops. 	<p>Proposed Action</p> <ul style="list-style-type: none"> • Increased restrictions (107,936 acres NSO, CSU, and TL) on oil-gas development through stipulations on new leases that would protect more mixed conifer habitat.
Olive-Sided Flycatcher	<ul style="list-style-type: none"> • Nests in coniferous trees generally far out from the trunk. • Needs forest edges for foraging and increases in density with a decrease in canopy cover. • Needs snags or tree tops near open areas or above canopy as diet consists mainly of larger flying insects, primarily bees. 	<p>Alternative 3</p> <ul style="list-style-type: none"> • Highest amount of restrictions (117,821 acres NSO, CSU, and TL) on oil-gas development through stipulations on new leases that would protect more mixed conifer habitat from surface disturbance.
Dusky Flycatcher	<ul style="list-style-type: none"> • Uses mixed conifer or ponderosa pine forest with a shrubby understory; brushy areas and open areas with scattered trees, such as early succession habitat following a disturbance, such as fire. • Shrub component appears to be critical in New Mexico. • Tends to choose shrubs with denser foliage for nesting. Nests built from 3 to 16 feet. • Openings near shrubs needed for foraging. 	

Sources: NMDGF 2001; NMPIF 2001; USFWS 2002b

Summary of Environmental Consequences

This effects analysis assumes that mitigation measures to preserve habitat for the NMPIF high priority migratory birds would be implemented. These measures, in addition to those typically implemented to comply with State and Federal laws, regulations, and policies, are referred to as . COAs are identified during the site-specific NEPA analysis of the surface use Plan of Operations submitted with the APD process. The primary causes of potential impacts to these species would be habitat loss and degradation from surface-disturbing activities. There would be no surface-disturbing activities directly resulting from implementation of any of the three alternatives.

Alternative 1—No Action

The No Action Alternative would provide the smallest acreage of surface use restrictions on oil-gas leases, resulting in the least amount of habitat protection for all migratory bird species within the study area.

Alternative 2—Proposed Action

Under the Proposed Action, the acreage of lease stipulations potentially providing protection to migratory bird habitat on new leases would increase about 47 percent over the No Action Alternative, to about 55 percent of the forest land in the study area. The additional acreage of proposed stipulations would apply only to new leases, including the expression of interest areas, providing the second highest amount of protection to all migratory bird species and habitats within the study area.

Alternative 3

Under Alternative 3, the acreage of lease stipulations potentially providing protection to migratory bird habitat on new leases would increase about 52 percent over the No Action Alternative, to about 60 percent of the forest land in the study area. Under Alternative 3, acreage of proposed stipulations on new leases would be the highest of the alternatives, providing the greatest protection to all migratory bird species and habitats within the study area.

Cumulative Impacts

Development of leases for oil-gas resources is a reasonably foreseeable action that requires a cumulative effects analysis. The Forest Service projects mineral development over the next 20 years to be about 20 new well locations and almost 3 miles of associated roads within the study area. All of the projected development would occur in the northern portion of the study area. The majority of the projected wells would occur within piñon-juniper and ponderosa pine habitat (10 and 7 wells, respectively). The remaining three wells are projected to occur within grassland habitat. Associated new roads projected to be built with the projected new wells include about 1.3 miles of road within ponderosa pine habitat, 0.8 mile of road within piñon-juniper habitat, and 0.7 mile of road within grassland habitat. All of the projected wells and associated projected roads would occur within existing leases. Therefore, neither of the Proposed Action alternatives would influence the development of the projected wells or roads, unless existing leases were relinquished and re-issued under proposed lease stipulations. The potential oil-gas development would most likely occur under standard terms and conditions, providing minimal surface protection for vegetative resources. The amount of projected development is minimal and, therefore, impacts to vegetative resources and associated migratory bird habitats would likely be negligible.

Migratory birds are mobile species with suitable habitat throughout the San Juan Basin. The existing surface disturbance from oil and gas operations plus disturbance projected within the study area, in combination with the mineral development projected for the San Juan Basin, would result in loss and fragmentation of habitat. The significance for migratory bird species would be impossible to predict without further monitoring, but it is unlikely that the projected oil-gas development in the Santa Fe National Forest would make major contribution to the disruption of habitats in the San Juan Basin.

Localized noises levels within the study area would be likely to occur due to the projected mineral development under all alternatives. This increase would contribute to the overall noise generated in the San Juan Basin from oil-gas development, but is not likely to create significant increases in noise in the region, but localized impacts may result in slight species shifts (LaGory et al. 2001). Due to the ambiguity regarding noise impacts on migratory birds, monitoring in the study area may be useful in quantifying these impacts.

Other foreseeable, surface-disturbing activities in the region include decommissioning of roads within the Cuba and Coyote Ranger Districts, the projects listed in Table OG-15, and other unknown construction projects on non-Federal land. In particular, projects 2, 3, 4, 6, 7, and 8 in Table OG-15 would have the greatest short-term impact on migratory birds that rely on forested habitat due to plans for thinning trees and prescribed fire. However, these projects should improve habitat over the long term.

The development of new wells, in combination with other habitat disruptions in the region, may affect migratory bird species, but the overall impacts from activities foreseen on national forest land in and near the study area would be minor.

Threatened, Endangered, and Sensitive Species

Special status wildlife, fish, and plants discussed in this section include species that are listed as threatened or endangered (T&E) under the Federal Endangered Species Act (ESA), Forest Service Region 3 sensitive species, or other species of special concern.

The Forest Service has adopted policies to ensure that Agency actions do not result in the decline of species and subsequent listing under the ESA. Those plants and animals listed as sensitive with the Forest Service have been identified by the Regional Forester for which population viability is a concern as evidenced by significant or predicted downward trends in either population or habitat capability (CNHP 1999).

Table OG-32 lists threatened, endangered, and sensitive species occurring on the Santa Fe National Forest or in the Rio Grande, with information on the status and likelihood of occurrence in the study area (NMDGF 2002; NMRPTC 2002).

Ten of the 21 species listed in Table OG-33 are known to occur or may occur in the study area. The other 15 species are highly unlikely to occur in the study area based on their known distribution or due to a lack of suitable habitat, and would not be affected by Forest Service actions within the study area.

Table OG-33. Threatened, endangered, and sensitive species occurring on or near the Santa Fe National Forest, with potential of occurrence in the study area

Common Name	Scientific Name	Status ¹	Potential to Occur in the Study Area
Goat Peak Pika	<i>Ochotona princeps nigrescens</i>	FS	Does not occur in study area based on species habitat and distribution
New Mexican (meadow) Jumping Mouse	<i>Zapus hudsonius luteus</i>	FS	May occur in riparian, mesic grass areas
Swift Fox	<i>Vulpes velox</i>	FS	Does not occur in study area based on species habitat and distribution
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T	Adjacent Chama River corridor overwintering (Nov. 1 to Mar. 1) area. Incidental in study area only in winter
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	FS	One known nest site, a portion of outer (D) zone of another nest site, and 1 to 3 potential cliff nest sites within or bordering the north part of the study area

Table OG-33. Threatened, endangered, and sensitive species occurring on or near the Santa Fe National Forest, with potential of occurrence in the study area

Common Name	Scientific Name	Status ¹	Potential to Occur in the Study Area
Northern Goshawk	<i>Accipiter gentilis</i>	FS	Habitat present and two PFAs (post-fledging areas) in northeastern part of the study area
Boreal Owl	<i>Aegolius funereus</i>	FS	May occur in high elevation spruce-fir forest in the study area
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	T	All or parts of four PACs (nest sites) in the study area
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	E	Does not occur in the study area based on species habitat and distribution
Western Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	FS	Does not occur in the study area based on species habitat and distribution
White-tailed Ptarmigan	<i>Lagopus leucurus</i>	FS	Does not occur in the study area based on species habitat and distribution
Jemez Mountains Salamander	<i>Plethodon neomexicanus</i>	FS	Habitat not delineated. Habitat is known in the study area, and may occur in riparian corridors
Northern Leopard Frog	<i>Rana pipiens</i>	FS	May occur in riparian, mesic grass areas
Rio Grande Silvery Minnow	<i>Hybognathus amarus</i>	E	Does not occur in the study area; species restricted to the middle Rio Grande, downstream from watersheds of the forest
Rio Grande Chub	<i>Gila Pandora</i>	FS	Found in segments of Clear Creek
Rio Grande Cutthroat Trout	<i>Oncorhynchus clarki virginalis</i>	FS	Found in segments of Clear Creek, San Jose Creek, Cecilia Creek, La Jara Creek, Rito de los Piños, Rio Capulin, and Rio Puerco del Grande in the study area
Blue-black Silverspot Butterfly	<i>Speyeria Nokomis Nokomis</i>	FS	Not recorded in Sandoval and Rio Arriba Counties
Holy Ghost Ipomopsis	<i>Ipomopsis sancti-spiritus</i>	E	Does not occur in the study area based on species habitat and distribution
Hairless Fleabane	<i>Erigeron subglaber</i>	FS	Does not occur in the study area based on species habitat and distribution
Chiricahua (Bloomer's) Dock	<i>Rumex orthoneurus</i>	FS	Does not occur in the study area based on species habitat and distribution
Arizona Willow	<i>Salix arizonica</i>	FS	Does not occur in the study area based on species habitat and distribution

¹ FS = Forest Service Region 3 Sensitive Species

E = Endangered Species (USFWS)

T = Threatened Species (USFWS)

New Mexican Jumping Mouse (*Zapus hudsonius luteus*)

Affected Environment

Jumping mouse habitat is characterized as moist lowlands with thick vegetation of grass and brush (AGFD 2005, NMDGF 2004a, NatureServe 2006a). The jumping mouse is found along streambanks, marshes, swamps, and moist meadows (AGFD 2005, NMDGF 2004a, NatureServe 2006a). Breeding occurs from late April to early September with a peak in June through August. Young are born from May to early October in subterranean nests, therefore, soils that permit burrowing are critical (AGFD 2005, NMDGF 2004a, NatureServe 2006a). The study area encompasses approximately 114 acres of riparian habitat that could potentially support New Mexican jumping mouse. Currently, all oil-gas leases within riparian areas are issued with standard terms and conditions.

Environmental Consequences

The oil-gas leasing decision to be made in this EIS would have no direct, on-the-ground effects on habitat or wildlife populations, but may affect future oil-gas development originating from current and future expressions of interest through constraints on new leases. All reasonably foreseeable development is projected to occur on existing leases under standard terms and conditions. Site-specific NEPA analysis would involve the selection of conditions of approval developed during the APD process and would take into account the existence of sensitive species according to required protocols. A summary of proposed lease stipulations within potential jumping mouse habitat is shown in Table OG-34.

Table OG-34. Proposed oil-gas lease stipulations within potential New Mexican jumping mouse habitat under the Proposed Action

Area	CSU (acres)	NSO (acres)	Standard Lease Terms and Conditions (acres)	Timing Limitations (acres)
Potential NM Jumping Mouse Habitat	29	41	45	0

The Proposed Action would have more stringent restrictions to protect surface resources than the No Action alternative through establishment of stipulations on new oil-gas leases. Because no surface-disturbing activities would occur within the study area as a direct result of implementing the Proposed Action, the new lease stipulations would not affect the New Mexican jumping mouse. However, the proposed NSO and CSU stipulations (41 acres and 29 acres, respectively) on new leases in riparian habitat would provide additional protection if development occurs in the future on new leases.

Conclusions

The New Mexican jumping mouse could potentially occur in the study area because potential habitat is present (Wargo 2006). Occurrence within habitats in the study area is likely to be localized. Because no surface disturbance would be a direct result under any alternative, there would be no effect on the New Mexican jumping mouse. Surface-disturbing activities related to projected future oil-gas development would continue under standard terms and conditions within the study area. Even under standard terms and conditions, adverse impacts to New Mexican

jumping mouse would be avoided during development, in compliance with State and Federal laws and policy, and would continue to result in no effect to individuals or their habitat.

Bald Eagle (*Haliaeetus leucocephalus*)

Affected Environment

In New Mexico, bald eagles are primarily associated with waterways but can sometimes be found far from water (NMDGF 2002). Snags and large trees are used as roosting, hunting, and loafing perches (NMDGF 2002). It is a common winter resident in Rio Arriba County, chiefly along river and lake shores, but also wherever carrion is available (NMDGF 2002). In the study area, the bald eagle occurs only occasionally, primarily due to the absence of desirable waterways.

Environmental Consequences

The oil-gas leasing decision to be made in this EIS would have no direct, on-the-ground effects on habitat or wildlife populations, but may affect future oil-gas development through stipulations on development under new leases. All reasonably foreseeable development is projected to occur on existing leases under standard terms and conditions. Site-specific NEPA analysis would involve the development of COAs during the APD process and would take into account the existence of threatened, endangered, and sensitive species according to required protocols.

Alternative 1—No Action

Under the No Action Alternative, leasing would continue primarily under standard terms and conditions, except in the 16,506 acres identified as limited surface use in the Forest Plan. No effect on bald eagles would result from the leasing decision.

Alternative 2—Proposed Action

The Proposed Action would have more stringent restrictions to protect surface resources than the No Action Alternative through the establishment of stipulations on new oil-gas leases. Bald eagle habitat that would support individuals other than transients is not present within the study area. For this reason, and the fact that no surface-disturbing activities would occur within the study area as a direct result of implementing the Proposed Action, new lease stipulations would not affect bald eagles.

Alternative 3

Alternative 3 would have more stringent restrictions to protect surface resources than the Proposed Action alternative through establishment of additional NSO stipulations on new oil-gas leases. Impacts to bald eagles (no effect) would be the same as those under the Proposed Action.

Conclusions

Current bald eagle use in the study area is limited to occasional transients and incidental winter roosting. There are currently no known bald eagle nests or habitat in the study area. Based on the fact that no surface disturbance would result under any alternative, there would be no effect on the bald eagle. Surface-disturbing activities related to projected future oil-gas development would continue under standard terms and conditions within the study area. Avoidance of impacts to bald

eagles during development, in compliance with State and Federal laws and policy, would continue to result in no effect to bald eagles.

Mexican Spotted Owl (*Strix occidentalis lucida*)

Affected Environment

The Mexican spotted owl (MSO) occurs in Rio Arriba County (NMDGF 2003), with nesting documented in the study area. No nesting pair has been found in the study area in recent years, but there are four designated MSO protected activity centers (PACs), as shown on Figure OG-33 with the designated critical habitat. A summary of current lease stipulations overlapping MSO PACs and critical habitat are shown in Table OG-35.

Table OG-35. Existing oil-gas lease stipulations within MSO areas of interest

Area	Standard Lease Terms and Conditions (acres)	Timing Limitations (acres)
MSO PACs	0	189
MSO Critical Habitat	6,590	0

The MSO's habitat is characterized by high structural complexity and canopy closure (Stacey and Hodgson 1999). It prefers uneven-aged, multi-layered old growth or mature mixed conifer forests (with large diameter trees, snags and logs); stands of ponderosa pine-oak woodlands with a well developed understory of Gambel oak; and steep canyons and shady canyon bottoms where a variety of deciduous and coniferous trees form multiple vegetation layers (USFWS 1995, Stacey and Hodgson 1999). Currently there are 6,590 acres of designated MSO critical habitat and 189 acres of MSO PACs within the study area (see Figure OG-32).

Environmental Consequences

The MSO is vulnerable to habitat loss or alteration of mature mixed conifer forest. Critical habitat for MSO exists in the southern portion of the study area. Activities that fragment mature mixed conifer forest, such as construction and oil-gas well development and maintenance, would be potentially detrimental to the MSO. A summary of proposed lease stipulations overlapping MSO areas are shown in Table OG-36. The oil-gas leasing decision to be made in this EIS would have no direct, on-the-ground effects on habitat or wildlife populations, but may affect future oil-gas development through stipulations on development under new leases. All reasonably foreseeable development is projected to occur on existing leases under standard terms and conditions. Site-specific NEPA analysis would involve the selection of conditions of approval developed during the APD process and would take into account the existence of threatened, endangered, and sensitive species according to required protocols.

Alternative 1—No Action

Under the No Action Alternative, leasing would continue under standard terms and conditions. No effect on MSOs or on their critical habitat would result from the leasing decision.

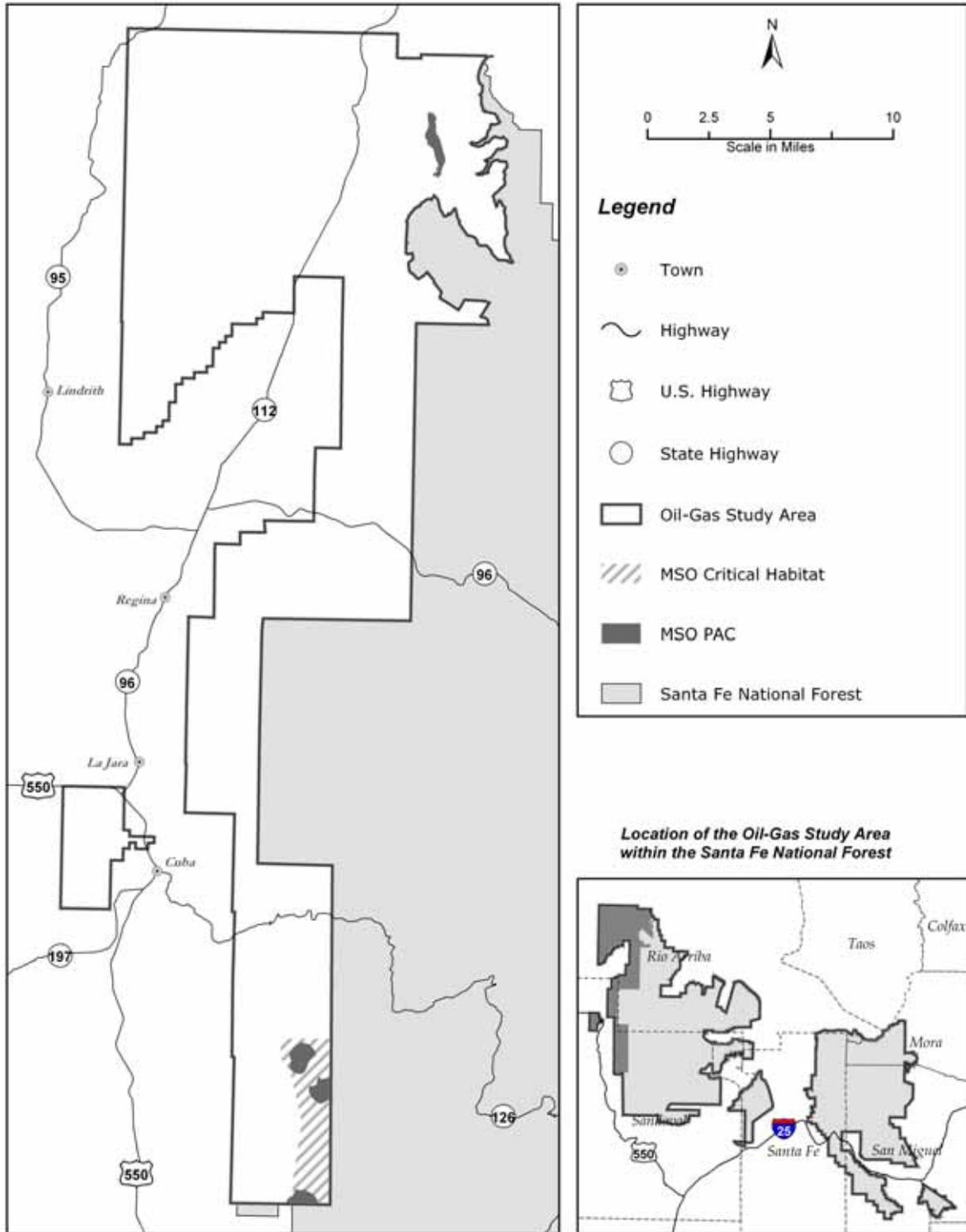


Figure OG-33. Mexican spotted owl protected activity centers and designated critical habitat in the study area

Alternative 2—Proposed Action

The Proposed Action would have more stringent restrictions to protect MSO PACs and critical habitat than the No Action Alternative through establishment of stipulations on new oil-gas leases. Because no surface-disturbing activities would occur within the study area as a direct result of implementing the Proposed Action lease stipulations, there would be no effects to MSOs or their critical habitat. However, the proposed NSO stipulations on new leases within MSO PACs and critical habitat (110 acres), and the new timing limitations (87 acres) within critical habitat, would provide additional protection to MSO areas of interest if development occurs on new leases.

Table OG-36. Proposed oil-gas lease stipulations within MSO areas under the action alternatives

MSO Area	CSU (acres)	NSO (acres)	Standard Lease Terms and Conditions (acres)	Timing Limitations (acres)
MSO PACs ¹	2	60	0	189
MSO Critical Habitat	6	70	450	87

¹ The acreage sum is greater than the total amount within the study area due to overlapping lease stipulations occurring within certain PACs.

Alternative 3

The additional NSO lease stipulations proposed under Alternative 3 would not occur in MSO PACs or critical habitat, so the effects to MSOs and designated critical habitat would be the same as those under the Proposed Action.

Conclusions

No direct or indirect impacts to the MSO PACs are anticipated under any alternative. Surface-disturbing activities related to projected future oil-gas development would continue under standard terms and conditions within the study area. Avoidance of impacts to MSOs and designated critical habitat during development, in compliance with State and Federal laws and policy, would continue to result in no effect to MSOs and their designated critical habitat.

American Peregrine Falcon (*Falco peregrinus anatum*)

Affected Environment

Peregrine breeding habitat is characterized as tall cliffs adjacent to a source of water (Johnsgard 1990). Cliffs provide nesting ledges that are inaccessible to predators and perches that allow a panoramic view of surrounding foraging habitat. Peregrines feed almost entirely on birds, often taken in full flight (Johnsgard 1990). Peregrines breed throughout the mountain ranges of New Mexico where they are rare to uncommon. They also winter throughout the state, most commonly west of the eastern plains (NMDGF 2003). The study area encompasses one known nest site, a portion of the outer zone of another nest site, and one to three potential cliff nest sites within or bordering the northern part of the study area, for a total of 110 acres. The northern portion of the study area contains potential habitat for peregrines but the quantity is unknown (Borrego 2005).

Currently, all oil-gas lease stipulations within peregrine falcon areas (110 acres) are issued with standard terms and conditions.

Environmental Consequences

The oil-gas leasing decision to be made in this EIS would have no direct, on-the-ground effects on habitat or wildlife populations, but may affect future oil-gas development through constraints on development under new leases. All reasonably foreseeable development is projected to occur on existing leases under standard terms and conditions. Site-specific NEPA analysis would involve the selection of COAs developed during the APD process and would take into account the existence of threatened, endangered, and sensitive species according to required protocols. A summary of proposed lease stipulations within peregrine falcon areas is shown in Table OG-37.

Table OG-37. Proposed oil-gas lease stipulations within peregrine falcon areas under the action alternatives

Area	CSU (acres)	NSO (acres)	Standard Lease Terms and Conditions (acres)	Timing Limitations (acres)
Peregrine Falcon Sites	37	44	12	18

Note: Acreage for the Proposed Action and Alternative 3 are the same.

Alternative 1—No Action

Under the No Action Alternative, leasing would continue under standard terms and conditions. No effect on peregrine falcons would result from the leasing decision.

Alternative 2—Proposed Action

The Proposed Action would have more stringent restrictions to protect surface resources than the No Action Alternative through establishment of stipulations on new oil-gas leases. Because no surface-disturbing activities would occur within the study area as a direct result of implementing the Proposed Action, the new lease stipulations would not affect peregrine falcons. One expression of interest area intersects the outermost Zone “D” of the one known nest site. The RFDS projected new oil-gas development sites are located some distance to the west of the known peregrine falcon aeries or potential nest sites. The proposed NSO stipulations (44 acres) and the new timing limitations (18 acres) on new leases near falcon sites would provide additional protection if development occurs in the future on new leases.

Alternative 3

Alternative 3 would have more stringent restrictions to protect surface resources than the Proposed Action Alternative through the establishment of additional NSO stipulations on new oil-gas leases, but none of the proposed additional NSO lease stipulations would occur near peregrine falcon sites. Impacts to peregrine falcons (no effect) would be the same as those under the Proposed Action.

Conclusions

Peregrines are known at one nest in the study area and potential habitat is present in the northern portion (Borrego 2005). Occurrence within the study area habitats would likely include only transient or migrant peregrines. Based on the fact that no surface disturbance would result under any alternative, there would be no effect on peregrine falcons. Surface-disturbing activities related to projected future oil-gas development would continue under standard terms and conditions within the study area. Even under standard terms and conditions, adverse impacts to peregrine falcons would be avoided during development, in compliance with State and Federal laws and policy, and would continue to result in no effect to individuals or their habitat.

Northern Goshawk (*Accipiter gentiles*)

Affected Environment

In New Mexico, goshawks typically breed in mature, closed canopy coniferous forests of mountains and high mesas (NMDGF 2003). Goshawks reside in Rio Arriba County (NMDGF 2003) with suitable habitat and two post-fledging areas (PFA) occurring within the study area.

Reynolds et al. (1992) identified three spatial components of northern goshawk home ranges: the nest area, the PFA, and the foraging area. The nest area is about 30 acres and may include multiple nests (usually 2 to 4). It is often characterized by stands of large, mature trees with dense canopy cover. The nest area is the center of all breeding activity and may be occupied by a goshawk pair from early March until late September (Reynolds et al. 1992).

The PFA consists of approximately 300 to 600 acres surrounding the nest area and corresponds to the area defended as a territory by a breeding pair. It receives concentrated use by the goshawk family from the time the young are fledged until they are independent in the fall. The PFA may be characterized by various size classes of trees, but usually includes some areas of dense forest suitable for maintenance of a variety of prey such as understory shrubs, downed-woody debris, and snags (Reynolds et al. 1992).

The foraging area is about 5,400 acres surrounding the PFA and represents the boundaries of a goshawk nesting home range. The foraging area has a variety of timber size classes with varied habitat structure to maximize prey species diversity and availability (Reynolds et al. 1992). Currently there are 81 acres of existing PFAs within the study area, all with standard terms and conditions for oil-gas leases. The amount of foraging area within the study area is unknown.

Environmental Consequences

The oil-gas leasing decision to be made in this EIS would have no direct, on-the-ground effects on habitat or wildlife populations, but may affect future oil-gas development through constraints on development under new leases. All reasonably foreseeable development is projected to occur on existing leases under standard terms and conditions. The closest RFDS projected new well site is about 3 miles northwest of a designated PFA and the closest expression of interest area is approximately the same distance to the south. Site-specific NEPA analysis would involve the selection of conditions of approval developed during the APD process and would take into account the existence of threatened, endangered, and sensitive species according to required protocols. A summary of proposed lease stipulations within goshawk PFAs is shown in Table OG-38.

Table OG-38. Proposed oil-gas lease stipulations within known goshawk post-fledging areas under the action alternatives

Area	CSU (acres)	NSO (acres)	Standard Lease Terms and Conditions (acres)	Timing Limitations (acres)
Goshawk PFA	0	5	22	55

Alternative 1—No Action

Under the No Action Alternative, leasing would continue under standard terms and conditions. No effect on northern goshawks would result from the leasing decision.

Alternative 2—Proposed Action

The Proposed Action would have more stringent restrictions to protect surface resources than the No Action Alternative through establishment of stipulations on new oil-gas leases. Because no surface-disturbing activities would occur within the study area as a direct result of implementing the Proposed Action, the new lease stipulations would not affect northern goshawks. However, the proposed NSO stipulations (5 acres) and the new timing limitations (55 acres) on new leases in goshawk PFAs would provide additional protection if development occurs in the future on new leases.

Alternative 3

Alternative 3 would have more stringent restrictions to protect surface resources than the Proposed Action through establishment of additional NSO stipulations on new oil-gas leases, none of which occur in goshawk PFAs. The impacts to northern goshawks (no effect) would be the same as those under the Proposed Action.

Conclusions

Goshawks are known to nest and forage in the study area. Based on the fact that no surface disturbance would result under any alternative, there would be no effect on northern goshawks. Surface-disturbing activities related to projected future oil-gas development would continue under standard terms and conditions within the study area. Avoidance of impacts to northern goshawks during development, in compliance with State and Federal laws and policy, would continue to result in no effect.

Boreal Owl (*Aegolius funereus*)**Affected Environment**

Boreal owl habitat is characterized as dense coniferous woodlands with adjacent open grasslands (NatureServe 2006b, NMDGF 2004b). Roosting occurs within dense cover. Important breeding areas include standing snags and hollow trees with abundant small mammals, birds, and insects for prey. Breeding begins with nests initiated from approximately mid-April to early June. Incubation is reported as 25 to 36 days and the young fledge at about 4 to 5 weeks (NatureServe 2006b, NMDGF 2004b). The study area encompasses approximately 36,889 acres of potential boreal owl habitat. This habitat is located at the higher elevations within the study area. Currently,

all oil-gas leases within boreal owl potential habitat are issued with standard terms and conditions.

Environmental Consequences

The oil-gas leasing decision to be made in this EIS would have no direct, on-the-ground effects on potential habitat or wildlife populations, but may affect future oil-gas development through constraints on new leases. All reasonably foreseeable development is projected to occur on existing leases under standard terms and conditions. Site-specific NEPA analysis would involve the selection of conditions of approval developed during the APD process and would take into account the existence of sensitive species according to required protocols. A summary of proposed lease stipulations within potential boreal owl habitat is shown in Table OG-39.

Table OG-39. Proposed oil-gas lease stipulations within potential boreal owl habitat under the Proposed Action

Area	CSU (acres)	NSO (acres)	Standard Lease Terms and Conditions (acres)	Timing Limitations (acres)
Potential Boreal Owl Habitat	3,827	10,362	21,741	959

The Proposed Action would have more stringent restrictions to protect surface resources than the No Action Alternative through establishment of stipulations on new oil-gas leases. Because no surface-disturbing activities would occur within the study area as a direct result of implementing the Proposed Action, the new lease stipulations would not affect boreal owls. However, the proposed NSO and CSU stipulations (10,362 and 3,827 acres, respectively) and the timing limitations (959 acres) on new leases within potential boreal owl habitat would provide additional protection if development occurs in the future on new leases.

Conclusions

Potential boreal owl habitat is present at higher elevations in the study area. Because no surface disturbance would result under any alternative, there would be no effect on boreal owls. Surface-disturbing activities related to projected future oil-gas development would continue under standard terms and conditions within the study area. Even under standard terms and conditions, adverse impacts to the boreal owl would be avoided during development, in compliance with State and Federal laws and policy, and would continue to result in no effect to individuals or their habitat.

Jemez Mountains Salamander (*Plethodon neomexicanus*)

Affected Environment

The Jemez Mountains salamander (JMS) is found in mixed forests of fir, spruce, aspen, and maple (NatureServe 2006c, NMDGF 2004c). The Jemez Mountains salamander is a nocturnal and subterranean species during most of the year, except during summer rains (typically June through August). Nesting habitat consists of underground burrows where clutches of about 8 eggs are laid between June and mid-August (NatureServe 2006c, NMDGF 2004c). Potential habitat for

the JMS is limited to riparian corridors. There is 114 acres of known riparian area within the study area. Currently, all oil-gas leases within Jemez Mountains salamander habitat are issued with standard terms and conditions.

Environmental Consequences

The Proposed Action would have more stringent restrictions to protect surface resources than the No Action Alternative through establishment of stipulations on new oil-gas leases. Because no surface-disturbing activities would occur within the study area as a direct result of implementing the Proposed Action, the new lease stipulations would not affect Jemez Mountains salamanders. However, the proposed NSO and CSU stipulations (41 acres and 29 acres, respectively) on new leases in riparian habitat would provide additional protection if development occurs in the future on new leases.

Conclusions

The Jemez Mountains salamander could occur in the study area because potential habitat is present (Wargo 2006). Occurrence within the study area habitats is likely to be localized. Because no surface disturbance would result under any alternative, there would be no effect on JMS populations. Surface-disturbing activities related to projected future oil-gas development would continue under standard terms and conditions within the study area. Even under standard terms and conditions, adverse impacts to the Jemez Mountains salamander would be avoided during development, in compliance with State and Federal laws and policy, and would continue to result in no effect to individuals or their habitat.

Northern Leopard Frog (*Rana pipiens*)

Affected Environment

Northern leopard frog habitat is characterized as spring, stream, marsh, bog, pond, reservoir, and lakes, usually with permanent water with rooted aquatic vegetation. In the summer months, wet meadows and fields are commonly occupied (Christman and Giermakowski 2003, Degenhardt et al. 1996, NatureServe 2006d, NMDGF 2004d). Breeding occurs in aquatic habitat, eggs are laid and larvae develop typically in shallow, still, permanent water, generally in areas well exposed to sunlight. Eggs are attached to vegetation just below the surface of the water (Christman and Giermakowski 2003, Degenhardt et al. 1996, NatureServe 2006d, NMDGF 2004d). The study area encompasses approximately 114 acres of riparian habitat that could potentially support leopard frogs. Currently, all oil-gas lease stipulations within riparian areas are issued with standard terms and conditions.

Environmental Consequences

The oil-gas leasing decision to be made in this EIS would have no direct, on-the-ground effects on potential habitat or wildlife populations, but may affect future oil-gas development through constraints on new leases. All reasonably foreseeable development is projected to occur on existing leases under standard terms and conditions. Site-specific NEPA analysis would involve the selection of conditions of approval developed during the APD process and would take into account the existence of sensitive species according to required protocols. A summary of

proposed lease stipulations within potential northern leopard frog habitat is shown in Table OG-40.

The Proposed Action would have more stringent restrictions to protect surface resources than the No Action Alternative through establishment of stipulations on new oil-gas leases. Because no surface-disturbing activities would occur within the study area as a direct result of implementing the Proposed Action, the new lease stipulations would not affect leopard frogs. However, the proposed NSO and CSU stipulations (41 acres and 29 acres, respectively) on new leases in riparian habitat would provide additional protection if development occurs in the future on new leases.

Table OG-40. Proposed oil-gas lease stipulations within northern leopard frog habitat under the Proposed Action

Area	CSU (acres)	NSO (acres)	Standard Lease Terms and Conditions (acres)	Timing Limitations (acres)
Potential northern leopard frog habitat	29	41	45	0

Conclusions

The leopard frog could occur in the study area because potential habitat is present (Wargo 2006). Occurrence within the study area habitats is likely to be localized. Because no surface disturbance would result under any alternative, there would be no effect on northern leopard frogs. Surface-disturbing activities related to projected future oil-gas development would continue under standard terms and conditions within the study area. Even under standard terms and conditions, adverse impacts to the northern leopard frog would be avoided during development, in compliance with State and Federal laws and policy, and would continue to result in no effect to individuals or their habitat.

Rio Grande Cutthroat Trout (*Oncorhynchus clarki virginalis*)

Discussion of the affected environment of the Rio Grande cutthroat trout and the environmental consequences of the three alternatives is described in the “Management Indicator Species” section.

Based on the fact that no surface disturbance would result under any alternative, there would be no effect on Rio Grande cutthroat trout. Surface-disturbing activities related to projected future oil-gas or EOI development would continue under standard terms and conditions or CSU stipulations within the study area. The potential future effects of implementing either action alternative would likely be beneficial through the increased protection from surface disturbance in some areas if new leases were developed, which could reduce sedimentation entering cutthroat trout streams. Under all alternatives, there would be no effect on the Rio Grande cutthroat trout from the leasing decision.