Encino Vista Landscape Restoration Project

Purpose and Need for Action and Proposed Action

Coyote Ranger District
Santa Fe National Forest

November 2019

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Project Location and Background

The Encino Vista Landscape Restoration Project (project) is located on the Coyote Ranger District of the Santa Fe National Forest south of the communities of Cañones, Youngsville, Coyote, and Gallina, New Mexico. The project boundaries encompass over 128,400 acres of which 119,767 acres are national forest lands. The project area overlaps thirteen HUC 12 sub-watersheds. The majority of the project is within these sub-watersheds: Coyote Creek, Cañones Creek, Headwaters Rio Puerco, Poleo Creek, Outlet Rio Puerco, Upper Rio Galina and Rio Capulin. Figure 1 shows the Encino Vista Landscape Restoration Project area and its location within the Coyote Ranger District.

The project area is situated between the elevation of 6,450 and 10,600 feet. Climate of the project area is typical of Climate Division 2 (Northern Mountain Division), and is characterized as a semi-arid continental climate pattern, with bi-modal precipitation, and large diurnal and annual temperature fluctuations (http://weather.nmsu.edu/products/climate-new-mexico/). Depending on the elevation, the annual precipitation ranges between 25 and 35 inches. An estimated 50 percent of the annual precipitation is snow. Summer rainfall occurs as thunderstorms of high intensity and short duration. Snow cover extends from early November to mid- April. The average annual snow accumulation is between 20 and 36 inches. The freeze-free period is an estimated 160 days.

The Encino Vista Landscape is a priority landscape for the Santa Fe National Forest. The area includes piñon/juniper woodlands, ponderosa pine, mixed conifer, aspen and spruce-fir forest types; it is the focal point of the district due to overstocked forested conditions. The ponderosa pine and dry mixed conifer ecosystems are particularly fire-prone ecosystems.

This Purpose and Need and Proposed Action document only pertains to National Forest System Lands administered by the Santa Fe National Forest.

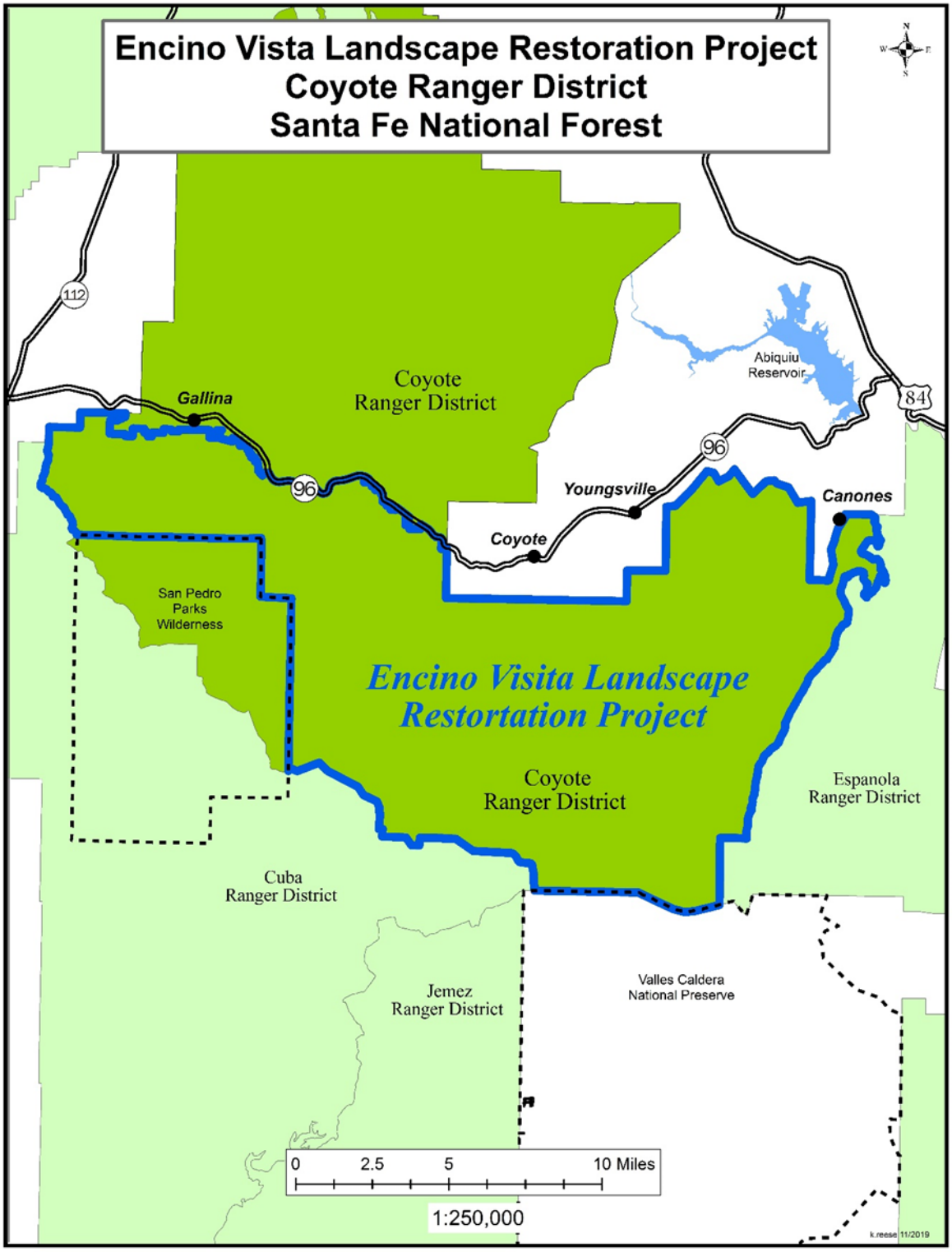

Figure 1. Encino Vista Landscape Restoration Project area and vicinity map.

Existing Conditions

Ecological Response Units

The Encino Vista project area encompasses a broad range of ecosystems along elevational gradients from pinon-juniper grasslands to spruce-fir forest. These ecosystem types are mapped using the ecological response unit (ERU) framework. ERUs are ecosystem types based on biophysical themes that represent the range of conditions (e.g., dominant species, vegetation associations, soils, landscape features, and climate) that prevail under natural disturbance regimes (e.g., fire, insects and disease). Each ERU has specific seral stages that describe smaller units of vegetation conditions and succession (e.g., dominance of post-disturbance species or closed-canopy conditions) that is influenced by both natural processes and management.

The project area has a wide variety of ecological response units (ERUs), the most represented being frequent-fire mixed conifer, piñon-juniper, ponderosa pine forest, spruce-fir forest, and mixed conifer w/ aspen. Other ERUs (non-forested, shrublands, & riparian) make up less than 10% of the project area. Figure 2 displays the ERU types and associated acreage (both forested and non-forested) for the project area.

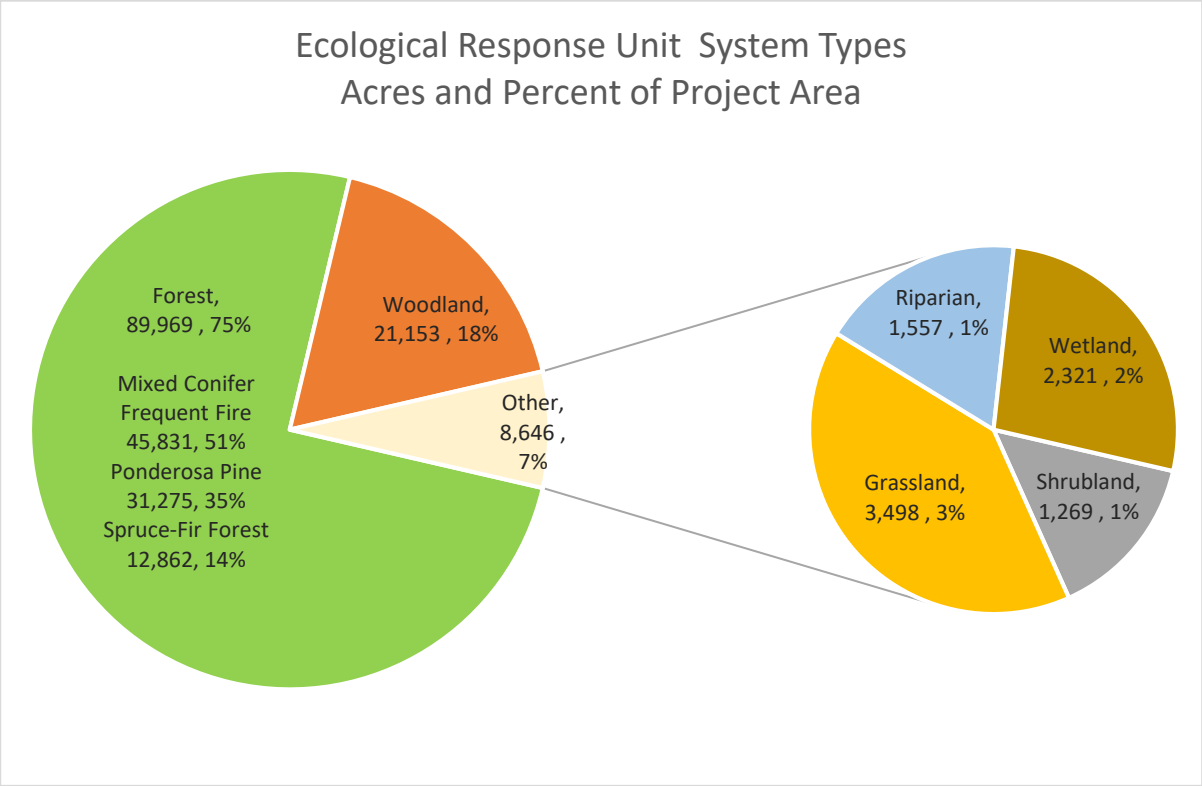

Figure 2. Ecological Response Units (ERUs) and associated acreage for the project area.

Forest Structure

Stand density (a measure of the degree of crowding of trees) is the dominant factor affecting the health and vigor of the forest. In terms of forest health and resiliency, high stand densities decrease growth and vigor, increased susceptibility to forest pests and disease, and increase fire risk. Stand densities are uncharacteristically high in the majority of the project area.

Forest Health

Data from aerial surveys conducted for more than two decades indicate a wide variety of forest insects causing damage and mortality in the project area. The two most prevalent types of damaging insects are bark beetles and defoliators. Since 1997, 13,005 acres of forest have suffered mortality due to bark beetles, and 58,183 acres have been damaged by defoliating insects. These insects are not uncommon to find in the forest at low population levels and often cause undetectable level of damage and mortality. However, when stand densities are high and/or climate conditions cause stress on trees these low population levels can explode into epidemic populations.

Another common pathogen in the forest not detected through the aerial surveys is dwarf mistletoes. This parasitic plant slows growth, reduces vigor, distorts branches, and cause mortality in heavily infected trees. All the conifer species in the project area may be infected by species-specific dwarf mistletoe, but it is most common in ponderosa pine and Douglas-fir. Region wide (AZ and NM), one third of ponderosa pine acreage and roughly half of the mixed conifer acreage is infected with dwarf mistletoe. (Field Guide to Insects and Diseases of AZ and NM Forests. MR-R3-16-3. USDA. FS. R3).

Watershed

The project area overlaps twelve HUC 12 sub-watersheds, but the majority (74%) of the project is within these sub-watersheds: Cañones Creek, Coyote Creek, Headwaters Rio Puerco, and Poleo Creek. These four sub-watershed are a crucial source of recharge of ground water used as drinking water for the communities of Coyote, Youngsville, Cañones and Abiquiu. Portions of four other sub-watersheds make up nearly 23% of the project area, they are: Outlet Poleo Creek, Upper Rio Gallina, Rio Capulin, and Abiquiu Reservoir. The Cañones Creek is an impaired functioning watershed. The other previously mentioned watersheds are functioning at risk.

Fire Risk

Two factors that contribute to stand-replacing crown fires are surface fuels and canopy fuel distribution. Surface fuels (live and dead vegetation including trees and shrubs, litter, duff, fine twigs and debris on the soil surface) and canopy fuels (the biomass in the forest canopy) are substantially more abundant and contiguous in the project area relative to historic conditions. This uncharacteristic loading of surface and canopy fuels, increases the likelihood of stand replacing crown fire, posing a major safety risk to surrounding communities. Fire suppression is the primary reason which has allowed for change in fuels (suppression combined with grazing and logging are the driving factors for change in fuel abundance, type, and arrangement).

Roads

Many of the roads in the project area are in poor condition. These roads do not provide safe and efficient access. Their degraded state may be causing soil erosion.

General Desired Conditions

Juniper Grass

The Juniper grass ERU (a woodland ERU type) is typically found on warmer and drier settings beyond the environmental limits pinyon, and just below and often intergrading with the pinyon-juniper zone. The Juniper grass ecosystem is generally uneven aged and very open in appearance, primarily on mollisol soils. Trees occur as individuals or in smaller groups and range from young to old. A dense herbaceous matrix of native grasses and forbs characterize this type. Typical disturbances (fire, insects, and disease) are low severity and high frequency. These disturbance patterns create and maintain the uneven-aged, open-canopy nature of this type. The tree and grass species composition varies consisting of a mix of one or more juniper species. Typically, native understory grasses are perennial species, while forbs consist of

both annuals and perennials. Shrubs are characteristically absent or scattered. Due to the effects of long-term fire suppression and grazing in this type, in many locations the current condition is severely departed from historic conditions. Typically these changes include in-filling of the canopy gaps, increased density of tree groups, and reduced composition, density and vigor of the herbaceous understory plants. Many of these sites currently are closed-canopy woodlands, with insufficient understory vegetation to support surface fires.

At the landscape scale, desired conditions for Juniper grass were developed from the Pinon-Juniper model (LANDFIRE 2010). Reference condition values were modified for ecological sustainability analysis work to reflect a high frequency, low severity fire regime where grass-forb-shrub (post replacement) plant communities would have been uncommon at watershed scales. Sixty percent of woodlands would be in a late-open or late-closed canopy seral state and would have old growth characteristics including old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. Thirty five percent would be in mid development state in predominantly seed/sapling trees with open canopy, but some small trees with closed canopy.

Piñon-Juniper (PJ) Sagebrush

The PJ Sagebrush is concentrated in geographic areas dominated by cold (winter) season precipitation regimes and the frigid soils. Trees occur as individuals or in smaller clumps, and range from young to old. Tree clumps are often even-aged. The understory is dominated by moderate to high density shrubs, and the development of the herb layer is limited and concentrated in canopy openings. The tree and shrub species composition varies throughout the Region; piñon is occasionally absent, but one or more juniper species are always present. Generally the sparse native understory grass development includes perennial species, while forbs consist of both annuals and perennials. Shrubs are characteristically well distributed, and usually achieve high canopy closure during mature successional phases or where livestock grazing has favored their development over herb species.

At the landscape scale, desired conditions for piñon-juniper sagebrush communities are composed of nearly even proportions, medium to large closed canopy trees, medium to large open canopy trees, and early seral grass/shrub/young tree states (Romme et al. 2009a, LANDFIRE 2014). Compared to pinon-juniper woodlands, this additional diversity resulted in smaller patches (1 to 10s of acres). The sagebrush understory provides more continuous fuel to carry fire which was likely more common and exerted a greater influence on stand structure. Low intensity fires were still very unusual. Most fires removed the shrub layer and killed some to all trees (Romme et al. 2009a). Fire return intervals were fairly long (50 to 100 years) (Gruell 1999, LANDFIRE 2014), but more frequent than in pinon- juniper woodlands. (Romme et al. 2009a).

Ponderosa Pine & Dry Mixed Conifer

Restoration and desired conditions for frequent-fire forests are based on the most recent, best available science. Desired conditions for forest vegetation are described in terms of composition (species mix), structure (size, density, and vertical or horizontal arrangement), and function (interaction with other physical, chemical, and biological elements of the forest environment). Composition, structure, and function relate directly to forest values, including forest health, wildlife habitat, recreation opportunity, aesthetics, forest products, livestock grazing, watershed condition, and fire regime.

The desired condition for frequent-fire forests within the project area would include fluctuating density and variety in structure and age. There would be diversity in how trees are spaced across the landscape, with areas of canopy gaps and interspaces. The uneven-aged forest would favor shade-intolerant forest species, which are most resistant to fire effects, including ponderosa pine and Douglas-fir. Shade tolerant conifer species such as white fir would occur, but they would not be the dominant species. Other species

such as aspen, Gambel oak (shrub form), and other hardwood species would be well represented and regenerate successfully across the landscape. Forests would be generally healthy, although normal levels of native insects and disease would continue to be present.

These key compositional and structural elements can be evaluated/seen/illustrated at three spatial scales: the fine-scale (an area less than 10 acres), mid-scale (an area between 10 and 1,000 acres), and landscape-scale (an area greater than 1000 acres).

Canopy gaps and interspaces mimic historic spatial patterns in a frequent fire forest and provide a number of benefits. They:

- allow regeneration of shade intolerant tree species,
- promote grass, forb, and shrub growth,
- improve hydrologic function,
- encourage development of rooting zones for tree groups, and
- facilitate reintroduction and maintenance of frequent surface fire as an ecological process.

Forest canopy gaps and interspaces are dynamic. Interspaces are not intended to remain open over time, recognizing that natural vegetation development would allow them to develop into new tree group/patches, while tree groups may be opened by natural disturbances, such as insect mortality, disease and fire.

Piñon-Juniper Woodlands

Piñon-juniper woodlands are mostly found on lower slopes of mountains and in upland rolling hills at approximately 5,300 to 10,000 feet in elevation. They have broad grouping of different plant associations with trees occurring as individuals or in smaller groups and range from young to old, but more typically as large, even-aged structured patches. Piñon-juniper woodlands characteristically has a moderate to dense tree canopy and a sparse understory of perennial grasses, annual and perennial forbs, and shrubs. Woodland development occurs in distinctive phases, ranging from open grass-forb, to mid-aged open canopy, to mature closed canopy. Piñon-juniper woodlands on broken or rocky terrain exhibits little to no natural fire, and insects and disease may be the only disturbance agents.

At the landscape scale, desired conditions for piñon-juniper woodlands consist of even-aged patches of piñons and junipers that at the landscape level form multi-aged woodlands. Seventy percent of woodlands would be in a late-open or late-closed canopy seral state and would have old growth characteristics including old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. These woodlands are often concentrated in mid- and fine-scale units as patches of old growth. The location of old growth shifts on the landscape over time as a result of succession and disturbance. At the mid-scale (10 – 1,000 acres) piñon-juniper woodlands would have a high tree density and canopy cover, with sparse to moderate shrub cover.

Spruce-Fir

The spruce-fir forest vegetation community generally occurs at elevations above 9,500’. It is often dominated by Engelmann spruce, but contains other species depending on elevation. Spruce-fir occurs on the coldest and highest elevation sites in the forest with the most precipitation.

Lower-elevation spruce-fir resembles wet mixed conifer with a different composition of tree species, due to relatively warmer, drier conditions, and is a transition zone between wet mixed conifer and the upper-elevation spruce-fir forest type. In the lower type, common seral tree species are aspen, Douglas-fir, white fir, and southwestern white or limber pine. Late seral forest is dominated by Engelmann spruce, white fir, and occasionally blue spruce. Subdominant species may include corkbark (subalpine fir), white fir, and

bristlecone pine. Patches of aspen are occasionally present, but aspen is typically incidental or co-dominant. Disturbances in these types typically occur at two temporal and spatial scales: large-scale infrequent disturbances (mostly fire) and small-scale frequent disturbances (fire, insect, disease, and wind).

At the landscape scale, desired conditions for spruce-fir are forests composed of multiple species of varying ages in a mosaic of seral stages and structures. Its arrangement on the landscape is similar to historic patterns, with groups and patches of variably sized and aged trees. Tree canopies are generally more closed than in mixed conifer forests. Seral state proportions are applied at the landscape scale, where contributions from all seral stages and low overall departure from reference proportions are positive indicators of ecosystem condition.

Mixed Conifer with Aspen

The mixed conifer with aspen forest (wet mixed conifer) vegetation community generally occurs at elevations ranging from approximately 6,500 to 10,000 feet. Mixed conifer with aspen stands typically occur on north and east aspects, lower slopes, and forested valley bottoms, and are more common at high elevations. Disturbances typically occur at two temporal and spatial scales: large-scale infrequent disturbances (primarily fire), and small-scale frequent disturbances (fire, insect, disease, wind). This forest has an understory of a wide variety of shrubs, grasses, and forbs depending on soil type, aspect, elevation, disturbance, and other factors.

Stands generally have dense structure and dominant and co-dominant vegetation which varies in elevation and moisture availability, and by seral stage. Ponderosa pine occurs incidentally or is absent, while Douglas-fir, southwestern white pine, white fir, and Colorado blue spruce occur as dominant and or co-dominant conifer species. Limber pine may be present in subdominant proportions.

At the landscape scale, desired future conditions for mixed conifer with aspen forests consists of communities composed of multiple species of varying ages in a mosaic of seral stages and structures. Its arrangement on the landscape is similar to historic patterns with groups and patches of variably-sized and aged trees and other vegetation associations. Tree canopies are generally more closed than in dry mixed conifer (frequent-fire).

Comparison of Existing Conditions and Desired Conditions

Existing conditions are generally departed from desired conditions and are outside the natural range of variability. Most current forest structures are even-aged and not uneven-aged. Canopy gaps and interspaces are rare throughout the landscape. Low severity fires do not frequently occur throughout the landscape. Native insect and disease mortality occurs at higher than historically normal rates.

Purpose and Need for Action

The landscape within the project area has been greatly altered from historic conditions. Fire suppression activities and departure from historic conditions have increased the risk for uncharacteristic wildfire across the landscape, threatening the watershed and local communities. Insects and disease have contributed to an overall decline in forest health in the area; especially in mixed conifer with aspen, spruce-fir, and piñon-juniper communities.

The purpose of the Encino Vista Landscape Restoration project is to restore overall forest health, lower fire risk, improve watershed health, and enhance wildlife habitat across the landscape. There is a need to increase forest ecosystem sustainability and resiliency to insects, disease, and climate change by shifting forest composition and structure toward desired conditions within the historic (or natural) range of

variability for each forest type. There is also a need to reduce the risk of uncharacteristic wildfires, to improve species habitat, and overall watershed conditions.

This project focuses on forest restoration and resiliency treatments to:

- Reduced stand densities
- Reintroduce fire on the landscape
- Revitalize meadows and aspen stands
- Promote a diverse forest structure for a variety of wildlife species
- Improve watershed conditions across the landscape, which would safeguard the water supply for villages, towns and ranches within the project area as well as downstream communities, by increasing the quality and quantity of water that flows through the network of streams improving watershed function within the Encino Vista Project area
- Significantly reduce the risk of catastrophic wildfire and its aftermath (flooding, debris flow)

Need for a Project-Specific Forest Plan Amendment

In 2012 the Mexican Spotted Owl recovery Plan, First Revision was published (USDI FWS 2012). There is a need for the project analysis to be in alignment with the management direction provided in the revised Recovery Plan. A project-specific plan amendment is needed because the 1987 Santa Fe National Forest Plan, as amended, includes direction from the former (1995) recovery plan.

The draft plan amendment would:

- Update definitions and direction for protected (protected activity centers (PACs)), recovery habitat, and other forest and woodland types to be in alignment with the current recovery plan.
- Update language and direction related to prescribed cutting and fire treatments in PACs to be consistent with the current recovery plan.
- Add forest structure guidelines for recovery habitat.
- Add direction for riparian forest habitats.
- Update survey information.
- Remove the direction for treating habitat in incremental percentages.

There is a need for the project analysis to be in alignment with the best available science for northern goshawk management. The Santa Fe National Forest Plan provides guidelines to manage for uneven-aged stand conditions, but does not provide guidelines for the management of interspaces at the fine-scale. Recent science (Reynolds et al. 2013) has shown that historically more interspaces were present on the landscape essentially remaining treeless within a frequent-fire regime, along with scattered individuals. In order to meet restoration objectives there is a need for a project-specific Forest Plan amendment to include: the definition of interspaces; how interspaces and openings relate to vegetative structural stage (VSS) and how canopy cover would be measured across the landscape.

The 1987 Forest Plan provides direction for frequent-fire forest types on three levels: management scale, outside goshawk post-fledgling areas, and within goshawk post-fledgling areas. Therefore a project-specific Forest Plan amendment would need to address the direction provided on all three levels (see Table 1). The Santa Fe National Forest is currently undergoing Forest Plan Revision, but because a final revised forest plan is not expected until 2020 an amendment to the 1987 forest plan is needed to:

- Replace forest plan standards and guidelines for ponderosa pine and dry mixed conifer (including northern goshawk direction) with desired conditions and guidelines.
- Add a desired condition for the percentage of interspaces within uneven-aged stands to facilitate restoration.
- Add the desired interspaces distance between tree groups.

Proposed Action

Because the existing condition within the project area is not meeting desired conditions, the Coyote Ranger District, Santa Fe National Forest proposes the following actions (all acreage is approximate):

- Ponderosa pine and dry mixed conifer (frequent fire): Broadcast and pile burning and subsequent maintenance burning in conjunction with or independent of, uneven- and even-aged silvicultural system methods on up to **77,106** acres. Silvicultural treatments include:
    - Group and/or individual tree selection on up to **39,720** acres, and prescribed burning
    - Combination of intermediate thinning and/or pre-commercial thinning, and/or prescribed burning on up to **26,480** acres.
- Pinon-juniper, spruce/fir, and mixed conifer with aspen (infrequent fire): Uneven- and even-aged silvicultural system methods in conjunction with broadcast and pile burning on up to **22,200** acres. Silvicultural treatments would focus on:
    - Manipulation of size class distribution within stands and across landscape to decrease threat to insects and disease and increase growth and vigor.
- Prescribed burning without prior silvicultural treatments on up to **10,907** acres; additional maintenance burning would occur on a 5-20 year rotation for all prescribed burning areas.
- Allocate approximately 20 percent of forested acres (**22,225**acres) for old growth characteristics.
- Construct approximately 5 to 10 miles of temporary roads.
- Road infrastructure improvement and maintenance on existing NFS roads within the project area.
- Utilize small ruminant animals, primarily goats, as a means to control Gambel oak.
- Amend the Santa Fe National Forest Plan to be in alignment with the management direction provided in the revised MSO Recovery Plan. A project-specific plan amendment is needed because the 1987 Santa Fe National Forest Plan, as amended, includes direction from the former (1995) recovery plan.
- Amend the 1987 Santa Fe National Forest Plan to add clarifying language for northern goshawk management to: (1) describe desired conditions for the project area managed for northern

goshawk; (2) express relative amounts of forest cover, as well as the distribution of that cover, including the interspaces between tree groups; (3) define the relationship between the interspaces and natural openings, such as meadows; (4) clarify that canopy closure is evaluated at the tree group scale within vegetation structural stages (VSS) 4, 5, and 6.

Treatment methods include but are not limited to: the use of chainsaws or feller-bunchers to cut trees and distribute slash, rubber tired or track laid skidders to move material to landings along Forest Service approved skid trails, and bulldozers to pile or rearrange slash for burning or erosion control. Other specialized equipment (e.g. masticators, bobcats) may be used to treat fuels or construct fire control lines in order to meet resource objectives. Mechanized systems would be limited to slopes less than 40 percent. Slopes greater than 40 percent would be treated via chainsaw and/or prescribed burning. Landings created for treatments would range in size from about ¼ to 1 acre.

Many products could result from treatments such as biomass, fuelwood, posts and poles, and saw timber, which could be sold through personal use and commercial wood product contracts. These products would be removed from the project area via existing and temporary roads. The project would support the rural/local communities surrounding the project area.

Fuelwood is an important resource to local communities. It would be available to the public from the project area. It is anticipated that fuelwood would be made available over the course of 8 to 10 years during project implementation. Actual fuelwood availability would be dependent upon treatment implementation and objectives.

It's important to note that the actual location of activities would occur where existing conditions are departed from desired conditions and implementing the actions described above would facilitate meeting the purpose and need of the project at the time of implementation.

Prescribed Burning

Prescribed burning refers to deliberately burning wildland fuels in either their natural or a modified state and under specified environmental conditions, which allows the fire to be confined to a predetermined area and produces the fire line intensity and rate of spread required to attain planned resource management objectives (SAF 2008). Broadcast, maintenance, jackpot and pile burning are all types of prescribed burning activity proposed for the project. Ignition sources include aerial and/or hand ignitions. Natural and existing features such as rocky slopes and travel routes may be used as containment lines. There is the potential need to construct fire lines via hand tools or mechanized equipment in order to confine fires to predetermined areas.

Conifer Removal within Meadows and Aspen Stands

Conifer species could be cut where they have encroached into existing meadows and aspen stands. Treatments would use hand tools and mechanized equipment. Where aspen is in decline or where conifer species have begun encroaching upon aspen stands, treatments would promote aspen growth by cutting conifer or aspen (to stimulate regeneration) species and applying prescribed fire where appropriate.

Treatments within Northern Goshawk Post Fledgling Areas (PFAs), foraging areas, and MSO Recovery Habitat

Uneven-age management (group and/or individual tree selection) would be used to regenerate fire-tolerant, shade intolerant species such as ponderosa pine, Douglas-fir and Gambel oak in openings 0.1 to 2 acres in size. These treatments would be prioritized in areas that are excessively dense and/or heavily infected with dwarf mistletoe. Tree groups would be maintained by age cohort, generally in groups of (but not limited to) 2 to 70 trees. Desirable dominant and co-dominant ponderosa pine and/or Douglas-fir

would be left as single trees or groups throughout the area. Shade tolerant conifers, such as white fir and blue spruce, may regenerated but would be subdominant in abundance.

Within the treatment units identified for uneven-aged management and intermediate thinning, post-settlement shade-intolerant or early seral shade-tolerant conifers may be removed from areas dominated by older trees in instances that are potentially harmful to safety and in some cases areas of high dwarf mistletoe infection. The creation of interspaces and majority of timber harvest activity would be primarily focused in young- to mid-aged forest conditions. Retaining large, old trees and old structures (Kaufman et al. 2007) (e.g., pre-settlement/heritage trees generally greater than 150 years old, with thick platy bark and deep furrows, flat or dead tops, and large lower branches) is high priority within treatment areas.

Proposed Forest Plan Amendment

In order to achieve project restoration objectives the Santa Fe National Forest Land and Resource Management Plan would be amended as follows:

For the purpose of this amendment, the following definitions apply:

1. A stand is defined as a contiguous area of trees sufficiently uniform in forest type, composition, structure, and age class distribution, growing on a site of sufficiently uniform conditions to be a distinguishable unit. Three classification characteristics are generally used to distinguish forest stands: bio-physical site (soils, aspect, elevations, plant community association, climate, etc.), species composition, structure (density and age (1-aged, 2-aged, uneven-aged)), and management emphasis (administrative requirements and local management emphasis that would shape structure over time).
2. Interspaces are defined by RMRS-GTR-310 (Reynolds et al. 2013) as areas within a stand that are not currently under the vertical projection of the outermost perimeter of tree canopies (drip-line). They are generally composed of grass-forb-shrub cover but could also be areas with scattered rock or exposed mineral soil. As spaces between trees, tree groups and tree clumps, interspaces contribute to “open canopy” character of frequent-fire forests. They often connect with other interspaces and thus are variably shaped and sized.
3. Openings are defined as generally persistent treeless areas having a fairly distinct shape or size, occurring naturally due to difference in soil types as compared to sites that support forests or woodlands. Openings include meadows, grasslands, rock outcropings, and wetlands. In contrast, created openings result from disturbances like severe fire or windthrow, or management activities to intentionally create space for new tree regeneration. Natural and created openings are not the same as interspaces found in the frequent-fire forests or woodlands.

Table 1. A comparison of existing Santa Fe Land and Resource Management Plan guidelines and proposed project-specific amendments

Existing Guideline Language Santa Fe Land and Resource Management Plan (1996 Update)	Proposed New Project-specific Guideline Language
Mexican spotted owl Standards	
Provide three levels of habitat management- protected, restricted, and other forest and woodland types to achieve a diversity of habitat conditions across the landscape (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Standard: Three levels of habitat management will be provided- protected (protected activity centers (PACs)), recovery habitat and other forest and woodland types.
Protected areas include delineated protected activity centers; mixed conifer and pine-oak forests with slopes greater than 40 percent where timber harvest has not occurred in the last 20 years; and reserved lands which include wilderness, research natural areas, wild and scenic rivers, and congressionally recognized wilderness study areas (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Delete
Restricted areas include all mixed-conifer, pine-oak, and riparian forest outside of protected areas (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Glossary and Background: Recovery habitat is primarily mixed conifer and riparian forest and rocky canyons that are either currently, or have the potential for becoming nest/roost habitat, or provide or could provide foraging, dispersal, or wintering habitats. Nesting/roosting habitat typically occurs either in well-structured forests with high canopy cover, large trees, and other late seral characteristics, or steep and narrow rocky canyons formed by parallel cliffs with numerous caves and/or ledges within specific geological formations. Guideline: 10 to 25 percent in mixed-conifer of forested recovery habitat should be managed as recovery nest/roost habitat varying by forest type and Ecological Management Unit (EMU) (formerly called Recovery Units). This habitat should be managed to replace nest/roost habitat lost due to disturbance (e.g., fire) or senescence and to provide additional nest/roost habitat to facilitate recovery of the owl. The remainder of forested recovery habitat should be managed for other needs (such as foraging, dispersing, or wintering) provided that key habitat elements are retained across the landscape.
Other forest and woodland types include all ponderosa pine, spruce-fir, woodland, and aspen forest outside protected and restricted areas (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Glossary and Background: Other forest and woodland types include ponderosa pine forest, and pinyon-juniper woodland that are neither restricted or within PACs. Guideline: No specific management is suggested for these habitat types. However, the needs of the owl should be designed to be compatible with the project's desired conditions of moving towards a sustainable and resilient forest at the landscape scale.

Survey all potential spotted owl areas including protected, restricted, and other forest and woodland types within an analysis area plus the area ½ mile beyond the perimeter of the treatment area (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Standard: The survey area shall include all areas where owls or their habitat might be affected by management actions. If an area is relatively large, it can be subdivided into manageable subunits to achieve the best survey results. In general, the survey area shall include the survey area and a 0.5-mile area from its exterior boundaries. Standard: Within the project area, all areas that contain forested recovery habitat, riparian forest, and canyon habitat, or might support owls will be surveyed as defined in the current recovery plan.
Establish a protected activity center at all Mexican spotted owl sited located during surveys and all management territories established since 1989 (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Standard: A 600-acre activity center will be established using boundaries of known habitat polygons and/or topographic boundaries, such as ridgelines, as appropriate. The boundary should enclose the best possible Mexican spotted owl habitat, configured into as compact a unit as possible, with the nest or activity center located near the center. This should include as much roost/nest habitat as is reasonable, supplemented by foraging habitat where appropriate.
Allow no timber harvest except for firewood and fire risk abatement in established protected activity centers. For protected activity centers destroyed by fire, windstorm, or other natural disaster, salvage timber harvest or declassification may be allowed after evaluation on a case-by-case basis in consultation with US Fish and Wildlife Service (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Standard: The project will be designed to meet or move towards the percent basal area by size class and the minimum density of large trees thresholds displayed in table 1 (derived from the revised Recovery Plan table C.2). Guideline: Management should sustain or enhance desired conditions for the owl, including fire-risk reduction, as well as monitoring owl presence. Guideline: Protection of PACs may require active management in forested habitat to reduce fuel loads and fuel continuity in areas adjacent to and within these areas to reduce potential for high severity and stand-replacement fires. Treatments should be located strategically and informed by fire behavior modeling across the landscape. Guideline: Selective cutting treatments in some PACs may be needed to achieve objectives. To determine which PACs may benefit from prescribed cutting treatments a landscape-scale analysis should be used to determine where the needs of fire risk reduction and habitat enhancement are greatest. Within the remaining PAC acreage (500+ ac), combinations of prescribed cutting and fire treatments may be used to reduce fire hazard while striving to maintain or improve habitat conditions for the owl and its prey.
Allow no timber harvest except for fire risk abatement in mixed-conifer and pine-oak forests on slopes greater than 40 percent where timber harvest has not occurred in the last 20 years (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Delete

Limit human activity in protected activity centers during the breeding season (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Guideline: Limit human activity in protected activity centers during the breeding season. Management activities should be deferred from the nest/roost core during the breeding season (1 Mar. – 31 Aug.), except where non-breeding is confirmed or inferred that year per the accepted survey protocol in the current recovery plan.
In protected and restricted areas, when activities conducted in conformance with these standards and guidelines may adversely affect other threatened, endangered, or sensitive species or may conflict with other established recovery plans or conservation agreements; consult with U.S. Fish and Wildlife Service to resolve the conflict (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Standard: In protected and recovery habitat areas, when activities conducted in conformance with these standards and guidelines may adversely affect other threatened, endangered, or sensitive species or may conflict with other established recovery plans or conservation agreements; consult with U.S. Fish and Wildlife Service to resolve the conflict.
A. General Guidelines	
Conduct surveys following Region 3 survey protocol (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Standard: Conduct surveys according to the current recovery plan.
Breeding season is March 1 to August 31 Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	No change
B. Protected Area Guidelines	
Protected Activity Centers: Delineate an area of not less than 600 acres around the activity center using boundaries of known habitat polygons and/or topographic features. Written justification for boundary delineation should be provided (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Guideline: PACs should encompass a minimum of 600 acres surrounding the core areas which is the nest site, a roost grove commonly used during the breeding season in absence of a verified nest site, or the best roosting/nesting habitat of both nesting and roosting information are lacking (revised Recovery Plan, pp. VIII, 317). Should any deviations in PAC acreage occur due to site specific conditions, address during consultation with the USFWS.
The protected activity center boundary should enclose the best possible owl habitat configured in as compact a unit as possible, with the nest or activity center located near the center (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Delete
The activity center is defined as the nest site. In the absence of a known nest, the activity center should be defined as a roost grove commonly used during breeding. In the absence of a known nest or roost, the activity center should be defined as the best nesting and roosting habitat (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Delete
Protected activity center boundaries should not overlap (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	No change

Submit protected activity center maps and descriptions to the recovery unit working group for comment as soon as possible after completion of surveys (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Standard: Submit protected activity center maps and descriptions to the USFWS for comment in a timely manner after completion of surveys.
Road or trail building in protected activity centers should be avoided but may be permitted on a case-by-case basis for pressing management reasons (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Guideline: Road or trail maintenance, repair, and building in PACs should be undertaken during the non-breeding season (1 Sep. – 28 Feb.) to minimize disturbance to owls unless non-breeding is inferred or confirmed that year per the accepted survey protocol (Appendix D). The construction of new roads in PACs will be minimized.
Generally allow continuation of the level of recreation activities that was occurring prior to listing (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	No change
Require bird guides to apply for and obtain a special use permit. A condition of the permit shall be that they obtain a subpermit under the U.S. Fish and Wildlife Service Master Endangered Species permit. The permit should stipulate the sites, dates, number of visits, and maximum group size permissible (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	No change
Harvest firewood when it can be done in such a way that effects on the owl are minimized. Manage within the following limitations to minimize effects on the owl: • Retain key forest species such as oak. • Retain key habitat components such as snags and large downed logs. Harvest conifers less than 9 inches in diameter only within those protected activity centers treated to abate fire risk as described below (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	No change

Treat Fuel Accumulations to abate fire risk: • Select for treatment 10 percent of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10 percent of the protected activity centers where nest sites are known as a paired sample to serve as control areas. • Designate a 100-acre “no treatment” area around the known nest site of each selected protected activity center. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center. • Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel treatment and prescribed fire to abate fire risk in the remainder of the selected protected activity center outside the 100-acre “no treatment” area. • Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood trees lager than 10 inches in diameter at the root collar. • Select and treat additional protected activity centers in 10% increments if monitoring of the initial sample shows there were no negative impacts or there were negative impacts which can be mitigated by modifying treatment methods. • Use light prescribed burns in non-selected protected activity centers on a case-by-case basis. Burning should avoid a 100-acre “no treatment” area around the activity center. Large woody vegetation should be retained and hardwood trees larger than 10 inches diameter at the root collar. • Pre- and post-treatment monitoring should be conducted in all protected activity centers treated for fir abatement (see monitoring guidelines).	Standard: Activities will be consistent with the 2012 MSO Recovery Plan, in consultation with the USFWS. Guideline: Within PACs, combinations of thinning trees up to 17.9 inches d.b.h., mechanical fuel treatment and prescribed fire should be used to abate fire risk to owl nest/roost habitats and improve habitat structure in select protected activity center outside the 100-acre core area. Low intensity prescribed fire should be used within select 100-acre core area to eliminate the need for fire line construction.
Steep slopes (Mixed-conifer and pine-oak forests outside protected activity centers with slopes greater than 40% that have not been logged within the past 20 years): No seasonal restrictions apply (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Delete

Treatment fuel accumulations to abate fire risk: • Use combination of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire. • Retain woody debris larger than 12 inches in diameter, snags, clumps of broadleafed woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar. • Select and treat additional protected activity centers in 10% increments of monitoring of the initial sample shows there were no negative impacts or there were negative impacts which can be mitigated by modifying treatment methods. • Use light prescribed burns on non-selected protected activity centers on a case-by-case basis. Burning should avoid a 100-acre "no treatment" area around the activity center. Large woody debris, snags, clumps of broad-leafed woody vegetation should be retained and hardwood trees larger than 10 inches diameter as the root collar. • Pre and post treatment monitoring should occur within all steep slopes treated for fire rick abatement. (See monitoring guidelines) (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	Delete
Reserved Lands (Wilderness, Research Natural Areas, Wild and Scenic Rivers, and Congressionally Recognized Wilderness Study Areas): Allow prescribed fire where appropriate (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	No change
C. Restricted Area Guidelines (Mixed-Conifer, pine-oak, riparian forests and rocky canyons) (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	C. Recovery Area Guidelines (Mixed-conifer, riparian forests, and rocky canyons)

Mixed-conifer and pine-oak forests (See glossary definition): Manage to ensure a sustained level of owl nest/roost habitat well distributed across the landscape. Create replacement owl nest/roost habitat where appropriate while providing a diversity of stand conditions across the landscape to ensure habitat for a diversity of prey species. The following table displays the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes 10% at 170 basal area and an additional amount of area at 150 basal area is +10% in BR-E and +15% in all other recovery units. The variables are for stand averages and are minimum threshold values and must be met simultaneously. In project design, no stands simultaneously meeting or exceeding the minimum threshold values should be reduced below the threshold values unless a district-wide or larger landscape analysis of restricted area shows that there is a surplus of restricted area acres simultaneously meeting the threshold values. Management should be designed to create minimum threshold conditions on project areas where there is a deficit of stands simultaneously meeting minimum threshold conditions unless the district-wide or larger landscape analysis shows there is a surplus. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Desired Condition: Mixed conifer and pine-oak forests (see glossary definition) have a sustained level of owl nesting and roosting habitat that is well distributed across the landscape. Replacement owl nesting and roosting habitat is available and there are diverse stand conditions across the landscape that ensures habitat diversity of prey species. Standard: Treatments are allowed within Recovery Habitat stands identified as meeting nest/roost conditions, as long as stand conditions remain at or above the values given in Table 1 (which is derived from the revised Recovery Plan Table C.3). This approach allows for treatments to reduce fire risks, lessen insect or disease problems, maintain seral species, or meet other ecosystem objectives. Guideline: The percentages of area in Table 1 are the minimum levels for MSO recovery habitat. If deficit occurs, additional stands should be identified and managed in alignment with Table 1. Even if the proportion of the planning area that meets nest/roost condition is greater than the percentages in Table 1 no stands should be lowered below these conditions until assessments at larger spatial scales (e.g., landscape, subregion, and region) demonstrate that desired conditions occur in recommended amounts at these larger scales. Using watersheds in allocating percentages of area to manage for nest/roost conditions should reduce the potential for creating excessively fragmented nesting habitat. Guideline: Emphasize attainment of nest/roost conditions as quickly as reasonably possible. Identify and assign stands that will reach these conditions soonest to satisfy area requirements in Table 1. Guideline: Natural variation, such as irregular tree spacing and various stand/patch/group/clump sizes should be incorporated into management prescriptions. Strive for heterogeneity both within and between stands.
Attempt to mimic natural disturbance patterns by incorporating natural variation, such as irregular tree spacing and various patch sizes, into management prescriptions (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Guideline: Design treatments to mimic natural disturbance patterns and natural landscape heterogeneity. Allow natural canopy gap processes to occur, or mimic those processes by designing treatments to produce horizontal variation in stand structure.
Maintain all species of native trees in the landscape including early seral species (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Guideline: Maintain all species native vegetation on the landscape, including early seral species. Allow for variation in existing stand structures and provide for species diversity (revised recovery plan, p. 268).
Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Delete

Emphasize uneven-aged management systems. However, both even-aged and uneven-aged systems may be used where appropriate to provide variation in existing stand structure and species diversity. Existing stand conditions will determine which system is appropriate (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Desired Condition: Patches of even-aged forest structure are present, but infrequent. Disturbances sustain the overall variation in age and structural distribution. Guideline: Incorporate natural variation, such as irregular tree spacing and various stand/patch/group/clump sizes, into management prescriptions. Strive for heterogeneity both within and between stands. Address analysis questions from Box C 5 in the current recovery plan before wide-scale implementation of management based on even-aged clumps.
Extended rotation ages for even-aged stands to greater than 200 years. Silvicultural prescriptions should explicitly state when vegetation manipulation will cease until rotation age is reached (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Delete
Save all trees greater than 24 inches d.b.h. In pine-oak forests, retain existing large oaks and promote growth of additional large oaks (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Guideline: Strive to retain trees greater than 24 inches.
Encourage prescribed and prescribed natural fire to reduce hazardous fuel accumulation. Thinning from below may be desirable or necessary before burning to reduce ladder fuels and the risk of crown fire (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	No change
Retain substantive amounts of key habitat components: • Snags 18 inches in diameter and larger • Down logs over 12 inches midpoint diameter Hardwoods for retention, recruitment, and replacement of large hardwoods (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Table 1 provides the minimum desired conditions for basal area in standing live trees in ponderosa pine and mixed conifer. Follow forest plan guidelines for snags, down logs and course woody debris in ponderosa pine and mixed conifer.
No corresponding language	Forest Recovery Foraging/Non-breeding Habitat Guideline: Design treatments needed to meet fuels and restoration management objectives in recovery habitats to minimize short-term losses of habitat components in areas that could be occupied by spotted owls.

Riparian Areas: Emphasize maintenance and restoration of healthy riparian ecosystems through conformance with forest plan riparian standards and guidelines. Management strategies should move degraded riparian vegetation toward good condition as soon as possible. Damage to riparian vegetation streambanks, and channels should be prevented (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Background and Description: Riparian Recovery Habitat consists of riparian forests outside of PACs that could frequently be used by owls for foraging, roosting, daily movements, dispersal, potentially for nesting. Riparian Recovery Habitat is considered to be key habitat for owl recovery. Desired Condition: Riparian recovery habitat is managed for proper functioning condition (PFC) and attains the highest ecological status and potential natural community structure (i.e., mid- to late-seral conditions) possible within the capability and potential of the site. Attaining goals that are dependent on site potential, benefits owl habitat be regenerating riparian tree cover and benefits its prey species by providing dense ground cover for small mammals). Guideline: Treatments should provide a diversity of age and size classes of native riparian trees and shrubs along with a diverse understory of native riparian herbaceous species to provide potential roost/nest sites for owls and cover for owl prey species. Guideline: Thinning trees and shrubs should be encouraged where such thinning restores properly functioning condition and improves the habitat or protects it against stand-replacing fire.
Old-Growth- except where otherwise noted, implement forest plan old growth standards and guidelines to maintain and promote development of owl habitat (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	No change
D. Other Forest and Woodland Types- Apply ecosystem approaches to manage for landscape diversity mimicking natural disturbance patterns, incorporating natural variation in stand conditions and retaining special features such as snags and large trees, utilizing appropriate fires, and retention of existing old growth in accordance with forest plan old growth standards and guidelines (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	No change
Monitoring Guidelines	
Monitoring and evaluation should be collaboratively planned and coordinated with involvement from each National Forest, U.S. Fish and Wildlife Service Regional Office, FS Regional Office, Rocky Mountain Research Station, recovery team, and recovery unit working groups (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	Monitoring and evaluation should be collaboratively planned and coordinated with involvement from each national forest, USFWS Ecological Service Field Office, USFWS Regional Office, FS Regional Office, Rocky Mountain Research Station, recovery team, and recovery unit working groups. Monitoring will be consistent with the most current MSO Recovery Plan.

Population monitoring should be a collaborative effort with participation of all appropriate resource agencies (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	See previous standard
Habitat monitoring of gross habitat changes should be a collaborative effort of all appropriate resource agencies (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	See previous standard
Habitat monitoring of treatment effects (pre- and post-treatment) should be done by the agency conducting the treatment. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	See previous standard
Prepare an annual monitoring and evaluation report covering all levels of monitoring done in the previous year. The annual report should be forwarded to the regional forester with copies provided to the recovery unit working groups, U.S. Fish and Wildlife Service Ecological Services field offices, and the U.S. Fish and Wildlife Regional Office (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	See previous standard
Rangewide: Track gross changes in acres of owl habitat resulting from natural and human-caused disturbances. Acreage changes in vegetation composition, structure, and density should be tracked, evaluated, and reported. Remote sensing techniques should provide an adequate level of accuracy. In protected and restricted areas where silvicultural or fire abatement treatment are planned, monitor treated stands pre- and post-treatment to determine changes and trajectories in fuel levels; snag basal areas; live tree basal areas; volume of down logs over 12 inches in diameter; and basal area of hardwood trees over 10 inches in diameter at the root crown (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).	See previous standard
Management Scale	
No similar direction in Forest Plan.	Distribution of habitat structures (tree size and age classes, tree density, snags, dead and down woody material, etc.) should be evaluated at the landscape level, at the mid-scale such as drainage, and at the fine scale.
No similar direction in Forest Plan.	Where VSS 6 is deficient within the ecosystem management area, all VSS 6 will be maintained regardless of location, except in situations when occasional trees may be removed in order to provide for understory health and development. For example, the exemption might be used

	for protection of young tree groups from diseased over-story trees. Threats to public health and safety would be another example when this exception is exercised. However, over time, the intent is to sustain a relatively even distribution (again, based on site quality) of VSS 6 across the ecosystem management area.
Vegetation Management Related to Northern Goshawk Management	
Landscapes Outside Goshawk Post-fledgling Family Areas	
No similar direction in Forest Plan.	General: Within ponderosa pine and dry mixed conifer stands, manage over time for uneven-aged stand conditions composed of heterogeneous mosaics of tree groups and single trees, with interspaces between tree groups. The size of tree groups, as well as sizes and shaped of interspaces should be variable. Over time, the spatial location of the tree groups and interspaces may shift within the uneven-aged stand.
General: The distribution of vegetation structural stages for ponderosa pine, mixed conifer and spruce-fir forests is 10% grass/forb/shrub (VSS 1), 10% seedling-sapling (VSS 2), 20% young forest (VSS 3), 20% mid-aged forest (VSS 4), 20% mature forest (VSS 5), 20% old-forest (VSS 6). Note: the specified percentages are a guide and actual percentages are expected to vary + or - up to 3%. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	Desired conditions for ponderosa pine and dry mixed conifer vegetation structure: At the landscape scale (10,000 acres and greater) the ponderosa pine and dry mixed conifer forest is a mosaic of structural states ranging from young to old trees. Forest structure is variable but uneven-aged and open in appearance. Sporadic areas of even-aged structure may be present on 10 percent or less of the landscape to provide structural diversity. At the mid-scale (100-1,000 acres) the ponderosa pine forest is characterized by variation in the size and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive sites contain more trees per group and more groups per area, resulting in less space between groups. Interspaces typically range from 10 percent in more biologically productive sites to 70 percent in the less productive sites. Tree density within forested areas ranges from 20 to 80 square feet basal area per acre. The tree group mosaic composes an uneven-aged forest with all age class, and structural stages present. Occasionally, patches of even-aged forest structure are present (less than 50 acres). Disturbances sustain the overall age and structural distribution. Northern goshawk post-fledging areas (PFAs) should have 10 to 20 percent higher basal area in mid-aged to old tree groups than northern goshawk foraging areas and the surrounding forest. Goshawk nest areas have forest conditions that are multi-aged and dominated by large trees with relatively denser canopies than the surrounding forest. At the fine scale (less than 10 acres) typically trees occur in irregularly –shaped groups and are variably spaced with some tight clumps. Tree crowns in the mid- to old-aged groups are interlocking providing for species that require these forest structure conditions. Interspaces surrounding tree groups are variably shaped and composed of a grass, forb, and shrub mix. Some may contain individual trees or snags.

The distribution of VSS, tree density, and tree age are a product of site quality in the ecosystem management area. Use site quality to guide in the distribution of VSS, tree density and tree ages. Use site quality to identify and manage dispersal PFA and nest habitat at 2 to 2.5 mile spacing across the landscape. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	See desired conditions for ponderosa pine and dry mixed conifer.
Snags are 18" or larger dbh and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, canopy cover is measured with vertical crown projection on average across the landscape. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	Desired Condition: In ponderosa pine and dry mixed conifer, snags and coarse woody debris are well distributed throughout the landscape. Snags are typically 18 inches in diameter or greater and average 3 per acre. Coarse woody debris, including logs, may range from 5 to 15 tons per acre. Logs may average 3 per acre within the forested area of the landscape. Guideline: Snags should be retained in the largest diameter classes available as needed to meet wildlife or other resource needs.
No corresponding forest plan direction	Guideline: Tree group spatial distribution may be highly variable based on the local site and current conditions; the interspaces between groups should range from 20 to 200 feet, but generally between 25 and 100 feet from drip line to adjacent dripline. This spacing of groups is not affected by single trees in the interspace.
No corresponding forest plan direction	Guideline: At the landscape scale and mid-scale the number of tree per group and number of groups per area should vary across the landscape. Collectively these stands should aggregate to uneven-ages forest landscapes, similar to natural conditions.
The order of preferred treatment for woody debris is: 1) prescribed burning, 2) lopping and scattering, 3) hand piling or machine grapple piling, 4) dozer piling. (Santa Fe NF Forest Plan, page 92)	No Change.
Canopy Cover: Canopy cover guidelines apply only to mid-aged to old forest structural stages (VSS 4, VSS 5, and VSS 6) and not to grass/forb/shrub to young forest structural stages (VSS 1, VSS 2, and VSS 3). (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	This language would be deleted because the desired conditions are to manage for mature tree groups with interlocking or nearly interlocking crowns. See desired conditions for ponderosa pine and dry mixed conifer in northern goshawk habitat at 3 scales.
Spruce-Fir: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60% and 2/3 40% mature forest (VSS 5) should average 60+% , and old forest (VSS 6) should average 60+%. Maximum opening size is 1 acre with a maximum width of 125 feet. Provide 2 groups of reserve trees per acre with 6 trees per group when opening size exceeds 0.5. Leave at least 3 snags, 5 downed logs, and 10-15 tons of woody debris per acre. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	No Change.
Mixed Conifer: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 40+%,	This language would be deleted because the desired conditions are to manage for mature tree groups with

mature forest (VSS 5) should average 50+%, and old forest (VSS 6) should average 60+%. Maximum opening sizes up to 4 acres with a maximum width of up to 200 feet. Retain1 group of reserve trees per acre of 3-5 trees per group for openings greater than 1 acre in size. Leave at least 3 snags, 5 downed logs, and 10-15 tons of woody debris per acre. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	interlocking or nearly interlocking crowns. See desired conditions for ponderosa pine and dry mixed conifer in northern goshawk habitat at 3 scales. Stand density index (SDI), trees per acre and basal area will be used to define canopy closure/openness (canopy relationships).
Ponderosa Pine: Canopy cover for mid-aged forest (VSS 4) should average 40+%, mature forest (VSS 5) should average 40+% and old forest (VSS 6) should average 40+%. Opening size is up to 4 acres with a maximum width of up to 200 feet. 1 group of reserve trees, 3-5 trees per group, will be left if the opening is greater than an acre in size. Leave at least 2 snags, 3 downed logs, and 5-7 tons of woody debris per acre. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	This language would be deleted because the desired conditions are to manage for mature tree groups with interlocking or nearly interlocking crowns. See desired conditions for ponderosa pine and dry mixed conifer in northern goshawk habitat at 3 scales. Stand density index (SDI), trees per acre and basal area will be used to define canopy closure/openness (canopy relationships).
Woodland: manage for uneven age conditions to sustain a mosaic of vegetation densities (overstory and understory), age classes, and species composition well distributed across the landscape. Provide for reserve trees, snags, and down woody debris. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	No Change.
Landscape Inside Goshawk Post-fledging Family Areas	
General: Provide for a healthy sustainable forest environment for the post-fledgling family needs of goshawks. The principle difference between "within the post-fledgling family area" and "outside the post-fledgling family area" is the higher canopy cover within the post-fledgling family area and smaller opening size within the post-fledgling family area. Vegetative structural stage distribution and structural condition are the same within and outside the post-fledgling family area. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	General: Provide for a healthy sustainable forest environment for the post-fledgling family needs of goshawks. The principle difference between "within the post fledgling family area" and "outside the post-fledgling family area" is higher basal area in mid-aged to old tree groups than northern goshawk foraging areas and surrounding forest.
No similar direction in Forest Plan.	Canopy Cover is measured with vertical crown projection within mid-aged to old forest structural stages groups (VSS 4, VSS 5, and VSS 6) and not within grass/forb/shrub to young forest structural stage groups (VSS 1, VSS 2, VSS 3) or in interspaces, natural meadows and grasslands, or other areas not managed for forest conditions.
Spruce-fir: Canopy Cover for mid-aged forest (VSS 4) should average 60+ percent and for mature (VSS 5) and old forest (VSS 6) should average 70+ percent. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	No change.

Mixed Conifer: Canopy Cover for mid-aged (VSS 4) to old forest (VSS 6) should average 60+ percent. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	This language would be deleted because the desired conditions are to manage for mature tree groups with interlocking or nearly interlocking crowns. See desired conditions for ponderosa pine and dry mixed conifer in northern goshawk habitat at 3 scales. SDI, tree per acre and basal areas will be used to define canopy closure/openness (canopy relationships).
Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 1/3 60+ percent and 2/3 50+ percent. Mature (VSS 5) and old forest (VSS 6) should average 50+ percent. (Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)	This language would be deleted because the desired conditions are to manage for mature tree groups with interlocking or nearly interlocking crowns. See desired conditions for ponderosa pine and dry mixed conifer in northern goshawk habitat at 3 scales. SDI, tree per acre and basal areas will be used to define canopy closure/openness (canopy relationships).