

# **Santa Fe Mountains Landscape Resiliency Project**

## **Appendices**



















## **Appendix C. Design Features, Best Management Practices, and Mitigation Measures**

# Design Features, Best Management Practices, and Mitigation Measures

This section contains additional information regarding how project activities under the proposed action alternative would be implemented. It includes a list of design features, best management practices (BMPs), and mitigation measures, as defined below:

- **BMPs:** guidelines or minimum standards for the proper application of management activities and operations.
- **Design Features:** a list of management actions that are designed to guide implementation of on-the-ground activities to achieve desired conditions while minimizing adverse effects. Design features are integral to and considered part of the Proposed Action.
- **Mitigation Measure:** an activity or limitation that is implemented in conjunction with a project activity in order to avoid, minimize, or eliminate adverse impacts that could result from implementation of the Proposed Action (40 CFR 1508.20).

The analysis of effects presented in Chapter 3 assumes the implementation of relevant design features, BMPs, and mitigation measures as they apply to the proposed conditions-based management actions. Monitoring measures are included in a separate monitoring plan, see Appendix D. The measures listed below are based on Forest Plan direction and policy, best available science, site-specific evaluations and other relevant policies, guidelines, standards.

## All Activities

### Best Management Practices

#### **Purpose: Communicate project and policy requirements to all parties involved in implementing management activities**

General-1 Implementation, layout and prep personnel, including the U.S. Forest Service, partners, contractors and others, would be briefed on all applicable design features, resource protection measures, BMPs, and standards and guidelines from the Forest Plan, recovery plans, etc. prior to implementation, between phases and as needed, such as, as personnel changes.

#### **Purpose: Minimize litter, waste, and other human-caused disturbances during project implementation.**

General-2 Santa Fe NF employees and contractors would follow Leave No Trace practices, including packing out all trash, burying human waste properly, and respecting wildlife that may be encountered.

#### **Purpose: Public safety and coordination.**

General-3 Recreation sites, roads, trails, or other areas scheduled for treatment may be temporarily closed during treatment activities to ensure public safety. Project activities would be coordinated with potentially affected adjacent landowners, range allotment permittees, special use permittees, and any other permit holders as needed to minimize access impacts.

## Botany and Invasive Species/Weeds

### Best Management Practices

**Purpose: Prevent the spread and establishment of noxious and invasive weeds.**

Plant-1 Weed prevention educational materials would be provided to fuelwood cutters and gatherers as part of the permitting process.

### Mitigation Measures

**Purpose: Prevent the spread and establishment of noxious and invasive weeds.**

Plant-2 All off-road equipment (e.g. masticators, OHVs) would be weed-free prior to entering the project area. Staging of equipment would be done in weed free areas. Equipment would be pressure-washed, inspected and weed-free (includes free of soil, seeds vegetative matter and other debris) before entering the project area and before moving between treatment areas.

Plant-3 Areas of noxious and invasive weeds would be avoided except for treatments that may be designed to reduce weed populations.

Plant-4 Disturbance areas such as staging areas and parking areas would be located outside of known weed areas by at least 300 feet. GIS mapping layers. Forest/District Weed specialist and a U.S. Forest Service Biologist would be consulted prior to treatments.

Plant-5 Fire lines would not be constructed through or within 150 feet of invasive weed sites.

Plant-6 If project implementation calls for seed mixes, mulches or fill, they would be State-certified as weed-free. Seed mixes used for re-vegetation of disturbed sites would consist of locally adapted native plants to the extent practicable.

## Ips Beetle

### Design Features

**Purpose: Prevent the establishment and spread of Ips beetle infestations.**

Ips-1 Slash would be treated promptly through lop/scatter, chipping, mastication, hand pile burning, or prescribed burning. Concentrations of chipped/masticated material would not be allowed to accumulate over 4 inches in depth on more than 20% of treatment unit. Chipped/masticated materials would be distributed on slopes where they would dry quickly.

Ips-2 Activity fuels would be disposed of as soon as possible and typically would not remain for more than two years depending on burn windows.

### Mitigation Measures

**Purpose: Prevent the establishment and spread of Ips beetle infestations.**

Ips-3 When practical, activity slash would be created only between July through December unless the potential for Ips infestation is determined to be low.

Ips-4 Creating activity slash in adjacent treatment areas would be avoided for multiple years if risk of beetle infestation is determined to be high by the Silviculturist.

Ips-5 Mechanical damage would be avoided to residual trees and their root systems to reduce risk of attracting bark beetles.

## Hydrology and Riparian Resources

### Best Management Practices

**Purpose: Communicate project and policy requirements to all parties involved in implementing management activities.**

Water-1. Activities in drainage bottoms (i.e., near stream channels and within swales) would be coordinated with wildlife, fisheries, and watershed personnel.

**Purpose: To maintain water quality**

Water-2. To prevent introducing chemical pollutants to waterbodies and soils, all equipment would be washed, clean and free of leaks prior to entering the project area. Regularly inspect equipment for leaks during use.

Water-3. Spill containment materials (e.g., impermeable containment berms, absorbent pads, etc.) would be required on site to ensure that spilled fuel would not leave the staging and fueling areas.

Water-4. Fueling and equipment staging/maintenance areas would be located outside of Riparian Management Zones (RMZ<sup>1</sup>) and would only be the minimum size needed for their function. Existing landings and non-system routes within RMZs may be used (given aquatic, biologic, or watershed specialist coordination) if water quality concerns can be abated through prevention measures.

### Design Features

**Purpose: To minimize noxious weed spread and re-establish native vegetation.**

Water-5. Where livestock have access to seeps and springs, trees would be felled directionally around the RMZ of these features to protect them from livestock access.

Water-6. For riparian planting activities:

- Where possible, source plants from local, native stock.
- Plant appropriate riparian species for the ERU.
- Monitor plantings shortly after implementation; where necessary, fence plantings from herbivory (especially within active range allotments).
- Do not plant in periods of drought, during or prior to dry seasons.

### Mitigation Measures

**Purpose: To minimize erosion, promote soil productivity, and to maintain water quality.**

Water-7. The RMZ is largely an equipment exclusion area. Vehicles, including heavy equipment (such as dozers, masticators), plows and ATV/UTVs, would be only minimally operated within RMZs when absolutely necessary. If vehicles must enter the RMZ, they would not be

---

<sup>1</sup> **Riparian Management Zones (RMZ)** are defined by either a site-appropriate delineation of the riparian area (including one site potential tree height) or a buffer of 100 feet from the edges (e.g., each bank) of all perennial and intermittent streams, lakes, seeps, springs, and other wetlands or 15 feet from the edges of the ephemeral channels. The exact width of RMZs may vary based on ecological or geomorphic factors or by waterbody type, but includes those areas that provide riparian and aquatic ecosystem functions and connectivity. The waterbody itself is considered part of the RMZ.

driven within a stream channel but would stick to designated routes and crossings as described in Water-6. Operation plans would be coordinated with watershed personnel.

- Water-8. Motor vehicles (including ATV/UTVs and heavy equipment) would only cross stream channels at designated crossing areas; perennial stream crossings would be designated in consultation with a watershed or aquatic habitat specialist. Where routes cross ephemeral or intermittent channels, crossing would be done when channels are dry. Stream channels would not be crossed where equipment would cause bank breakdown. Woody debris or rock may be placed into crossings to reduce soil disturbance and compaction. Upon completion of use, the crossing would be rehabilitated to maintain a stable channel.
- Water-9. New and existing landings, campsites, helipads, and drop points, would be located outside of RMZs and would only be the minimum size needed for their function.
- Water-10. New and existing landings, campsites, helipads, drop points, fueling and equipment staging/maintenance areas would be evaluated post-treatment (and decommissioned when no longer needed) to facilitate soil recovery and prevent erosion.
- Water-11. Prior to periods of wet weather, and immediately after an area has been treated, erosion control measures (e.g. waterbars, rolling dips) would be installed on all fireline, access routes, and staging areas. Waterbars would be installed with the maximum spacing dependent on slope gradient (Table C.1), have an open outlet, constructed lead-off, berm tied into the cut-bank, a 2% to 4% outslope, and a skew of 30 to 45 degrees (from perpendicular to the travel route), with a height (crown to trough) of 12 to 18 inches.

**Table C.1. Waterbar Construction Guidelines**

Gradient (%)	Spacing (feet)
<5	200
5–10	150
10–20	100
21–40	50
>40	25

### *Prescribed Fire and Slash Pile Burning in Riparian Areas*

## **Best Management Practices**

**Purpose: To minimize soil erosion, maintain soil productivity and maintain water quality.**

- Rx-1. If water drafting sites are needed for the project, they would meet BMPs<sup>2</sup> prior to use, during use and after final use for this project’s completion.
- Rx-2. Water drafting sites would only be used after coordination with a U.S. Forest Service Biologist. Drafting sites would not be used where they contain whirling disease or Chytrid fungus. To avoid the inadvertent spread of these organisms, water drafting equipment would be decontaminated before use in the project area, between different water sources, and after implementation is complete. Refer to guidance found in Preventing Spread of Aquatic Invasive Organisms Common to the Southwest Region Technical Guidelines for Fire Operations, Interagency Guidance Rev.

<sup>2</sup> U.S. Forest Service: FS-990a. National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1. April 2012. [https://www.fs.fed.us/naturalresources/watershed/pubs/FS\\_National\\_Core\\_BMPs\\_April2012.pdf](https://www.fs.fed.us/naturalresources/watershed/pubs/FS_National_Core_BMPs_April2012.pdf)

August 2009 or more recent, and the Guide to Preventing Aquatic Invasive Species Transport by Wildland Fire Operations (<https://www.nwccg.gov/publications/444>).

- Rx-3. Screens would be used to prevent organism entrapment during water drafting.
- Rx-4. Drafting would not completely dewater any water feature; enough water would remain for aquatic and wildlife species.

## **Design Features**

**Purpose: To minimize soil erosion, maintain soil productivity and maintain water quality.**

- Rx-5. To reduce fuel loads around stream channels and water bodies but maintain vegetation and duff, low-intensity prescribed fire may occur within the RMZ. Fire ignition however would not take place within the RMZ. Fire would be allowed to back down in the RMZ.
- Rx-6. Pre-treat (hand thin vegetation) within the RMZ as needed to avoid moderate and high intensity fire within the RMZ.
- Rx-7. Wherever possible, slash piles would be built outside of the RMZ, drainage bottoms, and swales (valley bottoms). If slash piles must be constructed in these areas, consult a watershed specialist for best placement. If slash must remain in these areas, scattering slash is preferred to piling. If piling must occur within these areas, the following would apply:
  - a) Piles would be stacked as far from the channel and riparian vegetation as possible; where no riparian vegetation exists, piles would be stacked as far away from the channel as possible (at least 25 feet from the channel and outside the high-water zone).
  - b) Piles would be built small (<100 square feet each) in order to minimize fire residence time and subsequent soil impacts.
  - c) Not all piles would be burned; maintain some unburned piles.
  - d) Piles would be burned when soil moistures are high, or when snow is on the ground.
  - e) If slash must be piled in windrows, rows would be along the contour and would not be in drainage bottoms.
  - f) Burn pile composition should contain a mixture of fuel sizes. Large woody fuels, over 8.9 inches in diameter, should be limited to less than 40% of the composition of the pile to prevent adverse impacts to the soil.

## **Mitigation Measures**

**Purpose: To minimize soil erosion, maintain soil productivity and maintain water quality.**

- Rx-8. Follow the implementation strategy for avoiding adverse cumulative watershed effects (CWEs) by the proposed action, as described in Appendix F.
- Rx-9. Water sources would not be contaminated with foaming agents.
- Rx-10. Fireline would not be installed parallel to stream channels and would intersect stream channels as perpendicular as possible; fireline width would be minimal, only as large as needed.

## *Riparian Thinning Activities*

### **Best Management Practices**

**Purpose: To maintain water quality and minimize soil erosion.**

Thin-1 Operators of masticators and other heavy equipment should strive to disturb the soil as little as possible; wherever possible, machines should not execute abrupt pivot turns, but instead make as broad of an arc as the terrain will allow. Machines should not cause ruts more than 4” deep. Masticators would use low psi tracks/tires.

### **Design Features**

**Purpose: To maintain and re-establish native vegetation.**

Thin-2 Other riparian species (willows, cottonwood, aspen, etc.) would not be cut or removed unless for transplanting, with the exception of some, but not all, aspen could be cut to promote regeneration in areas where health and vigor are insufficient.

**Purpose: To maintain streambank stability and water quality**

Thin-3 To maintain natural bank protection and shade, large downed wood in stream channels would remain in place and bank stability trees (large trees >12 inches dbh with roots in the bank and/or branches directly over the bank) would be left.

Thin-4 Maintain stream shade within the RMZ; consult a watershed specialist if thinning activities may substantially reduce stream shade. Where necessary or desired, plant site appropriate riparian species.

Thin-5 Galisteo Creek is not meeting state water quality standards for temperature and has an associated total maximum daily load (TMDL), which recommends increasing the percentage total shade from 8 to 81. Consult a watershed specialist when developing thinning prescriptions which may affect shade over this stream. Promote stream shade.

### **Mitigation Measures**

**Purpose: To maintain water quality and minimize soil erosion.**

Thin-6 So as to prevent disturbance by motor vehicles, do not promote fuelwood gathering by the public within the RMZ.

Thin-7 Machine piling of activity-generated slash would be conducted in a manner that minimizes the amount of soil displaced into burn piles. Duff and litter layers would be left as intact as possible.

Thin-8 Where it would not cause fuel loading or Ips beetle concerns, use slash to help infiltrate runoff, prevent erosion, and treat eroded areas.

Thin-9 Wherever possible, fell hillslope trees on contour; leave large sections of the boles (1000-hour fuels) in contact with the soil for the purpose of slowing overland flow as well as catching eroded soil, seeds, and nutrients. These logs should serve to quickly re-generate vegetation and filter water. This is especially important on south and west facing slopes.

Thin-10 Depth of masticated materials should not exceed an average of 4 inches and materials should be discontinuous at the quarter-acre scale to protect the soil and allow for natural revegetation.



## Soils

### Best Management Practices

**Purpose: To minimize soil erosion and maintain soil productivity.**

- Soil-1. UTVs and ATVs may be used for transportation around the project area during implementation. To the extent possible, travel on existing routes and trails; if off-route travel must occur, avoid travelling across side-slopes; attempt to travel on ridges.
- Soil-2. To protect road infrastructure from rutting, travel to and from the project area on Forest roads and trails would be limited during periods when resource damage could occur.
- Soil-3. To the extent possible, existing disturbance areas (e.g. staging areas, access trails) would be utilized rather than creating new ones.
- Soil-4. Where desired for ground cover and erosion control, access routes, firelines, staging areas and other disturbed areas may be scarified and seeded, mulched, and/or covered with slash.

### Design Features

**Purpose: To minimize soil erosion and maintain soil productivity.**

- Soil-5. Machine piling operations would remove only enough activity-generated slash to accomplish surface fuel reduction needs.
- Soil-6. The depth of scattered slash would be the minimum needed to limit soil erosion, so as not to impede understory growth of grasses, forbs and brush.

### Mitigation Measures

**Purpose: To minimize soil erosion and maintain soil productivity.**

- Soil-7. Prior to and during mechanical treatments, soil moisture conditions would be evaluated and monitored for operability. To prevent soil compaction and displacement, equipment (e.g., masticators, ATVs, UTVs, trucks) would only operate off of constructed roads when soil moisture is low, the ground is adequately frozen, or covered with sufficient snow.
- Soil-8. For the retention of long-term soil productivity and to reduce erosion, burning would be implemented when the lower duff layer (decomposed organic matter) in contact with the soil surface is moist enough so a cool burn can be assured to avoid hydrophobic soil conditions.

## Recreation

### Design Features

**Purpose: To reduce visibility of treatments.**

- Rec-1. Create a 150-foot visual buffer around campgrounds and picnic areas where no thinning or piling would occur. Prescribed fire would be allowed to back into these areas.

## Mitigation Measures

**Purpose: To protect and maintain trails within the project area and to minimize impacts on recreation users.**

- Rec-2. If equipment must cross trails and roads, crossing would be minimal, perpendicular to the trail, and rehabilitated after treatment of the area.
- Rec-3. Use of trails as access routes for heavy equipment should be considered carefully and other routes evaluated to best protect all resources, including recreation.
- Rec-4. If trails must be used as access routes, they need to be fully reclaimed with sustainable trail practices implemented such as proper cut slope, width for managed use, and drainage features including rolling grade dips, water turnouts, armoring above and below the trail at drainage crossings, water bars, and check darns. Trail reconstruction will be coordinated with the U.S. Forest Service recreation team.
- Rec-5. Avoid crossing or using motorized and nonmotorized system trails where feasible. If a trail or section of trail is affected, the trail shall be restored to the original condition. All treatment slash and debris would be removed from trails. It is acceptable to make perpendicular trail crossings. Trail crossing locations would be designated and flagged with input from a qualified U.S. Forest Service recreation staff or designated representative. Crossings of existing forest system trails would be restored to pre-project condition after use.
- Rec-6. Applicable signing would be placed at camping areas, trailheads and along trails to warn Forest visitors of project implementation activities such as tree thinning, or prescribed burning along trails. Information may also be provided through the U.S. Forest Service website, news releases, traffic control and signage, or other measures as appropriate.
- Rec-7. Where possible, schedule work that would limit recreation access such that it does not occur around holidays and weekends. Coordination would occur with any sponsors of recreational special use events to minimize impacts to planned events occurring in the project area during implementation.
- Rec-8. Where riparian areas are fenced, ensure that these do not block system trails. If they do, provide an easy portal through the fence.

**Purpose: To reduce visibility of treatments.**

- Rec-9. Stumps will be cut to a maximum of 8 inches within 50 feet of National Forest System trails, and as low as possible in all other distances zones.
- Rec-10. Paint and markings, such as butt marks, leave-tree and boundary markings within 150 feet of National Forest System trails, roads, and campgrounds would be applied facing away from these areas to reduce visibility. Flagging would be used in these areas, where practical, to mark unit boundaries and should be removed upon project completion.
- Rec-11. Cut trees flush with trail when they need to be cut on the edge of the trail and road.
- Rec-12. Disguise route entrances to firelines with rocks, boulders, downed trees, and forest litter to prevent them from being seen, easily accessed and becoming user trails. It should be difficult to access these areas for recreational use.

**Purpose: Achieve scenic integrity consistent with Forest Plan direction.**

- Rec-13. Activity-generated fuels created within 150 feet of National Forest System trails and roads would be piled and burned or removed within 2 years of operations and within 1 year for areas managed for a Visual Quality Objective of Retention. Where possible, leave a vegetative buffer of at least 33 feet alongside the trail.

## Scenery Resources

### Best Management Practices

**Purpose: Communicate project and policy requirements to all parties involved in implementing management activities.**

- Scen-1 A landscape architect or forest scenery specialist would be involved with the treatment unit layout strategy in Sensitivity (Concern) Level 1 areas. The extent of viewsheds from Sensitivity Level 1 areas would be confirmed in the field.
- Scen-2 When fencing is visible from Sensitivity Level 1 travelways and use-areas, consult Forest recreation staff about its design, e.g., form, color and material.

**Purpose: To reduce visibility of treatments.**

- Scen-3 When possible, firelines would utilize existing features such as roads and trails (considering stock trails if near the area desired) and natural features (rocks and cliff-faces)
- Scen-4 Fire control lines would be constructed, wherever possible, to reduce the contrast so that they are not noticeable in the middle and background views.
- Scen-5 Thinning of trees should have a form and shape that simulates natural patterns and openings and edges blended to minimize visibility of unit edges (such as avoiding straight lines, sharp corners, or geometric shapes). Where feasible, the edges of such treatments should be: tied into existing meadows and openings, follow natural topographic breaks and changes in vegetation, or provide feathering that allows gradual transition into the untreated adjacent forest area (as opposed to an abrupt line).
- Scen-6 When feasible, treat both sides of open system roads and trails to avoid contrast.
- Scen-7 Stumps will be cut to a maximum of 8 inches within 150 feet of National Forest System roads, and as low as possible in all other distances zones.

## Mitigation Measures

**Purpose: To reduce visibility of treatments.**

- Scen-8 Mechanical and manual thinning treatments along linear features, such as roads, trails or property lines would be implemented in a manner that does not emphasize straight lines and draw attention to the linear feature.
- Scen-9 No machine piles within the immediate foreground (300 feet) of sensitive viewpoints.
- Scen-10 Fire control line construction would only occur where necessary. Any fire control line constructed would be to minimal standard needed to complete prescribed burning.

## Cultural Resources

Standard cultural resource protection measures will be implemented to protect Historic Properties (also referred to as archaeological sites or cultural sites) and to ensure No Adverse Effect to Historic Properties. These standard protection measures are identified in Appendix J and Appendix E of the Region 3 Programmatic Agreement (USDA-FS 2010). These standard protection measures have been modified for the purposes of this project. Historic Properties *Listed* on the National Register of Historic Places (NRHP), *Eligible* for the NRHP, or *Unevaluated/Undetermined* for the NRHP will be protected during all project activities. Sites determined *Not Eligible* for listing on the NRHP will be documented but not protected. If previously unidentified cultural materials are discovered during implementation, work will cease in the area until a qualified professional archaeologist is notified and has approved restarting work.

## Best Management Practices

**Purpose: Communicate project and policy requirements to all parties involved in implementing management activities.**

Heritage-1 Allow project activities within site boundaries, provided a qualified professional archaeologist is present to monitor sites (those Listed, Eligible, or Unevaluated/Undetermined for the NRHP) during and following project activities.

## Mitigation Measures

**Purpose: Protect cultural resources and ensure No Adverse Effect to Historic Properties**

**Compliance with the National Historic Preservation Act (NHPA)**

Heritage-2 No ground disturbance will take place within site boundaries of Listed, Eligible, or Unevaluated/Undetermined sites without SHPO consultation.

**Purpose: Consistency with Appendix E of the Region 3 Programmatic Agreement (USDA-FS 2010)**

Heritage-3 Rubber-tired vehicles may cross through sites only on existing roads and must remain within the existing road prism.

Heritage-4 Utility Terrain Vehicles (UTVs) and All-terrain Vehicles (ATVs) may cross through sites only on existing roads and motorized trails as long as the vehicles remain within the existing road or motorized trail prism.

**Purpose: Consistency with Appendix J of the Region 3 Programmatic Agreement (USDA-FS 2010)**

Heritage-5 Do not use tracked vehicles or other heavy or mechanical equipment within site boundaries.

Heritage-6 Do not stage personnel or equipment within site boundaries.

Heritage-7 Do not pile logs, trees, and other thinned materials (slash) within site boundaries.

Heritage-8 Remove vegetation by hand from within site boundaries.

Heritage-9 Do not drag logs, trees, or thinned material (slash) across or within site boundaries.

**Purpose: Consistency with Forest Plan standards.**

Heritage-10 Reduce dense vegetation within site boundaries.

- Heritage-11 Remove dead and down vegetation within site boundaries, especially logs in direct contact with cultural features.
- Heritage-12 Qualified professional archaeologists will mark sites with white flagging tape or paint for identification during project activities.

### ***Vegetation Thinning Treatments***

When manual or mechanical vegetation thinning activities will occur, the following mitigations or combination of mitigations will be followed in addition to those listed above in the *Standard Design Features for all Project Activities within Archaeological Sites* section:

### **Design Features**

**Purpose: Protect cultural resources and ensure No Adverse Effect to Historic Properties**

**Consistency with Appendix J of the Region 3 Programmatic Agreement (USDA-FS 2010)**

- Heritage-13 Allow treatments within site boundaries, provided:
- a. Cutting is accomplished using hand tools only (chainsaws or cross-cut saws)
  - b. Trees are felled away from all features

### **Mitigation Measures**

**Purpose: Protect cultural resources and ensure No Adverse Effect to Historic Properties**

**Consistency with Appendix J of the Region 3 Programmatic Agreement (USDA-FS 2010)**

- Heritage-14 Allow construction of landing zones and staging areas in 100% surveyed areas, with archaeological monitoring as appropriate to ensure sites are avoided by ground-disturbing activities.
- Heritage-15 In areas of less than 100% survey, cultural resources survey and clearance is required prior to construction of landing zones and staging areas.

### ***Prescribed Fire Treatments***

Where prescribed burning activities will occur, the following mitigations or combination of mitigations will be followed, in addition to those listed above in the *Standard Design Features for all Project Activities within Archaeological Sites* section:

**Purpose: Protect cultural resources and ensure No Adverse Effect to Historic Properties**

**Consistency with Appendix J of the Region 3 Programmatic Agreement (USDA-FS 2010)**

- Heritage-16 No ignition points within site boundaries
- Heritage-17 Allow construction of safety zones, helicopter landing and sling sites, staging areas, and additional fire line in 100% surveyed areas, with archaeological monitoring as appropriate to assure sites are avoided.
- Heritage-18 In areas of less than 100% survey, cultural resources survey and clearance is required prior to construction of safety zones, helicopter landing and sling sites, staging areas, and additional fire line.

- Heritage-19 Site protection measures and fuel reduction treatments will occur prior to implementing prescribed burns.
- Heritage-20 Site protection measures and fuel reduction treatments will be monitored by a qualified professional archaeologist.
- Heritage-21 Allow prescribed fire to burn through sites with low or moderate fire sensitivity, provided that heavy fuels are removed prior to burning.
- Heritage-22 Protect fire-sensitive sites (i.e. sites with combustible features, rock art, rock or cave shelters, or structures comprised of friable stone). Protection measures may include the following:
- a. Exclude from project area, OR
  - b. Use hand line, black line or wet line to prevent the spread of fire into sites
  - c. Use foam retardant or structural fire shelter directly on fire-sensitive resources to prevent their consumption
  - d. Ensure that heavy fuels that cannot be removed from within site boundaries are not ignited
  - e. Implement same protective measures for all future maintenance burns
  - f. When using aerial ignition, provide pilot with GPS site locations to avoid the sites
  - g. A qualified professional archaeologist will monitor fire-sensitive sites during prescribed burning.

### ***Road Closure***

Where forest road closure will occur, the following mitigations, or combination of mitigations, will be followed, in addition to those listed above in the *Standard Design Features for all Project Activities within Archaeological Sites* section:

## **Mitigation Measures**

**Purpose: Protect cultural resources and ensure No Adverse Effect to Historic Properties**

**Consistency with Appendix E of the Region 3 Programmatic Agreement (USDA-FS 2010)**

- Heritage-23 Sites adjacent to a proposed road closure will be flagged for avoidance.
- Heritage-24 Earth-disturbing closure activities (i.e., earthen berm construction, ripping road tread) may take place within site boundaries only if the Forest and the SHPO agree that there will be No Effect or No Adverse Effect to sites.
- Heritage-25 Vehicles and equipment using U.S. Forest Service roads must stay on the road prism in areas that bisect heritage sites.
- Heritage-26 No new road construction, reconstruction, or modification of the existing road prism within site boundaries.

## Range Resources

### *Grazing Management Activities & Protection of Allotment Improvements:*

#### **Best Management Practices**

##### **Purpose: Maintain existing rangeland monitoring sites.**

Range-1. Existing rangeland monitoring sites would be located prior to treatments. Monitoring sites would not be excluded from treatments; however, sites would not be used for landing areas and slash piles.

##### **Purpose: Coordinate management activities with range staff to minimize impacts to rangeland resources.**

Range-2. Before treatments occur, consult with district range staff to coordinate pasture use.

Range-3. All water infrastructure (earthen dams, trick tanks, storage tanks, pipelines, drinkers, etc.) should not be removed or excluded from treatments. Any damage to infrastructure due to project implementation activities would be reported to the District and repairs coordinated with relevant District staff.

Range-4. Damage to range infrastructure would be avoided to the extent possible. If there is damage to infrastructure from treatments, it would be restored before the project is completed.

Range-5. Managers of vegetation treatment projects would consult with District range managers to ensure alteration of natural barriers does not allow livestock to circumvent fences and lose the integrity of the pasture or allotment.

Range-6. All pasture gates would be kept closed during the grazing season (May through November).

Range-7. Fence openings created to facilitate any management actions should be closed each day in active grazing areas during the grazing season. (May through November)

### *Prescribed Burning*

#### **Best Management Practices**

##### **Purpose: Minimize impacts to range infrastructure.**

Range-8. Fire and timber personnel would coordinate with district range staff on prescribed burn operations and thinning prior to implementation.

Range-9. Avoid damaging fire-sensitive range infrastructure (corrals, pipelines, water storage tanks, water troughs, fences, and cattleguards) to the extent possible. Methods may include pre-burn fuel removal, fire containment lines around structures, strategic ignition patterns, or other methods. Any damage to infrastructure due to project implementation activities would be reported to the District and repairs coordinated with relevant District staff.

Range-10. Fence lines would be used as burn area boundaries when possible.

Range-11. When and where possible, take advantage of natural barriers and existing roads to limit soil disturbance and construction of new fire lines.

## Design Features

### **Purpose: Minimize impacts to rangeland resources.**

- Range-12. Livestock would be managed to allow for habitat response after project implementation. Allotment pastures would be rested from grazing for a minimum of one year following broadcast burning of that pasture. Prior to livestock being authorized to graze an area that was treated with prescribed burning, interdisciplinary vegetation monitoring would be conducted to determine if plant health and groundcover has recovered sufficiently to support grazing and protect soil.
- Range-13. No single pasture within a grazing allotment would be treated with prescribed fire within two consecutive years.

## Air Quality and Public Health

### Mitigation Measures

#### **Purpose: Reduce impacts of prescribed burning to air quality and public health.**

- Air 1. Burn when fuel conditions are conducive for slow to moderate fire spread in short needle fuel beds. This typically occurs in the early spring, late summer, or fall. Short needle fuel beds occur under mixed conifer that dominates sites on north aspects.
- Air 2. Consider burning with relatively good nighttime humidity recoveries (weather conditions decrease fire activity)
- Air 3. Prescribed burning will use emission reductions techniques and will be coordinated with the State of New Mexico, in compliance with its smoke management plan, to minimize the effects on air quality. Monitoring would comply with NMED direction.
- Air 4. Activities will be planned to meet applicable Federal, State, and local air quality regulations, including protection of Pecos Wilderness Class I Airshed
- Air 5. Broadcast burning will only be conducted during accepted weather conditions for wind + ventilation. Pile burning, which is usually conducted in the late fall and winter, may be done during fair or poor ventilation days using a waiver.
- Air 6. Burn when weather conditions are predicted to reduce smoke impacts to population centers during ignitions and at least one day following ignitions.



## Wildlife Resources

*Note: The Biological Assessment and Biological Evaluation use the term Integrated Design Features (IDFs) to refer collectively to the Best Management Practices, Design Features and Mitigation Measures identified here.*

### Best Management Practices

**Purpose: Communicate project and policy requirements to all parties involved in implementing management activities.**

- Wild-1 A U.S. Forest Service Biologist would be consulted prior to treatment unit preparation as well as during implementation as necessary to assure these wildlife measures are taken into account.
- Wild-2 If treatments that might disturb nests are planned to occur during nesting season, nests and dens would be located during project preparations before implementation occurs. Procedures for locating the nests and dens would be coordinated with an FS Biologist.

**Purpose: Compliance with the Endangered Species Act.**

- Wild-3 If any U.S. Forest Service Sensitive Species or Threatened or Endangered species is observed within or near the project area before or during implementation, sufficient protection would be provided in accordance with recovery plans and specific forest, regional and national guidance. Implementation would cease until an FS biologist has been notified, has investigated and has made recommendations. Occurrences would also be documented and recorded in the appropriate databases, such as GIS.

**Purpose: Meet the project's desired conditions**

**Create and maintain diversity in structure, composition, and age classes across the landscape.**

- Wild-4 Large down logs would not be targeted for crushing or displacement with machinery, but some may be damaged during implementation (e.g. mastication along strategic fuel breaks).
- Wild-5 Prescribed burning treatments would be implemented to attain low-to-moderate fire severity across the burn area. Implementors would strive to limit high burn severity areas to <10% of each burn unit. Such efforts are expected to create a mosaic burn pattern, with a diversity of fuel consumption and fire intensity.
- Wild-6 If present, Gambel oaks would be retained by not targeting them for removal during thinning activities, but some may be removed when preparing firelines. To the extent feasible, native shrubs such as wild rose (*Rosa* spp.), mountain mahogany (*Cercocarpus montanus*), Rocky mountain maple (*Acer glabrum*), currants (*Ribes* spp.), and raspberry (*Rubus* spp.) would be retained during thinning activities. Prescribed fire implementation would not target these species for ignition but would be allowed to consume some in a mosaic manner; burning some while leaving others unburned.
- Wild-7 Where available, at least 3 trees per acre with unique branching, broke-off top, spike-top or multiple tops would be retained, with additional emphasis within 200 feet along cliffs, major ridges and openings. Preferred species for retention would be large pines and firs.

## Design Features

**Purpose: Consistency with Forest Plan direction for vegetation management.**

**Meet the project's desired conditions**

**Create and maintain diversity in structure, composition, and age classes across the landscape.**

**Create and maintain diverse habitat types across the landscape.**

- Wild-8 Leave-islands (thickets or clumps) and openings would be distributed throughout each treatment unit to provide for cover and foraging areas for wildlife species as well as to retain younger age classes. Leave islands would be approximately  $\frac{1}{4}$  to  $\frac{1}{2}$  acre in size and approximately 10% of the treatment unit.
- Wild-9 An average of 3 slash piles (approximately 3 feet high and 10 feet in diameter) per acre would be retained (not burned) except within a 0.25 mile of privately owned structures, where at least 1 slash pile (at least 3'h x 10'd) per acre would be retained. To provide cover and nesting habitat, location preference would be near (within  $\frac{1}{4}$  mile) water sources and away from infrastructure such as roads, campgrounds, buildings, private land, etc.
- Wild-10 The retention and release of aspen, oaks, Scouler's willow and the release of the largest ponderosa pines and largest Douglas fir would be facilitated by focused thinning immediately surrounding these species. Focused thinning would remove the conifers under and over the canopy of these species and ideally/approximately an additional 30 feet beyond. This would be done in coordination with an FS Biologist.
- Wild-11 Trees selected for retention in project-created openings would be suited for open stand conditions, such as pines. Firs would not be selected for retention in openings, as they are more susceptible to sun-scorch and wind-throw in open conditions.
- Wild-12 To the extent practical, cover would be maintained to provide connectivity corridors for big game as well as furbearers. This would include leave-islands and stringers that would generally connect across the landscape. Screening (areas that have not been thinned with sufficient vegetation cover to block viewing long-distances) would be used, especially along roads. Screening would be designated beyond the primary road corridor to allow for fire management.
- Wild-13 In pinyon-juniper (PJ) woodlands, depending on the habitat type (PJ persistent, PJ savanna, PJ grassland, etc.), treatments would be implemented to promote pinyon jay habitat (mast-producing trees, nesting cover and recruitment) and connectivity. At least 15% of mature and over-mature mast-producing stands of pinon-juniper and oak zones within each treatment area would be maintained.

## Mitigation Measures

**Purpose: Consistency with Forest Plan direction for vegetation management.**

**Meet the project's desired conditions.**

**Create and maintain diversity in vegetative structure, composition and age classes across the landscape.**

**Create and maintain diverse habitat types across the landscape.**

- Wild-14 Tree felling would be directed away from trees designated to be retained. Machinery would avoid contact with trees designated to be retained. Smaller diameter trees (<12 inches dbh) that are designated to be retained would be the most vigorous/healthy of the site.
- Wild-15 The largest coarse woody debris (downed logs) would be retained. Emphasis would be on the retention of wood in the largest size classes and in decay classes 1, 2, and 3, but also representing a range of decomposition classes if available.
- At least 5 logs per acre would be retained where available, according to Forest Plan guidelines.
  - The largest diameter logs available would be retained; at least 12 inches diameter, with preference for logs over 15 feet in length, but at least 8 feet long.
  - If these standards cannot be met with current downed logs, additional down logs would be supplemented by felling trees that meet the above standards and leaving them on site.
  - Where fuelwood gathering would be planned, downed logs retained to meet this standard would be painted (side away from roads and trails) along length.
  - Fuelwood permits would specify that trees and logs with paint would not be cut or removed.
- Wild-16 During thinning and prescribed fire prep, snags would not be cut unless they pose a safety hazard; for example, within falling/striking distance of high human residency time areas such as staging areas.
- Wild-17 If the desired number of snags per acre is not available for retention, snag creation would be considered. If determined as necessary to meet the desired conditions, snags would be created through methods such as girdling.
- Wild-18 Snags that are cut for this project (e.g. safety) would be left after felling to contribute to downed log habitat.
- Wild-19 Prescribed fire ignition would not target large down logs and ignition would not occur at the base of snags; however, these features may ignite if fire creeps to them while burning occurs.
- Wild-20 Burn piles would be located a sufficient distance from large snags and large down logs (where deficient) to minimize the risk of ignition to these habitat features during pile burning operations.
- Wild-21 Piles would be placed away from healthy, mature aspen (which have thin bark) to minimize negative impacts to them. An exception would be in cases where mature aspen are unhealthy to an extent that the stand is unlikely to remain sustainable without management, therefore, fire could be used to encourage the stand to re-sprout.
- Wild-22 Leaners (trees/snags that have fallen at an angle of approximately 15 to 45 degrees from the ground, often held up by surrounding trees or rocks) would be retained and avoided, where available, and/or could be created, which provide plucking posts (goshawks) and subnivean (under snow) access.

**Purpose: Consistency with the Migratory Bird Treaty Act.**

**Create and maintain diverse habitat types across the landscape.**

- Wild-23 When possible, treatments (such as thinning, burning, mastication, road work, etc.) would be implemented outside of nesting season to minimize impacts to migratory birds, especially in brush/shrub areas, riparian areas, along cliff faces, and rock features. Typically, breeding season is from April 15 through August 15. If treatments have to occur during the breeding season, treatments would be designed to minimize cumulative effects to migratory species during that specific breeding season, and a 150-foot buffer would be established around observed active songbird nests, which would not have thinning treatments.
- Wild-24 Trees would be inspected for nests and cavities prior to cutting/removal. Trees with an observed nest (bird, squirrel, etc.) or cavity would be retained during thinning and not targeted during burning, along with the trees immediately surrounding (interlocking crowns, provides shade or cover to nest) the nest tree to maintain the existing cover and shade. If a den is known or discovered, vegetation that provides cover surrounding the den and cover corridors from the den leading out of the project area would be retained during thinning and not targeted during burning. Prescribed fire implementation would not target these trees for ignition, but some may be burned.
- Wild-25 An FS biologist would be notified upon discovery of a large stick-type nest. From February through September, noise-producing project activities within ¼ mile of the nest would be temporarily paused, at least until the nest is investigated by an FS biologist who can provide recommendation for proceeding.
- Wild-26 There would be no intentional killing, harassment, removal or handling of animals, nests, eggs, dens, etc.

*Mexican Spotted Owl*

**Mitigation Measures**

**Purpose: Consistency with the 2012 Mexican Spotted Owl Recovery Plan**

- MSO-1 The 2012 Mexican Spotted Owl Recovery Plan would be implemented where applicable.
- MSO-2 Before implementing management activities, the U.S. Forest Service ID Team would be consistent with the Regional Mexican Spotted Owl Habitat Treatment and Implementation Guidance.

**Within MSO Protected Activity Centers (PACs)**

- MSO-3 Coordination with USFWS would occur when planning and implementing site-specific thinning within MSO PACs.
- MSO-4 No treatments would occur in the PACs during the breeding season, unless a U.S. Forest Service biologist confirms that the PAC is not occupied or that breeding is not occurring.
- MSO-5 Where needed to meet objectives, trees less than 9 inches in diameter maybe cut in PACs, but work would be focused in areas outside of the PACs.
- MSO-6 A 100-acre Core Areas would be designated in each PAC, burning would be allowed to enter into Core Areas only if they are expected to burn at low intensity with low severity effects. Coordination with USFWS would occur for any active ignitions needed within the core areas to protect habitat from high intensity burning.

- MSO-7 A fire management burn plan would be prepared for broadcast burning applications within PACs, employing low intensity fire.
- MSO-8 Timing and type of burning would be coordinated with wind direction, topography, time of year, and distance to PACs to reduce smoke impacts.
- MSO-9 Hardwoods, downed woody debris, snags and other key habitat variables would be retained, unless when their removal would be compatible with MSO habitat management objectives, documented through reasoned analysis.
- MSO-10 Fuelwood gathering units for the public would not be designated in PAC boundaries. Fuelwood gathering by the public would not be promoted in PAC boundaries.

### **Within MSO Recovery Habitats**

- MSO-11 All trees greater than 16 inches dbh, as well as hardwoods, large down logs, large trees and snags would be retained unless posing a hazard. If snags must be removed due to hazards, cutting should be avoided from March through September. Cut snags would remain on site to contribute to large downed wood debris habitat.
- MSO-12 Hardwoods, downed woody debris, snags and other key habitat variables would be retained, with an emphasis in managing for large hardwoods.

### **Within Nest/Roost Habitats**

- MSO-13 Before implementing management activities in areas that have been identified as draft recovery nest/roost habitat (per the most recent GIS shapefiles) U.S. Forest Service staff will review site conditions and project activities for compliance with MSO management direction, including amended forest plan standard S06 and guidelines G01, G02 and G03. This process will include the following considerations:
1. Field verification of existing stand conditions (e.g., tree species and forest structure, but potentially also landscape context and operability)
    - a) If the vegetation conditions do not warrant all or part of the proposed action, or it would be operationally infeasible, then the action could be modified or dropped. For example, if a stand does not have high density of small-diameter trees, it may not be appropriate to implement a thinning treatment but may still be appropriate to conduct prescribed burning.
    - b) If the vegetation conditions generally warrant the proposed action and there are not operational limitations, then implementation may proceed contingent on consistency with MSO management direction and guidance below.
  2. Based on observed site conditions, confirm whether the area has potential to meet recovery nest/roost conditions.
    - a) If an area identified as draft recovery nest/roost habitat is unlikely to develop nest/roost habitat conditions, the area may be removed from the recovery nest/roost candidate map and project implementation may proceed without additional design criteria for MSO. A minimum of 25% of the mixed-conifer forests in the SFMLRP area must be managed to maintain or promote desired conditions for nest/roost habitat.
    - b) If the area meets or has potential to meet the desired recovery nest/roost habitat conditions (see 2012 Recovery Plan, Appendix C, Tables 2 and 3), then evaluate whether implementation is consistent with amended forest plan standards and guidelines for managing MSO habitat and the analysis in the project EA and BA.

3. If conditions vary within a stand proposed for activities, including situations where part of the stand is designated as draft recovery nest/roost habitat, then the proposed activities may be modified to follow a. and b. above. For example, if a stand contains an INREV polygon identified as draft recovery nest/roost habitat, the proposed action may be modified within the INREV polygon to promote attaining nest/roost habitat characteristics but implemented as proposed in the rest of the stand for fuel reduction.

MSO-14 During site review or implementation, INREV polygons not previously identified as nest/roost habitat may be added to the recovery nest/roost candidate map if they are found to meet or show potential to meet nest/roost habitat conditions. Project implementation on such sites will then require the review described above.

### *Northern Goshawk*

## **Mitigation Measures**

### **Purpose: Consistency with Northern Goshawk management guidance in the current Forest Plan**

- NOGO-1 Guidance from the SFNF Forest Plan would be reviewed and followed which includes the Northern Goshawk Management Guidelines.
- NOGO-2 Suitable habitat within the project area, including ½ mile beyond the project boundary, would be surveyed to R3 Survey Protocol prior to project implementation of thinning and burning treatments that could impact the species.
- NOGO-3 A Goshawk Post-Fledging Area (GPFA) of approximately 600 acres and a Goshawk Home Range (GHR) of at least 6,000 acres would be designated around active northern goshawk nests and territorial goshawks. A Goshawk Nest Area (GNA) of at least 30 acres would be designated around active northern goshawk nests and each GPFA would have at least three nest areas and three nest replacement areas within it, for a minimum total of 180 acres of nest areas in each GPFA. These designated areas would be delineated by a FS Biologist to include the best available habitat within the immediate area.
- NOGO-4 A Limited Operating Period (LOP) would be in effect from March 1 through September 30 within ¼ mile of active GNA and GPFA boundaries. If the nest site cannot be determined, but territorial adult northern goshawks are present, the LOP would be within ¼ mile of an averaged activity center or the PFA. This LOP would not exclude work from occurring, but would restrict what types of work could occur and would consider noise level, human presence, duration, proximity to known species occurrence, topography, etc. to remain within the current effect determinations. Project activities proposed to be implemented during the LOP would be reviewed and agreed to by a U.S. Forest Service Biologist.
- NOGO-5 Vegetation Management guidelines for goshawk habitats described in the Forest Plan would be followed. Emphasis would be to maintain or create uneven-age stand conditions and retain live reserve trees, snags, downed logs, and woody debris levels throughout woodland, ponderosa pine, mixed conifer and spruce-fir forest cover types. Old age trees would be managed so as much old forest structure as possible is sustained over time across the landscape. A mosaic of vegetation densities (overstory and understory), age classes and species composition would be maintained or created across the landscape. Non-uniform spacing of trees and clumping would be promoted.
- NOGO-6 At least two groups of trees per acre with a minimum diameter of 12 inches would be retained, with a minimum of 3 trees per group (USDA 1992).

- NOGO-7 Prescribed burning would be implemented to ensure that the entire 6,000-acre home range would not be burned in one year. Human presence while implementing prescribed burning will be minimized within 100 yards of known active nest areas. A burn plan would be prepared for broadcast burning applications within GPFA boundaries to employing low intensity fire. Timing and type of burning would be coordinated with wind direction, topography, time of year, and distance to GNA boundaries to reduce smoke impacts, risk of crown fire, consumption of nest trees and displacement of adult goshawks.
- NOGO-8 The ground surface layer would be maintained in satisfactory condition to minimize soil compaction and maintain hydrologic and nutrient cycles. (See design features for Hydrology/Riparian Resources and Soils.)
- NOGO-9 Riparian vegetation would be managed to maintain or achieve good condition. Riparian vegetation, stream banks and channels would be protected. (See design features for Hydrology/Riparian Resources.)
- NOGO-10 Emphasis would be to maintain snags that are 18 inches or larger dbh and 30 feet or larger in height, downed logs that are 12 inches in diameter and at least 8 feet long, and woody debris is 3 inches or larger on the forest floor.
- NOGO-11 Canopy cover would be maintained according to goshawk area designation and stand type, and would consist of 40% to 60% or more canopy cover in landscapes outside GPFA, and 50% to 70% or more canopy cover within GPFA and GNAs.
- NOGO-12 Piling of debris (slash) would be avoided in goshawk designated areas, where possible. If needed, within GNAs piling would be by hand and would not utilize grapple or dozer piling, while outside of GNAs, piling would be done by hand or grapple to minimize soil compaction, and forest floor and herbaceous layer disturbance.
- NOGO-13 Fuelwood gathering units for the public would not be designated in PFA boundaries. Fuelwood gathering by the public would not be promoted in PFA boundaries.

#### **References:**

U.S. Forest Service

2010 *First Amended Programmatic Agreement Regarding Historic Property Protection And Responsibilities Among New Mexico Historic Preservation Officer and Arizona State Historic Preservation Officer and Texas State Historic Preservation Officer and Oklahoma State Historic Preservation Officer and the Advisory Council On Historic Preservation and United States Department Of Agriculture Forest Service Region 3.*

*Appendix E – Standard Consultation Protocol for Routine Road Maintenance, Road Closure, and Road Decommissioning Projects on National Forests in New Mexico*

*Appendix J – Standard Consultation Protocol for Large-Scale Fuels Reduction, Vegetation Treatment*

## **Appendix D. Monitoring Plan**



## **Santa Fe Mountains Landscape Resiliency Project Monitoring Plan**

The Santa Fe Mountains Landscape Resiliency Project (SFMLRP) would use a condition-based approach to restore desired conditions at the fine scale, mid-scale, and landscape scale. Project implementation would be monitored during and after completion of each phase (thinning, piling, burning, etc.) to allow for condition-based management as described in the Environmental Assessment (EA). Monitoring would be done by qualified individuals, such as a certified silviculturist, hydrologist and/or biologist as applicable, and reviewed by an interdisciplinary team of specialists, including those just listed.

The monitoring plan outlined below includes the monitoring activities required to support the draft Environmental Assessment for the SFMLRP project, including legal monitoring obligations. These high-priority U.S. Forest Service project monitoring activities will be complemented both by existing Forest Service monitoring activities and multi-party monitoring.

Examples of existing Forest Service monitoring include Forest Health Protection aerial detection surveys for bark beetle activity, regular monitoring of range sites, watershed condition monitoring, and wildlife monitoring, including MSO population monitoring. A comprehensive Forest-wide monitoring implementation plan will be developed upon release of the final revised Forest Plan for the Santa Fe National Forest.

A Multiparty Monitoring Strategy is also currently in development with partners through the Greater Santa Fe Fireshed Coalition. Current priorities for this Strategy include monitoring forest structure and composition, fuels and fire behavior, avian diversity and abundance, water quality, and air quality. Some of these monitoring activities, including the avian monitoring, would be developed as citizen science initiatives for public engagement and transparency.

All monitoring conducted for the SFMLRP will be based upon current best available science. As implementation proceeds, the U.S. Forest Service will work with internal and external partners to help ensure that knowledge and expertise is leveraged to address key management questions. Monitoring practices will be documented to ensure that processes are replicable through time and changing personnel.

The U.S. Forest Service will share the results of SFMLRP monitoring with partners and the general public at an annual science review meeting, with support from our partners at the Greater Santa Fe Fireshed Coalition.

<b>Monitoring Question</b>	<b>Monitoring Activity</b>	<b>Methodology</b>	<b>Timing/Frequency</b>	<b>Action to be taken if results do not meet minimum compliance levels or if impacts are not mitigated as planned</b>
Where are treatments needed and what treatments are most appropriate?	Pre-implementation monitoring	Field reconnaissance and vegetation surveys, protocols dependent on forest characteristics within the treatment area (e.g., homogeneity of stand conditions) and the availability of existing data (e.g., common stand exams).	Before treatment prescriptions are written	N/A
Are projects adhering to specifications, including implementation of silvicultural prescriptions, design features, best management practices, and mitigation measures?	Compliance monitoring	Site inspections	Daily to weekly while operations are active	Adjust treatments to ensure compliance
What restoration treatments are being applied in the project area?	Implementation monitoring	Site inspections, reporting in FACTS	Post implementation, tracked annually	N/A
How are thinning and burning treatments impacting MSO PAC occupancy?	Effectiveness monitoring- MSO PAC Occupancy	Recovery Plan	Pre and Post at PACs at intervals to be determined in coordination with USFWS	Adjust treatments (e.g., reduce thinning/burning). Before implementation during the breeding season, monitoring must confirm that the PAC is not occupied, or breeding is not occurring. Pre- and post-treatment monitoring would occur early so the impacts of treatments can be understood before proceeding with treatments in additional protected activity centers.
How are thinning and burning treatments impacting PAC and Nest/Roost habitat? Are these habitats moving towards desired conditions?	Effectiveness monitoring- Nest/Roost habitat monitoring and validation	U.S. Forest Service CSE protocol and FVS modeling	Pre and Post in Nest/Roost habitats at intervals to be determined in coordination with USFWS	Adjust treatments (e.g., reduce thinning/burning)
How are thinning and burning treatments impacting goshawk territory occupancy?	Effectiveness monitoring- Goshawk Territory Occupancy	Current Forest Plan direction and NOGO Survey Protocol	Pre and Post (approximately 2 and 10 years) at territories	Adjust treatments
How are thinning and burning treatments impacting goshawk territory habitat?	Effectiveness monitoring- Goshawk territory habitat	Site visits to document post-treatment conditions and movement towards desired conditions (criteria to be determined by Forest Service biologists)	Pre and Post (approximately 2 and 10 years) at territories and potentially suitable habitat	Adjust treatments

Monitoring Question	Monitoring Activity	Methodology	Timing/Frequency	Action to be taken if results do not meet minimum compliance levels or if impacts are not mitigated as planned
What are the cumulative effects of moderate and high severity burning on soil, water quality and range resources?	Cumulative Watershed Effects Monitoring in places with where there has been moderate or high severity burning (places devoid of vegetative groundcover post-burning)	<ul style="list-style-type: none"> <li>- Use BARC map to find/prioritize areas of concern</li> <li>- Use BMP protocols to evaluate impacts to water quality</li> <li>- Look at soil burn severity</li> <li>- Look for living roots and the potential for re-growth</li> <li>- Look at residual duff and needle-cast</li> </ul>	<ul style="list-style-type: none"> <li>- If a unit was burned in the spring, monitor in September, prior to the proposed fall burn.</li> <li>- If a unit was burned in the fall, monitor in March or April, prior to a proposed spring burn.</li> <li>- Monitor groundcover, forage recovery and resiliency prior to grazing burned pastures.</li> </ul>	<p>Postpone burning within the same watershed until ground cover has been adequately recovered.</p> <p>Postpone grazing until vegetative ground cover and forage are recovered and thriving (and for <i>at least</i> one year after a pasture is burned).</p>
What are the effects of implementation on cultural resources?	Post-Implementation Cultural Resource Assessments	SFNF Archaeological Site Form Update	During or Post-Implementation	Inform Forest Archaeologist; Cease management activity if adverse effects are observed; SHPO & Tribal consultations and Damage Assessments

**Appendix E. Proposed Forest Plan Amendment**

## Need for a Project-Specific Forest Plan Amendment

A project-specific plan amendment to the 1987 Santa Fe National Forest Land Management Plan (hereafter referred to as the “LMP” or “Forest Plan”), as amended through Amendment 13 (June 2010), is needed because the LMP includes outdated direction for MSO management. Management direction is currently based on the 1995 MSO Recovery Plan, but a revision of the recovery plan was published in 2012: the 2012 MSO Recovery Plan, First Revision (U.S. Fish and Wildlife Service 2012). There is a need for the project analysis to be in alignment with the management direction provided in the revised recovery plan.

In addition to outdated MSO management direction, the LMP also has outdated northern goshawk management direction; specifically, while it provides guidelines to manage for uneven-aged stand conditions, it 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; these interspaces remained essentially treeless within a frequent-fire regime, except for scattered individual trees. 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.

## How the 2012 Planning Rule Applies to the Plan Amendment

For the project, the LMP would be amended under the 2012 Planning Rule (36 CFR 219). The 2012 Planning Rule has different provisions than the 1982 Planning Rule under which the existing LMP was developed.

## Purpose of the Amendment

The purpose of this amendment is to implement updated management direction for the MSO, based on the 2012 MSO Recovery Plan, and updated management direction for northern goshawks, based on the best available science.

To address the need for updated MSO management direction, the draft amendment would:

- Update definitions and direction for protected (protected activity centers or 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.

In cases where the direction in the Forest Plan is not amended, it is because the language does not conflict with project needs (as related to the Recovery Plan). Forest Plan direction will be followed, but augmented by the MSO Recovery Plan direction, which provides specific details for management that are not included in the more broadly-written Forest Plan language.

The 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, to address the need for updated northern goshawk management direction, a project-specific Forest Plan amendment would need to address the direction provided on all three levels (see Table 1).

An amendment to the Forest Plan would:

- Replace Forest Plan standards and guidelines for ponderosa pine and dry mixed conifer (including northern goshawk direction) with desired conditions and guidelines described in Table 1.
- 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 Amendment Language

- Amend the Santa Fe National Forest Plan to be in alignment with the management direction provided in the revised (2012) MSO Recovery Plan when direction between the two plans is in conflict. A project-specific plan amendment is needed because the Forest Plan, as amended, includes direction from the former (1995) MSO 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.

## Proposed Forest Plan Amendment

In order to achieve project restoration objectives, the Forest Plan would be amended as follows:

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

- 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).
- 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.

- Openings are defined as generally persistent treeless areas having a fairly distinct shape or size and occurring naturally due to difference in soil types, as compared to sites that support forests or woodlands. Openings include meadows, grasslands, rock outcroppings, 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 E.1. Comparison of Existing Santa Fe Forest Plan Guidelines and the Proposed Project-specific Amendments**

Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
<b>Mexican Spotted Owl Standards</b>				
Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing. Mexican spotted owl Standards (AMENDMENT #6 OCTOBER 1996-1)	Provide three levels of habitat management- protected, <b>restricted</b> , and other forest and woodland types to achieve a diversity of habitat conditions across the landscape	This change is needed to correct language and definitions in the Forest Plan to match language and definitions in the 2012 Recovery Plan.	S01: Three levels of habitat management will be provided- protected (protected activity centers (PACs)), <b>recovery habitat</b> and other forest and woodland types [1]. [1] Habitat management levels are defined by the 2012 MSO Recovery Plan (USFWS 2012, p. VII)	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of plan component, or the removal or addition of a plan component
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-1)	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.	This change is needed to correct language and definitions in the Forest Plan to match language and definitions in the 2012 Recovery Plan. The change is covered by language in S01.	Delete	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-1)	Restricted areas include all mixed-conifer, pine-oak, and riparian forest outside of protected.	This change is needed to correct language and definitions in the Forest Plan to match language and definitions in the 2012 Recovery Plan. Restricted habitat has been changed to recovery habitat in the 2012 MSO Recovery Plan. The change is covered by language in S01.	Delete	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-1)	Other forest and woodland types include all ponderosa pine, spruce-fir, woodland, and aspen forest outside protected and restricted areas.	This change is needed to correct language and definitions in the Forest Plan to match language and definitions in the 2012 Recovery Plan. The change is covered by language in S01.	Delete	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component



Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-1)	Survey all potential spotted owl areas including protected, <b>restricted</b> , and other forest and woodland types within an analysis area plus the area ½ mile beyond the perimeter of the treatment area.	This change is needed to correct language and definitions in the Forest Plan to match language and definitions in the 2012 Recovery Plan.	S02: Within the project area, surveys should be conducted <b>in line with protocols as defined in the 2012 MSO Recovery Plan</b> . The MSO survey area shall include all areas where owls or their habitat might be affected by management actions as well as a 0.5-mile area from the survey area's exterior boundaries.	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-1)	Allow <b>no timber harvest</b> 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.	This change is needed to clarify what kinds of active management are allowed in PACs under the 2012 MSO Recovery Plan.	G01: Allow <b>active management<sup>1</sup> (including combinations of thinning trees up to 17.9 inches dbh, mechanical fuel treatment, and prescribed fire) in forested habitat adjacent to and within established PACs (but outside the 100-acre core area) when needed to reduce fuel loads and fuel continuity, thereby reducing the potential for high severity and stand-replacement fires. Low intensity prescribed fire should be used within select 100-acre core area to eliminate the need for fire line construction</b> . For PACs 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.  [1] Types of active management allowed in PACs are defined in the 2012 MSO Recovery Plan (USFWS 2012, p.74, p. 261).	A. Amendments that allow us to treat vegetation related to MSO PACs.  B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-1)	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.	This direction conflicts with project needs and direction in the 2012 MSO Recovery Plan.	Delete	A. Amendments that allow us to treat vegetation related to MSO PACs.  B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component

Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-1)	Limit <b>human activity in protected activity centers during the breeding season.</b>	This change is needed to clarify what kinds of active management are allowed in PACs under the 2012 MSO Recovery Plan.	G02: Limit <b>management activity in PACs during the breeding season (1 Mar. – 31 Aug.), and defer management activities from the nest/roost core during the breeding season. Except where non-breeding is confirmed or inferred that year per the accepted survey protocol in the current recovery plan.</b>	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component C. Clarifies activity restrictions during wildlife breeding seasons
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-1)	In protected and <b>restricted areas</b> , 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.	This change is needed to correct language and definitions in the Forest Plan to match language and definitions in the 2012 Recovery Plan.	S03: In protected and <b>recovery habitat areas</b> , 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.	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
<b>General Guidelines</b>				
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)	Conduct surveys <b>following Region 3 survey protocol.</b>	This change is needed because we no longer follow Region 3 survey protocol, and instead follow the protocol in the 2012 Recovery Plan.	S04: Conduct surveys <b>according to the current recovery plan.</b>	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
<i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)</i>	<i>Breeding season is March 1 to August 31</i>	<i>The project complies with this plan component</i>	<i>No change</i>	

Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
<b>C. Protected Area Guidelines</b>				
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)	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	The project complies with this plan component. Specifically, the 2012 Recovery Plan augments this component without conflict.	No change	
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)	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	The project complies with this plan component	No change	
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)	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	The project complies with this plan component	No change	
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)	Protected activity center boundaries should not overlap	The project complies with this plan component	No change	
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)	Submit protected activity center maps and descriptions <b>to the recovery unit working group</b> for comment as soon as possible after completion of surveys.	This change is needed because there are no longer consistent "recovery unit working groups."	S05: Submit protected activity center maps and descriptions <b>to the USFWS</b> for comment after completion of surveys.	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component

<b>Forest Plan (1996 Update) Section and Page Number</b>	<b>Existing Guideline Language Forest Plan (1996 Update)</b>	<b>Rationale for Change</b>	<b>Proposed New Project-specific Guideline Language</b>	<b>Amendment Type</b>
<i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)</i>	<i>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</i>	<i>The project complies with this plan component. The MSO 2012 Recovery Plan can be used to augment this component without conflict.</i>	<i>No change</i>	
<i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)</i>	<i>Generally allow continuation of the level of recreation activities that was occurring prior to listing</i>	<i>The project complies with this plan component</i>	<i>No change</i>	
<i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)</i>	<i>Require bird guides to apply for and obtain a special use permit. A condition of the permit shall be that they obtain a sub-permit 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.</i>	<i>The project complies with this plan component</i>	<i>No change</i>	
<i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-2)</i>	<i>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:</i> <ul style="list-style-type: none"> <li>• <i>Retain key forest species such as oak.</i></li> <li>• <i>Retain key habitat components such as snags and large downed logs.</i></li> </ul> <i>Harvest conifers less than 9 inches in diameter only within those protected activity centers treated to abate fire risk as described below.</i>	<i>The project complies with this plan component</i>	<i>No change</i>	

Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-3)	<p><b>Treat Fuel Accumulations to abate fire risk:</b></p> <ul style="list-style-type: none"> <li>• Select for treatment 10% of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10% of the protected activity centers where nest sites are known as a paired sample to serve as control areas.</li> <li>• 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.</li> <li>• 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.</li> <li>• Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar.</li> </ul>	The 2012 MSO Recovery Plan changes the treatment numbers and percentages that are allowable in PACs. This amendment allows specialists to use the most up-to-date treatment requirements.	<p><b>S06: Management activities will be consistent with the 2012 MSO Recovery Plan<sup>1</sup>, in consultation with the USFWS.</b> Fuel treatments include:</p> <ul style="list-style-type: none"> <li>• Up to 20% of the non-core PAC area can be treated within each EMU (2012 Plan, p. 262). This does not mean that 20% of each PAC must be treated or that only 20% of a PAC can be treated outside the breeding season.</li> <li>• All activities within the core should undergo consultation with FWS (USFWS 2012, p. 274). Designated 100-acre core areas should be deferred from mechanical treatment (USFWS 2012, p. 316). Planned ignitions should only be allowed to enter core areas if they will burn at low intensity and outside the breeding season (USFWS 2012, p. 263, 274).</li> <li>• Within the remaining PAC acreage, combinations of mechanical and prescribed fire treatments may be used to reduce fire hazard while striving to maintain or improve habitat conditions for the owl and its prey (USFWS 2012, p. 262).</li> <li>• Removal of hardwoods, downed woody debris, snags, and other key habitat variables should occur only when compatible with owl habitat management objectives as documented through reasoned analysis. (USFWS 2012, p. 261).</li> <li>• Monitoring should be conducted at a scale that encompasses multiple administrative units and, ideally, be a coordinated effort. It is not recommended that each individual PAC be monitored (USFWS 2012, p. 262).</li> <li>• See above. Low-intensity fire can be used within core areas. Hardwoods should be retained where they are compatible with owl habitat management objectives.</li> <li>• Treatments should be located strategically, informed by fire modelling, and take place on adjacent land outside of PACs where possible to maximize effectiveness of treatments while minimizing disturbance within PAC (USFWS 2012, p. 206, 258, 262).</li> </ul>	<p>A. Amendments that allow us to treat vegetation related to MSO PACs.</p> <p>B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component</p>

Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
	<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Pre- and post-treatment monitoring should be conducted in all protected activity centers treated for fire abatement (see monitoring guidelines).</li> </ul>		<p>See G01 for more on allowed diameter limits for thinning and management activities within the core.</p> <p>[1] See Appendix C in the 20120 MSO Recovery Plan (p. 249 – 298) for a list of general management recommendations.</p>	

Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-3)	<p>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):</p> <p>No seasonal restrictions apply</p> <p>Treat fuel accumulations to abate fire risk.</p> <ul style="list-style-type: none"> <li>• Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire.</li> <li>• Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar.</li> <li>• Pre and post treatment monitoring should occur within all steep slopes treated for fire risk abatement. (See monitoring guidelines)</li> </ul>	This change is needed because the 2012 MSO Recovery Plan removes the requirement to treat steep slopes with the same restrictions as PACs. In the project area, we will analyze steep slopes in the same manner as other landscapes to determine PAC status and associated treatment restrictions.	Delete	<p>A. Amendments that allow us to treat vegetation related to MSO PACs.</p> <p>B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component</p>
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-3)	<i>Reserved Lands (Wilderness, Research Natural Areas, Wild and Scenic Rivers, and Congressionally Recognized Wilderness Study Areas):</i> Allow prescribed fire where appropriate	<i>The project complies with this plan component</i>	<i>No change</i>	

Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-4)	C. <b>Restricted Areas</b> (Mixed-Conifer, pine-oak, riparian forests and rocky canyons)	This change is needed to correct language and definitions in the Forest Plan to match language and definitions in the 2012 Recovery Plan.	C. <b>Recovery Area</b> Guidelines (Mixed-conifer, riparian forests, and rocky canyons)	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-4)	<i>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.</i>	<i>The project complies with this plan component</i>	No change.	
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-4)	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.	We need to adopt the desired conditions listed in the 2012 MSO Recovery Plan, as these will result in better protection of the owl and its habitat (see introductory discussion for more detail on the rationale for transitioning to the 2012 MSO Recovery Plan direction with regards to MSO management on the forest).	G03: The percentages of area in Table 1 of the 2012 MSO Recovery Plan are the minimum desired conditions for MSO recovery habitat identified as meeting nest/roost conditions. Stands should be managed so that a specified portion (10-25%) of the landscape does not fall below the lower stand condition thresholds described. If a deficit of stands meeting the minimum thresholds identified, additional stands should be identified and managed in alignment with Table 1. Identify and protect stands that meet or exceed MSO recovery habitat nest/roost conditions and then assess whether or not these stands satisfy this area requirement. 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. Stands that neither meet nest/roost conditions nor that are designated for development of nest/roost conditions can be managed to meet other resource objectives. No stands should be lowered below the conditions in Table 1 until assessments at larger spatial scales (e.g., landscape, sub-region, and region) demonstrate that thresholds are met in recommended amounts at these larger scales. (USFWS 2012, p.267).	A. Amendments that allow us to treat vegetation related to MSO PACs. B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component



Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type														
<p><i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-4)</i></p>	<p>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</p>	<p><i>The project complies with this plan component</i></p>	<p>Table 1: Minimum desired conditions for mixed-conifer and pine-oak forest areas managed for Recovery nesting/roosting habitat. Forest types are defined in Appendix C, above. Parameter values are based on averages among plots sampled within forest stands. Numbers of stands included in analysis: 74 for Basin and Range-East (BRE), 27 for mixed-conifer forest in other EMUs, and 47 for pine-oak forest (table C3, USFWS 2012).</p> <table border="1" data-bbox="1094 508 1646 724"> <thead> <tr> <th rowspan="2">EMU(s) Forest Type</th> <th rowspan="2">% Area<sup>1</sup></th> <th colspan="2">% BA by Size Class</th> <th rowspan="2">Minimum tree BA<sup>2</sup></th> <th rowspan="2">Minimum density of large trees<sup>3</sup></th> </tr> <tr> <th>30-46 cm dbh (12-18 inches)</th> <th>&gt;46 cm dbh (&gt;18 inches)</th> </tr> </thead> <tbody> <tr> <td>SRM</td> <td>25</td> <td>&gt;30</td> <td>&gt;30</td> <td>27.5 (120)</td> <td>30 (12)</td> </tr> </tbody> </table> <p><sup>1</sup> % of area pertains to the percentage of the planning area, subregion, and/or region in the specified forest type that should be managed for threshold conditions.</p> <p><sup>2</sup>BAs in m2/ha (square feet/acre), and include all trees &gt;1 inch dbh (i.e., any species). We emphasize that values shown are minimums, not targets.</p> <p><sup>3</sup>Trees &gt; 46 cm (18 inches) dbh. Density is tree/ha (trees/acre). Again, values shown are minimums rather than targets. We encourage retention of large trees.</p> <p><sup>4</sup>Pine-oak forest type: ≥10% of the stand BA or 4.6 m2/ha (20 square feet/acre) of BA consist of Gambel oak ≥13 cm (5 inches) drc.</p> <p><sup>5</sup>Pine-oak recommendations apply only to the Mount Taylor and/or Zuni Mountains regions within the CP EMU.</p>	EMU(s) Forest Type	% Area <sup>1</sup>	% BA by Size Class		Minimum tree BA <sup>2</sup>	Minimum density of large trees <sup>3</sup>	30-46 cm dbh (12-18 inches)	>46 cm dbh (>18 inches)	SRM	25	>30	>30	27.5 (120)	30 (12)	<p><i>No change.</i></p>
EMU(s) Forest Type	% Area <sup>1</sup>	% BA by Size Class				Minimum tree BA <sup>2</sup>	Minimum density of large trees <sup>3</sup>											
		30-46 cm dbh (12-18 inches)	>46 cm dbh (>18 inches)															
SRM	25	>30	>30	27.5 (120)	30 (12)													

<b>Forest Plan (1996 Update) Section and Page Number</b>	<b>Existing Guideline Language Forest Plan (1996 Update)</b>	<b>Rationale for Change</b>	<b>Proposed New Project-specific Guideline Language</b>	<b>Amendment Type</b>
<i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-4)</i>	<i>Maintain all species of native trees in the landscape including early seral species</i>	<i>The project complies with this plan component</i>	<i>No change.</i>	
<i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-4)</i>	<i>Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure</i>	<i>The project complies with this plan component</i>	<i>No change.</i>	
<i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-4)</i>	<i>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.</i>	<i>The project complies with this plan component</i>	<i>No change.</i>	
<i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-5)</i>	<i>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.</i>	<i>This change is needed because it conflicts with the long-term needs of the project to support ongoing MSO habitat recovery</i>	<i>Delete</i>	<i>A. Amendments that allow us to treat vegetation related to MSO PACs.</i>
<i>Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-5)</i>	<i>Save all trees greater than 24 inches dbh. In pine-oak forests, retain existing large oaks and promote growth of additional large oaks.</i>	<i>The project complies with this plan component</i>	<i>No change.</i>	

Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-5)	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.	The project complies with this plan component	No change.	
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-5)	Retain substantive amounts of key habitat components: <ul style="list-style-type: none"> <li>• Snags 18 inches in diameter and larger</li> <li>• Down logs over 12 inches midpoint diameter</li> <li>• Hardwoods for retention, recruitment, and replacement of large hardwoods</li> </ul>	This language is for restricted areas, which are no longer supported by the 2012 Recovery Plan. We now use recovery areas, which have different management requirements. Table 1 provides the minimum desired conditions for basal area in standing live trees in ponderosa pine and mixed conifer in recovery areas.	Delete	A. Amendments that allow us to treat vegetation related to MSO PACs. B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
N/A	No corresponding language	This change is needed to add information on management in "recovery areas" to the Forest Plan, which have replaced "restricted areas."	Forest Recovery Foraging/Non-breeding Habitat G04: 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.	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-5)	<b>Riparian Areas:</b> 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.	This desired condition is necessary to explain the terminology change to "Riparian Recovery Habitat" from "Riparian Areas"	Desired Condition: <b>Riparian recovery habitat</b> <sup>1</sup> is in 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.  1. 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	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component

Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-5)	<b>Old-Growth-</b> except where otherwise noted, implement forest plan old growth standards and guidelines to maintain and promote development of owl habitat.	The project complies with this plan component	No change.	
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-5)	<b>D. Other Forest and Woodland Types-</b> 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.	The project complies with this plan component	No change.	
<b>Monitoring Guidelines</b>				
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-5)	Monitoring and evaluation should be collaboratively planned and coordinated <b>with involvement from each</b> National Forest, U.S. Fish and Wildlife Service Regional Office, FS Regional Office, Rocky Mountain Research Station, recovery team, and recovery unit working groups.	This change is needed because there are no consistent recovery unit working groups in existence, and we need flexibility in terms of being able to coordinate with changes organization and interested parties.	G05: Monitoring and evaluation should be collaboratively planned and coordinated with involvement <b>from all appropriate resource agencies</b> , such as different national forests, USFWS Ecological Service Field Office, USFWS Regional Office, FS Regional Office, Rocky Mountain Research Station, and recovery teams.  Monitoring will be consistent with the most current MSO Recovery Plan.	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-5)	Population monitoring should be a collaborative effort with participation of all appropriate resource agencies.	This change is needed because the idea is replaced by the monitoring strategy outlined in the 2012 Recovery Plan (see G05).	Delete See G05	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component

<b>Forest Plan (1996 Update) Section and Page Number</b>	<b>Existing Guideline Language Forest Plan (1996 Update)</b>	<b>Rationale for Change</b>	<b>Proposed New Project-specific Guideline Language</b>	<b>Amendment Type</b>
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-6)	Habitat monitoring of gross habitat changes should be a collaborative effort of all appropriate resource agencies.	This change is needed because the idea is replaced by the monitoring strategy outlined in the 2012 Recovery Plan (see G05).	Delete See G05	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-6)	Habitat monitoring of treatment effects (pre- and post-treatment) should be done by the agency conducting the treatment.	This change is needed because the idea is replaced by the monitoring strategy outlined in the 2012 Recovery Plan (see G05).	Delete See G05	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-6)	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.	This change is needed because the idea is replaced by the monitoring strategy outlined in the 2012 Recovery Plan (see G05).	Delete See G05	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component

Forest Plan (1996 Update) Section and Page Number	Existing Guideline Language Forest Plan (1996 Update)	Rationale for Change	Proposed New Project-specific Guideline Language	Amendment Type
Santa Fe NF Forest Plan, Appendix D- Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing (AMENDMENT #6 OCTOBER 1996-6)	<p>Track gross changes in acres of owl habitat resulting from natural and human-caused disturbances.</p> <p>Acreage changes in vegetation composition, structure, and density should be tracked, evaluated, and reported. Remote sensing techniques should provide an adequate level of accuracy.</p> <p>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.</p>	This change is needed because the idea is replaced by the monitoring strategy outlined in the 2012 Recovery Plan (see G05).	Delete See G05	B. Amendments that adopt aspects of the new proposed MSO Recovery Plan, either by modification of a plan component, or the removal or addition of a plan component

## Compliance with the Rule’s Applicable Substantive Provisions

The 2012 Planning Rule requires the Forest Service to identify which, if any, of the substantive requirements, i.e., 36 CFR 219.8 through 219.11, are affected or addressed by any amendment. The applicable substantive provisions apply only within the scope and scale of the amendment (36 CFR 219.13(b)(5)).

### Scope and Scale of the Amendment

Overall, the purpose of the amendment is to improve the Forest’s ability to manage MSO and northern goshawk habitat by updating direction to align with the best available science, including the most recent USFWS management plan for MSO. The scope of the amendment is the modification, addition, or deletion of 30 plan components in Appendix D of the Forest Plan (Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing.), which increase the Forest’s ability to successfully manage for MSO and goshawk habitat. The scale of the amendment is the Santa Fe Mountains Landscape Restoration Project, comprising 50,566 acres of NFS lands.

### Rule Provisions Directly Related to the Amendment

The 36 CFR 219 regulations pertaining to NFS land management planning (the 2012 Planning Rule) require that the responsible official provide notice “about which substantive requirements of 36 CFR 219.8 through 219.11 are likely to be directly related to the amendment” (36 CFR 219.13(b)(2)). Whether a rule provision is directly related to an amendment is determined by any one of the following:

- The purpose of the amendment (Subpart 219.13[b][5][i])
- Beneficial effects of the amendment (Subpart 219.13[b][5][i])
- Substantial adverse effects associated with a rule requirement (Subpart 219.13[b][5][ii][A])
- Substantial lessening of protections for a specific resource or use (Subpart 219.13[b][5][ii][A])
- Substantial impacts to a species or substantially lessening protections for a species (36 CFR, Subpart 219.13[b][6])

Application of a substantive rule requirement directly related to the amendment may demonstrate that the amendment is compliant and need not be changed or it may necessitate modification of the amendment to meet the requirements. The following specific substantive rule requirements contained in rule sections 219.8 through 219.11 would directly relate to this amendment:

- §219.8 Sustainability
- §219.9 Diversity of Plant and Animal Communities
- §219.10 Multiple Use

#### ***219.8—Sustainability***

Per 36 CFR 219.8, “a plan developed or revised under this part must provide for social, economic, and ecological sustainability within Forest Service authority and consistent with the inherent capability of the plan area...” Specifically, the activities that would be authorized by the amendment could potentially influence protections for:

- a) ecological sustainability, including ecosystem integrity to include structure, function, composition, and connectivity of terrestrial and aquatic ecosystems and watersheds; air quality; and water quality and resources; and

As stated in 36 CFR 218.8(a)(vi), “the plan must include plan components, including standards and guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including components to maintain or restore structure, function, composition, and connectivity, taking into account opportunities for landscape scale restoration.” All proposed modifications to the Forest Plan, under this amendment, would allow the project to be implemented in a manner to support landscape-scale forest restoration within the 50,566-acre project area. The methods for implementing the project consider the ecological integrity for terrestrial and aquatic ecosystems and watersheds during design, construction, and maintenance—contributing not only to ecological sustainability, but also providing long-term benefits for social and economic sustainability for the area’s future. The Forest Plan amendment to update management of MSO habitat to allow for more active forest restoration activities within and around PACs, including the use of prescribed fire and mechanical fuel treatments (vegetation thinning), would result in the long-term reduction of large-scale, uncharacteristic wildfire risk. By authorizing the management of unplanned wildfire, fewer damaging suppression techniques would need to be applied to areas where fire can safely burn without threatening life and property or the integrity of MSO habitat over the long-term. Forest restoration activities within PACs would result in beneficial impacts to air quality, soils, watersheds, and native vegetative communities because the potential for fuel removal in these areas would be greater than without the amendment. Forest restoration activities within MSO protected activity centers would improve forest health and resilience in a larger portion of the project area over the long term, thereby resulting in decrease in uncharacteristic wildfire potential and reduced risk of insect and disease. Allowing treatments to occur on steeper slopes (as analyzed and identified as appropriate at the project level) would reduce fuel continuity and reduce stand densities, thereby mitigating crown fire potential and the risk of high-intensity, stand-replacing wildfire. Long-term beneficial impacts to vegetation communities, air quality, soils, and watersheds would result because severe wildfires that are uncharacteristic in a number of the ecological response units in the project area would be mitigated. Furthermore, forest restoration activities on steep slopes would improve the vigor of residual trees by reducing competition for scarce resources, increasing the resilience of stands to insect and disease risk in a larger portion of the project area, and thereby resulting in improved forest health, watershed functioning, and wildlife habitat. Improved watershed functions would be expected to also improve water quality and riparian areas within the project area.

The proposed modification to the Forest Plan to allow for treatments within PACs and on steep slopes (to be determined, based on ground conditions) could alter recreation experience, particularly scenery as a result of surface disturbance, smoke and charred vegetation from unplanned and prescribed fires, and long-term changes in vegetation structure and composition. The impacts to scenery and recreational settings would be localized and visible in both the short and long term. Impacts from smoke would be short term; these impacts would dissipate when fire activities cease. Resulting charred vegetation from fires would be visible in the long term. Scenic quality would be further impacted in the short term by the presence of activity slash and temporary roads and skid trails. These impacts would be reduced by natural vegetation regeneration and site rehabilitation in the long term. Changes to vegetation structure would have long-term, positive effects on scenic quality, because improving forest health and resiliency also improves the recreation setting.

The proposed modifications to the Forest Plan would result in improved forest health, which would also improve ecosystem services and provide multiple use opportunities to local communities, such as clean air and water, an improved recreational setting, and increased forage for wildlife and livestock. By ensuring resilient ecosystems, the Forest Service can help to sustain local economic and social well-being, promote a sustainable flow of societal benefits, and manage multiple uses over the long term, so



that these lands provide enduring ecosystem services and contribute to social and economic stability, as well.

### ***219.9—Diversity of Plant and Animal Communities***

Per 36 CFR 219.9, “a plan developed or revised under this part must provide for the diversity of plant and animal communities, within Forest Service authority and consistent with the inherent capability of the plan area...” Additionally, the plan must support the persistence of most native species in the plan area. Specifically, the activities that would be authorized by the amendment could potentially influence protections for:

- a) ecosystem plan components, including ecosystem integrity of terrestrial and aquatic ecosystems and watersheds; and
- b) species-specific plan components, including providing for ecological conditions that contribute to the recovery of federally listed, proposed, and candidate species, and that contribute to the viability of sensitive species.

Stand-replacing fire has been defined as a major threat to the MSO and its critical habitat. The proposed modifications to the Forest Plan allowing for forest restoration activities, including vegetation thinning and the use of prescribed fire, within protected activity centers and critical habitat would improve ecological conditions for the species. Following treatments planned in the proposed action, crown fire hazard would decrease through fuel load reduction treatments. Furthermore, the proposed modifications to the Forest Plan would help the project area trend toward having a more diverse stand structure to meet the desired conditions for MSO, as defined in the 2012 recovery plan, thereby increasing the species’ habitat resilience to future wildfires, as well as insect and disease infestations. The proposed forest restoration treatments are intended to shift the mixed conifer and ponderosa pine ecological response units toward conditions more desirable for the persistence of MSO habitat, as well as more resilient toward wildfire.

For migratory birds, the activities associated with the proposed modifications to the Forest Plan, such as removing the requirement to treat steep slopes with the same restrictions as PACs, and allowing treatment within protected activity centers and northern goshawk habitat, would result in short-term negative impacts, as well as long-term beneficial impacts, to migratory birds. In the short-term, these proposed modifications would allow for restoration treatment that may disturb nests and disrupt courtship of nesting pairs. However, in the long term, they are expected to provide better habitat for migratory birds by creating openings and enhancing the development of large trees.

In conclusion, the proposed modifications to the Forest Plan would not result in substantial adverse impacts to plant and animal communities within the project area, including sensitive species such as the MSO. Nor would the proposed amendment substantially lessen protection for any plant and animal species. The proposed modifications support the persistence of native species in the project area and allow the project to align with the best available science for MSO and northern goshawk habitat management. As a result, this plan amendment is consistent with the diversity of plant and animal communities as required by 36 CFR 219.9.

### ***219.10—Multiple Uses***

Per 36 CFR 219.10, “a plan developed or revised under this part must provide for ecosystem services and multiple uses, including outdoor recreation, range, timber, watershed, wildlife, and fish, within Forest Service authority and the inherent capability of the plan area...”. Specifically, the activities that would be authorized by the amendment could potentially influence provisions for integrated resource management for multiple use including:

- a) aesthetic values, air quality, cultural and heritage resources, ecosystem services, fish and wildlife species, forage, grazing and rangelands, habitat and habitat connectivity, recreation settings and opportunities, riparian areas, scenery, soil, surface and subsurface water quality, timber, trails, vegetation, viewsheds, and other relevant resources and uses;
- b) protections for public water supplies and water quality; and scenic character.

The discussion of the proposed amendment's ability to support and enhance watershed conditions and wildlife habitat within the Santa Fe Mountain Landscape Restoration Project area is provided under 36 CFR 219.8 Sustainability and 36 CFR 219.9 Diversity of Plant and Animal Communities. Beneficial impacts to these resources would also improve the associated multiple uses. For example, by improving watershed conditions and wildlife habitat, there would be increased opportunities for wildlife viewing, improved recreational uses, and sustainable ecosystems. Timber treatments allowed as part of the proposed modifications to the Forest Plan could also contribute to traditional cultural uses, forest product industries, and rangeland uses, because access to such forest products or opening up stands would be desirable.

The proposed modification to the Forest Plan to allow for mechanical treatments on steep slopes could alter recreation experience, particularly scenery as a result of surface disturbance, smoke and charred vegetation from unplanned and prescribed fires, and long-term changes in vegetation structure and composition. The impacts to scenery and recreational settings would be localized and visible in both the short and long term. Impacts from smoke would be short term; these impacts would dissipate when fire activities cease. Resulting charred vegetation from fires would be visible in the long term. Scenic quality would be further impacted by the presence of activity slash and temporary roads and skid trails in the short term. These impacts would be reduced by natural vegetation regeneration and site rehabilitation in the long term. Changes to vegetation structure would have long-term, positive effects on scenic quality because improving forest health and resiliency also improves the recreation setting.

In conclusion, the proposed modifications to the Forest Plan would not result in substantial adverse effects associated with the multiple use requirement nor would the proposed amendment substantially lessen protection for a specific resource, such as cultural resources, or activities associated with multiple use. As a result, this plan amendment is consistent with the multiple use requirements at 36 CFR 219.10.

## Project and Activity Consistent with Plan

In conclusion, no conflicts or inconsistencies with the 2012 Planning Rule substantive requirements have been identified for the proposed amendment described above. The proposed amendment would aid forest restoration efforts by allowing implementation of needed vegetation treatments across the project area, as opposed to treating smaller portions of the project area. While there would be short-term adverse impacts from the project, the resulting long-term benefits would include a sustainable, resilient forest ecosystem capable of supporting diverse plant and animal communities and multiple uses valued by local communities and visitors.

The impacts of the proposed Forest Plan amendment are fully analyzed in the environmental assessment.

## **Appendix F. Strategy for Avoiding Cumulative Watershed Effects**

The following strategy was deemed necessary to avoid adverse cumulative watershed effects (CWEs) by the proposed action and grazing, while also considering the timing and potential effects of successive proposed treatments within a single watershed. These activities have the most potential to cause adverse CWEs because they both can reduce vegetative ground cover. Vegetative ground cover significantly diminishes the adverse effects of the proposed action by slowing, infiltrating, and filtering runoff. Figures F.1 and Figure F.2 display the strategy described in text below.

For a watershed of any size, a broadcast burn unit of any size, and once a broadcast burn unit has been implemented<sup>3</sup>-

- Fire managers will communicate vegetation burn severity to watershed staff; were there any areas of *moderate or high severity*?
  - *If not, no action.* Prescribed fire can continue within the watershed as soon as a burn window allows; the assumption being that ground cover has not been significantly and adversely affected; is expected to positively respond to the nutrients released by the burn and will become more effective at filtering and infiltrating water (by the next monsoon season).
  - *If the prescribed fire resulted in an area of moderate or high vegetation burn severity,* and the area is thought to be large enough to potentially have significant effects- an IDT of fire/fuels, watershed and range staff will go to the field to investigate. A BARC map may be used to better understand the extent of potential impacts. Areas of moderate or high severity will be targeted, especially those near stream channels. Evidence of impacts to water quality (e.g., ash flows, rills, debris flows) will be sought out. Residual ground cover and the potential for needle-cast will be assessed. The potential for winter precipitation and monsoon precipitation will be considered; what is the likelihood winter precipitation will support vigorous growth of ground cover in the spring? What is the likelihood the monsoon season will be very active? What is the risk of erosion during the monsoon season?
    - If there is evidence of impact to water quality *or* soil productivity, *or* there is concern for the regeneration of ground cover- consider delaying burning within the same watershed. Re-evaluate the burn unit after a wet season; resume burning in the watershed once enough ground cover has been established to eliminate or minimize cumulative adverse impacts.
    - If there are no impacts *and* ground cover regeneration is highly likely, consider burning additional blocks within the watershed. Because impacts to water quality are most likely to occur during the monsoon season, the potential for cumulative watershed effects by spring burns will be more difficult to assess than those by fall burns; *therefore, be more cautious when making the decision to burn in the spring (following a prior fall burn).*
- Per the range design feature; where prescribed fire overlaps with a pasture, grazing would be deferred for *at least* one year. Monitoring of forage volume and vigor would determine when grazing would commence. Assessment would be accomplished by an interdisciplinary team of fire/fuels, watershed and range staff.

---

<sup>3</sup> The proposed action applies the following annual limits to implementation:

- Maximum prescribed fire unit would be 2,000 acres
- Annual maximum prescribed fire treatment area would be 4,000 acres (in two sessions; one spring burn and one fall burn, in any one watershed.)
- Annual maximum vegetation thin would be 750 acres



