



United States Department of Agriculture

# Draft Record of Decision for the Southwest Jemez Mountains Landscape Restoration Project

## Santa Fe National Forest, Sandoval County, New Mexico



Forest Service

Santa Fe  
National Forest

Jemez  
Ranger District

MB-R3-10-21  
August 2015

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Printed on recycled paper – August 2015

# Contents

<b>Purpose of this Document and Background of the Project.....</b>	<b>1</b>
Decision .....	1
Permits, Licenses, and Authorizations Needed to Implement the Decision .....	3
Rationale for the Decision.....	3
Other Alternatives Considered.....	4
Alternative 2 – No Action .....	5
Alternative 3 – No Construction of Temporary Roads .....	5
Alternative 4 – No Prescribed Fire in Mechanical Treatment Areas .....	5
Alternative 5 – Implement the Existing Forest Plan Standards and Guidelines for Managing Mexican Spotted Owl Habitat.....	5
Environmentally Preferable Alternative .....	6
Public Involvement .....	6
Tribal Consultation .....	7
Findings Required by Law and Regulation.....	8
National Forest Management Act .....	8
National Environmental Policy Act (NEPA).....	8
Endangered Species Act.....	8
Forest Service Sensitive Species.....	9
Management Indicator Species.....	10
Migratory Bird Treaty Act and Executive Order 13186 .....	10
National Historic Preservation Act .....	10
Clean Water Act .....	10
Clean Air Act .....	11
Executive Orders 11990 and 11988 - Wetlands and Floodplain Management .....	11
Executive Order 12898 - Environmental Justice .....	11
Wild and Scenic Rivers Act .....	12
Inventoried Roadless Areas.....	12
Jemez National Recreation Area.....	12
Forest Plan Consistency.....	12
Implementation .....	13
Contact .....	13
<b>Appendix A. Design Features, Best Management Practices, Mitigations and Monitoring..</b>	<b>15</b>
<b>Appendix B. Forest Plan Amendments .....</b>	<b>53</b>



# Purpose of this Document and Background of the Project

This is the draft record of decision (DROD) for the Southwest Jemez Mountains Landscape Restoration Project (SWJM). An environmental impact statement was developed to analyze the potential effects of the SWJM project. The final environmental impact statement (FEIS) for the SWJM has been prepared pursuant to the requirements of the National Environmental Policy Act (NEPA, 40 CFR 1500-1508), the National Forest Management Act and its implementing regulations, and the Santa Fe National Forest Land and Resource Management Plan 1987, as amended (USDA Forest Service 1987). The decision presented in this document addresses activities proposed on lands administered by the USDA Forest Service for which Federal decisions are required.

In 2009, Congress authorized the Collaborative Forest Landscape Restoration Program (CFLR), which encouraged collaborative, science-based ecosystem restoration of forest landscapes. This is a competitive program that awards funding to the top restoration proposals nationwide. The program provided the opportunity for the Santa Fe National Forest and the key restoration partners—Valles Caldera National Preserve (VCNP), Jemez Pueblo, The Nature Conservancy, New Mexico Forest and Watershed Restoration Institute—to develop a proposal and move forward with landscape restoration in the Southwest Jemez Mountains area. Over 40 agencies and groups met and developed the Southwest Jemez Mountains Collaborative Forest Landscape Restoration Strategy (USDA Forest Service and VCNP 2010). The group proposed to treat over 210,000 acres across multiple land ownerships and integrate treatments for riparian and forest ecosystems, wildlife habitat, and cultural resources.

The FEIS documents the analysis of the environmental effects of forest and watershed treatments across approximately 110,000 acres of National Forest land. This work would be done over 8-10 years or until objectives are met. The purpose of the project is to restore ecosystem structure and function and increase resilience to undesirable, large-scale disturbances such as high-severity wildfire, climate change, or insect outbreaks in the Southwest Jemez Mountains. Five alternatives were considered and analyzed.

This DROD documents my decision along with the rationale, and alternatives considered in reaching the decision.

## Decision

This decision answers:

Whether the proposed action should be implemented as proposed, modified by another action alternative, or not implemented at all, and whether to amend the forest plan. The decision includes determining; (1) the location and treatment methods for all restoration activities; (2) design criteria, mitigation, and monitoring requirements; (3) the components that will be included in the monitoring plan; (4) the wood products or material made available as a by-product of project activities; and (5) whether the forest plan will be amended if an action alternative is chosen.

Based on my review of the environmental analysis disclosed in the Southwest Jemez Mountains Landscape Restoration FEIS, the project record, and consideration of public comments received

on the environmental impact statement, I have decided to implement alternative 1, with modifications, further referred to as the Selected Alternative. The Selected Alternative is the proposed action as described in chapter 2 of the FEIS. All project design features, mitigation measures, and best management practices that apply to this decision are included in appendix A of the DROD. These are intended to avoid, minimize, rectify, reduce, eliminate and/or compensate for project impacts. These measures are an integral and required part of this project. Monitoring requirements will be implemented according to the forest plan. All practicable means to either avoid or minimize environmental impacts have been adopted as part of this decision.

I have also decided to amend the forest plan (pages 56, 62, 63, 72, 151, 171, and appendix D). The amendments address; (1) treating vegetation in Mexican spotted owl habitat; (2) clarifying language regarding openings or interspaces in northern goshawk habitat; (3) removing activity restrictions during breeding seasons for northern goshawk and turkey; (4) modifying scenery and visual quality objectives; and (5) changing management and survey protocols in peregrine falcon nesting habitat. These amendments update the Forest Plan with the best available science associated with restoration of frequent fire forests in the Southwest, recovery of the Mexican spotted owl (2012 Revised Recovery Plan), and help us to meet the purpose and need of the project. The final forest plan amendments are in appendix B of this DROD.

The Selected Alternative authorizes the following activities for implementation over the next 8-10 years or until objectives are met:

- Mechanically treat approximately 30,000 acres of ponderosa pine and mixed conifer forest
- Use prescribed fire on approximately 77,000 acres
- Allocate 20 percent of ponderosa pine and 20 percent of dry mixed conifer vegetation types as old growth
- Create and maintain aspen stands
- Restore and revegetate riparian areas by planting native vegetation, stabilizing streambanks, and building exclosures to restrict impacts from grazing ungulates
- Protect and improve water flow from seeps and springs by removing competing vegetation
- Control nonnative and invasive plants using methods other than herbicides
- Protect cultural resources by treating vegetation and controlling erosion
- Improve riparian and aquatic wildlife habitat by installing instream structures
- Close and revegetate degraded campsites
- Re-open and reconstruct, if necessary, approximately 20 miles of existing closed roads and close them after use
- To support project activities, re-open and maintain approximately 87 miles of existing closed roads and close them after use.
- Construct approximately 12 miles of temporary roads for use on the project and decommission them when treatments are completed
- Decommission up to 100 miles of roads identified as candidates for decommissioning as part of this project
- Develop up to five gravel pits and access roads to provide gravel for road maintenance and improvement work

- Amend the Forest Plan with 12 site-specific, nonsignificant forest plan amendments

The following modifications to Alternative 1 are incorporated into the Selected Alternative:

- Additional design criteria were added for the gravel pit locations and associated rehabilitation plan
- Additional design criteria were added for temporary roads, their use, locations, and associated rehabilitation plan
- Additional mitigation measure regarding pre-treatment surveys for Mexican spotted owl was added
- Additional design criteria for wetlands protection were added
- Additional design criteria, mitigation measures, and monitoring were added for the Mexican spotted owl, Jemez Mountains salamander, and the meadow jumping mouse as a result of consultation with the U.S. Fish and Wildlife Service.
- Additional design criteria were added for wetlands protection

## Permits, Licenses, and Authorizations Needed to Implement the Decision

- The discharge of dredged and fill material resulting from the instream habitat improvement treatments requires a section 404 permit from the U.S. Army Corps of Engineers.
- The discharge of pollutants (sediment) to waters of the U.S. requires a Clean Water Act 401 Water Quality Certification and a Clean Water Act 402 National Pollutant Discharge Elimination System (NPDES) permit from the New Mexico Environment Department.
- Obtain appropriate air quality permits, as applicable, from the New Mexico Environment Department for all quarrying, crushing and screening equipment or facilities contracted in conjunction with the project.
- Continue consultation with the USFWS in accordance with Section 7 of the Endangered Species Act.
- Consult with the New Mexico State Historic Preservation Officer, tribes, and consulting parties regarding identification, evaluation, and determination of effects of the project on cultural resources in accordance with Section 106 of the National Historic Preservation Act.
- Coordinate prescribed fire applications with New Mexico Environment Department, Air Quality Bureau to ensure compliance with air quality regulations.

## Rationale for the Decision

My decision is based on a review of the project record, which includes a thorough examination of relevant scientific information and acknowledgement of incomplete or unavailable information, scientific uncertainty, and risk. I have considered input from groups and individuals with responsible opposing views and addressed their comments in the FEIS, appendix C, Response to Public Comments on the Draft Environmental Impact Statement. These responses are also found in the project record.

I believe the Selected Alternative best meets the purpose and need of the project by identifying a suite of treatments that afford the greatest opportunities to restore ecosystem structure and function and increase forest resilience to undesirable, large-scale disturbances in the Southwest Jemez Mountains. At the same time, as a by-product of restoration activities, forest products will be produced, and utilization of these materials will help support the economy of the surrounding rural communities. Road and watershed treatments will improve conditions in all watersheds including the San Antonio Creek sub-watershed. Treatments will provide protection for nearly 3,000 cultural sites, enhance recreation opportunities, and improve overall forest and watershed health. Through the use of prescribed fire on 77,000 acres, we will reduce hazardous fuels and the risk of severe wildfires and reintroduce an important natural process that historically helped to sustain desired forest conditions. The SWJM project exemplifies the purpose of the Collaborative Forest Landscape Restoration Program and meets Congress's intentions for accelerating restoration across large landscapes using a collaborative process.

For more than five years, members of my staff have worked collaboratively with a broad range of stakeholders in the development of the Southwest Jemez Mountains Landscape Restoration Strategy (SWJM Strategy) and the FEIS. The holistic restoration goals and objectives of the SWJM Strategy- *improving the resilience of ecosystems to recover from natural disturbance; reducing the risk of uncharacteristic wildfire; restoring natural fire regimes; increasing forest diversity and old growth characteristics; improving fish and wildlife habitat; improving water quality and watershed function; mitigating climate change impacts; and utilizing woody by-products*- were a critical factor in the SWJM project's selection for funding. These goals and objectives, along with cultural site projection, were brought forward into, and are clearly reflected in the purpose and need for this project.

Change in a forest is incremental. The Selected Alternative considers the tradeoffs between short-term adverse effects (i.e., environmental harm) and long-term benefits. Implementation of the Selected Alternative will lead to some unavoidable adverse effects on endangered species (individuals), sensitive species (individuals), water quality, air quality, and scenic quality. However, mitigation measures (appendix A) have been adopted to reduce these adverse effects to the extent practicable while still achieving project objectives.

My decision considered all comments received during the scoping period, field trips, and notice and comment period. The Selected Alternative considers the comments received from stakeholders with the environmental consequences as described in the FEIS.

I recognize that there is a range of strong public opinions regarding the variety of treatments identified in the Selected Alternative. However, I have concluded that my decision is an informed one that best meets the SWJM project's purpose and need, moves the SWJM project area toward desired conditions, and considers the environmental consequences(both positive and negative) of the selected restorative actions. Monitoring and evaluation during implementation will provide information on the effects of this decision.

## Other Alternatives Considered

The FEIS displayed the effects of five alternatives. The Selected Alternative was described previously. The other four alternatives are summarized below and are described in detail in the FEIS. The environmental effects of the alternatives are compared in table 3 in the FEIS. Three

additional alternatives were considered but eliminated from detailed study for reasons described in the FEIS, chapter 2.

### **Alternative 2 – No Action**

This is the no action alternative as required by 40 CFR 1502.14(c). There would be no changes in current management and the forest plan would continue to be implemented. Alternative 2 is the point of reference for assessing action alternatives (see FEIS, chapter 2). This alternative would implement pre-approved activities including thinning approximately 900 acres of ponderosa pine and dry mixed conifer and using prescribed fire on approximately 18,400 acres. Some other pre-approved activities, such as cultural resource protection, nonnative and invasive plant control, and wildlife habitat improvement projects would be implemented.

### **Alternative 3 – No Construction of Temporary Roads**

This alternative responds to the issue of constructing new temporary roads to implement mechanical treatments (see FEIS, chapter 2). Only those areas accessed by existing forest system roads would be mechanically treated. Those acres not accessible by existing roads would be treated with prescribed fire instead of being mechanically treated, as in alternative 1. This alternative would mechanically treat approximately 28,300 acres of fire-adapted ecosystems (ponderosa pine and dry mixed conifer) and use prescribed fire on approximately 77,000 acres. Other restoration treatments for cultural resources, watersheds, and wildlife habitat are included in this alternative. These actions are listed in chapter 2 of the FEIS. Site-specific forest plan amendments are needed to implement this alternative.

### **Alternative 4 – No Prescribed Fire in Mechanical Treatment Areas**

This alternative responds to the issues of smoke and the scale of prescribed fire treatments (see FEIS, chapter 2). Prescribed fire would not be used in areas that are mechanically treated. The total area treated is the same as the proposed action. Instead of prescribed fire, slash resulting from mechanical treatments would be chipped or ground up (masticated), or lopped and scattered and left on site. Prescribed fire would occur in areas described as prescribed fire only under alternative 1. This alternative would mechanically treat approximately 29,900 acres of fire-adapted ecosystems (ponderosa pine and dry mixed conifer) and use prescribed fire on approximately 45,500 acres. Other restoration treatments for cultural resources, watersheds, and wildlife habitat are included in this alternative. These actions are listed in chapter 2 of the FEIS. Site-specific forest plan amendments are needed to implement this alternative.

### **Alternative 5 – Implement the Existing Forest Plan Standards and Guidelines for Managing Mexican Spotted Owl Habitat**

This alternative was designed in response to issues raised regarding treatments in Mexican spotted owl (MSO) protected activity centers (PACs) and restricted habitat (see FEIS, chapter 2). The proposed forest plan amendments related to treatments in Mexican spotted owl habitat would not be needed to implement this alternative. This alternative would mechanically treat approximately 29,900 acres of fire-adapted ecosystems (ponderosa pine and dry mixed conifer) and use prescribed fire on approximately 76,300 acres. Other restoration treatments for cultural resources, watersheds, and wildlife habitat are included in this alternative. These actions are listed in chapter 2 of the FEIS. Site-specific forest plan amendments that do not pertain to the Mexican spotted owl are needed to implement this alternative.

## Environmentally Preferable Alternative

The environmentally preferable alternative "...is the alternative that will best promote the national environmental policy as expressed in NEPA's section 101 (42 USC 4321). Ordinarily, the environmentally preferable alternative is that which causes the least harm to the biological and physical environment; it also is the alternative which best protects and preserves historic, cultural, and natural resources. In some situations, there may be more than one environmentally preferable alternative," (36 CFR 220; FSH 1909.15). Social and economic factors are not considered when identifying the environmentally preferable alternative. Identification of the environmentally preferable alternative is required by 40 CFR 1505.2(b) in a record of decision.

For this project, I believe that Selected Alternative is the environmentally preferable alternative because it best meets the goals of Section 101 of the National Environmental Policy Act for this proposed federal action:

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
- (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
- (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

## Public Involvement

The SWJM project was posted on the Santa Fe National Forest's schedule of proposed actions on April 1, 2012. During the spring and summer of 2012, the Forest solicited comments on the purpose and need and the proposed action through public meetings and field trips. Detailed information about these meetings can be found in the project record. The notice of intent to prepare an environmental impact statement was published in the Federal Register on July 11, 2012 (Volume 77, Issue 133). A draft of the proposed action was sent to a mailing list (hard copy and email) of individuals, organizations, State and local governments, Federal and State agencies, and tribes. A report summarizing the comments received on the draft proposed action was posted on the Santa Fe National Forest website in February 2013.

The interdisciplinary team reviewed the comments received and used them to identify relevant issues. Four key issues were used to develop alternatives, develop design features or mitigation measures that reduce unwanted effects, and to evaluate, analyze, and compare the effects of the different alternatives. These relevant issues were:

- the use of prescribed fire, smoke, and their effects on the environment and human health;
- the scale of the area to be treated with mechanical treatments (tree cutting), and how this may affect wildlife, watersheds, and scenery;
- opening closed roads and building new temporary roads and their effects on the environment, and
- the effects of the mechanical treatments and prescribed fire on habitat for the Jemez Mountains salamander, Mexican spotted owl, and northern goshawk.

The team also identified other comments as nonsignificant issues or concerns. Many of these concerns were considered and incorporated in the FEIS or design criteria, mitigations, and best management practices. Others were addressed in the environmental consequences. These and other changes made to the proposed action in response to public comments and interdisciplinary team discussions are listed in chapter 1 of the FEIS.

A notice of availability announcing the comment period for the DEIS was published in the Federal Register (volume 79, issue 40) on February 28, 2014. A legal notice announcing the availability of the *Southwest Jemez Mountains Landscape Restoration Project Draft Environmental Impact Statement* for review and comment was published in the *Albuquerque Journal* on March 4, 2014. The 45-day comment period ended April 15, 2014. Twenty-five individuals, organizations, and agencies submitted written comments within the comment period; two comments were received after the comment period closed. Substantive comments are summarized along with Forest Service responses in appendix C of the FEIS. Appendix D of the FEIS contains comment letters received from government agencies in their entirety in accordance with Forest Service Handbook 1909.15. All public comments and mailing lists are available in the project record.

## Tribal Consultation

Tribal consultation has occurred throughout the project development and analysis. This project has been included in the forestwide annual tribal consultation. Consultation packages were submitted to 36 tribal governments, their representatives, and allied government organizations. These tribes included Pueblo, Navajo, and Apache groups (see appendix A in the cultural resources specialist report for a complete list). These tribes have historic ties and an interest in the Santa Fe National Forest. Tribal members and representatives also participated in field trips to the project area. The Pueblo of Jemez has played an integral role in the development of the archaeological site treatments. They attended partner meetings during the early development of the landscape strategy and have also attended field trips to the SWJM project area.

Several of the surrounding tribes raised the issue of the importance of protecting Douglas-fir stands. Douglas-fir boughs are used for ceremonial purposes and recent wildfires have destroyed many Douglas-fir stands in the area. Tribal members and representatives who attended the field trips expressed strong support for the fuels and erosion control treatments on archaeological sites. The Pueblo of Jemez and the State Historic Preservation Office agreed that low-intensity prescribed fire would further reduce fuel loads and promote long-term protection of these sites from unplanned ignitions.

## Findings Required by Law and Regulation

After consideration of the discussion of environmental consequences (FEIS, chapter 3), I have determined that the Selected Alternative is consistent with the Santa Fe National Forest Land and Resource Management Plan, as amended, and Agency directives. I have also determined that the Selected Alternative is consistent with applicable Federal laws, Executive Orders, and regulations. The following is not an all-inclusive listing, but summarized conformance with the laws and regulations most relevant to this decision.

### **National Forest Management Act**

I find that this decision, including the nonsignificant amendments to the Santa Fe National Forest Land and Resource Management plan, as amended, is consistent with the goals and objectives of the forest plan. This decision also complies with the management direction and standards and guidelines for all relevant management areas described in the plan.

### **National Environmental Policy Act (NEPA)**

The NEPA requires Federal agencies to consider and disclose the effects of proposed actions that significantly affect the quality of the human environment. The Southwest Jemez Mountains Landscape Restoration Project FEIS analyzes the alternatives and displays the effects in conformance with NEPA (40 CFR 1500 to 1508 and FSH 1909.15).

### **Endangered Species Act**

This decision is consistent with the Endangered Species Act of 1973. The FEIS discloses potential impacts to the Federally-listed species in the SWJM project area- the Mexican spotted owl (threatened), the Jemez Mountains salamander (endangered), and the New Mexico meadow jumping mouse (endangered) in chapter 3.

The analysis concludes that the Selected Alternative may affect, and is likely to adversely affect the Mexican spotted owl and its critical habitat. Short-term impacts to the species will likely result; however, the selected alternative also results in long-term benefits to the owl by increasing habitat resilience to large, high-severity wildfires. Also, vegetative diversity will likely improve, which would improve prey abundance and availability for the owl.

For the Jemez Mountains salamander, the analysis concludes that the Selected Alternative may affect, and is likely to adversely affect, the salamander and its critical habitat. The adverse effects are expected to be short term and there is a projected long-term benefit to the salamander by increasing habitat resilience to large, high-severity wildfires.

For the jumping mouse, the analysis concludes that the Selected Alternative may affect, and is likely to adversely affect, the mouse and its proposed critical habitat. Adverse effects to the mouse are expected to be very minor and many actions in the Selected Alternative will result in improvement of proposed critical habitat for the Mouse. The U.S. Fish and Wildlife Service concurred with our determination of effects on the Mexican spotted owl, the Jemez Mountains salamander and the New Mexico meadow jumping mouse. For all three species, the design features and mitigation measures listed in appendix A would minimize effects on individual animals and their habitats.

The analysis for threatened and endangered species also included proposed and candidate species that may become federally protected within the life of the project. These species are the wolverine (proposed 10(j)) and the following candidate species: Western yellow-billed cuckoo, Rio Grande cutthroat trout, and Canada lynx. The determinations are shown in the table below.

**Table 1. Summary of determination for federally protected and candidate species in the Southwest Jemez Mountains Landscape Restoration Project area**

Species	Status	Determination
Jemez Mountains salamander	Endangered	May affect, likely to adversely affect
Mexican spotted owl	Threatened	May affect, likely to adversely affect
New Mexico meadow jumping mouse	Endangered	May affect, likely to adversely affect
North American wolverine	Proposed experimental population	May affect, not likely to adversely affect
Western yellow-billed cuckoo	Proposed threatened	May affect, not likely to adversely affect
Rio Grande cutthroat trout	Candidate	May affect, likely to adversely affect

Since we have determined that the Selected Alternative may adversely affect Rio Grande cutthroat trout, this species was considered as though it were a proposed species for the purpose of the analysis.

Formal consultation occurred with the U.S. Fish and Wildlife Service and a final, signed biological opinion was issued. The conservation and other protective measures in the biological opinion are incorporated by reference in appendix A of the FEIS. The site-specific amendments related to treatments in owl habitat are designed to meet the guidance within the 2012 Revised Recovery Plan for the owl and are therefore consistent with recovery objectives for the owl.

### Forest Service Sensitive Species

Federal law and direction applicable to Forest Service sensitive species are included in the National Forest Management Act and the Forest Service Manual (2670). The Regional Forester has developed the sensitive species list for plants and animals for which population viability is a concern. We prepared a biological evaluation on species designated as sensitive by the Regional Forester. It was determined that the Selected Alternative may affect individuals, but will not cause a trend toward federal listing for the following sensitive species: pale Townsend's big-eared bat, American marten, masked shrew, northern leopard frog, Preble's shrew, water shrew, American peregrine falcon, northern goshawk, gray vireo, boreal owl, Rio Grande chub, Rio Grande sucker, Springer's blazing star, yellow lady's slipper, and wood lily.

It was determined that the Selected Alternative would have no effect on the following sensitive species: white-tailed ptarmigan, burrowing owl, bald eagle, Lilljeborg's pea-clam, American pika, Goat Peak pika, Gunnison's prairie dog, Canada lynx, tufted sand verbena, Greene's milkweed, Chaco milk vetch, Pecos mariposa lily, Pecos fleabane, Chama blazing star, Heil's alpine whitlowgrass, and Arizona willow. These species are not known to occur in the project area, the

project area is not within the range of the species, or the project area does not have essential habitat for the species.

### **Management Indicator Species**

Effects on management indicator species (MIS) are disclosed in chapter 3 of the FEIS. Wildlife MIS within the project area include Rocky Mountain elk, Merriam's turkey, mourning dove, hairy woodpecker, pinyon jay, Mexican spotted owl, and Rio Grande cutthroat trout. Project activities will have short-term effects on these species. I find that the Selected Alternative is consistent with the standards and guidelines pertaining to MIS. Additionally, based on the limited effects to any MIS, the Selected Alternative does not result in a reduction in the number of acres of available habitat for any of the MIS, and does not contribute towards a negative trend in viability on the Forest.

### **Migratory Bird Treaty Act and Executive Order 13186**

The Selected Alternative, with the design features, mitigation measures, and best management practices described in appendix A of the FEIS and DROD, provides for adequate conservation measures for migratory birds. Unintentional take of some individual birds may occur under the Selected Alternative, but no long-term impacts on bird populations are expected (FEIS chapter 3).

### **National Historic Preservation Act**

The National Historic Preservation Act (NHPA) and the NEPA both require that consideration be given to the potential effects of federal undertakings on historic resources (including historic and prehistoric cultural resource sites). The guidelines for assessing effects and for consultation are outlined in the Region 3 programmatic agreement with the New Mexico State Historic Preservation Office and section 106 of the NHPA. Cultural resource surveys have been conducted for upcoming ground-disturbing activities requiring inspection and are documented in the cultural resources clearance report. Because the project will be conducted over more than one year, clearance of future activities will be accomplished using a phased approach as defined in appendix J of the programmatic agreement.

The potential effects from this project are not considered to be adverse. The recommended protective measures will adequately protect the known cultural resources. The site protection measures were developed to be consistent with the NHPA and adapted for use across the Forest. The New Mexico State Historic Preservation Office has completed Phase I of the clearance. Contracts will contain provisions listed in the SHPO review for the protection of known and new sites found during project activities.

### **Clean Water Act**

The Clean Water Act of 1948, as amended, establishes as Federal policy the control of point and nonpoint pollution and assigns the States the primary responsibility for control of water pollution. Compliance with the Clean Water Act by National Forests in New Mexico is achieved under State law. The Selected Alternative will not result in long-term, adverse impacts to water quality within or downstream from the area (FEIS, chapter 3). The Selected Alternative is expected to result in minor increases in sediment delivery to the low gradient, perennial, intermittent and/or ephemeral stream channels as a result of the use of heavy machinery for mechanical treatments and instream work. These increases would occur in the first year following activities. With the use of the site-specific design features, mitigation measures, and best management practices, this alternative

meets the laws and associated regulations designed to protect water quality. Based on this analysis, I find that the Selected Alternative is consistent with the Clean Water Act.

## **Clean Air Act**

The Clean Air Act, as amended, is the comprehensive Federal law that regulates air emissions from stationary and mobile sources. This law authorizes the Environmental Protection Agency to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emission of hazardous air pollutants. The FEIS (chapter3) has a thorough analysis of the Selected Alternative's potential impacts on air quality, including compliance with NAAQS.

The Selected Alternative is designed to be consistent with the provisions of the Clean Air Act, its implementing regulations, and associated State and Federal air quality standards. The Selected Alternative meets all conditions of the New Mexico Smoke Management Program (SMP), which meets the requirements of the Clean Air Act and the Regional Haze Rule (40 CFR 51.309). The primary concern with this project in regard to air quality is smoke emissions from prescribed fires. No exceedance of Federal or State NAAQS is expected from the operation of vehicles (including exhaust and fugitive dust) or prescribed fire treatments. There is a potential for significant health impacts because of exposure to PM<sub>2.5</sub>. Prescribed fires will be planned, designed, and implemented to achieve good smoke dispersal and minimize adverse smoke effects on air quality and public health and safety, complying with the New Mexico SMP. As such, I find that the Selected Alternative is consistent with the Clean Air Act.

## **Executive Orders 11990 and 11988 - Wetlands and Floodplain Management**

Appendix A of the FEIS lists the mitigation measures and best management practices. Wetlands and floodplains will be avoided and protected by streamside management zones. There will be minor pulses of sediment and ash into wetlands and riparian areas resulting from use of heavy machinery and prescribed fire treatments. Treatments for roads and headcuts, streambank stabilization, and instream work would reduce the amount of sediment into streams and wetlands. The riparian and channel restoration treatments will create additional wetland areas and increase connected and functional floodplain areas. The Selected Alternative protects floodplains and water quality adjacent to wetlands.

## **Executive Order 12898 - Environmental Justice**

Executive Order 12898 governs Federal actions to address environmental justice in minority and low-income populations. The provisions also apply to programs involving Native Americans.

This decision will result in disproportionate impacts on minority, low-income, and/or Native American population as a result of smoke emissions from prescribed fires. There are also beneficial effects on these populations from the creation of jobs in the wood products industry, generation of wood products for personal use, and protection of cultural resources.

Prescribed fire management techniques and other measures described in appendix A of the FEIS will reduce impacts from smoke. Mitigation measures include notification of potentially affected minority, low-income, and/or Native American communities before and during prescribed fire treatments. Also, in accordance with Forest Service policy, contracting procedures will be

advertised and awarded in a manner that gives proper consideration to minority and women-owned business groups.

Local tribes were consulted throughout the development of this project and they will continue to be involved throughout the decision-making and implementation processes.

### **Wild and Scenic Rivers Act**

The SWJM project actions were assessed for potential effects on the East Fork Jemez Wild and Scenic River to determine compliance with Section 7 of the Wild and Scenic Rivers Act. All activities were assessed for their effects on free flow, water quality, and the Outstandingly Remarkable Values for which the East Fork was designated. No adverse effects on the East Fork are expected. The project is in compliance with the Comprehensive River Management Plan, as amended into the forest plan.

### **Inventoried Roadless Areas**

The 2001 Roadless Area Final Rule (36 CFR Part 294) established protections for Inventoried Roadless Areas (IRAs). The rule prohibits road construction, reconstruction, and timber harvest except for other than stewardship purposes. The proposed treatments meet the criteria for stewardship purposes.

The project record contains an analysis of the effects of the restoration treatments on each of the nine values or features that often characterize inventoried roadless areas, as identified in the Roadless Area Final Rule. The analysis found that the proposed treatments, including the mechanical treatments would improve or have no adverse effect on the nine values or features of roadless areas. Therefore, this project is consistent with the 2001 Roadless Rule.

### **Jemez National Recreation Area**

The analysis of effects on the Jemez National Recreation Area (JNRA) found that effects are largely positive. Proposed project implementation is consistent with the JNRA Management Plan as amended into the forest plan.

### **Forest Plan Consistency**

My decision to implement the Selected Alternative is consistent with Forest Plan goals and objectives, and standards and guidelines as documented in the resource sections in chapter 3 of the FEIS, in the Rationale section of this DROD, and the Forest Plan Consistency report in the project record. The Selected Alternative incorporates forest plan amendments that are not significant. The amendments are listed in appendix B of this record of decision to the 1987 Santa Fe National Forest Plan and were analyzed and presented in the FEIS in chapters 2 and 3.

The amendments adopt language that allows treatment of vegetation within Mexican spotted owl protected activity centers; that is consistent with the revised recovery plan for the Mexican spotted owl; eliminates activity restrictions during breeding seasons for northern goshawk and turkey; that clarifies vegetation needs for northern goshawk habitat, that eliminates language referring to other plans that do not exist, and modifies scenery and visual quality objectives. These amendments are necessary to assure that we meet the purpose and need of this project while assuring consistency with the forest plan.

All of the proposed amendments are not significant. Regulations guide development, revision, and amendment of land management plans. The amendments were initiated as part of the notice of intent in July 2012, using the 1982 planning rule provision to amend the plan as allowed by the transition language of the 2012 planning rule (36 CFR 219.17(b)(3)). On amending a forest plan, the 1982 planning regulations state: “If the change resulting from the amendment is determined not to be significant for the purposes of the planning process, the Forest Supervisor may implement the amendment following appropriate public notification and satisfactory completion of NEPA procedures (36 CFR 219.10(f)(1982)).”

The amendments are not significant because they (1) do not significantly alter the multiple-use goals and objectives for long-term land and resource management, (2) consist of adjustments of management area boundaries or management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management, or (3) are minor change in standards and guidelines (FSM 1926.51).

As Forest Supervisor of the Santa Fe National Forest, I have determined from the review of the FEIS that these amendments do not change the goals, objectives, or outputs of the forest plan and do not constitute significant amendments to the forest plan. I have also determined that the amendments provide a better means of achieving the desired ecological conditions described in the forest plan for northern goshawk and Mexican spotted owl habitats as well as the purpose and need.

## Implementation

If no objection is filed, implementation may begin on, but no sooner than the fifth business day following the end of the 45-day objection filing period (36 CFR 218.11). If an objection is filed, implementation may begin immediately following the date of the final decision.

## Contact

For additional information concerning this draft decision and final environmental impact statement, please contact Chris Napp, Southwest Jemez Mountains Landscape Restoration Project EIS team leader, Santa Fe National Forest, by telephone at 505-438-5448, or by email at [cnapp@fs.fed.us](mailto:cnapp@fs.fed.us). Additional information is also available on the project website (<http://go.usa.gov/BUVh>).



# Appendix A. Design Features, Best Management Practices, Mitigations and Monitoring

This section contains additional detail regarding how the various project activities will be implemented on the ground. They include; Design Features, Best Management Practices, Mitigation Measures, Conservation Measures and Monitoring Measures:

**Design Features:** a list of existing conditions and management actions designed to guide implementation of on the ground activities to achieve desired conditions while minimizing adverse effects.

**Best Management Practices (BMPs):** guidelines or minimum standards for proper application of forestry operations. These are designed primarily to prevent soil erosion and water pollution and to protect certain wildlife habitat values in riparian and wetland areas.

**Mitigation Measure:** an activity or limitation placed upon a project activity to avoid or minimize adverse effects.

**Conservation Measure:** a mitigation measure designed to address effects on wildlife.

**Monitoring Measure:** physical and biological evaluation of project activities to determine how well objectives are being met and if the effects of the activities are within those projected during the analysis.

## All Activities

### Design Features

**Purpose:** **The cumulative watershed effects analysis will provide the “hard look” required by NEPA and provide the decision-maker with the best available science.**

1. Use suitable tools to analyze the potential for cumulative watershed effects to occur from the additive impacts of the proposed project and past, present, and reasonably foreseeable future activities on National Forest System and neighboring lands within the project watersheds. This analysis will use the Equivalent Disturbed Area-Equivalent Roded Area (EDA/ERA) method.

### Best Management Practices

**Purpose:** **To minimize impacts to soil and water resources, to minimize non-point source pollution, to adhere to the Clean Water Act, and to adhere to the agreement between the Southwestern Region of the Forest Service and the New Mexico Environment Department.**

2. Implement best management practices (BMPs) and design criteria for those actions requiring non-point source and point source water quality through the iterative process of monitoring and adjusting BMPs and water quality standards.

## Air Quality and Smoke Management

### Design Features

**Purpose:** **To reduce emissions**

#### For Prescribed Fires:

3. Follow all requirements listed in the New Mexico State Smoke Management Regulations, including coordination requirements with New Mexico Environmental Department's Air Quality Bureau (AQB). The AQB will facilitate coordination with agencies to ensure that burning does not occur on the same days as other prescribed fires that may impact the same areas, and to avoid exceeding air quality or visibility standards, in accordance with Clean Air Act requirements.
4. Notify potentially affected communities, other agencies, fire departments, campground visitors, Jemez Pueblo, and others, in advance of and during the burn activities.
5. Include specific smoke management (emission reducing) objectives and measures in burn plans, including the use of backing fires, aerial ignitions, and other methods known to reduce emissions (Hardy et al. 2001).
6. Burning will occur during times of relatively high fuel moistures in the larger fuels so that they are not consumed; this can reduce emissions by 43% (Hardy et al. 2001).
7. Do not burn when ventilation is considered poor, below 20,000 knot-feet, for the entire day<sup>1</sup>. Stop ignitions before nightfall to allow for good ventilation and smoke clearing at night. Avoid situations that lead to overnight active fire behavior.
8. Monitor meteorological conditions, smoke dispersion and emissions, before and during prescribed fire treatments, and coordinate with the State Environment Department to determine whether to stop ignitions or take other corrective actions if air quality standards are exceeded or public health or safety is compromised by smoke.
9. Plan individual burn blocks so that ignitions will not exceed 3 days, not including blacklining.

### Mitigation Measures

**Purpose:** **To reduce fugitive dust**

#### For Road Construction, Maintenance, and Decommissioning:

10. Where no requirements exist, dust control measures will be considered according to the standards and specifications for federal road construction (FHWA 2003).

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<sup>1</sup> Ventilation is the atmospheric potential to disperse airborne pollutants. It is calculated by multiplying the mixing height by the transport wind speed. 20,000 knot-feet is approximately 23,000 mph-ft.

## Cultural Resources

### Design Features

**Purpose:** These are overall design features for all sites and are derived from typical practices.

**For all sites:**

11. Sites listed on the National Register of Historic Properties will receive priority for treatment. Sites that are not eligible for listing on the National Register of Historic Properties will be documented, but not treated.
12. The existing road system will be used to access sites.
13. Prescribed fire treatment of archaeological sites will be implemented at the same time as the landscape restoration burning, provided heavy fuels are removed from sites prior to burning.

**Purpose:** These design features are specific to archaeological sites in ponderosa pine and mixed conifer forests. They are derived from typical practices used in fuels removal from cultural sites and resources.

**For archaeological sites in ponderosa pine and mixed conifer vegetation types:**

14. Remove dead and down logs that are lying on the site, especially those in direct contact with rubble mounds. Old, decomposing logs will not be removed during monsoon season or when the ground is wet.
15. Cutting will be done with chainsaws. Do not use mechanical ground disturbing equipment.
16. Use directional felling to keep trees from falling on rubble mounds.
17. On rubble mounds, cut all trees less than 16-inches diameter. Use professional judgment on trees 16-24-inches in diameter. Leave most trees greater than 24-inches diameter, which would survive a fire.
18. Cut stumps flush to the ground. On artifact scatter around the rubble mounds, thin trees to a 20-foot spacing. Favor leaving trees larger than 16-inches diameter.
19. In ponderosa pine and mixed conifer, favor leaving ponderosa pine over other tree species.
20. In ponderosa pine and mixed conifer, cut all piñon and juniper.
21. Prune trees up to 4 feet above ground level.

**Slash Treatments:**

22. Generally, do not make slash piles within site boundaries unless directed by the district archaeologist.
23. Slash will be hand-carried outside of the site boundary or to an area designated by the district archaeologist.

24. If there is a small amount of slash, scatter it so that the slash is less than 2-feet high. If there is too much slash to scatter, pile slash in a location determined by the district archaeologist. Slash piles will be burned at a later time or chipped.
25. Utility vehicles (UTVs) may be used outside the site boundary and on existing 2-track roads or UTV trails within the site boundary if approved by the district archaeologist. Do not create new UTV trails or 2-track roads.
26. Spread slash in areas with active erosion. Place logs on the contour and away from site features or areas with artifacts. Remove branches so that the log will be in contact with the ground surface and decompose more quickly.

**Purpose:** **These design features are specific to archaeological sites in the piñon-juniper woodlands. They are derived from typical practices of fuels removal from cultural sites and resources and erosion prevention techniques.**

**Archaeological sites in piñon-juniper vegetation types:**

27. Cut all trees on rubble mounds except datum tree. Prune the datum tree to 4-feet above ground level.
28. Cutting will be done with chainsaws. Do not use mechanical ground-disturbing equipment. Use directional felling to keep trees from falling on rubble mounds.
29. Around the rubble mounds, cut trees using a 10-foot spacing (between outside edge of crowns).

**Slash:**

30. Place slash over rills, headcuts, erosional areas, sheeting outside the site boundary. Small amounts of slash can be strategically placed in headcuts inside site boundaries as directed by district archaeologist. When possible, scatter slash instead of making piles. Chipping is acceptable.
31. Follow UTV guidelines for ponderosa pine and mixed conifer vegetation types above

**Mitigation Measures**

**Purpose:** **Items 32-34 are standard mitigations for all work in areas that contain archaeological sites. Item 35 is part of the phased approach that is allowed through the Region 3 Programmatic Agreement. Items 36 and 37 are mitigation measures specific to the Southwest Jemez Landscape Restoration Project.**

**Items 38-39 are derived from Appendix J of the Region 3 Programmatic Agreement, which is the standard protocol for large-scale fuels reduction, vegetation treatment, and habitat improvement projects.**

**Items 40-44 are derived from Appendix E of the Region 3 Programmatic Agreement, which is the standard protocol for routine road maintenance, road closure, and road decommissioning.**

**Items 45-50 are associated with the design criteria for treatments in archaeological sites also presented in this table. These mitigations are specific to the treatment of archaeological sites, but will be conducted in parallel with prescribed fire and mechanical treatments.**

**For all activities:**

32. Mark all archaeological sites on-the-ground for identification purposes using white flagging tape or white paint to delineate the boundary to ensure that all mitigation measures can be applied. The site datum or reference tree will be marked with three horizontal bands.
33. Within archaeological site boundaries, avoid any ground-disturbing activity, including commercial thinning (i.e. timber sales), construction of firelines, mop-up actions, slash piling, staging or turnaround of heavy equipment, staging of materials, or use of mechanized or ground-disturbing equipment.
34. If previously unidentified cultural materials are discovered during implementation, cease working in the area until Forest Service archaeologists have been notified and approve restarting the work.
35. Initiation of work in any phase of the project will be contingent upon completion of the identification and protection of historic properties and compliance with applicable provisions of the National Historic Preservation Act in accordance with the Standard Consultation Protocol, including consultation with Native American Tribes.
36. In areas where only prescribed fires or only mechanical thinning may occur, brush and remove dead fuels for a distance beyond site boundaries in order to reduce the intensity of prescribed fires or wildfires in the area. The treatment would be sufficient to reduce fire effects to cultural resources to the level of a low intensity fire depending on site specific conditions as determined by a professional archaeologist with experience in fuels treatment to reduce fire effects.
37. After prescribed fire is used, monitor the areas around sites for fire-killed trees that need to be felled away from the archaeological sites.

**For prescribed fires:**

38. Avoid fire ignition points within boundaries of fire-sensitive archaeological sites (i.e. sites with wooden features, rock art, cliff dwellings, etc.). Provide aerial ignition pilots with GPS locations of specific fire-sensitive sites and large pueblo sites to avoid when conducting aerial ignitions.
39. Protect fire-sensitive sites using the following methods: lining, back burning, foaming, and/or otherwise insulating wooden features, in addition to removing heavy fuels. Monitor fire-sensitive sites subsequent to burning and modify protection measures if effects are documented.

**For road maintenance and road decommissioning:**

40. Conduct limited testing within the road prism to determine whether the road has cut below the cultural deposits of a known archaeological site.

41. Restrict vehicular traffic to the existing road prism within known archaeological sites to protect intact cultural deposits that lie outside the road prism.
42. Place temporary fencing to keep equipment out of known archaeological site boundaries.
43. Close or gate roads to protect archaeological sites.
44. Prohibit road maintenance activities within site boundaries unless limited testing demonstrates the road has cut below cultural deposits and consultation on effect has been completed.

**For treatments conducted within archaeological site boundaries:**

45. All treatments will be conducted with district or forest archaeologist oversight and/or monitoring.
46. Cut trees using chainsaws only.
47. Fell large diameter trees away from all features.
48. Remove fuels from sites by hand carrying.
49. Do not drag logs, trees, or thinned materials across or through sites and features.
50. Allow prescribed fire to burn over non-fire-sensitive sites, provided heavy fuels are removed prior to burning.

## **Monitoring Measures**

**Purpose:** **Effectiveness monitoring**

51. Additional monitoring for the effectiveness of treatments would be done throughout the life of the project. Long-term site monitoring would focus on public visitation and vandalism of sites.

**Purpose:** **Consultation**

52. Consult with the tribes to identify traditional cultural properties and traditional use areas before treatments are implemented in a particular area.

## **Fire and Fuels**

### **Design Features**

**Purpose:** **To maintain long-term soil productivity and minimize sediment delivery from containment lines.**

53. If containment lines are put in place, rehabilitate lines after use by either rolling the berm back over the entire fireline, spreading slash across the fireline or installing waterbars on the fireline. If the line is only to be rehabilitated with waterbars, disguise the first 400 feet or past straight line of sight of line to discourage use as a trail

**Purpose:** **To maintain long-term soil productivity.**

54. On areas to be treated with prescribed fire, fire prescriptions should be designed to minimize soil temperatures over the entire area. High intensity fire should occur on 10% or less of the entire area. Fire prescriptions should be designed so that soil and fuel

- moisture are such that fire intensity is minimized and soil health and productivity are maintained.
55. On areas to be treated with prescribed fire, manage for 5-7 tons per acre of coarse woody debris in ponderosa pine to be left on site after burning to maintain long-term soil productivity.
  56. Within the piñon-juniper cover type, snags and large woody debris LWD (generated as a result of the prescribed fire treatments will be left on site as a resource benefit.

**Purpose:** **In accordance with Forest Service National Core BMPs (2012), Aquatic Management Zones will be used in project planning, analysis, and decision making and will further incorporate BMPs and design features to improve water quality.**

**To minimize sediment and/or ash delivery into drainages and maintain water quality**

57. In areas to be treated with prescribed fire, establish filter strips (also known as Aquatic Management Zones). These stream reaches will be designated as protected streamcourses and wetlands. Do not ignite fuels within this buffer area. Fire is allowed and expected to creep into the buffer. The following are recommendations to protect streamcourses and wetlands.

*Riparian streamcourses and wetlands:*

- Severe erosion hazard: 120 feet on each side of streamcourse and wetland.
- Moderate erosion hazard: 100 feet on each side of streamcourse and wetland.
- Slight erosion hazard: 70 feet on each side of streamcourse and wetland.

*Non-riparian streamcourse:*

- Severe erosion hazard: 100 feet on each side of streamcourse.
- Moderate erosion hazard: 70 feet on each side of streamcourse.
- Slight erosion hazard: 35 feet on each side of streamcourse.

**Purpose:** **To minimize sediment and/or ash delivery into drainages and maintain water quality and maintain soil productivity.**

58. Construct drainage structures (waterbars, rolls, dips, armor) along fire containment lines as needed to prevent erosion and runoff.

## **Best Management Practices**

**Purpose:** **To reduce soil loss and sediment input to streams. Maintain soil productivity and channel function.**

### **For all prescribed fire treatments:**

59. Conduct prescribed fires to minimize the residence time on the soil while meeting the burn objectives. Manage fire intensity to maintain target levels of soil temperature and duff and residual vegetative cover within the limits and at locations described in the prescribed fire plan. Conduct prescribed fire treatments, including pile burning for slash disposal, in a way that encourages efficient burning to minimize soil impacts while achieving project objectives.

## Gravel Pits

### Design Features

**Purpose:** **To minimize effects on recreation use.**

60. Conduct exploratory drilling to determine extent and quality of rock source.
61. The maximum size of a single pit will not exceed 5 acres.
62. To the extent possible rock pits will be located near existing system roads to minimize the need for road construction and reconstruction.
63. Newly constructed pits will not be located in inventoried roadless areas, the Jemez Wild and Scenic River Corridor, the Jemez National Recreation Area, the Monument Canyon Research Natural Area, Management Area I, Mexican spotted owl protected activity centers, Jemez Mountains salamander critical habitat, areas with a Visual Quality Objective level of Retention or Partial Retention.
64. Access roads will not exceed one-half mile (0.5 miles) in length.

**Purpose:** **To reduce emissions**

65. Contract provisions for quarrying operations will require operators to obtain the appropriate air quality permits under NMAC 20.2.72, as applicable, for gravel quarrying, crushing, and screening operations.

**Purpose:** **Gravel pit rehabilitation**

66. Save as much soil as possible during mine operations. If the soil has a well-developed profile and there is room for a stockpile, it is best to create a discrete stockpile. If there is not much soil and it does not have an A-B-C profile, and there is no room to stockpile, the use the soil to create berms to prevent off-site runoff. Silt fencing would also be installed outside the berms. Plant saved topsoil with native shrubs, trees, legumes, or grasses.
67. Contour to blend into the surrounding area.
68. Limit drainage out of the site to reduce sedimentation.
69. Excess waste materials will be spread evenly over the bottom of the area excavated.
70. Restore slopes in excess of 1:2 to less than 1:2 (50% slope).
71. After restoration, the graded or backfill area shall not allow polluted water to collect or remain in the area.
72. Stabilization shall be accomplished by surfacing with soil of a quality that is at least equal to the topsoil of land areas immediately surrounding the gravel pit.
73. Such topsoil, as required in item 13, will be planted with native shrubs, trees, legumes, or grasses.

## Harvesting Operations

### Design Features

**Purpose:** **To minimize loss of soil productivity and limit erosion.**

74. The timber sale administrator or contracting officer representative will contact the watershed staff prior to proposed unit closeout to ensure that mechanical equipment remains onsite to implement erosion control measures.

**Purpose:** **To minimize sediment detachment and to minimize impacts on severe erosion soils.**

75. Do not blade roads when the road surface is too dry. If the road surface is too dry, use a water truck to apply water, or the project can be scheduled for when adequate moisture occurs to complete the project.

**Purpose:** **To minimize impacts to streams and soils in meadows from tree harvesting operations.**

76. In meadow restoration sites where wood is being removed, designate skid trails in order to limit disturbance from skidding. Where material is not being removed, lop and scatter or manually remove slash from meadow; these are the preferred methods of treating slash.

77. No skidding over wet meadows or across live streams or stream channels.

78. Leave sufficient numbers of cut trees (large woody debris) onsite for needed surface flow grade control. Forest watershed personnel will identify locations for large woody debris before works starts and/or inspect large woody debris placement work done by the timber sale administrator or contracting officer representative at unit closeout.

79. Do not machine pile slash and woody debris within meadows.

**Purpose:** **To minimize soil erosion, maintain soil productivity, and to minimize impacts on severe erosive soils.**

80. Place slash on or cross-ditch (waterbar) skid trails and obliterated roads to break the energy flow of water. Placing slash on skid trails is the preferred method. Waterbars are only to be built using equipment with an articulating blade (no skidders) or by hand.

81. Do not design a long, straight skid that would direct water flow. Locate skid trails outside of filter strips

**Purpose:** **To minimize ground disturbance from skidding operations and minimize impacts on severe erosive soils.**

82. Require felling to the lead to minimize ground disturbance from skidding operations. Felling to the lead is cutting trees in a predetermined direction within a certain area of the unit based on terrain and the skid road system. This makes it is easier for the skidders to gather and remove the logs and has fewer impacts on the soil.

**Purpose:** **To minimize soil loss and sedimentation of streamcourses from skidding operations and to minimize noxious weed spread and re-establish native vegetation and to minimize impacts on severe erosive soils.**

83. Outline the timing and application of erosion control methods in the sale contract. Seed mix will include certified weed-free native species.

84. Use the Santa Fe National Forest Terrestrial Ecosystem Survey to identify potential vegetation for individual sites and seed type needed for revegetation.

85. Use the design features in Forest Service Handbook (FSH 2509.22, Chapter 20.24.22) to minimize soil loss and sedimentation. The preferred erosion control method on skid trails in the harvest areas is spreading slash. Other acceptable erosion control measures include, but are not limited to, waterbarring, removing berms, seeding, mulching and cross-ripping. Waterbars should not be more than two feet deep and need at least a ten-foot leadout. Erosion control after skidding operations must be timely to minimize the effects of log skidding.

**Purpose:** **To minimize soil movement, maintain water quality, and to minimize impacts on severe erosion soils.**

86. Control road drainage with the following methods including, but not limited to: rolling the grade, insloping, outsloping, crowning, water spreading ditches, and contour trenching. Reduce sediment loads at drainage structures by installing sediment filters, rock and vegetative energy dissipaters, and settling ponds. Include road designs in the transportation plan of the task order.
87. As part of the contract and task order, require prehaul and post haul maintenance on all local roads used for hauling.

**Purpose:** **In accordance with Forest Service National Core Design Criteria (2012), aquatic management zones will be used in project planning, analysis, decision making, and implementation to improve water quality.**

**To provide sediment filtering ability and/or to provide bank stability on all streamcourses and wetlands and minimize impacts on erosive soils.**

88. The designation of filter strips (also known as Aquatic Management Zones) minimizes onsite soil movement from timber harvest activities along streamcourses and wetlands. These stream reaches and wetlands will be designated as protected streamcourses and wetlands. Include locations of protected streamcourses and wetlands in the individual Task Order Maps, and mark these streamcourses and wetlands with a protected streamcourse designation.
89. The following are recommendations to protect streamcourses and wetlands within the proposed tree harvest units in relation to riparian streamcourses and wetlands and non-riparian streamcourses. The guidelines for filter strip designations are as follows:

*Riparian streamcourses and wetlands:*

- Severe erosion hazard: 120 feet on each side of streamcourse and wetland.
- Moderate erosion hazard: 100 feet on each side of streamcourse and wetland.
- Slight erosion hazard: 70 feet on each side of streamcourse and wetland.

*Non-riparian streamcourse:*

- Severe erosion hazard: 100 feet on each side of streamcourse.
- Moderate erosion hazard: 70 feet on each side of streamcourse.
- Slight erosion hazard: 35 feet on each side of streamcourse.

90. Do not cut any tree contributing to shade on the stream in the primary shade zone (this zone represents any tree providing shade to a perennial stream during greatest solar inputs, 1000 hours through 1400 hours. Do not cut any tree that will destabilize the

streamcourse bank. Manual cutting and hand dragging of trees is allowed. No mechanical entry in aquatic management zones.

91. Should a perennial stream crossing be needed, the timber sale administrator or the contracting officer representative will contact the Supervisor's Office watershed staff for pre-planning and field visits.

**Purpose:** **To filter sediment and/or provide bank stability on all drainage courses and to minimize impacts on drainage courses.**

**For all intermittent drainages:**

92. Establish a 30-foot filter from the channel center.
93. Do not cut trees cut that will destabilize the drainage course.
94. Do not operate mechanical equipment within the filter area.
95. Obtain onsite approval for any needed crossing from the timber sale administrator, contracting officer representative, or Supervisor's Office watershed staff. Crossings will have sufficient armoring.
96. Allow handcutting and hand-dragging of trees within the filter if cutting them does not destabilize the drainage course.
97. Allow chain-dragging trees out of the 30-foot filter on dry or frozen soil. The heavy equipment doing the dragging is NOT allowed in the 30-foot filter area.
98. Do not place any slash pile within the filter boundaries.
99. Do not allow construction of landings within the filter area.

**For all ephemeral drainages:**

100. Establish a 15-foot filter from the channel center.
101. Do not cut trees cut that will destabilize the drainage course.
102. Do not operate mechanical equipment within the filter area.
103. Obtain onsite approval for any needed crossing from the timber sale administrator, contracting officer representative, or Supervisor's Office watershed staff. Crossings will have sufficient armoring.
104. Allow handcutting and hand-dragging of trees within the filter if cutting them does not destabilize the drainage course.
105. Allow chain-dragging trees out of the 15-foot filter on dry or frozen soil. The heavy equipment doing the dragging is NOT allowed in the 15-foot filter area.
106. Do not place any slash pile within the filter boundaries.
107. Do not allow construction of landings within the filter area.

**Purpose:** **To promote long-term soil productivity.**

108. Manage for a minimum of 5 to 7 tons per acre of boles on ponderosa pine sites.

**Purpose:** **To minimize and mitigate impacts from activities that compact sites and restore long-term soil productivity and to minimize impacts on severe erosion soils.**

109. Identify landings and staging areas for heavy equipment and any in-woods processing sites outside of filter strips and meadows. Rehabilitate sites after use by methods such as, but not limited to: 1) ripping to remove compaction; and 2) seeding with certified weed free native seed to 5 pounds per acre; and 3) spreading of slash to disguise the site and provide a mulch for seeds. Use the Santa Fe National Forest Terrestrial Ecosystem Survey to identify species for seed mix.

**Purpose:** **To promote long-term soil productivity.**

110. Because operating during wet or soil saturated conditions is the top condition leading to resource damage, suspend task order unit activities when wet or saturated operating conditions are identified by the timber sale administrator, contracting officer representative, Supervisor's Office watershed staff, the timber sale administrator, contracting officer representative, or Supervisor's Office watershed staff or operators.

111. Manage for all slash in piñon-juniper sites to be spread effectively and sufficiently in order to slow overland flows of water.

112. Allow mechanical crushing of lopped slash only on slopes of 0-25%.

## **Design Feature and Monitoring Measure**

**Purpose:** **EDA/ERA validation monitoring. The project offers an opportunity to test the EDA/ERA cumulative effects indicator with real world data collected through the CFLR program. Through this monitoring, along with data collected by the New Mexico Environment Department and watershed condition surveys, EDA/ERA may be correlated to the modeled EDA/ERA effects. The interdisciplinary team used a threshold of concern of 15% to model cumulative effects for HUC 12s. By comparing these projections against the data collected, we can determine if the threshold modeled is too high or too low.**

113. For HUC 12s with an EDA/ERA existing condition of less than 15%: recalculate the EDA/ERA and compare it with the monitoring data every two years.

114. For HUC 12s with an EDA/ERA existing condition of greater than 15%, including Church Canyon-Jemez River, East Fork Jemez River, Outlet Rio Cebolla and Outlet San Antonio, recalculate the EDA/ERA and compare it with the monitoring data every year.

## **Headcut Treatments**

### **Design Features**

**Purpose:** **To minimize loss of soil productivity and limit erosion.**

115. Headcuts accessed by existing roads with surrounding non-erosive soils are candidates for mechanical treatment (placing of materials by machinery). Headcuts not accessed by

existing roads or that are on erosive soils can receive mechanical treatment if done when dry or frozen soil conditions exist.

116. Conditions or timing may limit treatments by hand crews.

**Purpose:** **To minimize loss of soil productivity and limit erosion.  
Prevent further loss of soil due to headcut migration.**

117. Mechanical treatments include using a dump truck, backhoe, and a small staging area.

118. Place staging area on the road or immediately adjacent to the road.

119. Use locally available material when feasible.

120. Use hand treatments at those locations without road access or those areas needing less (mechanical) disturbance due to resource concerns (soils, cultural, wildlife).

121. Hand treatments may include mechanical staging of fill material.

122. Prioritize treatment locations with respect to current sediment inputs into perennial streams and those perennial streams that are 303-d listed for sediment and/or turbidity

## **Best Management Practices**

**Purpose:** **To reduce soil detachment and transport.**

123. Repair degraded channel function (headcut) and improve water quality and soil stability.

## **Instream Habitat Restoration, Bank Stabilization, and Stream Channel Treatments**

### **Design Features**

**Purpose:** **Design feature specific to project.**

124. For all activities, use local materials and native plants when available.

**Purpose:** **To prevent sediment inputs into the stream; prevent increasing of width-to-depth ratio and entrenchment ratio.  
Create aquatic habitat.**

125. Bank stabilization treatments may include the following: 1) mechanical actions (i.e. use of a dump truck for staging material and backhoe for placing material); 2) installing or placing post-vanes, bank armor, or grade control large woody debris or boulders; 3) key rootwad placement, or 4) gravel or bedload augmentation.

126. Use bank stabilization treatments on those perennial streams needing actions to improve a 303-d listing or those needed for aquatic habitat improvement.

**Purpose:** **To prevent sediment inputs into the stream; prevent increasing of width-to-depth ratio and entrenchment ratio.**

**For all bank stabilization treatments (including removal of failed fish structures):**

127. Use silt fences or waddles, if needed, to stop localized soil disturbance.

128. Plant native riparian vegetation to further stabilize the bank work.

- 129. Install fencing to protect the bank work.
- 130. Work will take place during base-flow conditions and dry or frozen soil conditions.
- 131. When feasible, use manual labor in the placing of post-vane, armor, bed-load additions or other similar structures

**Purpose:** **To prevent sediment inputs into the stream; prevent increasing of width-to-depth ratio and entrenchment ratio. Create aquatic habitat. Create wetland habitat.**

- 132. Stream re-channelization will be used only in stream reaches meeting the qualifying stream channel physical characteristics. The primary technique will be plug and pond.
- 133. This action may take place on 2 identified locations, one each on San Antonio Creek and the Rio Cebolla, with each reach not to exceed 200-yards of stream course.

**For all stream re-channelization:**

- 134. A 401/404 permit from the U.S. Army Corps of Engineers is required.
- 135. Mechanical equipment may be used and includes the use of dump trucks and backhoes. Use silt fences and/or waddles, if needed, to keep sediment out of streams.
- 136. Actions will not take place during periods of bankful flow. Actions will take place during periods at or near base-flow.
- 137. Install fencing around both the old and new stream channels in each of the selected stream reaches.
- 138. Plant native riparian vegetation for bank stabilization.

**Best Management Practices**

**Purpose:** **To prevent soil detachment and transport, reduce sedimentation, stabilize streambanks and provide aquatic habitat.**

**To reconnect flow to floodplain, create riparian and aquatic habitat, and reduce soil loss and sedimentation.**

**For all bank stabilization treatments:**

- 139. Design and implement stream channel projects in a manner that increases the potential for success in meeting project objectives and avoids, minimizes, or mitigates adverse effects to soil, water quality, and riparian resources.

**For all stream re-channelization activities:**

- 140. Design channels with natural stream pattern and geometry and with stable beds and banks; provide habitat complexity where reconstruction of stream channels is necessary.

## Nonnative and Invasive Plants

### Mitigation Measures

**Purpose:** To prevent spread and establishment of nonnative and invasive plants.

#### For harvesting operations:

141. Prior to moving off-road equipment onto the sale area, purchaser shall identify the location of the equipment's most recent operation. Purchaser shall not move any off-road equipment that most recently operated in an area infested with one or more invasive species of concern onto the sale area without having cleaned such equipment of seeds, soil, vegetative matter, and other debris that could contain or hold seeds, and having notified the Forest Service.
142. Prior to moving any off-road equipment subject to cleaning requirements, the purchaser will advise the Forest Service of its cleaning measures and make the equipment available for inspection. The Forest Service will have two days, excluding weekends and Federal holidays, to inspect the equipment after it has been made available. After satisfactory inspection or after the 2-day period, the purchaser may move the equipment as planned. Equipment will be considered clean when a visual inspection does not disclose seeds, soil, vegetative matter, and other debris that could contain or hold seeds. The purchaser will not be required to disassemble equipment unless so directed by the Forest Service after inspection.
143. If the purchaser desires to clean off-road equipment on National Forest land, such as at the end of a project or prior to moving to, or through an area that is free of invasive species of concern, Purchaser shall obtain prior approval from Contracting Officer as to the location for such cleaning and measures, if any, for controlling impacts.

#### For road maintenance:

144. Clean and carefully inspect all earth-moving or tree-masticating equipment prior to entry onto forest land to ensure removal of all dirt, plants, and other foreign material that may transport noxious weed seeds.
145. Treatment may be deferred on a particular weed species when a reason is stated.

## Private Property and Structures

### Mitigation Measures

**Purpose:** To protect flammable structures

146. Notify landowners in advance of prescribed burning.
147. Protect flammable structures in the project area from fire-related damage by removing fuels, building firelines, burning blacklines, or other methods.

## Rangeland Resources

### Mitigation Measures

**Purpose:** To protect range infrastructure. Monitor resource conditions.

**For prescribed burning:**

- 148. Protect fire-sensitive range infrastructure (corrals, pipelines, water storage tanks, water troughs, fences, and cattleguards) from fire damage. Methods may include pre-burn fuel removal, fire containment lines around structures, strategic ignition patterns, or other methods.
- 149. Fencelines will be used as burn area boundaries when possible.
- 150. Fire and timber personnel will coordinate with district range staff on prescribed burn operations and harvesting activities at least one year prior to implementation.

**For all activities:**

- 151. Existing rangeland monitoring sites will be located prior to treatments. Monitoring sites will not be excluded from treatments; however, sites will not be used for landing areas, skid trails, slash piles, gravel pits or roads.
- 152. Timber operations will consult with the district range staff to determine pasture use during harvest activities.
- 153. All fences will be protected from harvesting activities. Temporary cattleguards will be installed if needed. Skid trails, and temporary roads will be laid out so as to avoid cutting fences.
- 154. All water facilities (earthen dams, trick tanks, storage tanks, pipelines, drinkers, etc.) should not be removed or excluded by harvesting or prescribed burning operations.

**Purpose:** **To minimize economic effects on grazing permittees.**

- 155. No single grazing allotment will be treated with prescribed fire for two consecutive years.
- 156. When and where possible, take advantage of natural barriers and existing roads to limit soil disturbance and construction of new fire lines.

## Recreation

### Mitigation Measures

**Purpose:**

- To maintain consistency with Forest Plan in regard to tree cutting in wild segment of the East Fork Jemez River Wild and Scenic River. (p. 2002-4).**
- To provide resource protection on trails within project area.**
- To minimize impacts on majority of visitors, who use the forest during summer season.**
- Protect trail amenities.**
- To avoid mechanical treatments in the Semi-Primitive Non-Motorized ROS setting within wild segment of the East Fork Jemez River Wild and Scenic River.**

157. Avoid using trails as skid trails or temporary roads. If a trail, or section of trail, is used as a skid trail or temporary road, include trail clean up and rehabilitation in the contract. This shall include restoring the trail to its original width.
158. Avoid conducting initial entry prescribed burns in the Jemez National Recreation Area (JNRA) during peak recreational season (Memorial Day weekend through Labor Day).
159. Avoid treatment implementation on weekends and during holiday weekends.

## Riparian Area Restoration

### Design Features

**Purpose:** **Design features specific to project. To reduce ungulate use in riparian areas and impacts along streambanks.**

160. Dispersed recreation areas needing treatment will be identified by the district recreation staff and the forest watershed specialist.
161. Close sites by placing soil, rock, and boulders on and around the site. Exclosures may be built to limit access by livestock and people.
162. Best effort will be made to use immediate, locally available material and plants.
163. Gaps between exclosures should be a sufficient length to spread out livestock and wildlife water access use to reduce concentrated stream and streambank impacts. Gaps along the stream between exclosures should be at least double the size of the exclosures.
164. Where vegetation has been severely impacted, planting of riparian shrubs, i.e., willow, and transplanting of sedges may be done within the exclosures.

## Road Decommissioning and Rehabilitation Treatments

### Design Features

**Purpose:** **To reduce effects from roads.**

165. Intensity of treatment will depend on what resources are in the area, length of the road, soil conditions, slope of the roads, and resource being damaged.
166. Use the following methods: installing signs, blocking entrances, restoring vegetation, eliminating the road bed, and other methods described in Forest Service Manual 7734.1.
167. Roads causing damage to hydrological resources, cultural resources or threatened endangered, and sensitive species habitat are a priority for decommissioning.

**Purpose:** **To minimize soil erosion and minimize spread of noxious weeds.**

**For site rehabilitation on stream-crossing projects where ground disturbance occurs:**

168. Seed with native, certified weed-free seed mix at rate and composition needed for each site. Use the Santa Fe National Forest Terrestrial Ecosystem Survey to identify species to be seeded at individual sites. Where feasible, spread slash across the disturbed area to create microclimates and protect from grazing ungulates.

**Purpose:** **To minimize soil erosion and minimize spread of noxious weeds.**

169. Install silt fences and/or waddles downstream from ground-disturbing activities in stream channels to minimize sediment delivery into the stream during construction. Remove silt fences when revegetation is completed.

**Purpose:** **To comply with state and federal water quality standards by minimizing sediment delivery to drainages and to create microclimate for regeneration of grass and forb communities and minimize spread of noxious weeds.**

170. Use hydromulch, mulch, erosion mats, slash, or other methods to protect newly disturbed soils (e.g.) at stream-crossing sites as needed and where feasible. Use only certified weed-free straw.

**Purpose:** **To comply with state and federal water quality standards by minimizing soil erosion through the stabilizing influence of vegetation ground cover. Minimize spread of noxious weeds.**

**Site rehabilitation at stream crossing sites:**

171. Use one of the following revegetation methods for site rehabilitation such as, but not limited to: 1) Store sod removed from the initial ground disturbance and replace the sod from the top of the bank on the disturbed site; 2) Seed with a native seed mix (see above) 3) Protect site with slash spread across the disturbed area to create microclimates and protect from grazing ungulates. Limit slash placement to the upper 2/3 of the streambank to limit downstream transport of woody material; 4) Fence out ungulates until the site has reestablished); 5) use mycorrhizal inoculum on severely disturbed sites where no topsoil is left; and 6) install erosion mats.

**Purpose:** **To minimize disturbance in drainage systems and minimize sediment production within channel.**

172. Do not borrow road fill or embankment materials from the stream channel or meadow surface on road maintenance or stream crossing projects. Compact (compress) the fill dirt.

**Purpose:** **To minimize sediment delivery into drainage and to minimize disturbance in drainage systems and minimize sediment production within channel.**

173. Relocate roads out of filter strips to an upland location where feasible. If this is not feasible, use riprap or velocity checks to stabilize or disperse water outfall on road maintenance projects when roads are located within filter strips.

**Purpose:** **To comply with state and federal water quality standards by minimizing soil erosion through stabilization of ground cover. Minimize noxious weed spread.**

174. At stream crossing sites, restore riparian-dependent grasses by 1) seeding native species, and 2) planting plugs of rushes and sedges to improve success of regeneration efforts. Fence with ungulate proof fencing until plants are established.

## Best Management Practices

**Purpose:** **To comply with Clean Water Act provisions and to reduce channel sedimentation.**

**Roads not stabilized or maintained contribute to excessive soil loss and degraded channel function.**

175. Coordinate stream crossing rehabilitation (channel, shoreline, lake, pond, and wetland activities) with appropriate state and federal agencies. Incorporate Clean Water Act 404 permit requirements and other federal, state, and local permits or requirements into the project design and plan.
176. Road decommissioning includes a variety of treatments to block the road, revegetate the road surface, restore surface drainage, remove crossing structures and fills, mitigate road surface compaction, re-establish drainage-ways, remove unstable road embankments, and recontour the surface to restore natural slopes. One or more treatments are applied to decommission the road depending on resource objectives and cost.
177. Roads not needed for access for long periods (more than 1 year) may be put into “storage” to reduce maintenance costs. Level 1 roads receive basic custodial maintenance focusing on maintaining drainage facilities and runoff patterns to avoid or minimize damage to adjacent resources and to perpetuate the road for future use. The integrity of the roadway is retained to the extent practicable and measures are implemented to reduce sediment delivery from the road surface and fills and reduce the risk of crossing failure and stream diversion.

## Road Maintenance Treatments

### Design Features

**Purpose:** **To reduce channel sedimentation**

178. Mechanized equipment would not be used within clearly defined drainages (perennial, intermittent, or ephemeral) or riparian areas.
179. Restrict ground-based equipment from operating when soils are saturated or approaching saturation.
180. Roads will receive maintenance as needed throughout the life of the project or duration of the contract.

## Scenery

### Design Features

**Purpose:** **Achieve a level of scenic integrity consistent with direction established in the Forest Plan**

**All activities within the viewshed of Sensitivity Level 1 travelways and use-areas (the most sensitive area) as shown on Sensitivity map in the scenery specialist report.**

181. The viewsheds, or areas visible, from the Sensitivity Level 1 areas will be managed to meet or exceed a scenic integrity level of High within five years after implementation: the landscape appears natural; management activities are present but not evident.

182. A landscape architect or forest recreation specialist will be involved with the unit layout strategy in Sensitivity Level 1 areas. The extent of viewsheds from Sensitivity Level 1 areas will be confirmed in the field. Portions of the project area that are representative of the various treatments proposed will be used to convey specific resource instructions and overall marking strategies.

183. For prescribed fire, use existing barriers (roads) and natural barriers as control lines whenever possible.

184. Protect large mature trees where possible, particularly those with a diameter over 26 inches and with yellow bark features.

**All activities within Management Area F (East Fork Jemez Wild and Scenic River):**

185. Existing groupings of gamble oak and other understory vegetation will be retained and encouraged to promote visual diversity.

186. Seeding mixtures will contain a high percentage of berry-producing shrubs, colorful plants, and wildflowers, as prescribed in the Jemez Wild and Scenic River Plan.

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

**Mechanical treatments visible from Sensitivity Level 1 travelways and use-areas:**

187. All created openings will be in scale with the surrounding landscape features. Openings will be strategically located to maintain or create distant views of scenery.

188. Mechanical treatments will be designed to enhance the visual diversity within the landscape by providing for a variety of tree sizes, spacing, and densities.

**Purpose:** **To reduce visibility of fences seen from Sensitivity Level 1 travelways and use-areas.**

189. Design fences that complement the natural and cultural setting by either blending visually into the landscape or reflecting the cultural history of the area. Dark colored metal posts, split-rail, or buck and pole fencing are recommended in areas visible from of Sensitivity Level 1 travelways and use areas.

**Purpose:** **To reduce visibility of meadow treatments, instream work, and headcut treatments seen from Sensitivity Level 1 travelways and use-areas:**

190. Areas where heavy machinery will be used will be restored to a natural-appearing state. Re-grade and re-vegetate around earthen dams and constructed pools and channels to simulate the natural terrain of the area and blend into existing contours.

## **Mitigation Measures**

**All activities within East Fork Jemez Wild and Scenic River**

**Purpose:** **Consistency with management direction in the forest plan.**

191. In the East Fork Jemez WSR, any tree harvest decks and landings will be located outside of the immediate foreground zone (300 feet) of the river, roads, trails, and recreation areas. Landings will be restored to original or characteristic contours and re-vegetate within one year of project completion.

192. Within the East Fork Jemez WSR, dispose of activity-generated slash in the immediate foreground zone (300 feet) of the river, trail and recreation areas within one year of project completion, with the exception of a maximum of five logs per acre with a minimum 12-inch diameter and 15-foot length for wildlife.

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

**Road skid trail and landing construction activities visible from Sensitivity Level 1 travelways and use-areas:**

193. Rehabilitate all equipment staging areas, log landings, skid trails, temporary roads and firelines at the end of the project so as to not be visually evident from Sensitivity Level 1 areas immediately following implementation. Rehabilitation will include returning the ground to natural contours, implementing decompaction and erosion control measures as needed, pulling slash and rocks across firelines, disguising entrances and covering bare soil with slash, chips, needles or cut brush as necessary. Restore proper drainage and reseed as needed with native species. Reseed and mulch landings according to applicable BMPs (see soil and water resources specialist report) as soon as possible to speed recovery. If trails are used, rehabilitate trails to original width, condition, and designated class level.
194. Align temporary roads to use topography and vegetation where possible to help screen them from vista points and Sensitivity Level 1 travelways.
195. Minimize the distance you can see down temporary roads and skid trails from intersections with Sensitivity Level 1 roads and trails. Efforts should be made to have them intersect at a right angle, then curve the temporary road or skid trail soon after the junction to limit the distance seen down the temporary road.
196. Avoid using machinery within the dripline of leave-trees to prevent scarring by equipment.

**Purpose:** **To reduce impacts on scenic integrity**

**For Mechanical Treatments Visible from Sensitivity Level 1 Travelways and Use-areas**

197. The size of created openings visible within foreground distances (½ mile) from the Sensitivity Level 1 areas will range up to 4 acres. Openings in middleground distances (½ mile to 4 miles) will range up to 10 acres.
198. Maintain free-form shapes and edges that reflect the natural, open-space patterns of the desired landscape character. Create openings in the canopy that vary in size and shape while leaving groups or clumps of uneven-aged trees. The shape will relate to the topography and will flow with the contours, following natural lines of the slopes, mesas, ridges, drainages and rock outcrops.
199. Stump heights shall be cut as low as possible, with the cut angled away from the viewer. Flush cut stumps within 4 inches of the uphill side of the stump where possible.
200. Avoid unnatural-looking (straight) lines by undulating edges of the treatment areas horizontally and establishing a diverse height of leave trees.
201. Feather the edges of mechanical treatments to blend into the surrounding landscape. Where the treatment unit is adjacent to denser forest, the percent of thinning within the transition zone is progressively reduced toward the denser edges of the unit. Similarly,

where the treatment unit interfaces with an opening (including meadows and other natural openings) the transition zone is progressively increased toward the open edges of the unit.

202. Mark trees that are to be removed on the backs of trunks, away from the primary viewing point, so marks do not detract from the landscape character.
203. If machine piling is used in areas visible from Sensitivity Level 1 areas, then special brush rakes or grapples are recommended to minimize damage to existing groundcovers.

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

**Slash Treatments Readily Visible from Sensitivity Level 1 Travelways and Use-areas:**

204. Pile and burn, or masticate woody debris visible from Sensitivity Level 1 use-areas as soon as possible after project implementation.
205. No residual material should be left after pile burning. Excess slash to be burned will be piled in irregularly-spaced intervals. Do not build piles in straight lines. Care must be taken to create irregularly shaped burn piles so as to not leave a circular burn footprint.
206. Scatter burned slash on control lines to reduce the color contrast of the exposed soil.

**Purpose:** **To reduce visibility of fences seen from Sensitivity Level 1 travelways and use-areas**

207. In areas visible from Sensitivity Level 1 travelways and use-areas, use dark colored steel posts for elk enclosure fences (8 feet tall).

**Purpose:** **To reduce visibility of meadow treatments seen from Sensitivity Level 1 travelways and use-areas.**

208. Avoid machine piling in meadow areas.
209. Construct concrete barriers, retaining walls, and/or highly visible headwalls and endwalls of box culverts with color and/or texture qualities that blend into the existing landscape.
210. Use native plants characteristic to the area to screen tanks and drinkers from roads and trails.
211. If slash is not removed in meadow treatment areas, then the preferred treatment is to lop and scatter to 24-inches high.

## Seep and Spring Treatments

### Design Features

**Purpose:** **To reduce effects on soil and water resources, limit ungulate access to seep and spring areas, and to retain large trees.**

212. No operation of mechanical (harvest/thin) equipment within the spring-seep complex. No mechanical equipment will be allowed within the spring-seep complex unless the soil is frozen. Cut and remove conifers less than 16-inches diameter that are within 100 feet of identified seeps or springs.
213. Do not cut trees that will lead to destabilization of the spring, seep, or channel. Cutting or falling of conifers is allowed. Drag trees from site only when soil is frozen. Do not drag trees if the drag path crosses or destabilizes a seep, spring, channel or other feature.

214. If possible, pile slash along the 100-ft boundary to limit ungulate access.

215. Large trees may be cut and removed or cut and left in place.

**Purpose:** **To comply with state and federal water quality standards by minimizing soil erosion through stabilization of ground cover. Minimize spread of noxious weeds.**

216. Obtain Supervisor's Office approval and selection of an onsite spring and seep protection specialist(s). This specialist will be onsite during ground-disturbing activities.

**Purpose:** **To improve hydrologic function of seeps and springs.**

217. Cutting and/or removal of conifers is allowed if spring or seep has an existing non-conifer woody or riparian component. If no riparian component exists, remove trees less than 16-inches diameter leaving only those that will improve hydrologic function. If site has all smaller age-classes, leave an appropriate number of trees that will improve hydrologic function.

218. Remove livestock grazing access at spring or seep complexes with fencing. Use material cut onsite or pile (jackstraw) cut material

**Purpose:** **Sufficient quantities of water needed for spring and wetland function will have equal priority to water needed for livestock.**

219. If a spring or seep with a water trough or other water structure is being used by livestock, relocate the water structure away from spring or seep complex.

**Purpose:** **To improve hydrologic function of seeps and springs.**

220. Slash and cut trees can be used (placed) to improve spring or seep hydrologic function. Use manual methods to drag excess fuels offsite, and place in burn piles not exceeding 6-foot diameter and 5-feet high.

**Purpose:** **To improve success of regeneration efforts.**

221. At spring restoration sites, restore riparian-dependent plants by seeding native species and/or planting plugs or cuttings of native plants (trees, shrubs, grasses, forbs, etc.).

## **Best Management Practices**

**Purpose:** **To restore spring and seep habitat to improve function and water quality and quantity.**

222. Consider how existing water quality and quantity and habitat conditions at the project site have been affected by past habitat alterations, hydrologic modification, and riparian area changes in the watershed.

## **Silviculture Treatments**

### **Design Features**

**Purpose:** **To meet forest plan direction for vegetation management.**

#### **Uneven-aged management using selective cutting in ponderosa pine:**

223. A target basal area 50-70 within groups of trees or about 20-70 overall (including interspaces).

- 224. Groups are 0.1 to 4 acres, averaging 0.5 acres, and generally consist of 2 to 14 dominant and co-dominant trees per 0.1 acre.
- 225. Approximately 10% of the area would be in openings (grasses and forbs), and approximately another 10% in regeneration (seedlings and saplings).
- 226. Crown spacing between groups of trees (interspace) would vary depending on treatment intensity. Interspaces would be 30-60 feet between groups of trees. A total of 30-60% of the area would not be treed because of openings and interspaces. There would be more openings where the site index is lower.
- 227. Openings are up to 4 acres in size and placed in VSS 3 and 4 stands, or stands with heavy mistletoe, or around existing openings.
- 228. Size classes would be balanced as much as possible.
- 229. Species composition would be primarily ponderosa pine with Gambel oak and juniper. Douglas-fir and limber pine are incidental.
- 230. Leave 5-7 tons per acre of woody debris and 2 snags per acre.
- 231. Prescribe burn every 5-10 years.

**Purpose:** **To move stands toward desired condition.**

**Stand improvement thinning and burning in ponderosa pine:**

- 232. Thin, primarily from below, to improve growth and vigor.
- 233. Thin tree groups to free-to-grow conditions to allow for rapid growth and development.
- 234. Establish interspaces between remaining tree groups.
- 235. Establish crown spacing between groups that would vary from 30 to 60 feet depending on treatment intensity.
- 236. The priority for establishing openings would be in currently non-stocked areas and in areas that have moderate to severe dwarf mistletoe infection.
- 237. We would use this type of thinning in young, even-aged stands such as plantations, stands with light to moderate dwarf mistletoe, along some prescribed burn firelines, and in remote and/or steep stands.
- 238. Use prescribed fire to treat slash.

**Purpose:** **To meet forest plan direction.**

**Uneven-aged management using selective cutting in dry mixed conifer:**

- 239. Target basal area of 60-80 within groups, or about 30-80 overall (including interspaces).
- 240. Groups are 0.1 to 2.5 acres, averaging less than 1 acre. 10% of the area would be in openings, another 10% in regeneration. A total of 10-50% of the area would not be treed because of openings and interspaces. Interspaces are 30-60 feet between groups of trees.
- 241. Size classes would be balanced as much as possible.
- 242. Species composition is a mix of ponderosa pine, Douglas-fir, limber pine, white fir, and aspen.
- 243. Leave aspen as individual trees or small groups.
- 244. Leave 10-15 tons per acre of down logs greater than 12-inches diameter and 3 snags per acre, on average.

245. Prescribe burn every 7-12 years.

**Purpose:** **To move toward desired condition.**

**Stand improvement thinning and burning in dry and wet mixed conifer:**

**Dry mixed conifer:**

- 246. Treatments are similar to those described for ponderosa pine stand improvement.
- 247. Create groups and openings, but smaller than in ponderosa pine. Higher stand density than in ponderosa pine.
- 248. Prescribe burn to reduce slash.

**Wet mixed conifer:**

- 249. Individual tree selection, light thinning if needed to reduce fire hazard. Burn only if fire backs into stand from an adjacent burn.
- 250. Possible reasons for treatment are: proximity to endangered species habitat, WUI, springs, insects, disease, or other special need areas, or as small inclusions of wet mixed conifer within other cover types.
- 251. Treatments would be uneven aged, individual tree selection across size classes with small (0.1 acre) openings for regeneration.
- 252. Balance successional stages. If early succession (aspen) is lacking (less than 20% of the cover type), cut patches to stimulate regeneration.

**Purpose:** **To move toward desired condition, create diversity across the landscape.**

**Treatments to maintain or increase aspen cover type:**

- 253. To maintain acres in aspen, cut invading conifers in stands. Cut trees may be removed.
- 254. To create new acres of aspen, stimulate regeneration by cutting conifers where they have overtopped aspen stands.
- 255. Focus on stimulating new aspen stands on the north and west portions of the project area, because the eastern portion is near the Las Conchas burn which has lots of new aspen.
- 256. Create patches of 5-40 acres, spread across the landscape, to provide vegetative diversity and fire breaks.
- 257. Put patches in existing conifer stands of VSS 3 and 4. Focus patches on places where conifers have mistletoe, budworm, high bark beetle risk, etc.
- 258. Leave conifers larger than 24-inches diameter

**Purpose:** **To maintain and enhance cover type.**

**Treatments in piñon-juniper:**

- 259. Desired residual tree densities are between 50-200 trees per acre.
- 260. Leave a range of tree sizes.

- 261. Prioritize areas for treatment to reduce erosion, protect heritage sites, or to increase habitat for songbirds.
- 262. Firewood may be gathered where roads allow.
- 263. Scatter slash to provide ground cover or pile and burn.

**Purpose:** **To maintain and enhance stands with old-growth characteristics for forest diversity and wildlife habitat.**

**Old growth treatments:**

- 264. Prioritize stands within or adjacent to Mexican spotted owl protected activity centers, goshawk post-fledging family areas, Jemez Mountains salamander locations, and visually-sensitive areas for old growth management.
- 265. Select stands classified as VSS 5 and 6 for inclusion in the old growth allocation.
- 266. Thin primarily small trees and create gaps in the overstory with group or individual tree selection.
- 267. Leave trees larger than 24-inches diameter.
- 268. Burn slash from mechanical treatments, but avoid reducing the amount of large woody debris.

**Mitigation Measures**

**Purpose:** **To control bark beetles.**

**In ponderosa pine:**

- 269. Slash greater than 3-inches in diameter that is created between January and June must be removed, burned, cut to short lengths, chipped, or otherwise treated, within 21 days. Material cut in winter may be left on site until March 15. These measures may be modified by a silviculturist based on weather and specific stand conditions.

**Soil and Watershed Health and Function**

**Design Features**

**Purpose:** **Conduct operations that reduce erosion, compaction, soil detachment, transport, and rutting.**

- 270. Cumulative and proposed actions and their combined proposed soil impacts exceeding 15% of the Huc12 will require additional design criteria as listed in the watershed specialist's report.

**Purpose:** **Conduct operations that reduce erosion, compaction, soil detachment, transport, and rutting. These actions will produce less detached sediment and less sediment delivery into all drainage types, thus improving water quality and soil productivity.**

- 271. Winter logging on frozen soil is preferred to mitigate surface disturbance and accelerate vegetative recovery.

272. Conduct logging operations using the least surface-disturbing equipment. The preferred equipment is a harvester-forwarder with an articulating boom and a harvester head, and wide, rubber-tracked wheels that are used on designated skid trails.
273. Attempt to make no more than 3 passes on a skid trail as research shows compaction greatly increases after a third pass.
274. Do not operate in wet or saturated soil conditions.

**For all treatments on Mollisol soils (TEU units 156, 630, 631, 641, 642, and 652):**

275. Do not exceed a 5 percent increase per year in existing bare soil conditions (see the Watershed and Soils Specialist Report).
276. If possible, avoid locating new landings within these units. If unavoidable, use an older or formerly existing landing. If no suitable prior area of disturbance can be located within the Mollic unit, consult with the watershed staff person. Landings must be ripped, seeded, and covered with adequate slash to minimized erosion, but allow for vegetative recovery.
277. Minimize construction of new skid trails, and use existing trails, routes, and roads instead.
278. Roads and skid trails used in treatment polygons within the Mollisol soil units will be hydrologically stabilized within 24 hours of the unit or polygon closeout. This will be verified by the Supervisor's Office watershed staff, timber sale administrator, contracting officer representative, or personnel approved by the watershed staff.

**Purpose:** **Low soil severity burn on Mollisol soils will reduce vegetative recovery times and improve overland flow or infiltration, and reduce soil detachment and transport.**

279. Grinding or chipping operations on the Mollisol soil units will not exceed a 2-inch or one-layer thickness of chip-grind material.

**Purpose:** **Monitoring**

280. For vegetation and prescribed fire treatments, implement the Forest Soil Disturbance Monitoring Protocol (FSDMP) and the Soil Disturbance Field Guide. Pre-disturbance data (baseline data) will represent all ecotypes and treatments and further provide a seamless transition into BMP monitoring. Implement proper functioning condition (PFC) monitoring on the streams within the project area. The pre-treatment PFC monitoring will provide a baseline to determine post-treatment effectiveness in the project area streams and associated riparian corridors.
281. The timber sale administrator will monitor the implementation of BMP's during timber harvesting activities. Forest watershed specialists will employ those BMPs necessary to the riparian, stream, springs and seeps actions.
282. The timber sale administrator will verify that the timber sale purchaser has implemented all erosion control measures prior to the closure of the timber sale. Primary responsibility will be that of the timber sale administrator and the Forest watershed staff.
283. The district fire management officers will verify that all BMPs associated with all burning activities have been implemented and monitored.
284. Within the first 5 years after timber sale closure, BMP's are evaluated for effectiveness. Monitoring will concentrate on such items as erosion control measures for skid trails, log

landing or decking areas, road maintenance, road obliteration, and burned areas. Conduct a soil condition and disturbance evaluation within treatment units, focusing on vegetative ground cover, coarse woody debris, soils erosion, soil compaction, and soil displacement.

285. Documented information from monitoring is used to adjust BMPs as necessary, to improve implementation and effectiveness of BMPs. This information will be made available to the New Mexico Environmental Department for review as specified in the intergovernmental agreement.

## **Best Management Practices**

**Purpose:** **To maintain and improve watershed function and soil productivity.**

286. Avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources by implementing measures to control surface erosion, gully formation, mass slope failure, and resulting sediment movement before, during, and after mechanical vegetation treatments.

## **Temporary Road Construction and/or Opening Existing Closed Roads**

### **Design Features**

**Purpose:** **To reduce impacts from temporary roads and other road work.**

287. Temporary roads will be of the lowest design specification possible while providing adequate access for product removal.
288. Locate temporary roads to avoid excessive skidding distances, skidding on steeper slopes, adverse skids and to go around wet areas or meadows.
289. For opening existing closed roads, use design features for road maintenance treatments.
290. Temporary roads will receive maintenance as needed throughout the life of the project or duration of the contract.
291. Existing closed roads will receive maintenance as needed throughout the life of the project or duration of the contract. Close these roads after use.

**Purpose** **Decommissioning measures for temporary roads.**

292. Temporary roads will be decommissioned as part of the closing work.
293. Remove any berm on the road edge that would hold or channel water.
294. If compaction is evident, road will be ripped before seeding.
295. Install waterbars to prevent water from following the decommissioned road.
296. Seed areas of bare soil with certified, native plant rehab mix.
297. Slash may be pulled onto the road.
298. Closure may be a berm, rocks, or stumps to block motorized access.

299. Decommissioned temporary roads will be monitored every other year for six years. If there is evidence that unauthorized use has occurred, use other measures to ensure that they stay closed. This may include using larger berms, rocks or other barriers to block access.
300. People using decommissioned temporary roads would be in violation of the closure order created under the Travel Management Decision and may be cited.

## Threatened and Endangered Species

### Mexican Spotted Owl

#### Design Features

**Purpose:** Conservation measures to avoid or minimize effects on species and habitat.

301. Adhere to the Forest Plan, as amended, applicable to proposed activities in Mexican spotted owl habitat (USFS 1987b, Appendix D, pp.1-6).
302. In Mexican spotted owl protected activity centers avoid nest areas during prescribed fire operations to the extent possible. Plan ignitions away from the nest area.
303. All PACs within the project area will be monitored for occupancy and reproduction.
304. Implementation activities will occur in no more than half of the PACs per year. In addition, the Forest will attempt to minimize the amount of time that it is operating in PACs to reduce disturbance to owls. For example, if trees are cut in January-February, then burning will occur in the fall. If cutting occurs in September, then burning would occur in the fall of the following year.
305. All activities within PACs will be avoided during the breeding season unless adequately surveyed to determine occupancy for the season.
306. Plan ignitions away from the nest area but allow prescribed fire to burn through the nest area.

#### Silvicultural Treatments

307. No thinning/mechanical treatments in nest areas.
308. Thin if owl habitat can be improved to reduce fire risk. This will move the stands toward having larger trees and a multi-storied canopy.
309. Thin primarily small trees (less than 18-inches diameter) and create gaps in the overstory using group or individual tree selection.
310. Leave trees larger than 18-inches diameter.
311. Burn slash from treatments.

#### Mitigation Measures

**Purpose:** Maintain consistency with the forest plan

312. Prior to implementation of activities where owls or their habitat might be affected by management actions, survey all areas that contain forested recovery habitat, riparian forest, and canyon habitat, or that might support owls. In general, the survey area should

include the survey area (area of project activities) and an 800-meter (0.5 mile) area from its exterior boundaries. These areas will be surveyed as defined in the Revised Recovery Plan for the owl (USFWS 2012).

**Purpose: Comply with the terms and conditions as outlined in the USFWS Biological Opinion**

The Santa Fe National Forest (Forest) will implement the following terms and conditions as outlined in the Biological Opinion unless the U.S. Fish and Wildlife Service (USFWS) approves deviation from these terms and conditions through site-specific project consultation.

**The following terms and conditions will implement reasonable and prudent measure 1:**

313. Avoid activities within 0.25 mile of PACs during the breeding season (March 1 to August 31) that could result in disturbance to nesting owls. If the Forest determines through protocol surveys that spotted owls are not nesting the year of the proposed project or locates a nest and is able to buffer the breeding owls from noise throughout the breeding season, then this restriction would not apply. Other options include documenting topographic buffers in specific PACs or using a noise tampering technology to reduce noise impacts.
314. Management activities within PACs and restricted habitat shall be coordinated and implemented to reduce potential disturbance to Mexican spotted owls. For example, where possible, thinning and/or burning activities associated with habitat adjacent to PACs will be coordinated with overall PAC thinning and/or burning activities in order to minimize the frequency and duration of operations within and immediately adjacent to these areas.
315. The Forest, in coordination with the USFWS, shall develop contingency plans in the event of new PACs being established or PAC boundary modifications due to owl movement or habitat changes. Flexibility shall be built into the project (including task orders) so that as owls move or new sites are located, project activities can be modified to accommodate these situations.
316. The Forest shall ensure that all contractors associated with thinning and burning activities, transportation of equipment and forest products, research, or restoration activities are briefed on the Mexican spotted owl, know to report sightings and to whom, avoid harassment of the owl, and are informed as to who to contact and what to do if a Mexican spotted owl is incidentally injured, killed, or found injured or dead on the Santa Fe National Forest. If an owl fatality is discovered, the USFWS Mexican spotted owl lead will be contacted as soon as possible.
317. Haul trucks will not exceed 25 miles per hour on Forest Service System Roads in the project area.

**The following terms and conditions will implement reasonable and prudent measure 2:**

318. The Forest shall coordinate management activities within PACs and restricted habitat in order to reduce effects to habitat from multiple entries that can disturb owls and result in adverse effects to habitat.
319. The Forest shall meet annually with the USFWS to discuss the upcoming year's thinning and burning plans in Mexican spotted owl habitat and review the past year's thinning and burning activities in owl habitats.

**The following terms and conditions will implement reasonable and prudent measure 3:**

320. The Forest shall monitor the effects of mechanical thinning and prescribed burning on owl occupancy and reproduction, and key habitat components (as defined in the Revised Mexican spotted owl Recovery Plan, table C.2) in all six PACs. Owl occupancy and reproductive data shall be collected for at least two years prior to treatment and two years post-treatment. Vegetation data should be collected pre-treatment and at defined intervals post-treatment. The specific plan development, selection of PACs, and monitoring framework, shall be developed in coordination with the USFWS (including the Mexican spotted owl lead) and Santa Fe National Forest Staff to ensure coordination with other projects and monitoring efforts. This monitoring plan shall be designed and implemented to evaluate the effects of thinning and prescribed fire on owl occupancy and reproduction, and retention of or movement toward desired habitat conditions within PACs.
321. The Forest shall monitor the impacts of incidental take resulting from implementation of the proposed action and report these findings to the USFWS. Incidental take monitoring shall include information such as when the project was implemented, whether the project was implemented as proposed and analyzed in this BO (including conservation measures and best management practices), breeding season(s) over which the project occurred, relevant owl survey information, and any other pertinent information about the project's effects on the species.
322. Annual reports will describe actions taken under this proposed action and impacts to the owl and its critical habitat. The annual report shall be sent to the New Mexico USFWS Ecological services field office and the USFWS Mexican spotted owl species by March 1 of each year.

## **Conservation Measures**

**Purpose:** **Conservation measure to avoid, improve, or minimize effects on species and habitat.**

323. The Forest will work with the USFWS to conduct Mexican spotted owl surveys over the next several years to attempt to determine how owls modify their territories in response to wildland fires on the Santa Fe National Forest. This information will aid in understanding the short- and long-term impacts of fire on the owl, and its subsequent effect on the status of the species in the SRM EMU. Surveys would be coordinated with the USFWS prior to implementation of any project.
324. The Forest will continue to work with the USFWS to design forest restoration treatments across the Santa Fe National Forest that protects existing nest/roost habitat from high-severity, stand-replacing fire, and enhance existing or potential habitat to aid in sustaining Mexican spotted owl habitat across the landscape. PACs can be afforded substantial protection from wildland fire by emphasizing fuels reduction and forest restoration in surrounding areas outside of PACs and nest/roost habitat.

## **Jemez Mountains Salamander**

### **Design Features**

**Purpose:** **Conservation measures to avoid, improve, or minimize effects on species and critical habitat.**

325. Springs or seeps found in wet mixed conifer in Jemez Mountains salamander critical habitat will not be treated.
326. Burning during the salamander restriction period will be conducted when most or all salamanders would not be surface active because salamanders are only surface active when environmental conditions are wet enough to keep their skin moist, which generally is too wet to carry fire.
327. General habitat elements will be monitored before and after treatment implementation through fire effects monitoring plots. The Forest is currently collecting this information using the fire ecology crew at Bandelier National Monument.
328. The Forest is working with Rocky Mountain Research Station, Fire Sciences Laboratory on a project designed to evaluate prescribed fire burn intensities near archeological sites and its influence on large logs. The Forest will look for opportunities to use these data where feasible to reduce impacts to salamander habitat features from prescribed burning activities.
329. The Forest will target some salamander survey efforts in aspen stands to assess salamander occupancy in this forest type.
330. Slash in aspen treatment areas will be managed to generate only enough slash to burn at low to moderate fire intensities to achieve desired results in aspen stands. Approximately 5-7 tons per acre will be left onsite. Excess wood will be removed to prevent a hot fire from damaging the soil.
331. With the exception of aspen treatments, creation of openings in mixed conifer in designated critical habitat for the salamander will be one acre or smaller.
332. Roads causing damage to hydrological resources, cultural resources or threatened, endangered, and sensitive species habitat are a priority for decommissioning.
333. The Forest will work with the USFWS during annual meetings to identify the locations of road decommissioning and the level of effort that will be needed to protect salamanders.
334. The Forest will rehabilitate all equipment staging area, log landings, skid trails, temporary roads, and firelines at the end of the project. Rehabilitation may include returning the ground to natural contours, implementing decompaction and erosion control measures as needed, pulling slash and rocks across firelines, disguising entrances, and covering bare soil with slash, chips, needles, or cut brush as necessary, and reseeding with native seeds as needed. Any rehabilitation that disturbs the soil, rocks, woody debris, or potential cover objects in designated critical habitat for the salamander will occur when conditions are dry or frozen, or outside of the surface activity season for the salamander.
335. On areas to be prescribed burned, fire prescriptions will be designed to minimize soil temperatures over the entire area. High intensity fire should occur on 10% or less of the entire area. Fire prescriptions will be designed so that soil and fuel moisture are such that fire intensity is minimized and soil health and productivity are maintained. Fire effects monitoring plots will be used to assess percentage of high intensity fire that occurred over prescribed burn areas.
336. Areas for old growth management will be prioritized stands within or adjacent to owl protected activity centers; goshawk post-fledging family area; Jemez Mountains salamander locations, salamander designated critical habitat, and visually-sensitive areas.

337. The Forest will work with the USFWS to identify how to best implement silviculture treatments in wet mixed conifer.
338. Disturbance of soil, rocks, boulders, and large woody debris in designated critical habitat will be avoided to the greatest extent practical.
339. Any activity that uses heavy machinery will only occur in designated critical habitat for the salamander when soils are dry or frozen unless there is an exemption. Working when soils are dry or frozen will reduce the risk of crushing salamanders, as they are unlikely to be impacted when soil is dry or frozen, and will minimize compaction of soil.
340. For road maintenance and decommissioning activities, heavy machinery may be used at times when the soil is not dry or frozen, but will be kept strictly to existing compacted road surfaces (and will not enter the shoulder of the road) in designated critical habitat for the salamander unless otherwise agreed upon and documented between the Forest and USFWS.
341. As much as practicable, ignite prescribed fire in a manner to minimize torching within occupied salamander habitat.

**Critical Habitat:**

342. Implement meadow treatments as described in the proposed action.
343. Implement cultural resource protection treatments as described in the proposed action.
344. Treat seeps and springs at the upper end of the basal area range based on vegetation type in ponderosa pine and dry mixed conifer.
345. Implement riparian treatments as described in the proposed action.
346. Do not build temporary roads in critical habitat.
347. No new ground disturbance in potential road decommissioning sites.
348. In ponderosa pine, leave a residual stand with a basal area of 60 to 80.
349. In dry mixed conifer, leave a residual stand with a basal area of 80 to 100.

**Mitigation Measures**

**Purpose:**

**Conservation measures to avoid, improve, or minimize effects on the Jemez Mountains salamander and its critical habitat.**

350. Do not cut Douglas-fir for bank stabilization treatments in critical or occupied habitat for the Jemez Mountains salamander.
351. Avoid building or making jackpot piles of slash on top of existing large logs.
352. Burn jackpot piles as soon as possible, preferably within one year of creation, to minimize salamander colonization and use of piles as habitat, in critical habitat.
353. Burn piles before broadcast burning to reduce fire intensity and heat penetration into the soil within critical habitat.
354. Firelines for prescribed fires will not be constructed in critical habitat during the salamander restrictive season of June 15 through October 30.

355. Use of heavy machinery, and other activities, with the exception of burning, that could directly affect salamanders that are active above ground (surface active) will only be conducted when ground is frozen or dry, and outside of the salamander restriction period, June 15 through October 30. If seasonal rains begin earlier than June 15, any activity that could directly affect salamanders will not occur in designated critical habitat. Exemptions to implementing activities (except burning) during the salamander restriction period (June 15 through October 30), or when salamanders may be surface active that could directly affect salamanders that are surface active will only be done with coordination and agreement between the Forest and USFWS.
356. Soil and watershed BMPs in this appendix will be followed to protect salamander habitat.
357. Disturbance around road decommissioning sites will attempt to stay in the compacted footprint of the road except where re-establishment of contours or re-connecting natural drainages are required to address water quality or watershed issues. New ground disturbance along the edges will be minimized.
358. The Forest will leave 10-15 tons per acre of downed logs greater than 12-inches diameter in dry mixed conifer and 3 snags per acre, on average. Douglas fir trees will be favored for placement in designated critical habitat for the salamander.
359. The Forest will limit new landings in salamander critical habitat to 0.25 acres.
360. The Forest will attempt to make no more than three passes on a skid trail, as research shows compaction greatly increases after a third pass.

**Purpose:** **Comply with the terms and conditions as outlined in the USFWS Biological Opinion.**

The Forest will implement the following Terms and Conditions as outlined in the Biological Opinion unless the USFWS approves deviation from these terms and conditions through site-specific project consultation.

**The following terms and conditions will implement reasonable and prudent measure 1:**

361. The Forest shall ensure that all contractors associated with thinning and burning activities, transportation of equipment and forest products, research, or restoration activities are briefed on the Jemez Mountains salamander, important habitat features to avoid when practicable, and are informed of the conditions salamander are typically surface active (moist soil at about 12 degrees C or 54 degrees F), and who to contact and what to do if a Jemez Mountains salamander is observed or incidentally injured, killed, or found injured or dead on the Santa Fe National Forest. If a salamander injury or fatality is discovered, the USFWS Jemez Mountains salamander lead will be contacted as soon as possible.
362. When seeking an exemption to the salamander restriction period, June 15 through October 30, the Forest shall develop a methodology or protocol that will be used to assess site specific environmental conditions and criteria used for determining suitability for surface activity for conducting work in salamander critical habitat. The coordination between the Forest and USFWS should be documented for the project record.

**The following terms and conditions will implement reasonable and prudent measure 2:**

363. The Forest shall demonstrate that treatments that affect Jemez Mountains salamander or its designated critical habitat will be implemented in a staged manner so that effects can be dispersed over time and space, learning can take place, and new information can be applied to future treatments to minimize adverse effects to those species and habitat. The staged implementation may be coordinated and documented with the USFWS at annual meetings, or presented as an entire detailed implementation schedule prior to project implementation.
364. The Forest shall apply soil and watershed health and function design features stated on page 298 of the DEIS to salamander critical habitat to minimize effects to salamander primary constituent elements.
365. The Forest shall limit aspen treatments to 2 acres in size in designated critical habitat until the Forest is able to collect and present information regarding effects of the treatments on the salamander or its habitat. Subsequent to receiving this information, the Service may approve in writing conducting aspen treatments up to 10 acres in size in designated critical habitat.
366. Material (e.g. rocks, boulders, logs) used for any treatment such as instream habitat restoration, headcut, or stabilization treatments, and site closings will not be removed from designated critical habitat.
367. The Forest will assess soil compaction resulting from heavy machinery using the first two treatment blocks in designated critical habitat and determine affects to salamander PCEs. Soil compaction data should include soil type or types, pre-treatment compaction data, equipment type used and, and relevant environmental or biophysical parameters present during treatment. The Forest shall report to the USFWS findings of compaction assessment in salamander critical habitat and any potential mitigations or BMPs that are developed to reduce effects of compaction.
368. The Forest shall develop BMPs, or work with the Service to develop BMPs, on how to best rehabilitate areas that have been impacted by new firelines in designated critical habitat. Development of BMPs and rehabilitation of new firelines shall occur within one year burn.
369. The Forest will use the data collected from the before and after treatment implementation fire effects monitoring plots to better understand how structural habitat features such as woody debris may be affected by burning activities. Results will be assessed and reported, with any potential BMPs or mitigation that may be developed within one year of collection to the USFWS.
370. The Forest will continue to work with the USFWS to develop additional BMPs to minimize impacts to the salamander, its designated critical habitat, and potential critical habitat.
371. Heavy machinery or other equipment used for treatments to restore instream habitat or used in aquatic systems will be cleaned of all soil, mud, and debris followed by disinfection with approved chemicals prior to moving equipment into undisturbed areas (e.g. outside of existing road beds) occupied or potentially occupied by salamanders to minimize the risk of spreading or introducing amphibian pathogens.
372. The Santa Fe National Forest shall meet annually with the USFWS to discuss the upcoming year's implementation schedule for the proposed action, including thinning and burning plans in Jemez Mountains salamander critical habitat and potential habitat

and review the past year's thinning and burning activities in salamander habitat and review the development of an occupancy model or other scientifically sound equivalent.

**The following terms and conditions will implement reasonable and prudent measure 3:**

373. The Forest shall monitor the impacts of incidental take resulting from implementation of the proposed action and report these findings to the USFWS. Incidental take monitoring shall include information such as when the project was implemented, whether the project was implemented as proposed and analyzed in this BO (including conservation measures and best management practices), acreages of habitat affected and how, salamander survey information, and any other pertinent information about the project's effects on the species or its habitat.
374. Annual reports will describe actions taken under this proposed action and impacts to the salamander and its critical habitat. The annual report shall be sent to the New Mexico USFWS Ecological Services field office by March 1 of each year.

## **Conservation Measures**

**Purpose:** Conservation measure to avoid, improve, or minimize effects on species and habitat.

375. The Forest will work with the USFWS to develop a strategy that provides for long term management and recovery of the salamander. This includes:
- a. not avoiding treatments in designated critical habitat for the salamander or potential salamander habitat, but rather continue to pursue how to best implement treatments to minimize impacts to salamanders and their habitat while improving habitat conditions and reduction of risk of high severity wildfire throughout the range of the salamander on Forest Service lands;
  - b. continuing to work with the USFWS in identifying the occupied range of the species in potential habitat; and
  - c. continuing to work with the USFWS to conduct targeted salamander surveys in potential habitat.
376. The Santa Fe National Forest will work with the USFWS to develop an occupancy model or scientifically sound equivalent that can be used to assess occupancy or changes in occupancy through time while taking into account factors that affect the probability of detection of the salamander.

## **Meadow Jumping Mouse**

### **Design Features**

**Purpose:** Conservation measures to avoid or minimize effects on species and habitat.

377. Install fencing to protect the bank on instream habitat restoration and stream channel treatments around both the new and old channel and native riparian planting (for bank stabilization).

378. Riparian restoration on San Antonio Creek and Rio Cebolla, will be prioritized to improve habitat at known jumping mouse locations.
379. Bank stabilization will be selected for those perennial streams needing actions to improve a 303-d listing or needed for aquatic habitat improvement.
380. Project activities with heavy equipment will take place outside of the jumping mouse active season. Use of locally available material will be considered.
381. Follow riparian streamcourse buffers within proposed Critical Habitat:
- a. Severe erosion hazard: 120 feet on each side of streamcourse.
  - b. Moderate erosion hazard: 100 feet on each side of streamcourse.
  - c. Slight erosion hazard: 70 feet on each side of streamcourse.

**Fire and Fuels management within proposed Critical Habitat:**

382. In areas to be prescribed burned, establish filter strips (also known as Aquatic Management Zones). These stream reaches will be designated as a protected streamcourse.
383. Fuels will not be ignited within this buffer area, though fire would be allowed and is expected to creep into the buffer.
384. Avoid, minimize, or mitigate adverse effects of prescribed fire and associated activities on soil, water quality, and riparian resources that may result from excessive soil disturbance as well as inputs of ash, sediment, nutrients, and debris into waterways.

**Headcut Treatments within proposed Critical Habitat:**

385. Use hand treatments at those locations without road access or those areas needing less (mechanical) disturbance due to resource concerns (soils, cultural, wildlife).

**Riparian Area Restoration within proposed Critical Habitat:**

386. Best effort will be made to use immediate, locally available material and plants.
387. Where vegetation has been severely impacted, planting of riparian shrubs (i.e., willow) and transplanting of sedges may be done within the exclosures.

**Road Decommissioning within proposed Critical Habitat:**

388. Roads causing damage to jumping mouse proposed Critical Habitat are a priority for decommissioning.

**Conservation Measures**

**Purpose:** Conservation measures to avoid, improve, or minimize effects on species and habitat.

389. The Forest will work with the USFWS to develop a strategy that provides for long-term management and recovery of the meadow jumping mouse. This includes:
- Completion of comprehensive jumping mouse surveys within areas that have not been surveyed since 2005 and 2006, but also in areas that contain suitable habitat. Surveys should also be conducted within areas where riparian vegetation is restored to document project success. This information will greatly assist all parties in gaining a better understanding of the current status and whether habitat restoration leads to additional

populations of the species. The USFWS will discourage the Forest from assuming future projects within potential jumping mouse habitat are occupied or continued to be occupied in lieu of conducting up-to-date survey.

## Wildlife Habitat Treatments

### Design Features

**Purpose:** Conservation measures to avoid or minimize effects on species and habitat.

390. Monitor the effects on peregrine falcon through occupancy surveys during the breeding season.

**For all treatments to screen water sources from human disturbance:**

391. Plant vegetation at existing developed water sources near roads or in open (visible) areas throughout the project area.

392. Use hand or mechanical methods for planting.

**For all treatments to increase water sources for wildlife:**

393. Water sources may include trick tanks, earthen tanks, drinkers, and other types of developed water sources.

394. Earthen dams would not be placed in stream channels.

395. Screen water sources where necessary using design features listed above.

396. Provide ramps in water tanks, as necessary, to allow small animals to escape.

**For all treatments to create snags:**

397. Work would be done throughout project area in stands lacking large diameter (greater than 16 inches) snags or that do not meet forest plan standards.

398. Create snags by girdling trees or other means.

**Purpose:** To minimize effects on neotropical migratory birds.

399. When designing site-specific projects, consider avoiding vegetation disturbance during the peak breeding season: May 15 through July 31 (estimated peak bird breeding season at higher elevations in this project area).

### Mitigation Measures

**Purpose:** Conservation measures to avoid, improve, or minimize effects on species and habitat.

400. Around active elk wallows and seeps, preferentially select groups of understory trees to provide desired screening.

401. All work within the channel of Rio Grande cutthroat trout (RGCT) occupied streams will be avoided from March 1 to July 15th to minimize effects to spawning fish.

402. In-stream and riparian restoration activities will take place after RGCT spawning during base-flow conditions, and on dry or frozen riparian soil conditions where possible.

# Appendix B. Forest Plan Amendments

**Table 1. Forest Plan Amendments**

Existing Forest Plan Language	Purpose of the Amendment (Reason for Change)	Proposed Forest Plan Language
<p>In Mexican Spotted Owl Protected Activity Centers: Designate a 100-acre “no treatment” area around the known nest site of each selected protected activity center. (Appendix D – Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).</p>	<p>The 2012 Mexican Spotted Owl Recovery Plan allows prescribed fire in the 100-acre no treatment area.</p>	<p>Designate a 100-acre limited treatment area around the identified core area of a protected activity center (PAC). Limited treatment means that only prescribed fire is allowed.</p>
<p>In Mexican Spotted Owl Protected Activity Centers: Select for treatment 10% of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. (Appendix D – Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).</p>	<p>This guidance is in line with the 2012 Mexican Spotted Owl Recovery Plan and allows us to treat all six PACs within the project area and better achieve desired conditions.</p>	<p>Conduct restoration treatments in up to 20% of PACs within each ecosystem management unit (EMU) that exhibits high fire risk conditions.</p>
<p>In Mexican Spotted Owl Protected Activity Centers: Also select another 10% of the protected activity centers where nest sites are known as a paired sample to serve as control areas. (Appendix D – Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing).</p>	<p>The proposed monitoring was developed in conjunction with USFWS and allows for us to monitor changes but still treat the PACs.</p>	<p>Paired monitoring of PACs will take place within the project area using the existing PACs and separating treatments within PACs by at least two years. This will aid in distinguishing between effects from treatment versus environmental or other influences on Mexican spotted owl.</p>
<p>In Mexican Spotted Owl Protected Activity Centers: 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. (Appendix D – Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)</p>	<p>To meet the desired conditions, we want to be able to cut trees up to 18-inches diameter in PACs, outside of the core area.</p>	<p>Within Mexican spotted owl PACs, use combination of cutting trees less than 18-inches diameter, mechanical fuel removal, and prescribed fire to treat fuel accumulations to abate fire risk.</p>

Existing Forest Plan Language	Purpose of the Amendment (Reason for Change)	Proposed Forest Plan Language
<p>In Mexican Spotted Owl Restricted Areas: 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. The additional area of 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 areas shows that there is a surplus of restricted area acres simultaneously meeting the threshold values. Management should be designed to create minimum threshold conditions on project areas where there is a deficit of stands simultaneously meeting minimum threshold conditions unless the districtwide or larger landscape analysis shows there is a surplus. (see table 1a below)</p>	<p>Adjusts requirements for nest/roost characteristics in recovery habitat to guidance from the 2012 Mexican Spotted Owl Recovery Plan.</p>	<p>Table C.3 from the revised recovery plan (p. 278) displays the minimum desired conditions for mixed-conifer forest areas managed for recovery nesting/roosting habitat. Manage stands so that a specified portion (25%) of the landscape does not fall below the lower stand condition thresholds in table C.3. Identify and protect stands that meet or exceed nest/roost conditions and then assess whether or not these stands satisfy this area requirement. Stands that do not meet nest/roost conditions and are not designated for development of such can be managed to meet other resource objectives. The environmental analysis for this project is striving for these desired conditions in the recommended amounts at this large spatial scale. See table 1b at the end of this appendix</p>
<p>In Mexican Spotted Owl Restricted Areas: Encourage prescribed and prescribed natural fire to reduce hazardous fuel accumulation. Thinning from below may be desirable or necessary before using prescribed fire to reduce ladder fuels and the risk of crown fire. (Appendix D – Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)</p>	<p>Remove language specifying the use of thinning from below. This can indicate that only the lowest size classes of trees are removed. Uneven-aged management requires the removal of intermediate size classes as well.</p>	<p>Encourage prescribed and prescribed natural fire to reduce hazardous fuel accumulation. Thinning may be desirable or necessary before using prescribed fire to reduce ladder fuels and the risk of crown fire.</p>

Existing Forest Plan Language	Purpose of the Amendment (Reason for Change)	Proposed Forest Plan Language
<p>Northern goshawk: Limit human activities in nesting areas during the breeding season. (March 1- September 30).</p> <p>Limit human activity in or near nest sites and post-fledgling family areas during the breeding season so that goshawk reproductive success is not affected by human activities.</p> <p>(Appendix D – Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing)</p>	<p>Allows treatment during breeding season which facilitates meeting desired conditions.</p>	<p>Northern goshawk: Human activities will be limited to no more than two consecutive years during the breeding season (March 1 to September 30).</p>
<p>No corresponding forest plan direction regarding interspaces. (Appendix D – Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing and Glossary (for the definition) pp. 195-224).</p> <p>The definition will be added to the Glossary – pp. 195-224.</p>	<p>Adds language to allow for interspaces in addition to VSS groups 1-6.</p>	<p>Canopy cover is evaluated at the group level within mid-aged to old forest structural stages groups (VSS 4, VSS 5, and VSS 6) and not within grass/forb/shrub to young forest structural stage groups (VSS 1, VSS 2, and VSS 3) or in interspaces, natural meadows, and grasslands, or other areas not managed for forest conditions.</p> <p>(Definition) Interspaces are areas not currently under the vertical projection of the outermost perimeter of tree canopies. They are generally composed of grass-forb-shrub communities but could also be areas with scattered rock or exposed mineral soil. Interspaces do not include meadows, grasslands, rock outcroppings, and wetlands (i.e., exclusions adjacent to and sometimes within forested landscapes.)</p>
<p>Timber activities in turkey nesting areas will be coordinated to minimize impacts between April 20 and June 10 (replacement page 72).</p>	<p>Allows treatment during breeding season which facilitates meeting desired conditions.</p> <p>The nesting areas are not defined. It is impractical to identify Turkey nesting areas. The benefits of the project outweigh the potential detriments to turkeys.</p>	<p>Delete.</p>

Existing Forest Plan Language	Purpose of the Amendment (Reason for Change)	Proposed Forest Plan Language
<p>When a peregrine falcon site plan doesn't already exist and a Biological Evaluation finds that a proposed action may negatively impact an occupied eyrie, develop a site plan for the eyrie before approving the project. Adhere to site plan mitigations for the eyrie. (Replacement page 62)</p> <p>Develop a site plan for each peregrine falcon eyrie (designated suitable nest site). Follow the specific requirements described in the site plans for each eyrie and the surrounding habitat zones, including requirements for evaluating potential impacts, monitoring, restricting the timing of activities, and controlling activities that may cause disturbance or pose a threat to the eyrie (replacement page 63).</p>	<p>Site plans established zones with time restrictions for up to 4 miles outward of the eyrie to avoid disturbance to peregrine falcon. Adhering to such restrictions would significantly delay restoration work and inhibit the Forest's ability to meet the intent of the CFLRP.</p>	<p>The Forest will do project level surveys within 1/2 mile of peregrine falcon nesting habitat ("A" zone) before and after project activities to assess how these activities affect occupancy and nest use.</p>
<p>Develop viewshed corridor plans for those sensitive level 1 roads specified in each management area. These plans will define project level landscape characteristics and identify the key visual elements for management. Plans will outline the activities to sustain the desired scenic landscape character overtime. (Replacement page 56)</p>	<p>The forest does not currently have any of these plans in place. The intent of these viewshed corridor plans will be met through design criteria and mitigations included in the project.</p>	<p>Delete.</p>
<p>Manage for a visual quality objective of preservation (p. 151)</p>	<p>The visual quality objective of preservation conflicts with the amendment in the Jemez National Recreation Area that allows for vegetation treatments in this management area ('M').</p>	<p>Manage for a Visual Quality Objective of High.</p>

**Table 1a. Existing Forest Plan, Appendix D – Standards and Guidelines for Management of Mexican Spotted Owl, Northern Goshawk, and Livestock Grazing**

<b>Variable</b>	<b>MC ALL RU</b>	<b>MC BR-E RU</b>	<b>MC OTHER RU</b>	<b>Pine-oak</b>
Restricted area %	10%	+10%	+15%	10%
Stand Averages for: Basal Area	170	150	150	150
18 inch + trees/ac	20	20	20	20
Oak basal area	NA	NA	NA	20
<b>Percent total existing stand density index by size class:</b>				
12-18"	10	10	10	15
18-24"	10	10	10	15
24+"	10	10	10	15

**Table 1b. Minimum desired conditions for Mexican Spotted Owl Recovery nesting/roosting habitat in the mixed-conifer forest type of the Southern Rocky Mountain Ecological Management Unit<sup>1</sup>.**

<b>Percent of Area<sup>2</sup></b>	25%
<b>Percent Basal Area in 12-18 inch d.b.h. class</b>	>30
<b>Percent Basal Area in &gt; 18-inch d.b.h. class</b>	>30
<b>Minimum Tree Basal Area<sup>3</sup></b>	27.5 (120)
<b>Minimum Density of Large Trees<sup>4</sup></b>	30 (12)

<sup>1</sup> This table is derived from table C.3 in the revised recovery plan for the Mexican spotted owl (USFWS 2012). Notes 2, 3, and 4 are the original table notes from table C.3.

<sup>2</sup> Percent of area pertains to the percent of the planning area, subregion, and/or region in the specified forest type that should be managed for threshold conditions.

<sup>3</sup> BAs in m<sup>2</sup>/ha (ft<sup>2</sup>/acre), and include all trees >1 inch d.b.h. (i.e., any species). We emphasize that values shown are **minimums**, not targets.

<sup>4</sup> Trees greater than 46 cm (18 inches) d.b.h. Density is tree/ha (trees/acre). Again, values shown are minimums rather than targets. We encourage retention of large trees.





