

Appendix F – Mexican Spotted Owl Conservation Recovery Framework

(Appendix F has been added since publication of the DEIS, gray highlights are not added because of this.)

The USDA Forest Service (FS), U.S. Fish & Wildlife Service (FWS), and WildEarth Guardians (WEG) reached an out-of-court resolution by the Regional Forester’s letter dated October 26, 2020 and jointly submitted a stipulation for dismissal of the lawsuit, the injunction, and pending litigation to the United States District Court of Arizona on October 27, 2020.

Both the FS and the FWS have begun taking actions to implement a conservation and recovery framework consistent with the 2012 Mexican Spotted Owl (MSO) Recovery Plan, First Revision. The Forest Service and FWS identified six measures to implement a conservation and recovery framework for the owl across the Southwestern Region.

This appendix contains the Regional Guidance and checklists for the Mexican spotted owl that was developed in 2021 in response to the six identified measure.

This appendix includes:

- a. The Southwest Region step by step MSO Habitat Treatment and Implementation Guidance.
- b. Guidelines for Forest Vegetation Data Collection within Mexican Spotted Owl Habitat
- c. Pre-implementation Compliance Review for the Regional Mexican Spotted Owl Recovery Strategy, August 6, 2021
- d. Mexican Spotted Owl Habitat Environmental Analysis Project Checklist, June 7, 2021

Disclaimer: The Regional Guidance documents could change as necessary. This appendix is meant to show the current condition as the planning team works to complete these documents. As these documents are updated, it will fall to the implementation team to include updated versions of these documents and any new direction that may be needed.

The Pre-implementation Compliance Review is a checklist that the implementation team will complete on the ground prior to beginning management and restoration activities. As above, if the Region changes the Compliance Review document, the implementation team will bring in the latest version as they continue to implement.

The Environmental Analysis Project Checklist was completed by the interdisciplinary team and included in the appendix below.

Regional Step-by-Step Mexican Spotted Owl Habitat Treatment and Implementation Guidance

June 7, 2021

Follow this guide prior to implementing or conducting an environmental analysis for forest vegetation treatments with Mexican spotted owl (MSO) protected activity centers (PACs), recovery nest roost habitat, recovery foraging/dispersal habitat, and critical habitat.

The purpose of this guidance is to address Mexican Spotted Owl (MSO) management prior to and during implementation of any vegetation treatments that occur within MSO habitat, especially PACs and Recovery Nest Roost. This includes all timber and fuels activities completed by mechanical thinning and/or prescribed fire.

Follow this guide and provide documentation during the implementation phases of any vegetation treatment in MSO habitat as directed below. At the time of analysis if site specific data does not exist, then follow these steps prior to treatment to confirm if the proposed action will result in desired conditions as required per the MSO Recovery Plan and the project's Section 7 consultation with USFWS.

In situations during NEPA planning where stand data is lacking in MSO PACs and Recovery Nest Roost habitat include this document as a design feature appendix in the project record and in the Decision. This will ensure that Recovery Nest Roost habitat is being identified and managed correctly on the ground.

For projects implementing Decisions under the 1995 MSO Recovery Plan, see additional direction on pages 5–6 of this document.

PACs

- ◆ Review Project NEPA decision and Section 7 consultation regarding proposed mechanical and/or burning treatments, and supporting actions such as, but not limited to, road construction in PAC(s).
- ◆ Conduct an interdisciplinary meeting and/or field review to discuss desired conditions for PAC based on existing conditions (See Table C.2 [USFWS 2012]).
 - The interdisciplinary team (IDT) should consist of the USFS wildlife biologist, silviculturist, fuels, and timber staff and the FWS species lead and/or geographic lead. Consult with range staff to determine how range actions and vegetation restoration projects affect the overall desired conditions.
 - Does the PAC need mechanical treatment to improve habitat and/or protect key habitat components during prescribed fire or wildfire?
 - Does the PAC need hand-thinning to improve habitat and/or protect key habitat components during prescribed fire or wildfire?
 - Is prescribed burning going to occur before mechanical thinning?
- ◆ If the PAC is part of a **management experiment**, follow the established plan in the Biological Opinion for type, timing, and methodology for monitoring owls and vegetation (this includes timing, data collection, data storage, data analysis, and reporting) in close coordination with the USFWS. Collect the following vegetation data, at a minimum, USFS Common Stand Exam (CSE) protocol for extensive plots. If there is a **management experiment** for the site, the USFWS Regional Species lead will be engaged in the process.

- If the PAC is not part of a management experiment, then refer to the **GUIDELINES FOR FOREST VEGETATION DATA COLLECTION WITHIN MEXICAN SPOTTED OWL HABITAT** on pages 7–10 of this document and determine as an IDT if stand data is needed for monitoring of the activity being implemented.
- ◆ Document discussion and path forward for the project record and implementation plan.
- ◆ Collect pre-treatment data on owl occupancy and vegetation conditions relevant to owl habitat. Re-delineate new stands as appropriate per established protocol. Enter data into appropriate reporting and spatial databases (for example, FSVEG and Wildlife).
- ◆ Conduct proposed vegetation treatments in coordination with the IDT (including USFWS).
- ◆ Collect post-treatment data on vegetation conditions and owl monitoring). Enter data into appropriate databases. Document all post-implementation measures completed (for example, temporary road closures, rehabilitation, etc.)
- ◆ Project lead and project biologist will provide documents to the Forest NEPA Coordinator to post under the associated project in the Planning, Appeals and Litigation System (PALS), refer to pages 11–14 of this document on directions for uploading to PALS.

Recovery Nest/Roost Habitat (2012 Recovery Plan, USFWS 2012)

- ◆ Review NEPA decision and information in Section 7 consultation regarding recovery nest/roost (N/R) habitat proposed mechanical and burning treatments.
- ◆ Conduct an interdisciplinary meeting and/or field review to stands identified in NEPA as potential N/R habitat. Visit stands to determine if they currently meet desired conditions, have the potential to meet the desired conditions, or have no potential to meet those conditions (for desired conditions see Table C.3 in USFWS 2012 or updates to table from Recovery Team [Ganey et al. 2016 for BRE EMU])
 - The interdisciplinary team (IDT) should consist of the USFS wildlife biologist, silviculturist, fuels, and timber staff and the USFWS species lead and/or geographic lead. Consult range staff to determine how range actions and vegetation restoration projects affect the overall desired conditions.
- ◆ The IDT may use quantitative (at minimum the quick plot stand exam protocol required if quantitative) or qualitative (stand entirely on south-facing slope, open ponderosa pine, etc.) data to determine if N/R candidate stand is meeting conditions, has potential, or has no N/R. potential. Refer to the **GUIDELINES FOR FOREST VEGETATION DATA COLLECTION WITHIN MEXICAN SPOTTED OWL HABITAT** on pages 7–10 of this document and determine as an IDT if stand data is needed for monitoring of the activity being implemented.
- ◆ If the stand is at N/R conditions or has potential to be N/R habitat (per Table C.3 [USFWS 2012]), then determine the following:
 - If not already a stand, then re-delineate the N/R area as a distinct stand and document per established protocols.
 - Does the N/R stand need mechanical thinning to improve habitat and/or protect key habitat components during prescribed fire or wildfire?
 - Does the N/R stand need hand-thinning to improve habitat and/or protect key habitat components (for example large trees) during prescribed fire or wildfire?
 - Would treatment in potential N/R habitat reduce conditions below minimums in Table C.3? If so, document the reasoning for this.

- **Scenario 1:** If stand is at or above desired conditions, the prescription may be thin from below to a minimum or higher basal area, per the forest type shown in Table C.3. Trees greater than 18 inches d.b.h. will be retained at or above the minimum TPA shown in Table C.3. Alternatively, no treatment may be necessary if the desired conditions are present.
- **Scenario 2:** This describes stands managed to develop the characteristics shown in Table C.3. This situation typically applies where the required minimum acreages for N/R habitat do not currently exist in the project landscape. Select stands based on the ability to develop into the desired conditions (Table C.3) within the shortest timeframe possible (typically 20–30 years). Base prescriptions upon actions that will achieve the desired characteristics during these time frames as demonstrated by FVS modeling. Alternately, no treatment may be necessary if the current condition is developing toward desired conditions without vegetation treatment.
- ◆ If the stand does not have potential to be N/R habitat, then drop it from the candidate list of N/R habitat and find additional candidate stands if the planning area (for example, project area, ranger district, Forest, etc.) is deficient. If the planning area is not deficient, remove the stand from the list of candidate stands and track this information in the Forest database update N/R habitat map and spatial layer
- ◆ Document discussion and path forward for Administrative Record and Implementation Plan.
- ◆ Collect pre-treatment data, as agreed by IDT (vegetation plots and owl occupancy surveys). Enter data into appropriate databases (FSVEG and Wildlife).
- ◆ Conduct proposed vegetation treatments in coordination with IDT (including USFWS).
- ◆ Collect post-treatment data as needed. Document all post-implementation measures completed (for example temporary road closures, rehabilitation, etc.).
- ◆ Enter data into appropriate databases.
- ◆ Project lead and project biologist will provide documents to the forest NEPA coordinator to post under the associated project in the Planning, Appeals and Litigation System (PALS), refer to pages 11–14 of this document on directions for uploading to PALS.

Recovery Foraging/Non-breeding Habitat

- ◆ The Recovery Plan intent is to manage Recovery Foraging/Non-breeding Habitat so that we conserve important but difficult-to-replace habitat elements while allowing management flexibility. There may be less need for an Interdisciplinary Team (IDT) to review all sites for Recovery Foraging/Non-breeding Habitat in the field (as with PACs and N/R habitat above), but there should still be discussion between members of the IDT regarding the vegetation and prescribed burn prescriptions, the proximity of these areas to PACs and N/R habitat, and the landscape context of the proposed treatments. Consult with range staff to determine how range actions and vegetation restoration projects affect the overall desired conditions.
- ◆ Management should strive to maintain conditions where multiple components occur in proximity to one another. For example, if a stand contains large trees, logs, and snags, design prescriptions to keep as many of these components as possible while achieving management objectives such as fuels reduction and ecosystem restoration.
- ◆ Such prescriptions can result in the short-term reductions of key habitat components, but they should strive to maintain some of these components within the stand. Base management on the

best judgment of the professionals involved to balance our intent with the objective(s) of the prescription.

- **Emphasize Large Hardwoods.** Within pine-oak and other forest types where hardwoods are a component of owl habitat, emphasis management that retains, and promotes the growth of additional, large hardwoods.
- **Retain Large Trees.** Strive to retain (do not cut) all trees greater than 24 inches d.b.h. To the extent practical, design fuel breaks to avoid the removal of larger trees (trees over 18 inches d.b.h.). We recognize that prescribed fire is an inexact tool and that applying prescribed fire may result in the loss of large trees. However, we strongly recommend that action agencies take reasonable steps to minimize the loss of trees greater than 24 inches d.b.h.
- **Retain Key Owl Habitat Elements.** Design and implement management treatments within Forested Recovery Foraging/Non-breeding habitat so that most hardwoods, large snags (greater than 18 inches d.b.h.), large downed logs (greater than 18 inches diameter at any point), trees (18 inches d.b.h.) are retained, unless this conflicts with forest restoration and/or owl habitat enhancement goals. When implementing this guideline, managers should strive to achieve a balance between retaining a sufficient density and distribution of important features that spotted owls may require and reducing the risk of losing existing roosting and nesting habitat from insect epidemics and stand-replacing fires.

Critical Habitat

Primary constituent elements related to forest structure:

- Manage for a range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 percent to 45 percent of which are large trees with a trunk diameter of 12 inches (0.3 meter) or more when measured at 4.5 feet (1.4 meters) from the ground.
- Manage for a shade canopy created by the tree branches covering 40 percent or more of the ground.
- Manage for large dead trees (snags) with a trunk diameter of at least 12 inches (0.3 meter) when measured at 4.5 feet (1.4 meters) from the ground.

Primary constituent elements related to maintenance of adequate prey:

- Manage for high volumes of fallen trees and other woody debris.
- Manage for wide range of tree and plant species and including hardwoods.
- Manage for adequate levels of residual plant over to maintain fruits, seeds, and allow plant regeneration.

Primary constituent elements related to canyon habitat include one or more of the following:

- Manage for retaining the presence of water (often providing cooler and often higher humidity than the surround areas).
- Manage for clumps or stringers of mixed conifer, pine-oak, pinyon-juniper, and/or riparian vegetation.
- Manage the retention of canyon walls containing crevices, ledges, or caves.
- Manage for high percent of ground litter and woody debris.

MSO 1995 Recovery Plan (USDI Fish and Wildlife Service 1995)

◆ Protected Habitats:

Protected Activity Center (PAC)

- Within each selected PAC, the designated 100-acre nest/roost core will be deferred from all treatments.
- The remaining acres outside the 100-acre nest/roost core within a PAC may have a combination of thinning up to 9 inches d.b.h., and/or prescribed fire to reduce fire hazard and to improve habitat conditions for owl prey. Light burning of ground fuels may be allowed. Habitat components such as large logs (12 inches d.b.h. or greater) and snags (16 inches d.b.h. or greater) and hardwoods will be maintained or enhanced.
- Treatments can only occur during the nonbreeding season (1 September–28 February) in a PAC unless MSO surveys indicate non-breeding can be determined for that particular season. All surveys must be done according to USFWS MSO survey protocol.

Steep Slopes (mixed conifer and pine-oak on slopes greater than 40 percent outside of PACs)

- Within mixed-conifer and pine-oak types, allow no harvest of trees greater than 9 inches d.b.h. on any slopes greater than 40 percent where timber harvest has not occurred in the past 20 years.
- The use of prescribed fire with or without mechanical thinning is allowed in this habitat. Light burning of the understory will be emphasized during implementation.
- Retain or enhance hardwoods, large down logs, and snags.

◆ Restricted Habitats (mixed conifer and pine-oak outside of PAC on slopes less than 40 percent):

Restricted Target/Threshold Habitat

- Manage target habitat (mixed conifer and pine-oak) in such a way to meet threshold conditions as soon as possible in the future.
- No stand that currently meets threshold conditions can be treated in such a way as to lower that stand below conditions specified in Table III.B.1 of the 1995 MSO Recovery Plan.
- All trees greater than 24 inches d.b.h. will be retained unless overriding management situations require their removal to protect human safety and/or property.
- Retain or enhance hardwoods, large down logs, and snags.
- Emphasize the retention of trees greater than 18 inches d.b.h.
- Treatments should incorporate natural variation, such as irregular tree spacing and various stand patch sizes to mimic natural disturbance patterns.

Restricted Non Target/Threshold Habitat

- Manage non target/threshold habitat (mixed conifer and pine-oak) to provide habitat needs for the MSO. These needs predominately consist of foraging, dispersing or overwintering.
- All trees greater than 24 inches d.b.h. will be retained unless overriding management situations require their removal to protect human safety and/or property.
- Retain or enhance hardwoods, large down logs, and snags.
- Treatments should incorporate natural variation, such as irregular tree spacing and various stand patch sizes to mimic natural disturbance patterns.

- All habitat specifications such as e.g., basal area, canopy cover, tree spacing and trees per acre will be determined by forest specialists. These specifications will be designed in a way to meet the foraging needs of the MSO.
- Emphasize the retention of trees greater than 18 inches d.b.h. as much as possible.

Guidelines for Forest Vegetation Data Collection within Mexican Spotted Owl Habitat

The purpose of this document is to inform vegetation management project leads, line officers, silviculturist, and other project interdisciplinary team members when, why and how to collect common stand exam data when conducting vegetation management projects in Mexican spotted owl habitat.

When proposing vegetation management projects in MSO recovery habitats, it is necessary to disclose, document, and demonstrate that proposed vegetation treatments are consistent with the respective Recovery Plan requirements and desired conditions for habitat components; and post-treatment outcomes are consistent with planned objectives. The intensity of data collection to inform treatment prescriptions and monitor outcomes will vary based upon the specific habitat components, and proposed actions. Ideally, forest vegetation stand exams and fuels data would be collected in all areas prior to development of treatment prescriptions and sampled again post-treatment to monitor treatment outcomes. However, data collection is not always practical, feasible, or necessary for every project area or habitat component. The following outline identifies a list of common examples of approaches and considerations for data collection for forest vegetation management projects. This is a comprehensive, but not an exhaustive list; project vegetation managers should always discuss these approaches with the project biologist and USFWS conservation biologist before proceeding.

Stand exams (purpose):

Pre-treatment stand exams are used in project planning to understand and document the existing condition of forest vegetation and fuels. Stand exams (including fuels data) are collected under USFS agency protocols at 3 levels of data intensity, based on data needs, and data is archived in the agency FSVEG database. Pre-treatment exams can be conducted for the purposes of:

1. **Developing vegetation stratum** - like forest conditions that can be grouped for common treatments. Typically, a percentage of stands in a stratum are sampled with stand exams, while the remainder of similar stands are observed with walk-through reconnaissance to verify these areas are similar enough to be included in the stratum. The percentage of the area inventoried with data vs. walk-through observations should vary by project area to reflect the diversity (or lack thereof) of vegetation conditions and habitat component importance.
2. **Developing treatment prescriptions** – Representative stand data is used for modeling vegetation treatment alternatives and development of the proposed treatment prescriptions.
3. **Documentation of pre-treatment conditions** – when this is necessary and/or desired.

Post-treatment stand exams are used less frequently, but may be desired or necessary for the purposes of:

1. Documentation of the treatment outcome, and that implementation occurred as planned.
2. As a baseline for monitoring and/or modeling forest vegetation development over time.

Considerations for forest vegetation data collection in MSO habitats:

Project Planning - Data collection should be commensurate with habitat priority and/or need to know.

1. **Pre-treatment data collection may only be efficient and prudent on a limited percentage of the area for general MSO recovery habitat.** Data collection should be supplemented with field reconnaissance.
2. **Pre-treatment data collection should be more intensive within areas that are candidates for replacement nest/roost recovery (RNR) or protected activity center (PAC) habitats (based on current vegetation conditions).** All potential RNR areas proposed for silvicultural cutting treatments should be sampled to determine if these stands meet or are suitable for development into desired RNR habitat (modeling treatment alternatives to develop treatment prescriptions). All PAC areas proposed for vegetation management experiments should be sampled to develop treatment alternatives and document existing conditions. Areas designated for RNR habitat allocation, but not proposed for treatment should receive walk-through reconnaissance to determine suitability for allocation as RNR habitat.
3. **It may not be efficient or prudent to collect pre-treatment data on areas where the proposed treatments will minimally or not effect overall forest density, structure, or overstory trees.** (Example: thinning from below to 9 inches d.b.h.). This will need to be assessed by the project interdisciplinary team on a case by case basis.
4. **It may not be efficient or prudent to collect pre-treatment data on areas where the NEPA decision is signed.** In this case, if RNR allocations have been identified in the project decision, focus on post-treatment data collection in treated RNR and PAC habitat areas to demonstrate that the treatments were implemented consistent with the NEPA decision and Biological Opinion requirements. Where specific RNR habitat area allocations were not identified in the project decision, it may be necessary to collect data or do reconnaissance to identify areas for habitat allocation.
5. **It may not be feasible to collect pre-treatment data on some areas of landscape scale projects proposed for planned fire ignitions only.** In these circumstances, it will be necessary to include mitigation measures as described in the Recovery Plan, and implementation instructions into the burn plan to strive for achievement of outcomes that protect and/or enhance MSO habitat components.

Prescribed fire plan writers and burn bosses should consult with the project biologist early in the process when MSO concerns are identified within planned unit boundaries or adjacent. When writing a prescribed fire unit plan, it is common practice to identify special features or sites that may need additional protection, such as arch sites or structures. The presence of MSO nests, PACs, and replacement nest/roost habitat components should be no different. If planning a project outside of designated breeding season and periods of no burning, managers should list how they will burn through the area, what particular areas will need to be prepped or excluded, and how the operation will be carried out.

In the prescribed fire plan template (PMS-484), certain elements should cover the procedures and process in more detail, starting with Element 4 of the plan. In Element 4, section C, the writer should identify and describe all unique features, natural resources, values. Here is where you would list MSO nesting sites, PACs, etc., within the planned unit. In Element 5, section A, the writer should develop an objective related to MSO habitat, PACs, and nesting sites. This information can be pulled from the NEPA document or developed with the project biologist. Element 7, section A should have a weather and fuels prescription that will meet the objectives identified in Element 5. If a different prescription, e.g., burning on the cooler end is needed for the MSO objective to be met, it is acceptable to have two different prescriptions listed. Element 8, sections A and C, should discuss scheduling and constraints around MSO concerns. Element 9,

section A should detail any on-site prep work needed before ignitions start. MSO concerns related to operations could be listed in Element 10 as a measure to ensure they are talked about on the day of project ignitions. Consider adding a Resource Advisor (READ or REAF) to the organization in Element 11. In Element 15, section A, describe how the area related to MSO would be fired around or through in enough detail that personnel on the ground can follow directions from the plan. Element 16, section B should address any holding concerns related to the MSO area being protected, excluded, or fired through. If no holding concerns are needed, it would be good to mention that here, so the Holding Boss can focus on other locations. If smoke drifting into adjacent MSO areas is of concern, that should be discussed in Element 19, section B. Consider adding a Fire Effects Monitor (FEMO) to the organization to monitor the project's objectives related to fire. If monitoring is needed before, during, or after ignitions, discuss it in Element 20, section D. List any types and procedures related to monitoring in this section. If maps of MSO locations are needed to operate and burn in MSO areas successfully, they should be added to appendix A in the plan. Finally, the complexity analysis should measure how the mitigation techniques related to MSO add any complexity or risk to the operation.

Writing a quality prescribed fire plan will help the agency administrator, burn boss, forest biologist, and fireline personnel understand and implement the operation. The intent is not to exclude treatments in areas with MSO but to ensure all parties have a clear picture and carry out the operation to benefit the landscape and MSO.

Project Monitoring - Data collection should be commensurate with habitat sensitivity and/or need to know.

1. **Post-treatment data collection may only be efficient or prudent on a limited percentage of the area for general MSO recovery habitat.** Data collection should be supplemented with field reconnaissance.
2. **Post-treatment data collection should be more intensive within areas that are allocated for replacement nest/roost (RNR) or protected activity center (PAC) habitats.** All allocated RNR areas and PACs that received silvicultural cutting treatments that substantially affected overall forest density or overstory trees should be sampled to determine if the treatments were implemented as proposed.

Post-treatment monitoring of landscape scale projects that received planned fire ignitions only.

Post-treatment monitoring should follow procedures outlined in the prescribed fire plan under Element 20, section D. Site visits to RNR and/or PAC may be necessary after treatment to monitor first order fire effects (for example, did the planned treatment burn to hot? Are crown densities still within acceptable ranges? Did you meet your objectives?) If fire effects were not in line with predicted fire behavior, additional follow-up with the project biologist and USFWS should take place. Document any adverse fire effects and adjust future prescribed fire prescription parameters. Second order fire effects may be observed and recorded post-treatment after one year. Share results with project biologist, fuels specialist, and USFWS.

Pre-implementation Compliance Review for the Regional Mexican Spotted Owl Recovery Strategy

August 6, 2021

The purpose of this document is to ensure that all vegetation management projects identified within a Forest’s 5-year plan with signed NEPA decisions are compliant with the appropriate MSO recovery plan(s).

This document should be prepared and reviewed by interdisciplinary specialists who have knowledge of the project area, MSO habitat and recovery needs, and the treatments to be implemented. At minimum, this will normally require the project lead, such as a forester and/or fuels specialist, a certified silviculturist, and qualified biologist.

Pre-Implementation Compliance Review

Project Name:	
USFS Forest and District :	
Recovery Plan (RP) implementing (1995, 2012, or both:	
Which EMUs are present in the treatment areas?	
Reviewed by qualified Biologist (Name, Title):	
Prepared by Project Lead (Name, Title):	
Date Project Reviewed:	

Project Type	
Timber Sale?	
Service Contract with tree cutting?	
Grant or Agreement with Tree Cutting?	
Force Account Thinning / tree cutting?	
Grant or Agreement with Prescribe Burning?	
Force Account Prescribe Burning?	
Project Description: (Thin, Pile, DBH limit, acres, etc.)	
Estimated Implementation Timeline	

NEPA Decision Project Name	
NEPA Decision Document Type (DM, DN, ROD)	
Responsible Line Officer	
Decision Date	

Review Survey/Monitoring	Yes/No	Completed or Scheduled Survey Dates
1. Were there 2 years of MSO survey prior to project implementation?		
2. If the survey information for the project/treatment area is more than 5 years old , have you conducted or planned another year of inventory survey prior to implementation of treatment?		
3. If approaching the 5-year mark, do we have plans during the current Fiscal Year to complete the additional year survey prior to implementation?		
If two years of pre-implementation surveys have been completed and 5 years have not elapsed, project can proceed.		
If answer to any is <i>No</i> , then inform the local Line Officer and contact the Regional Threatened and Endangered Program Manager to determine what remedy is needed.		
Estimated timeframe for the remedy?		

Review – Habitat and Management Areas (see definitions and terms below) (If the project is located within MSO habitat refer to and follow the Regional MSO Habitat Treatment Implementation Guidance)	Yes/No
1. Is protected habitat (PACs or steep slopes) and/or restricted habitat identified? Including target/threshold habitat (1995 RP)? Or, is PAC and recovery habitat, including recovery nest/roost habitat, identified (2012 RP)? If NO, then inform the local Line Officer and contact the Regional Threatened and Endangered Program Manager to determine what remedy is needed.	
2. Is project within MSO PAC Core?	
3. Is project within MSO PACs outside of Core?	
4. Is project within MSO Critical Habitat?	
5. Is project within MSO Recovery (2012 RP), Protected (Outside of PACs) (1995 RP), or Restricted Habitat (1995 RP)?	
6. Is project within MSO Recovery Nest/Roost (NR) (2012 RP) or Target/Threshold Habitat (1995 RP)?	
7. Is the project within MSO Recovery Foraging (2012 RP) or Restricted Non-Target Threshold Habitat (1995 RP)?	
Remarks on Habitat Determinations	
Please add a short statement about the vegetation in the project area to provide context to MSO habitat in this EMU (e.g., the vegetation is pure ponderosa or PJ; the EMU does not include pine-Gambel oak).	
If the answer is Yes for any questions above, <i>ensure that treatments are consistent with the direction in the Regional MSO Mgt Strategy and the MSO Recovery Plan and/or the ESA Section 7 consultation. [Initials]</i>	

Definitions and Terms

The section below provides information to help define the terms used in the tables above. For additional information please refer to the parent documents.

MSO 1995 Recovery Plan (USDI Fish and Wildlife Service 1995)

- ◆ **Protected Habitats:**
 - Protected activity centers (PAC): a minimum of 600-acre buffer that is developed around Mexican spotted owl nest/roost sites that incorporates the best nest/roost habitat. Within the PAC, an established 100-acre buffer (core area) is developed around nest or primary roost areas.
 - All areas in mixed conifer and pine-oak types with slope greater than 40 percent where timber harvest has not occurred in the past 20 years outside of PACs.
- ◆ **Restricted Habitats:** Currently unoccupied Mexican spotted owl habitat occurring in pine-oak (depending on EMU), mixed conifer, and riparian forests. These habitats may be or have the potential to be used by owls for nesting, roosting, foraging, dispersal, and/or other life history needs.
 - **Restricted Target/Threshold Habitat:** Habitat outside of PACs where nesting structure currently exists or can be managed to be met in the future (Table III.B.).
 - **Restricted Non Target/Threshold Habitat:** Habitat outside of PACs that is currently not in nesting structure or less likely to be met in the foreseeable future. Forested stands managed to provide foraging, dispersal, wintering, or other habitat needs.

MSO 2012 Recovery Plan (USDI Fish and Wildlife Service 2012)

- ◆ **Protected Habitats:** Protected habitat encompasses the area that is found within a protected activity center (PAC). A PAC is a 600-acre buffer that is developed around Mexican spotted owl nest/roost sites. Within the PAC, an established 100-acre buffer (core area) is developed around nest or primary roost areas.
- ◆ **Recovery Habitats:** Currently unoccupied Mexican spotted owl habitat occurring in pine-oak (depending on EMU), mixed conifer, and riparian forests and/or rocky canyons. These habitats may be or have the potential to be used by owls for nesting, roosting, foraging, dispersal, and/or other life history needs.
 - **Forested Recovery Habitat:** Forested habitat occurring in mixed-conifer and pine-oak (depending on EMU) forests outside of PACs.
 - **Recovery Nest/Roost Habitat:** Forested stands identified as meeting or exceeding owl nest/roost conditions (See Tables C.2 & C.3 of MSO Recovery Plan).
 - **Recovery Foraging/Non-breeding Habitat:** Forested stands managed to provide foraging, dispersal, wintering, or other habitat needs.
 - **Riparian Recovery Habitat:** Riparian forests are plant communities affected by surface and subsurface hydrologic features of perennial or intermittent water bodies. Riparian forests are: (1) distinctively different tree and shrub species than the adjacent areas; and/or, (2) tree species similar to adjacent areas but exhibiting more vigorous or robust growth forms.

Critical Habitat (USDI Fish and Wildlife Service 2004)

Critical habitat is specific geographic areas that are essential for the conservation of a threatened or endangered species and that may require special management considerations. Designated critical habitat only exists in areas defined as MSO habitat in the 1995 Recovery Plan and its 2012 revision.

- ◆ Primary constituent elements (PCEs): PCEs are essential to the conservation of the owl and include those physical and biological features that support nesting, roosting, and foraging. PCEs are only found within designated specific geographic areas of critical habitat.
 - Primary constituent elements related to forest structure.
 1. a range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 percent to 45 percent of which are large trees with a trunk diameter of 12 inches (0.3 meter) or more when measured at 4.5 feet (1.4 meters) from the ground;
 2. a shade canopy created by the tree branches covering 40 percent or more of the ground; and
 3. large dead trees (snags) with a trunk diameter of at least 12 inches (0.3 meter) when measured at 4.5 feet (1.4 meters) from the ground.
 - Primary constituent elements related to prey base.
 1. High volumes of fallen trees and other woody debris;
 2. A wide range of tree and plant species, including hardwoods; and
 3. Adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.
 - Primary constituent elements related to canyon habitat (one or more of the following).
 1. presence of water (often providing cooler and often higher humidity than the surrounding areas.
 2. clumps or stringers of mixed conifer, pine-oak, pinyon-juniper, and/or riparian vegetation.
 3. canyon wall containing crevices, ledges, or caves.
 4. high percentage of ground litter and woody debris.

Literature Cited

- U.S. Department of Interior, Fish and Wildlife Service. 1995. Recovery plan for the Mexican spotted owl. Vol. 1. Albuquerque, New Mexico. 172 pp. Available at <https://www.fws.gov/southwest/es/arizona/Documents/RecoveryPlans/MexicanSpottedOwl.pdf>
- . 2012. Final Recovery Plan for the Mexican Spotted Owl (*Strix occidentalis lucida*), First Revision. U.S. Fish and Wildlife Service. Albuquerque, New Mexico. 413 pp. Available at https://ecos.fws.gov/docs/recovery_plan/MSO_Recovery_Plan_First_Revision_Dec2012.pdf
- . 2004. Final designation of critical habitat for the Mexican spotted owl. Final Rule. Fed. Register. 69 (168): 53182- 53298. Available at <https://www.govinfo.gov/content/pkg/FR-2004-08-31>.

Mexican Spotted Owl Habitat Environmental Analysis Project Checklist

June 7, 2021

The purpose of this document is to assist and guide interdisciplinary teams (IDT) on how to conduct environmental analysis for vegetation management projects that would implement mechanical and prescribed fire treatments within Mexican spotted owl habitat.

All vegetation management project documentation/analysis are required to address the following list of items to assure consistency with land management plan and the Recovery Plan (RP) for the Mexican spotted owl (MSO), First Revision (USFWS 2012).

As the IDT conducts the analysis it should consider the caution on pages 74–75 in the 2012 Recovery Plan that much of the work needed to reduce the fire risk to Mexican spotted owl habitat can be achieved by treating areas outside of PACs and Recovery nest/roost habitat to develop forest structure and density conditions that facilitate low-severity surface fires in the surrounding project landscape. Often, these forest restoration treatments outside the PACs can be combined with minimal treatments inside the PACs such as low thinning, selection cutting, and prescribed burning to also facilitate lower-severity fire behavior potential within the PACs. Management approaches to protecting and enhancing PAC habitats should be based on local existing and projected vegetation conditions, and management alternatives focused on the minimal treatments necessary to protect or enhance PAC habitats.

Project: Four Forest Restoration Initiative Rim Country Project

District, Forest: Apache-Sitgreaves, Coconino, and Tonto National Forests

Description: Table F-1 was used to assist and guide the Rim Country interdisciplinary team in planning treatments in Mexican spotted owl habitat. The Rim Country district wildlife biologists, fire, fuels, and silviculture specialists planned treatments in protected activity centers using the information included in the checklist. Before implementation, an interdisciplinary team will verify that treatments are needed to improve habitat characteristics important to Mexican spotted owls and to reduce the risk of high severity wildfire in the protected activity centers, core areas, and in Mexican spotted owl Recovery habitat. Treatments in protected activity center habitat were developed in the Rim Country Biological Assessment PAC Atlas, which includes protected activity center treatment descriptions. Due to the sensitive nature of nest and roost locations this information is not publicly available. Table F-1 documents the interdisciplinary team review process. Modeling using the Forest Vegetation Simulator was done in Mexican spotted owl habitat for the existing condition, 10 years after implementation, and 20 years after implementation. The FVS model results measure some variables of habitat that are important for the Mexican spotted owl such as canopy cover, trees per acre by tree size classes, and herbaceous and shrub layers. The model results are not spatial, so some variables could not be modeled such as horizontal heterogeneity, diversity, patch size, etc. These variables will be handled at the prescription level by the implementation team.

Date: 09/23/2021

Table F-1. Consistency with land management plans and the recovery plan for the Mexican spotted owl

Task	X = done	Comments
Project and Analysis Area:		
1. Clearly delineate and display the project area .	X	Rim Country, FEIS Chapter 1
2. Clearly delineate and display or describe the analysis (action) area	X	Rim Country, FEIS Chapter 1
3. Identify Forest Cover Type (e.g., mixed conifer, pine-oak, other forest and woodland; see appendix C, pp. 250–256, of the MSO Recovery Plan, First Revision; USFWS 2012)	X	Available in Biological Assessment (BA) and Terrestrial Wildlife Specialist Report (TWSR)
Mexican spotted owl habitat delineated in the project area (locations mapped, and total acres displayed):	X	In BA and TWSR
1. Protected Activity Centers identified in the project/action area. These are mapped and total acres are displayed.	X	In BA and TWSR
2. Recovery Habitat includes all mixed conifer, riparian forests, and pine-oak for some Ecological Management Units (EMUs). Refer to the MSO Recovery Plan, First Revision; USFWS 2012 for locations of EMUs, on Figure II.1 on pg. 9, for EMU descriptions see pp. 10-14 and for Forest types for Recovery habitat associated with each EMU see Table C.3.	X	In BA and TWSR
3. Recovery Nest/Roost Habitat identified and delineated in the project/action area.	X	In BA and TWSR
a. Recovery Nest/Roost Habitat are mapped, and at least the minimum percentages are delineated for the project area and/or the unit (District or Forest). The following data sources could be used to identify and map these areas:	X	In BA and TWSR
<ul style="list-style-type: none"> • Contemporary stand exam data should be used where available. • Absent stand exam data, other sources of information may be used: <ul style="list-style-type: none"> ○ imputed nearest neighbor, ○ LiDAR, ○ Landsat remote sensing, ○ geophysical modeling, ○ slope, ○ aspect, ○ field examination by certified silviculturist and a qualified biologist ○ Regional Recovery Habitat map ○ Habitat Trend Modeling information (Gavin Jones et al.) that will be useful in identifying recovery nest/roost habitat. 		
This should be accomplished with coordination with the U.S. Fish and Wildlife Service (USFWS), a certified silviculturist, and a qualified biologist.		
i. Describe the methodology used to identify and delineate recovery nest/roost habitat for project/unit.	X	In BA and TWSR
a. Identify the areas that currently meet or are above the minimum desired conditions listed in Table C.3 of the Recovery Plan (p. 278), or areas that have the greatest potential to attain these conditions in the appropriate locations on the landscape (e.g., cooler, north/northeast-facing aspects).	X	In BA and TWSR
4. Recovery Dispersal/Forage Habitat identified and delineated in the project/action area.	X	In BA and TWSR
5. Critical Habitat Unit(s) identified and delineated in the project/action area.	X	In BA and TWSR
a. Quantify area of critical habitat in the critical habitat unit and within the project area.	X	686,287 in project area (all landowners), 674,634 on FS land in project area. 264,635 acres have PCEs for the MSO.
b. List all primary constituent elements (PCEs) of the physical and biological features in the Biological Assessment.	X	In BA and TWSR
Pre-project surveys within the project area as well as ½ mile beyond in MSO habitat.	X	Some areas will likely need pre-project surveys, some areas already have it.

Task	X = done	Comments
I.A.1 Description of existing, pre-treatment conditions in PACs:	X	Done with FVS modeling and District Specialists (See PAC Atlas)
1. Describe conditions INSIDE OF NEST/ROOST CORE AREA.	X	Done with FVS modeling and District Specialists
a. Core areas will be deferred from mechanical treatment. (Appendix D of the Recovery Plan p. 316)	X	In BA and TWSR
b. Provide information regarding broadcast burning outside of the breeding season or during if non-breeding is inferred or confirmed for that year. Provide information that describes the plan and conditions that help to ensure the burn can be conducted at a low intensity with low-severity effects.	X	Design features are very clear on this.
c. Provide existing condition information as related to Table C.3	X	Done for BA by cover type 120 MC/110 PO: also done for TPA >18 inches with 12 the DC for mixed conifer and ponderosa pine-oak.
I.B.2 Description of post-treatment conditions in PACs immediately following prescribed burning:		
1. Describe conditions INSIDE OF NEST/ROOST CORE AREA.	X	This will be done by the wildlife biologist and silviculture specialist on the implementation team
I.A.2 Description of existing, pre-treatment conditions in PACs:		
1. PAC OUTSIDE OF NEST/ROOST CORE AREA.	X	In BA, PAC Atlas, and TWSR
• Fire risk assessment within the project area and in the planning area.	X	Done for each PAC with Mechanical Treatment proposed in the PAC Atlas
• Provide information regarding how the proposed treatments in the PAC, outside nest/roost core, may reduce fire hazard while striving to maintain or improve habitat conditions for the owl and its prey.	X	In BA and TWSR
• Assess the percentage of proposed mechanical treatments in non-core PAC area for the EMU. Should not exceed 20 %. However, treatments can exceed 20% of the non-core area within a single PAC if justified to affect fire behavior to reduce the risk to nest/roost cores.	X	Included in the BA.
• No prescribed fire or mechanical treatments should occur within PACs during the breeding season unless non-breeding is inferred or confirmed the year of treatment per the accepted protocol (Appendix D, Recovery Plan).	X	Covered with design features.
• Removal of hardwoods, downed woody debris, snags, and other key habitat variables should occur only when compatible with owl habitat management objectives as documented through reasoned analysis.	X	Prescription Level. Prescribed burning will not target hardwoods.
• All treatments in PACs should be coordinated with the appropriate FWS Office.	X	Districts will coordinate with USFWS before treatments. Design features also state this.
2. Description may include the following conditions:		
a. Diversity of patch size outside nest/roost core	X	This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.
b. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.	X	This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.
c. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.	X	This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.
d. Diverse composition of vigorous native herbaceous and shrub species.	X	FVS modeling shows treatments will maintain or enhance these habitat variables.
e. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)	X	This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.

Task	X = done	Comments
f. Minimum canopy cover of 40% in pine-oak and 60% in mixed conifer within stands (openings or canopy gaps between patches are not included in canopy cover measurements).	X	FVS Modeling shows treatments will maintain or enhance these habitat variables.
g. Structural diversity of trees	X	This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.
Refer to Table C.2 in the Recovery Plan for additional description and the relevance of these desired conditions to the Mexican spotted owl along with potential variables to measure.	X	This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.
I.B. Description of post-treatment conditions in PACs immediately following thinning and/or prescribed burning:		
1. PAC OUTSIDE OF NEST/ROOST CORE. May include information regarding the following:		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
a. Diversity of patch size outside nest/roost core		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
b. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
c. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
d. Diverse composition of vigorous native herbaceous and shrub species.		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
e. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
f. Minimum canopy cover of 40% in pine-oak and 60% in mixed conifer within stands (openings or canopy gaps between patches are not included in canopy cover measurements).		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
g. Structural diversity of trees.		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
h. Diversity of tree sizes with goal of having trees ≥16" DBH contributing ≥50% of the stand basal area.		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
Refer to Table C.2 in the Recovery Plan for additional description and the relevance of these desired conditions to the Mexican spotted owl along with potential variables to measure.		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
II.A Description of existing, pre-treatment conditions in RECOVERY nest/roost habitat:	X	FVS modeling
1. Describe conditions inside of recovery nest/roost habitat.	X	FVS Modeling, BA, and Terrestrial Species Wildlife Specialist Report
a. Mechanical treatments are not recommended in recovery nest/roost habitat and should be deferred. Though avoidance should be the first choice, there may be very limited circumstances, if warranted for the benefit of the owl, when minimal mechanical treatment may be needed as described in the MSO Recovery Plan.	X	Acres selected will need to be verified in the field. This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.

Task	X = done	Comments
b. Provide Justification for any mechanical treatment or thinning	X	Reducing fire risk or improving habitat is shown in fire modeling and FVS modeling in the BA and TWSR.
c. Provide information regarding broadcast burning	X	Design Features call for low severity prescribed burn.
d. Provide existing condition information as related to Table C.3	X	In BA and TWSR. Acres selected will need to be verified in the field.
* if stand exam data exists for delineated nest/roost recovery habitat at the time of the analysis, then follow Regional MSO Habitat Treatment Implementation Guidance to conduct the analysis and develop the proposed action.	-	-
II.B. Description of post-treatment conditions in recovery nest/roost habitat*	-	-
1. If treatments are proposed in recovery nest/roost habitat , provide justification with specific information for why treatments are necessary and why deferment isn't an option or if conditions are not suitable as recovery habitat and how the treatment will directly improve owl habitat., Provide post-treatment condition information as related to Table C.3 in the Recovery Plan, First Revision (USFWS 2012), or Table III.B.1 in the original MSO Recovery Plan (USFWS 1995) if working under the 1996 amendment to your land management plan. Describe how it meets land management plan requirements. Do not treat the minimums in Table C.3 as targets rather treat only what is minimally needed.		See above.
2. Replacement nest/roost habitat post-treatment variables:		This will be done by the implementation team; Silviculture Specialist, wildlife biologist, and with USFWS coordination.
a. % of recovery habitat in the project area/planning area		See above
b. Canopy cover		See above
c. Basal area		See above
d. % Basal Area 30-46 cm (12-18 in) diameter at breast height (d.b.h.)		See above
e. % Basal Area >46 cm (>18 in) d.b.h.		See above
f. Large trees >46 cm (>18 in) d.b.h. per acre		See above
* if stand exam data exists for delineated nest/roost recovery habitat at the time of the analysis, then follow Regional MSO Habitat Treatment Implementation Guidance to conduct the analysis and develop the proposed action.		-
III.A. Description of pre-treatment conditions in recovery habitat:		-
1. <u>Recovery dispersal/foraging habitat</u> , that is, recovery habitat outside of recovery nest/roost habitat. May include the following information:		This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.
a. Diversity of patch size outside nest/roost core		This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.
b. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.		This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.
c. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.	X	FVS modeling shows treatments will maintain or enhance these habitat variables. The implementation team will need to verify prescription and DFs are for MSO Recovery habitat.
d. Diverse composition of vigorous native herbaceous and shrub species.	X	FVS Modeling shows treatments will maintain or enhance these habitat variables.
e. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)		This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.

Task	X = done	Comments
f. Minimum canopy cover of 40% in pine-oak and 60% in mixed conifer within stands (openings or canopy gaps between patches are not included in canopy cover measurements).	X	FVS Modeling shows treatments will maintain or enhance these habitat variables. The implementation team will need to verify prescription and DFs are for MSO Recovery habitat.
g. Structural diversity of trees		This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.
Refer to Table C.2 in the Recovery Plan for additional description and the relevance of these desired conditions to the Mexican spotted owl along with potential variables to measure.		This will be done by the implementation team; silviculture specialist and wildlife biologist with USFWS coordination.
III.B. Description of post-treatment conditions in <u>recovery dispersal/foraging habitat</u> outside of recovery nest/roost habitat:		-
2. Recovery habitat dispersal/foraging habitat, that is, recovery habitat outside of recovery nest/roost habitat. May include the following information:		-
a. Diversity of patch size outside nest/roost core		This will be done by the implementation team; silviculture specialist, wildlife biologist, and with USFWS coordination.
b. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.		See above
c. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.		See above
d. Diverse composition of vigorous native herbaceous and shrub species.		See above
e. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)		See above
f. Minimum canopy cover of 40% in pine-oak and 60% in mixed conifer within stands (openings or canopy gaps between patches are not included in canopy cover measurements).		See above
g. Structural diversity of trees		See above
Refer to Table C.2 in the Recovery Plan for additional description and the relevance of these desired conditions to the Mexican spotted owl along with potential variables to measure.		See above
IV. Description of pre- and post-treatment conditions in Critical Habitat – Critical habitat is specific geographic areas that are essential for the conservation of a threatened or endangered species and that may require special management considerations. Primary constituent elements (PCEs) are found within these specific geographic areas. PCEs are essential to the conservation of the owl and include those physical and biological features that support nesting, roosting, and foraging. Designated critical habitat only exists in areas defined as MSO habitat in the 1995 Recovery plan and its 2012 revision see https://ecos.fws.gov/ecp/report/criticalHabitat .		
A. <u>Primary constituent elements related to forest structure:</u>		BA and TWSR addressed existing condition and modeled treatments 10 and 20 years into the future. The implementation team will need to verify that treatments will promote PCEs.
1. a range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30% to 45% of which are large trees with a trunk diameter of 12 inches (0.3 meter) or more when measured at 4.5 feet (1.4 meters) from the ground;		See above
2. a shade canopy created by the tree branches covering 40% or more of the ground; and		See above
3. large dead trees (snags) with a trunk diameter of at least 12 inches (0.3 meter) when measured at 4.5 feet (1.4 meters) from the ground.		See above
B. <u>Primary constituent elements related to maintenance of adequate prey:</u>		See above
1. High volumes of fallen trees and other woody debris;		See above
2. A wide range of tree and plant species, including hardwoods; and		See above
3. Adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.		See above

Task	X = done	Comments
C. Primary constituent elements related to canyon habitat include one or more of the following:		See above
1. presence of water (often providing cooler and often higher humidity than the surrounding areas);		See above
2. clumps or stringers of mixed conifer, pine-oak, pinyon-juniper, and/or riparian vegetation.		See above
3. canyon wall containing crevices, ledges, or caves; and		See above
4. high percent of ground litter and woody debris.		See above
Develop monitoring plan with the USFWS, may include one or both of the following:	-	-
1. Monitor occupancy and reproduction in treated Mexican spotted owl PACs	X	District and 4FRI Staff
2. Management Experiments for treatments in PACs (Box C.5, pp. 281-283, 2012 MSO RP)	-	-
3. Monitor pre- and post-treatment	X	District and 4FRI Staff
Report implementation of the action and compliance with the terms and conditions as required by the reasonable and prudent measures in the incidental take statement of the biological opinion, or other consultation document (measures included in concurrence letter for NLAA determinations), and associated NEPA documentation and analysis and make available to the Public This will be done by utilizing the guidance provided in the Regional MSO Habitat Vegetation Management Implementation Guidance.	X	District and 4FRI Staff

*if stand exam data exist for delineated nest/roost recovery habitat at the time of the analysis, then follow MSO habitat treatment implementation guidance to conduct the analysis and develop the proposed action.

¹ % 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.

²BAs in m²/ha (ft²/acre) and include all trees >1 inch d.b.h. (i.e., any species). We emphasize that values shown are **minimums**, not targets.

³Trees > 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.

⁴Pine-oak forest type: ≥10% of the stand BA or 4.6 m²/ha (20 ft²/ac) of BA consist of Gambel oak ≥ 13 cm (5 in) diameter a root collar.

⁵Pine-oak recommendations apply only to the Mount Taylor and/or Zuni Mountains regions within the CP EMU.

Please also refer to Appendix C in the 2012 Mexican Spotted Owl Recovery Plan, First Revision, for recommended management actions, monitoring treatment effects, and information on desired conditions for nest/roost core areas, PACs, and recovery habitat.

Table C.2 and C.3 in Appendix C of the Mexican Spotted Owl Recovery Plan, First Revision (USFWS 2012)

Table C.2 and C.3 in Appendix C of the Mexican Spotted Owl Recovery Plan, First Revision (USFWS 2012) referenced above in the checklist.

Table C.2. Generalized description of key habitat variables comprising Desired Conditions in forest, riparian, canyon, and woodland cover types typically used by Mexican spotted owls for nesting and roosting.

Desired conditions should guide management within PACs and recovery nest/roost habitats. The ecological relevance of each desired condition to this owl subspecies and examples of variables that may be useful to quantify desired conditions are also shown. Where possible numbers are derived from past research, where information was unavailable, we used the collective best professional knowledge of the Recovery Team.

Desired Condition	Relevance to Owl	Potential Variables (Examples)
Strive for a diversity of patch sizes with minimum contiguous patch size of 1 ha (2.5 ac.) with larger patches near activity center; mix of sizes toward periphery (Peery et al. 1999; Grubb et al. 1997; May and Gutiérrez 2002). Forest type may dictate patch size (i.e., mixed conifer forests have larger and fewer patches than pine-oak forest). Strive for between patch heterogeneity.	Nest/roost habitat patches are the most limiting habitat for the owl. Patches should enhance spatial heterogeneity, provide nest/roost options, provide varied microclimates (thermoregulation) options, and create edges for prey species (for example, <i>Neotoma</i>).	Size, cumulative acreage, density of patches, % of landscape, amount of edge habitat, average patch canopy cover, average age of dominant overstory component of patch. Frequency distribution of patches by size class, total edge, core to edge distance, fractal index of patch (area to edge ratios).
Horizontal and vertical habitat heterogeneity within patches, including tree species composition.* Patches are contiguous and consist of trees of all sizes, unevenly spaced, with interlocking crowns and high canopy cover (Ganey et al. 2003).*	Provides roosting options, thermal and hiding cover for the owl, and habitat for a variety of prey species.	Patch size and configuration (shape), juxtaposition (topology of patches), interspersions, edge length; canopy cover by height strata; number of vegetation strata present (herbaceous, shrub, sapling, pole, mature trees); uneven tree spacing.
Tree species diversity, especially with a mixture of hardwoods and shade-tolerant species (Willey 1998).* For example, Gambel oak provides important habitat for woodrats and brush mice (Block et al. 2005, Ward 2001)	Provides habitat and food sources for a diversity of prey, roosting options, and perches and hiding cover for young owls during early flight development. Large tree-form Gambel oaks are an important nesting substrate for owls (Ganey et al. 1992; SWCA 1992; May and Gutiérrez 2002). Diversity increases probability of some tree species setting seed in a given year. Owls use hardwoods (e.g., big-toothed maple, western hop hornbeam and chinkapin oak) for roosting (Mullet and Ward 2010)	Species occurrence (presence), diversity indices (including richness and equitability), BA by species, density/species.
Diverse composition of vigorous native herbaceous and shrub species (Ward 2001).*	Provides sustainable habitat for a variety of prey; fine fuels to carry surface fire.	Cover/plant group; plant height; vertical density profile; diversity measure (e.g., richness and equitability); vertical distribution; maximum height.
Opening sizes between 0.04 – 1 ha (0.1 – 2.5 ac.).* Openings within a forest are different than natural meadows. Small canopy gaps within forested patches provide for prey habitat diversity. Openings should be small in nest/roost patches, may be larger in rest of PAC.	Openings provide habitat for a variety of prey and can slow or reduce fire severity by breaking the continuity of dense tree canopies and ladder fuels.	Frequency distribution of openings by size class, % of landscape in openings. Grass and herbaceous cover in openings (Daubenmire plots for coverage percent).
Minimum canopy cover of 40% in pine-oak and 60% in mixed conifer (Ganey et al. 2003).* Measure canopy cover within stands.	Provides thermal environment needed for nesting/roosting and prey habitat.	Canopy cover line or point intercept method).

*Rocky Canyon Recovery Habitat: results from habitat studies suggest these desired conditions are important in canyon environments where forest, woodland, and riparian habitats are present (e.g., Zion National Park).

Table C.3. Minimum desired conditions for mixed-conifer and pine-oak forest areas managed for Recovery nesting/roosting habitat. Forest types are defined in Appendix C, above.

Parameter values are based on averages among plots sampled within forest stands. Numbers of stands included in analysis: 74 for Basin and Range-East (BRE), 27 for mixed-conifer forest in other EMUs, and 47 for pine-oak forest.

EMU(s) Forest Type	% of Area ¹	% BA by size class 30-46 cm d.b.h. (12-18 in)	% BA by size class >46 cm d.b.h. (>18 in)	Minimum tree BA ²	Minimum density of large trees ³
BRE Mixed-conifer	20	>30	>30	33.3 (145)	37 (15)
CP, UGM, SRM, BRW Mixed-conifer	25	>30	>30	27.5 (120)	30 (12)
CP ⁴ , UGM, BRW Pine-oak ⁵	10	>30	>30	25.3 (110)	30 (12)

¹ % 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.

² BAs in m²/ha (ft²/acre) and include all trees greater than 1 inch d.b.h. (any species). We emphasize that values shown are **minimums**, not targets.

³ 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.

⁴ Pine-oak forest type: greater than or equal to 10 percent of the stand BA or 4.6 m²/ha (20 ft²/acre) of BA consist of Gambel oak greater than or equal to 13 cm (5 in) drc.

⁵ Pine-oak recommendations apply only to the Mount Taylor and/or Zuni Mountains regions within the CP EMU.

U.S. Fish and Wildlife Service (USFWS). 2012. Final Recovery Plan for the Mexican Spotted Owl (*Strix occidentalis lucida*), First Revision. U.S. Fish and Wildlife Service. Albuquerque, New Mexico, USA. 413 pp.