

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 forest plans 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: **Santa Fe Mountains Landscape Resiliency Project**

District, Forest: **Espanola and Pecos-Las Vegas Ranger Districts, Santa Fe National Forest**

Date: **7/12/21**

Task	√ = done	Comments
Project and Analysis Area:		
1. Clearly delineate and display the project area .	√	Add legal description.
2. Clearly delineate and display or describe the analysis (action) area	√	
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)	√	
Mexican spotted owl habitat delineated in the project area (locations mapped, and total acres displayed):		
1. Protected Activity Centers identified in the project/action area. These are mapped and total acres are displayed	√	Would be helpful to add PAC names to map.
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.	√	
3. Recovery Nest/Roost Habitat identified and delineated in the project/action area.		
a. Recovery Nest/Roost Habitat are mapped, and the minimum percentages are delineated for the project area and/or the unit (District or Forest). The following data sources could be used identify and map these areas: <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, 		Stand exam data not used. Minimum percentages not delineated for project and/or District/Forest. Could use more discussion on the habitat model used to delineate recovery habitat.

<ul style="list-style-type: none"> ○ LiDAR, ○ Landsat remote sensing, ○ geophysical modeling, ○ slope, ○ aspect, ○ field examination by a certified Silviculturists 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. <p>This should be accomplished with coordination with the U.S. Fish and Wildlife Service (FWS), a certified Silviculturist and a qualified biologist.</p>		
i. Describe the methodology used to identify and delineate recovery nest\roost habitat for project/unit.		Need to improve our discussion of how habitat was delineated. Included link does not take reader to a site that includes habitat delineation document.
b. 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).	✓	
4. Recovery Dispersal/Forage Habitat identified and delineated in the project/action area.	✓	
5. Critical Habitat Unit(s) identified and delineated in the project/action area.		Critical habitat is mapped but need to identify units.
a. Quantify area of critical habitat in the critical habitat unit and within the project area.		Not quantified in the critical habitat unit.
b. List all primary constituent elements (PCEs) of the physical and biological features in the Biological Assessment.	✓	
Pre-project surveys within the project area as well as ½ mile beyond in MSO habitat.		Partial surveys completed.
I.A.1 Description of existing, pre-treatment conditions in PACs:		
1. Describe conditions INSIDE OF NEST/ROOST CORE AREA.		Not done.
a. Core areas will be deferred from mechanical treatment. (Appendix D of the Recovery Plan p. 316)		Not done. Included in design features?
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.	✓	Light on plan/conditions information.
c. Provide existing condition information as related to Table C.3	✓	A little light on this topic.
I.B.2 Description of post-treatment conditions in PACs immediately following prescribed burning:		
1. Describe conditions INSIDE OF NEST/ROOST CORE AREA.		Not done.
I.A.2 Description of existing, pre-treatment conditions in PACs:		
1. PAC OUTSIDE OF NEST/ROOST CORE AREA.		
<ul style="list-style-type: none"> • Fire risk assessment within the project area and in the planning area. 	✓	Very light on assessing the risk. Almost exclusively discusses how the undefined risk will be mitigated.
<ul style="list-style-type: none"> • 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. 	✓	
<ul style="list-style-type: none"> • 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. 		Lists amount of the PAC in project area but not area slated for mechanical treatment.
<ul style="list-style-type: none"> • 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). 	✓	
<ul style="list-style-type: none"> • 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. 	✓	Probably better fleshed out in design features.

<ul style="list-style-type: none"> All treatments in PACs should be coordinated with the appropriate FWS Office. 		Not explicitly stated.
2. Description may include the following conditions:		
a. Diversity of patch size outside nest/roost core		Only desired conditions discussed.
b. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.		Only desired conditions discussed.
c. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.		Only desired conditions discussed.
d. Diverse composition of vigorous native herbaceous and shrub species.		Only desired conditions discussed.
e. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)		Only desired conditions discussed.
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).		Only desired conditions discussed.
g. Structural diversity of trees	✓	
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.		
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:		
a. Diversity of patch size outside nest/roost core	✓	
b. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.	✓	
c. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.	✓	
d. Diverse composition of vigorous native herbaceous and shrub species.	✓	
e. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)	✓	
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).		
g. Structural diversity of trees.	✓	
h. Diversity of tree sizes with goal of having trees ≥16" DBH contributing ≥50% of the stand basal area.	✓	
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.		
II.A Description of existing, pre-treatment conditions in <i>RECOVERY nest/roost habitat</i> *:		
1. Describe conditions <i>inside of recovery nest/roost habitat</i> .		
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.		Only desired conditions discussed.
b. Provide Justification for any mechanical treatment or thinning		Only desired conditions discussed.
c. Provide information regarding broadcast burning		Only desired conditions discussed.
d. Provide existing condition information as related to Table C.3		Only desired conditions discussed.
* 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 <i>recovery nest/roost habitat</i> *		
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		I believe we need to expand on this section. The need for treatment in recovery nest/roost isn't well-defined and I'd really like to see it supplemented with actual numbers, stand exam data, etc.

amendment to your forest plan. Describe how it meets Forest Plan requirements. <i>Do not treat the minimums in Table C.3 as targets rather treat only what is minimally needed.</i>		
2. Replacement nest/roost habitat post-treatment variables:		
a. % of recovery habitat in the project area/planning area	✓	
b. Canopy cover	✓	
c. Basal area	✓	
d. % Basal Area 30-46 cm (12-18 in) diameter at breast height (dbh)	✓	
e. % Basal Area >46 cm (>18 in) dbh	✓	
f. Large trees >46 cm (>18 in) dbh per acre	✓	
<i>* 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.</i>		
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:		
a. Diversity of patch size outside nest/roost core		Only desired conditions discussed.
b. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.		Only desired conditions discussed.
c. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.		Only desired conditions discussed.
d. Diverse composition of vigorous native herbaceous and shrub species.		Only desired conditions discussed.
e. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)		Only desired conditions discussed.
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).		Only desired conditions discussed.
g. Structural diversity of trees		Only desired conditions discussed.
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.		
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:		
h. Diversity of patch size outside nest/roost core	✓	
i. Horizontal and vertical vegetative heterogeneity within patches, including tree species composition.	✓	
j. Tree species diversity, especially with a mix of hardwoods and shade-tolerant species.	✓	
k. Diverse composition of vigorous native herbaceous and shrub species.	✓	
l. Opening sizes between 0.04 – 1 hectare (0.1 – 2.5 acres)		
m. 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).	✓	
n. Structural diversity of trees	✓	
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.		
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 (PCE's) are found within these specific geographic areas. PCE's 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>		
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	✓	Weak on pre-treatment conditions.

percent of which are large trees with a trunk diameter of 12 inches (0.3 meters) 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 meters) when measured at 4.5 feet (1.4 meters) from the ground.	✓	
B. <u>Primary constituent elements related to maintenance of adequate prey:</u>		
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.	✓	
C. <u>Primary constituent elements related to canyon habitat</u> include one or more of the following:		
1. presence of water (often providing cooler and often higher humidity than the surrounding areas);		NA?
2. clumps or stringers of mixed conifer, pine-oak, pinyon-juniper, and/or riparian vegetation.		NA?
3. canyon wall containing crevices, ledges, or caves; and		NA?
4. high percent of ground litter and woody debris.		NA?
Develop monitoring plan with the FWS, may include one or both of the following:		
1. Monitor occupancy and reproduction in treated Mexican spotted owl PACs		Mentioned in passing.
2. Management Experiments for treatments in PACs (Box C.5, pp. 281-283, 2012 MSO RP)		Not mentioned.
3. Monitor pre- and post-treatment		Not mentioned?
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 (e.g., 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 <i>Regional MSO Habitat Vegetation Management Implementation Guidance</i> .		

*if stand exam data exists 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 >1inch dbh (i.e., any species). We emphasize that values shown are **minimums**, not targets.

³Trees > 46 cm (18 inches) dbh. Density is tree/ha (trees/acre). Again, values shown are minimums rather than targets. We encourage retention of large trees.

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) referenced above in the checklist.

Table C.2. (Below) 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.

276 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 towards 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 (e.g., <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		Minimum tree BA ²	Minimum density of large trees ³
		30-46 cm dbh (12-18 in)	>46 cm dbh (>18")		
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.

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

³Trees > 46 cm (18 inches) dbh. Density is tree/ha (trees/acre). Again, values shown are minimums rather than targets. We encourage retention of large trees.

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) drc.

⁵Pine-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.