Linking Mexican Spotted Owl Recovery Guidance and Desired Conditions for Mixed Conifer Forest

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Presentation Outline

• Background
• What do we currently know about owls/forest management
• Revised Recovery Plan Recommendations
• Links with Forest Service Desired Conditions for Mixed Conifer
• Need for additional information
Background

• Listed as threatened in 1993 under the ESA, Critical Habitat designated in 2004
• Recovery Plan signed in 1995
• Recovery Plan Incorporated into Forest Plans by amendment in 1996
• Revised Recovery Plan 2012
Threats: Then and Now

• Listing 1993: Even-aged management, lack of regulatory mechanisms

• Recovery Plan 1995: Forest management, high-severity wildfire, lack of regulatory mechanisms

• Recovery Plan Revision: High-severity wildfire, forest management (Jones et al. 2016, etc.)
What have we learned about owls and forest management?

• To date, few treatments have occurred in PACs
• More treatments conducted in unoccupied habitat, but....
• Very little pre- and post-treatment habitat and owl monitoring data available for any of these projects
California Spotted Owl Response to Thinning Treatments

- Stephens et al. 2014, northern Sierra Nevada
- Documented decline in the number of CSO territories as a result of landscape fuel treatments
- Factors driving decline unknown
Ecological Forestry*

- Retention of structural and compositional elements
- Manipulation to direct forest development
- Identify key structures/processes (fire!)
- Maintain owl habitat patches or patch clusters

*Franklin et al. 2007
General Revised RP Recommendations for Forest Management

- Embed high-quality owl habitat patches in a matrix that has been treated
- Embed owl habitat patches where fire refugia may naturally occur
- Focus on creating and enhancing diverse forest structure
- Manage for a range of stand conditions
- Use fire as appropriate

**MONITOR!!!!!!!**
General Management Recommendations in Revised Recovery Plan

- Protect known territories (PACs)
- Manage for replacement nest/roost habitat
- Other forest and woodland types

- Pine-Oak within NFS lands (5%)
- Mixed-Conifer within NFS lands (13%)
- Other forest land within NFS lands (79%)
- Pac (3%)
PAC Recommendations in Revised Recovery Plan

- Delineate ~600 acres around known owl sites
- Delineate ~100-acre nest/roost core within PAC
- Rx fire recommended outside breeding season in PAC
- May thin 20% of PAC area in each Ecological Management Unit
Managing for Future Owl Habitat (nest/roost replacement habitat)

- Within a sub-set of recovery habitat, recommendation to manage for future nest/roost habitat
- In mixed-conifer, 20% of recovery habitat should be identified as nest/roost replacement habitat in BRE EMU.
Key Habitat Components

- Multi-layered canopy with large overstory trees
- Species diversity (conifer and hardwoods)
- Moderate to high canopy closure
- Wide range of tree sizes (“uneven-aged”)
- High levels of large snags and downed woody debris
Desired Conditions within PACs and Recovery Nest/Roost Habitat

- Diversity of patch size
- Horizontal and vertical habitat heterogeneity within patches
- Tree species diversity, esp. mix of hardwoods and shade-tolerant spp.
- Diverse herbaceous and shrub layer
- Openings (0.1 to 2.5 ac)
- Minimum canopy cover (60% in MC, 40% in PO)
- Diversity of tree sizes, with larger trees contributing >50% of stand BA
a.k.a. Conditions That Make Forest Managers Nervous

• Multi-layered structure can result in fire ladders, crown fire

• Stands with higher tree densities can be more susceptible to insects and pathogens
Provide diversity of tree species and age composition

Diversity of forest spatial characteristics (e.g. openings, closed-canopy forest)

Manage for biological diversity and natural frequency/level of disturbance
# Minimum Desired Conditions

## Nest/Roost Habitat

<table>
<thead>
<tr>
<th>EMU(s) Forest Type</th>
<th>% of area</th>
<th>% BA by size class</th>
<th>Minimum tree BA (ft²/acre)</th>
<th>Minimum density of large trees (trees/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12-18”</td>
<td>&gt;18”</td>
<td></td>
</tr>
<tr>
<td>BRE Mixed-conifer</td>
<td>20</td>
<td>&gt;30</td>
<td>&gt;30</td>
<td>145</td>
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<tr>
<td>CP, UGM, SRM, BRW Mixed-conifer</td>
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<td>&gt;30</td>
<td>&gt;30</td>
<td>120</td>
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<tr>
<td>CP, UGM, BRW Pine-oak</td>
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<td>&gt;30</td>
<td>&gt;30</td>
<td>110</td>
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</tbody>
</table>
Lincoln NF DFCs for N/R Replacement Habitat

- Only 22% of nest sites evaluated met all four conditions simultaneously
- Canopy cover and % BA trees > 18 inches dbh best predictors of nest sites
- Need to revise desired conditions in Sacramento Mountains
- Need to repeat assessment in other geographic areas
How do we link Desired Conditions and Recovery?

• Integrating management of owl habitat with landscape-scale restoration is a major challenge

• However, planning at the landscape scale may be key
Revised Mexican Spotted Owl Management Guidelines

- **No Guidelines**
- **Protected Habitat (160,784 ac)**
- **Recovery Habitat (239,045 ac)**
- **Undeveloped Areas**
- **Developed Areas**
- **Highways**

Condensed metadata:
Protected habitat = PACs only
Restricted habitat = pine oak and mixed con veg types located outside of PACs.
(These data were filtered to remove any areas smaller than 20 acres.)

Data sources:
Vegetation composition - ForestERA WMPALA (2004), Landsat ETM, late 1960s;
Slope - U.S. Geological Survey;
MOS Protected Activity Centers (2004)-U.S. Forest Service
Forest Restoration and Owls

• Logically, we can assume either:
  – Areas/sites occupied by owls for nesting/roosting were less common on the landscape, or
  – Occupied sites were more open
  – Or both?
Forest Restoration and Owls

• This suggests we could manage for:
  – Fewer nest/roost patches, or
  – More open nest/roost patches

• But, where are the thresholds?
  – How much can we open up these patches?
  – How many patches do we need? How big?
  – How should these patches be arranged on the landscape?
Challenges

- Scale
- Lack of information
- Cost of treatments, monitoring
- Stands vs. habitat
- Details, details, details...
Implementation and Need for Additional Information

• We cannot move forward without learning from what we are doing. Research and monitoring are needed to understand how thinning and fire affects owls.

• If PACs are treated, it should be within an adaptive management framework.

• Monitoring should be dual-faceted: effectiveness and overall population monitoring needed.