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MSO 101: A synthesis of the ecology of the Mexican spotted owl keeps on giving

Between increasing drought, high-severity wildfires driven by climate change, and habitat loss caused by past and current land uses, conserving the Mexican spotted owl (MSO) has become a complex undertaking. Even as research delivers new insights about how these trends affect the species, understanding the basic ecology of these owls may be more important now than ever. One report published nearly ten years ago still serves as a leading guide for early career or seasoned managers who might need a refresher on the ecology of the Mexican spotted owl. The publication, Status and Ecology of Mexican Spotted Owls in the Upper Gila Mountains Recovery Unit, Arizona and New Mexico (RMRS-GTR-256), continues to provide the best synthesis to date.

Adult and juvenile Mexican spotted owls perched above a nesting cavity in a large gambel oak tree, Coconino National Forest, Arizona (photo: J. Ganey, USDA Forest Service).

"The report pulls together a wealth of information from a large number of sources," says Joseph Ganey, a Research Wildlife Biologist at the Rocky Mountain Research Station in Flagstaff, AZ. and lead author of the report. "It provides one stop shopping for planners and managers interested in Mexican spotted owls, saving them from having to read numerous separate papers to understand the basic ecology of Mexican spotted owls."

In 94 pages, the report summarizes essential information on the status and ecology of the Mexican spotted owl found in the Upper Gila Mountains Recovery Unit which supports a majority of the known population. Topics range from distribution, abundance, demography and life history; to home range size, habitat use and selection, and prey ecology; to movement, migration, and landscape connectivity.

When the report was published in 2011, MSO management recommendations on National Forest System lands in Arizona and New Mexico hadn't been updated since the Mexican Spotted Owl Recovery Plan was created in 1995. (The subspecies was listed as a threatened species under the Endangered Species Act in 1993). Many recommendations in the 2011 report

such as managing forests to reduce the risk of stand-replacing fires and retaining important owl habitat were adopted when the plan was updated in 2012

What have we learned in the last decade?

Ganey, who has contributed to more than 30 years of research on the ecology of the MSO and has helped inform recovery plans, continues to study the species. He recognizes that with so much new research published since 2011, an update or companion to the report might be warranted.

"This would involve adding new knowledge as opposed to changing previous knowledge," he says, "because the ecological knowledge summarized in the GTR remains valid."

For example, a 10-year RMRS study in the Sacramento Mountains has contributed new information about owl demography and ecology. Multiscale habitat modeling, which has come a long way in the last ten years, has increased understanding of spatial distribution and connectivity of owl habitat. Wildfire trends in owl habitat under realistic climate scenarios as well as the relationships between owls and fire is better understood now thanks to both empirical data and habitat modeling. And, although the ecology of the Mexican spotted owl is relatively similar across its range in the Southwest, scientists are learning about important differences within the region.

KEY MANAGEMENT CONSIDERATIONS

- A comprehensive general technical report summarizes essential information on the status and ecology of the Mexican spotted owl found in the Upper Gila Mountains Recovery Unit which supports a majority of the known population
- Many of the recommendations in the 2011 report were adopted when the Mexican Spotted Owl Recovery Plan created in 1995 was updated in 2012
- Recent research adds to the existing knowledge with improved understanding about owl demography and ecology, spatial distribution and connectivity of owl habitat, wildfire trends in owl habitat, and regional differences in ecology.

A pair of Mexican spotted owls in the Sacramento Mountains, New Mexico (photo: USDA Forest Service).

PROJECT LEAD

Joe Ganey is a research wildlife biologist at the Rocky Mountain Research Station in Flagstaff, Arizona. Connect with Joe at https://www.fs.usda.gov/rmrs/people/jganey.

FURTHER READING

Ganey, Joseph L.; Ward, James P. Jr.; Willey, David W. 2011. Status and ecology of Mexican spotted owls in the Upper Gila Mountains recovery unit, Arizona and New Mexico. Gen. Tech. Rep. RMRS-GTR-256. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 94 p.

Ganey, Joseph L.; White, Gary C.; Ward, James P., Jr.; Kyle, Sean C.; Apprill, Darrell L.; Rawlinson, Todd A.; Jonnes, Ryan S. 2014. Demography of Mexican spotted owls in the Sacramento Mountains, New Mexico. Journal of Wildlife Management. 78(1): 42-49.

Wan, H-Y., S. A. Cushman, and J. L. Ganey. 2019. Recent and projected wildfire trends across the ranges of three spotted owl subspecies under climate change. Frontiers in Ecology and Evolution 7:37.

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