## **Mexican spotted owl (*Strix occidentalis lucida*)**

Status

Threatened (58 FR 14248; March 16, 1993) with Designated Critical Habitat (69 FR 53182; August 31, 2004).

Species Summary Table

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|  | Feeding | Breeding | Sheltering |
| Juvenile | Adult | Adult | Juvenile | Adult |
| Habitat | In nest | Pinyon-juniper and evergreen woodlands, cliff faces and terraces  | Forests and rocky-canyons |
| Prey | Small mammals, birds, reptiles, and insects | N/A |
| Perches | N/A | Tall trees and canyon ledges |
| Cover | In nest | Open cover to high canopy cover in forests | Some cover in canyons (caves) and high canopy cover in forests |
| Temperature | N/A | N/A | N/A | N/A | N/A |
| Lighting | N/A | Nocturnal hunting | N/A | Daytime roosting within covered canopy |
| Moisture | N/A | N/A | N/A | N/A | N/A |
| Sound | Both juveniles and adults are sensitive to noise during all activities |
| Water | Important in canyon habitats |
| Dispersal | Fed by parents in nest | Hunts within established home range. Home ranges are large and vary based on habitat and geographic location. | Mated pairs and high site fidelity. | 0.6 to 57.2 miles when dispersing from natal territory.  | May migrate 3-31 miles down-slope to wintering areas.  |
| Seasonal Activity | N/A | N/A | Late March-early April | Leave natal territory in September | If migratory, move down-slope in November-December and return in January-April. |

Life History

*Species Description and Ecology*

The Mexican spotted owl (MSO) is a medium-sized owl with no ear tufts, dark eyes, and a facial disk that is concentrically barred with dark brown. This owl also has brown upper-parts that are mottled with irregular large, white spots giving it a lighter appearance than the other two owl subspecies. The wings and tail are brown with distinct white and lighter brown barring (USFWS 2012).

MSOs are territorial and remain in the same territory or home range year after year. Home ranges are relatively large with its size varying geographically and amongst different habitats. The majority of owls are not thought to be migratory and remain within their home ranges year-round. However, migration has been observed amongst some individuals. Owls that migrate likely move down-slope to warmer temperatures in November-December, to avoid persistent snow, and then return to their up-slope range between January and April. Owls that choose to migrate do not necessarily migrate each year and factors that may cause migration are currently unknown (USFWS 2012).

MSOs are active at night, preying on small mammals, birds, reptiles, and insects. In Arizona, they prey particularly on wood rats, pocket gophers, rabbits, voles, and deer mice and forage in a variety of habitats including managed and unmanaged forests, pinyon-juniper woodlands, mixed-conifer and ponderosa pine forests, cliff faces and terraces between cliffs and riparian zones. They typically locate prey from an elevated perch, "pounce", and capture it with their talons (USFWS 2012).

*Reproduction*

MSOs breed sporadically and will not nest every year. They do not build nests, but rather occupy pre-existing ones, which may include potholes and ledges on cliffs, cavities and debris platforms in trees, or abandoned hawk or raven nests. Mated pairs defend a breeding territory within a larger home range and have high fidelity to these areas.

Females normally lay one to three eggs with two being the most common. Eggs are normally laid in April, and the young typically fledge in early to mid June, but stay with their parents within the territory until late August. Young generally disperse by September, and are extremely vulnerable to predation during this period. Dispersal occurs throughout a wide variety of habitats, many of which differ greatly from typical breeding habitat. Young may travel 0.6-57.2 miles to establish their adult territory (USFWS 2012).

During the breeding season, noise disturbances have the potential to alter breeding behavior causing owls to flush from nesting and roosting sites which increases vulnerability to predators and heat-related stress. Typically, the closer and louder the noise disturbance, the more frequent owls flush (USFWS 2012).

*Suitable Habitat*

These owls are typically associated with late seral forests or rocky canyon habitats. Forests used for roosting and nesting are typically uneven-aged, multi-storied with a high canopy cover. This may include mixed conifer, pine-oak, riparian, or madrean woodland forests. Canyon habitats are typically steep, rocky with ledges and caves for nesting and roosting.

Designated critical habitat for the MSO was finalized in 2004 and includes 8.6 million acres within Arizona, Colorado, New Mexico, and Utah. Habitat features commonly associated with MSO occupancy within critical habitat were identified as primary constituent elements (PCE's). There are PCE's related to forest structure, maintenance of adequate prey species, and canyon habitat and are as follows:

* PCE's Related to Forest Structure:
	+ A range of tree species, including mixed-conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30-45% of which are large trees with a trunk diameter of ≥0.3 m (12 in) when measured at 1.4 m (4.5 ft) from the ground
	+ A shaded canopy created by the tree branches and foliage covering ≥40% of the ground
	+ Large, dead trees (i.e., snags) with a trunk diameter of at least 0.3 m (12 in) when measured at 1.4 m (4.5 ft) from the ground.
* PCE's Related to Maintenance of Adequate Prey Species:
	+ High volumes of fallen trees and other woody debris
	+ A wide range of tree and plant species, including hardwoods
	+ Adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration
* PCE's Related to Canyon Habitat (one or more of the following):
	+ Presence of water (often providing cooler air temperature and often higher humidity than the surrounding areas)
	+ Clumps or stringers of mixed-conifer, pine-oak, pinyon-juniper, and/or riparian vegetation
	+ Canyon walls containing crevices, ledges, or caves
	+ High percentage of ground litter and woody debris

Threats

Human-managed alteration of forests has led to the increased threat of stand-replacing wildland fires, which also threaten the destruction of MSO habitat. Livestock grazing and selective timber harvesting have also caused substantial changes to forest structure within MSO habitat thus eliminating the amount of suitable habitat in the species range. Vehicle collisions, electrocution, as well as direct effects associated with wildland fires have been identified as causes of direct fatalities to the Mexican spotted owl (USFWS 2012).

Range and Survey History

MSO occur throughout much of Arizona (except for the arid southwestern portions of the state) primarily in forested mountains and canyons at elevations ranging from 4,500 to 10,000 feet. South of the Mogollon Rim, MSO occupy scattered mountains and canyons at higher elevations. North of the Mogollon Rim, occupancy is generally restricted to forested habitats in the White Mountains, along the Mogollon Rim, the peaks around Flagstaff, the Grand Canyon, and forested areas on the Navajo Reservation

The 2012 MSO Recovery Plan identifies three ecological management units (EMUs) within Arizona including the Basin and Range West EMU, Upper Gila Mountains EMU, and the Colorado Plateau EMU. Each EMU identifies common patterns of owl distribution and habitat use and geographically subdivides habitat into three levels of management to organize owl recovery efforts. The geographic subdivisions are as follows:

* *Protected Area Centers* (PACs): PACs are comprised of at least 600 acres of ideal roosting, nesting, and foraging habitat currently or historically used by MSO. The Recovery Plan recommends the strictest guidelines for these areas.
* *Recovery Habitat*: Ponderosa pine-Gambel oak, mixed-conifer forests, and riparian areas that is currently, or has the potential for becoming nest/roost habitat or does/could provide foraging, dispersal, or wintering habitats. Target/threshold criteria are defined such that a given proportion of the landscape should be maintained as suitable nesting and roosting habitat for the MSO. Guidelines specific to riparian areas are also provided to ensure a mix of size and age classes.
* *Other Forest and Woodland*: Ponderosa pine and spruce-fir forests, pinyon-juniper woodlands, aspen, and riparian forests not included within PACs. No specific management recommendations are given for these areas.

Identify if a survey has been completed within your project area, which EMU your project is located in, and where the nearest designated critical habitat and/or PAC is located in relation to your project to establish an environmental baseline (i.e. survey data, local status, etc) for MSO within your projects vicinity. The following references and resources may assist in establishing an environmental baseline. Always obtain permission from the ADOT biologist prior to contacting outside agencies about an ADOT project.

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| Arizona Game and Fish Department  |
| Michael Ingraldi | Wildlife Contracts Branch Supervisor | (928)245-8662 | mingraldi@frontiernet.net |
| Renee Wilcox | Wildlife Contracts Branch Supervisor | (623)236-7306 | rwilcox@azgfd.gov |
| Keith Knutson | Wildlife Contracts Branch Chief | (623)236-7247 |  |
| Website: https://www.azgfd.gov/w\_c/research\_mexican\_spotted\_owl.shtml |

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| US Fish and Wildlife Service |
| Shaula Hedwall | Species Lead |  | Shaula\_hedwall@fws.gov |
| Website: https://www.fws.gov/southwest/es/MSO\_Main.html |

References

US Fish and Wildlife Service. 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.