

## **Flammulated Owl (*Otus flammeolus*)**

NMPIF level: Species Conservation Concern, Level 1 (SC1)

NMPIF assessment score: 17

National PIF status: Watch List

NM stewardship responsibility: Moderate

New Mexico BCRs: 16, 34, 35

Primary Habitat(s): Ponderosa Pine Forest, Mixed Conifer Forest

Other habitats used: Spruce-Fir Forest, Madrean Pine-Oak Woodland

### **Summary of Concern**

Flammulated Owl is a widespread, insectivorous owl of western montane forests. It has a low reproductive rate, and may be declining due to loss or alteration of mature pine forest habitat.

### **Associated Species**

Whip-poor-will (BC2), Broad-tailed Hummingbird (SC2), Acorn Woodpecker, Williamson's Sapsucker (SC2), Northern Flicker, Western Wood-Pewee, Pygmy Nuthatch, Western Bluebird (SC2), Grace's Warbler (SC1), Chipping Sparrow, Cassin's Finch

### **Distribution**

Flammulated Owl breeds in coniferous forest habitat from British Columbia south to Oaxaca in southern Mexico. It winters from western Mexico south to Central America.

In New Mexico, it may be found during the summer across the western two-thirds of the state, in forested portions of BCRs 16, 34, and 35 (McCallum 1994). It was fairly numerous where studied by McCallum et al. (1995) in the Zuni Mountains in Cibola County. During migration it has been found at various wooded locations across the eastern plains.

### **Ecology and Habitat Requirements**

Flammulated Owls occur across a fairly broad altitudinal range, but are primarily associated with open ponderosa pine forest. At higher elevations, the species may be found in mixed conifer habitat, in association with Douglas-fir, white fir, or blue spruce. It also uses aspen groves and montane oak woodlands. Across its range, the owl consistently selects habitat that combines open forest stands with large trees and snags for nesting, with adjacent openings that provide edge habitat for foraging (McCallum 1994). Thickets of denser foliage also seem to be a necessary habitat component, and are used for calling and roosting (McCallum and Gehlback 1988).

This small, insectivorous owl forages by hovering and hawking, and thus requires a fairly open forest structure such as is associated with mature or old growth ponderosa pine habitat. In Colorado, owls concentrated their foraging in small patches of older ponderosa pine and Douglas-fir forest (Linkhart et al. 1998). The species also requires snags of fairly large diameter trees for nest cavities. Flammulated Owls nest in cavities excavated by woodpeckers, including Northern Flicker, Acorn Woodpecker, Red-naped Sapsucker, and Williamson's Sapsucker (McCallum 1994). In the Zuni Mountains of New Mexico, territories were characterized by low shrub density, high canopy height, and the presence of mature pinyon pine. Nests were located 3-7 m off the ground in ponderosa or pinyon pine snags (McCallum and Gehlback 1988). Ligon (1961) reports a preference for nesting in flicker or woodpecker holes in aspens.

This species is highly migratory. Flammulated Owls arrive on their New Mexico breeding grounds in late April or early May. Mean territory size has been reported at 11-18 ha in Colorado (Linkhart et al. 1998). Concentration of territories in certain locations is probably more due to specific habitat requirements than colonial behavior (D. Arsenault, pers. comm.) Eggs are laid from late May to early June; fledging from late June to late July (McCallum 1994). Clutch size is typically two or three, with one brood raised per year. Low reproductive output may contribute to the vulnerability of this species. At its lower elevation limit in a forest-woodland ecotone, Flammulated Owls showed smaller clutch sizes and reduced nesting success (McCallum et al. 1995).

## Conservation Status

### Species Assessment

DISTRIBUTION	4
THREATS	3
GLOBAL POPULATION SIZE	5
LOCAL POPULATION TREND	2
IMPORTANCE OF NEW MEXICO TO BREEDING	3

<b>COMBINED SCORE</b>	<b>17</b>
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Flammulated Owl is a Species Conservation Concern, Level 1 species for New Mexico, with a total assessment score of 17. Flammulated Owl is a national PIF Watch List Species. It receives high vulnerability scores from PIF for its very small population size and restricted non-breeding distribution. Flammulated Owl is a U.S. Fish and Wildlife Service (2002) national Bird of Conservation Concern.

### **Population Size**

Total population for the state is unknown. PIF estimates a United States and Canada population of 40,000, but this estimate is based on BBS data, which may not be a reliable index for detecting numbers of nocturnal birds.

### **Population Trend**

No present monitoring system provides adequate data to determine a long-term trend at the state or regional level. The local population trend score of 2 was assigned by expert opinion, and indicates a stable or increasing population.

### **Threats**

Flammulated Owls are threatened by loss of suitable nesting habitat. Replacement of open, old-growth ponderosa pine and mixed conifer forest with younger, high-density vegetation is considered detrimental to this species. Elimination of large snags due to logging or firewood gathering may limit nesting opportunities and make habitat unsuitable. Forest change may also bring about changes in abundance of insect prey, with unknown consequences (McCallum 1994). Habitat for this species has deteriorated slowly over time, as decades of fire suppression have created large areas of dense, "doghair" ponderosa stands. Immediate threats include the loss of remaining areas of open, mature forest habitat to logging or catastrophic fire. Forest thinning and controlled burning in overgrown ponderosa and mixed conifer habitat should help reverse long-term habitat degradation and hence benefit this species. However, such efforts should proceed with caution, as population responses to habitat restoration have not been adequately studied.

### **Management Issues and Recommendations**

Management for Flammulated Owls should focus on restoring a more historically typical forest structure with open, multi-storied ponderosa pine, Douglas-fir and mixed conifer stands with fewer and larger trees, snags for nesting, a grassy understory and patchy shrub cover. Such forests were maintained historically by frequent low-intensity fire that cleared away young trees and brush accumulation. Natural and controlled burning, and mechanical thinning, can be used to create more open forest parklands dominated by large, mature trees. In addition to such restoration, existing areas of mature or old-growth forest should be protected and maintained. It is important to note that the absence of Flammulated Owls from large areas of apparently suitable habitat suggests that habitat needs of this species are not completely understood (McCallum 1994). Hence any forest manipulations should be accompanied by careful monitoring to evaluate habitat quality.

### **NMPIF Recommendations**

- Maintain large stands of mature and old-growth ponderosa pine and mixed conifer forest.
- Maintain large snags for nesting and patchy shrub cover in mature forest habitat.
- Carry out restoration of ponderosa pine forests to reestablish forest structure similar to historical conditions.
- Demographic studies and careful monitoring should accompany habitat restoration efforts.

### **Species Conservation Objectives**

#### **PIF Objectives**

The PIF North American Landbird Conservation Plan designates Flammulated Owl as a Long Term Planning and Responsibility species, and sets an objective of maintaining the present species population over the next 30 years.

#### **NMPIF Objectives**

- Develop an appropriate monitoring/inventory method to assess population size and status.
- In all mountain ranges, maintain a density of 2 pairs per 100 ac (or 40 ha) in suitable habitat.

### **Sources of Information**

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Linkhart, B. D., R. T. Reynolds, and R. A. Ryder. 1998. Home range and habitat of breeding Flammulated Owls in Colorado. *Wilson Bulletin* 110:342-351.

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McCallum, D. A., and F. R. Gehlback. 1988. Nest site preferences of Flammulated Owls in western New Mexico. *Condor* 90:653-661.

McCallum, D. A., F. R. Gehlback, and S. W. Webb. 1995. Life history and ecology of Flammulated Owls in a marginal New Mexico population." *Wilson Bulletin* 107: 530-537.

U.S. Fish and Wildlife Service. 2002. Birds of conservation concern 2002. Division of Migratory Bird Management, Arlington, VA. 99 p.