



Elf Owl, photo by ©Bill Radke

Conservation Profile

Species Concerns	
Habitat Loss and Degradation	
Invasive Plants	
Climate Change (Drought)	
Conservation Status Lists	
USFWS ¹	BCC List (BCR 33,34)
AZGFD ²	Tier 1C
DoD ³	No
BLM ⁴	No
PIF Watch List ^{5b}	No
PIF Regional Concern ^{5a}	Regional Concern and Stewardship Species BCR 33
Migratory Bird Treaty Act	
Covered	
PIF Breeding Population Size Estimates ⁶	
Arizona	8,500 ●
Global	46,000 ●
Percent in Arizona	18.48%
PIF Population Goal ^{5b}	
Maintain	
Trends in Arizona	
Historical (pre-BBS)	Declines on lower Colorado R. ^{8,9}
BBS ⁷ (1968 – 2013)	Not given
PIF Urgency/Half-life (years) ^{5b}	
Insufficient data	
Monitoring Coverage in Arizona	
BBS ⁷	Not adequate
AZ CBM	Not covered
Associated Breeding Birds	
White-winged Dove, Whiskered Screech-Owl, Elegant Trogon, Acorn Woodpecker, Gila Woodpecker, Gilded Flicker, Purple Martin, Yellow-breasted Chat	

Breeding Habitat Use Profile

Habitats Used in Arizona	
Primary: Lowland Riparian Woodlands	
Secondary: Sonoran Desertscrub	
Key Habitat Parameters	
Plant Composition	Saguaros, mesquite, and paloverde in Sonoran Desert sites ¹⁰ ; sycamores, cottonwood or willow in riparian and adjacent oaks in mountain foothills ⁸
Plant Density and Size	Largest and oldest saguaros used; riparian areas may have open understory, but fairly dense canopy ¹⁰ ; avg. stems/acre: 635 trees and shrubs in upland desert: 540 trees, 1,950 shrubs in montane riparian ⁸ ; size classes unknown
Microhabitat Features	Armed saguaros, old sycamore, cottonwood, willow trees for nesting ⁸ ; DBH of nest tree likely > 11 inches but not studied
Landscape	Riparian woodland patches > 5 acres ¹¹ ; area requirements in saguaro landscapes unknown; nearby riparian areas likely increase suitability ⁸
Elevation Range in Arizona	
470 – 5,600 feet; locally to 6,000 feet ⁹	
Density Estimate	
Territory Size: 1 – 7 acres ^{8,12}	
Density: 7 – 16 pairs/square mile ⁸	

Natural History Profile

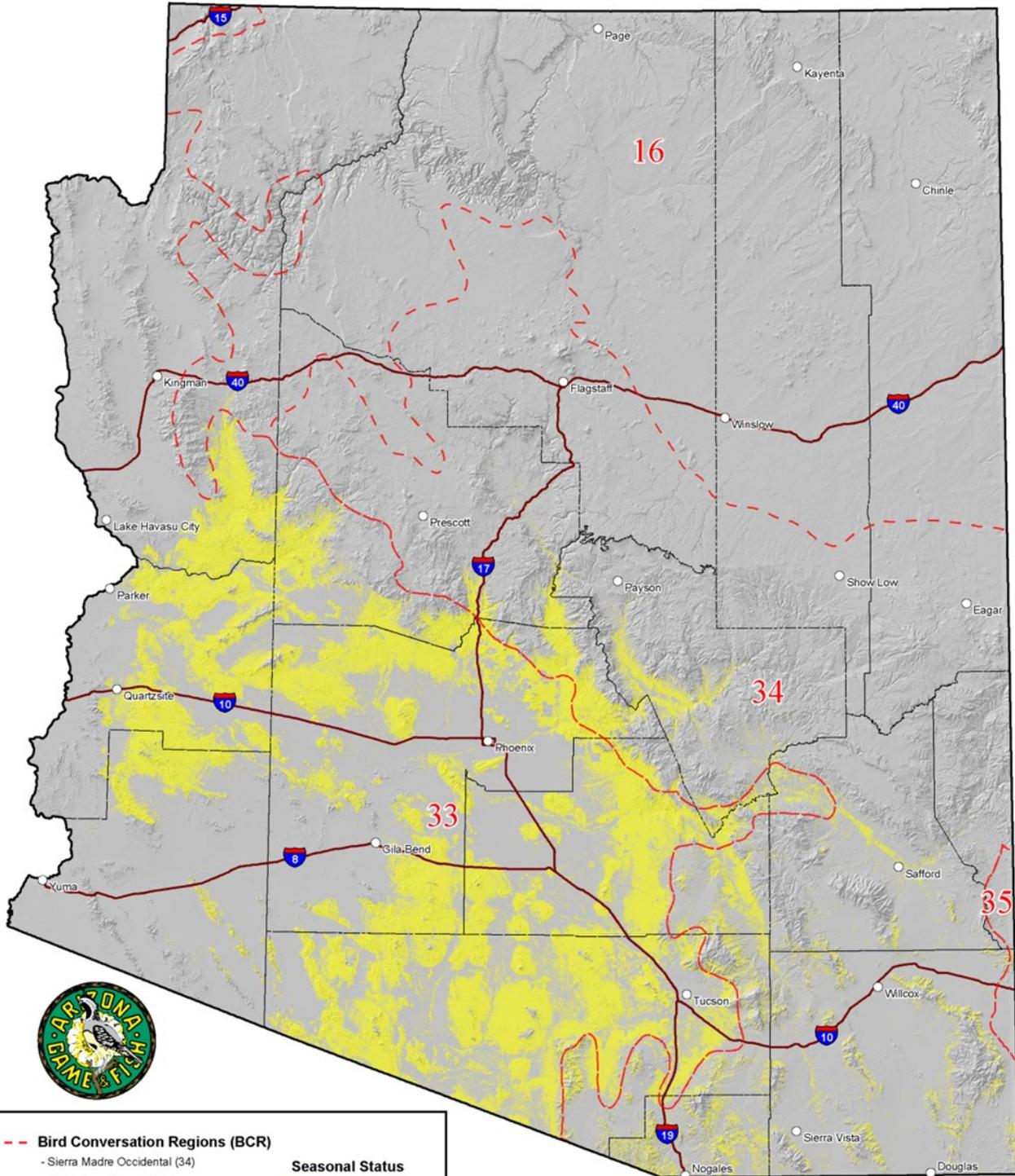
Seasonal Distribution in Arizona	
Breeding	Late March – mid-July ⁹
Migration	March – late April; late Aug – Sept ^{8,9}
Winter	Typically absent
Nest and Nesting Habits	
Type of Nest	Natural and woodpecker cavities ⁸
Nest Substrate	Saguaro, sycamore, cottonwood ⁸ ; also mesquite, willow, ash, walnut, etc. ⁸
Nest Height	10 – 40 feet in saguaro; ≤ 60 feet in sycamores ⁹
Food Habits	
Diet/Food	Nocturnal flying insects ⁸
Foraging Substrate	Air, ground, lower foliage ⁸



Confidence in Available Data: ● High ● Moderate ○ Low ^ Not provided

Last Update: April 2023

Distribution of Elf Owl



-- Bird Conservation Regions (BCR)

- Sierra Madre Occidental (34)
- Chihuahuan Desert (35)
- Sonoran & Mojave Deserts (33)
- Southern Rockies & Colorado Plateau (16)

Seasonal Status

Breeding Only

Counties

This map represents the predictive distribution for an individual species. AZGFD warrants no guarantees of accuracy or currency of the data represented.



SPECIES ACCOUNT ● ELF OWL *Micrathene whitneyi*

General Information

Distribution in Arizona

Elf Owls occur throughout the southern half of Arizona, approximately south of the latitude of Prescott and Clifton (Wise-Gervais 2005). They are most common in the central part of that region, primarily from 4,700 – 5,600 ft. in elevation, and locally to 6,000 ft. These owls become more sporadic and locally distributed in the southeastern and southwestern counties. They are currently considered extirpated from the lower Colorado River Valley except at the Bill Williams River confluence (Wise-Gervais 2005; U.S. Bureau of Reclamation, pers. comm.) Elf Owls reach the northern-most extent of their breeding population in Arizona, and Arizona supports an estimated 45% of their global breeding population. Because of this, the state has responsibility for the future of this species and is in a unique position to make progress toward securing its populations. Elf Owls are migratory and winter exclusively south of the U.S.-Mexico border (Henry and Gehlbach 1999).

Habitat Description

Most of Arizona's Elf Owls occur in the upper Sonoran Desert zone, which has abundant saguaros with multiple arms and scattered thorny trees such as paloverde, ironwood, and mesquite (Wise-Gervais 2005). Historically Elf Owls may have had their densest and most stable populations in riparian areas (Henry and Gehlbach 1999), and their highest population densities today are often found in foothill riparian forests at 5,000 – 5,500 ft. elevation (Henry and Gehlbach 1999).

In the Sonoran Desert of southern Arizona, Elf Owl abundance is positively correlated with cover of overstory perennial vegetation, particularly mesquite, and with the density of mature saguaros (Hardy et al. 1999). In these settings, Elf Owls are only found in areas that have a combination of mixed-cactus uplands and wooded washes with mesquite (Hardy et al. 1999).

Microhabitat Requirements

Although Elf Owls occasionally nest in natural cavities, they prefer woodpecker-created cavities in large trees or saguaros, and their density is correlated with the abundance of such cavities (Henry and Gehlbach 1999). In the Sonoran Desert, Elf Owl abundance is correlated with the density of the largest size classes of saguaros (> 16 feet tall with more than two arms; Hardy et al. 1999). This is similar to the nest requirements of Gila Woodpecker, who likely create most nest cavities used by Elf Owls. At higher elevations in mountain foothill drainages, Elf Owls routinely use cavities excavated by Acorn and possibly Arizona Woodpeckers.

Landscape Requirements

Along the lower Colorado River, 90% of nest cavities historically used by Elf Owls were in mature cottonwood-willow riparian woodlands at least 5 acres in size with no off-road vehicle use (Haltermann et al. 1987). Although Elf Owls can tolerate light-density housing near their habitats (Henry and Gehlbach 1999), they no longer occur in many historically occupied areas around Phoenix (Wise-Gervais 2005). No other landscape requirements are currently known, particularly for the upland desert populations.



Conservation Issues and Management Actions

Threats Assessment

This table is organized by Salafsky et al.'s (2008) standard lexicon for threats classifications. Threat level is based on expert opinion of Arizona avian biologists and reviewers. We considered the full lexicon but include only medium and high threats in this account.

Threat	Details	Threat Level
Residential and Commercial Development • Housing and urban areas		High
Agriculture • Livestock farming and ranching		Medium
Biological Resource Use • Logging and wood harvesting	Excessive mesquite and oak fuel-wood harvesting	Medium
Human Intrusions and Disturbance • Recreational Activities		Medium
Natural System Modifications • Fire and fire suppression • Dams and water management/use • Other ecosystem modifications		High
Invasive and Problematic Species • Invasive non-native/alien plants		High
Climate Change • Ecosystem encroachment • Changes in temperature regimes • Changes in precipitation and hydrological regimes		High

In the following section we provide more detail about threats, including recommended management actions. Threats with similar recommended actions are grouped.

Residential and Commercial Development:

- Housing and urban areas

Agriculture:

- Livestock farming and ranching

Biological Resource Use:

- Logging and wood harvesting



Elf Owls tolerate low-density urban development when native vegetation is relatively intact. However historically occupied areas have been lost to urban growth around Phoenix, Tucson, and other cities (Henry and Gehlbach 1999). Agricultural clearing and urbanization are partially responsible for declines within the lower Colorado River valley (Halterman et al. 1989).

Recommended Actions:

1. Encourage low-density urban development and retention of native desert vegetation as open spaces in new developments planned for saguaro and mesquite uplands.
2. Discourage further loss of riparian areas with potential for restoration for Elf Owl breeding habitat.
3. Increase public knowledge and appreciation of the wildlife values of mature saguaro and mesquite stands, including their sensitivity to catastrophic fire and other disturbances.

Natural System Modifications:

- Dams and water management/use
- Other ecosystem modifications

Past habitat loss seems to have impacted Elf Owl breeding areas in riparian woodland the most. Along the lower Colorado River in the 1980s, Elf Owls were found at only 10 sites and were absent at many historic locations due to the proliferation of tamarisk, agricultural clearing, bank stabilization projects, and urbanization (Halterman et al. 1989). Similar declines occurred along Salt and Gila rivers (Henry and Gehlbach 1999). Efforts to reestablish suitable native riparian woodland for this species are ongoing along the lower Colorado River, and the Elf Owl is a “covered” species of the Lower Colorado River Multi-Species Conservation Program that targets creation of suitable habitat. Effectiveness monitoring is needed to determine the degree of Elf Owl re-establishment in riparian areas (Henry and Gehlbach 1999).

Recommended Actions:

1. Protect stands of mature saguaros from destructive land use and conversion, especially where they occur in association with overstory mesquite (Hardy et al. 1999).
2. Establish additional habitat restoration in riparian areas, as well as effectiveness monitoring in historically occupied Elf Owl sites > 5 acres in size.
3. Include an aggressive revegetation plan in riparian restoration projects for Elf Owls that establishes and protects cottonwood and willow trees to reach overstory height, create snags, and grow to DBHs large enough to allow woodpeckers to create suitable cavities.
4. Explore the use of nest boxes as nest site alternatives for Elf Owls in habitat patches that appear suitable but which lack appropriate nest cavities.

Natural System Modifications:

- Fire and fire suppression

Invasive and Problematic Species:

- Invasive non-native/alien plants

Two types of invasive plants degrade habitat suitability for Elf Owls: tamarisk invasion of riparian areas and



invasive annual grasses and forbs in upland deserts with saguaros and mesquite woodlands. Their effects can lower recruitment of species that provide nest sites and increase frequency of catastrophic fires.

Recommended Actions:

1. Revegetate riparian areas with Fremont cottonwood and Goodding's willow to create an overstory of native trees that accommodate woodpecker cavities.
2. Manage invasive exotic grasses and forbs in Sonoran desert to minimize catastrophic fires that threaten saguaros and larger woody trees.

Climate Change:

- Ecosystem encroachment
- Changes in temperature regimes
- Changes in precipitation and hydrological regimes

Elf Owls are at the northern edge of their breeding range. If the effects of climate change shifts owl distribution, Arizona is likely where these shifts would occur first. Elf Owls are sensitive to prolonged droughts that may not only affect the availability of their preferred habitat of lowland and montane riparian forests, but also the availability of their secondary habitat, Sonoran desertscrub.

Recommended Actions:

1. Delineate occupied areas of current Elf Owl breeding populations in Arizona and determine types and levels of land uses that may compound the effects of prolonged droughts on habitat suitability.
2. Use these areas for strategic planning of conservation action and population monitoring.
3. Develop a monitoring plan for Elf Owls that allows for both population trend estimation and detection of distributional shifts in response to climate change.

Research and Monitoring Priorities

1. Explore options for better monitoring and population assessment to determine Arizona population status and trends. As a nocturnal species, Elf Owls will likely require a separate monitoring program from standard multi-species efforts. Consider the use of dedicated community ("citizen") scientists, as the basic methods do not require specialized birding skills.
2. Study disturbance buffers and minimum intact habitat patch size; incorporate results into management plans.
3. Clarify ecological factors limiting populations at the northern and western limits of the range (Millsap 1988).
4. Include restoration effectiveness monitoring in proposals for restoration projects that aim to restore Elf Owl habitat.



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