

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Animal Abstract

Element Code: ABNSB08041

Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Glaucidium brasilianum cactorum* van Rossem
COMMON NAME: Cactus Ferruginous Pygmy-owl
SYNONYMS: *Glaucidium ridgwayi cactorum*, *Strix brasiliiana* Gmelin
FAMILY: Strigidae

AUTHOR, PLACE OF PUBLICATION: Van Rossem. 1937. Proceedings of the Biological Society of Washington, 50, Feb. 23, 1937. p.27.

TYPE LOCALITY: Between Guaymas and Empalme, Sonora.

TYPE SPECIMEN: 30225 California Institute of Technology (original number 12940).

TAXONOMIC UNIQUENESS: One of as many as fifteen subspecies of Ferruginous Pygmy-owl recognized over the entire range. The Cactus Ferruginous Pygmy-owl is the northernmost subspecies (Proudfoot et al. 2000).

Additional work is needed to clarify the taxonomic classification of pygmy-owls (USFWS 2021a). Several authorities have suggested splitting *Glaucidium brasilianum* into two species, observing that North American populations and South/Central American populations share no mitochondrial haplotypes and evidently no geneflow (Proudfoot et al. 2006), with some authorities considering North American taxa as *G. ridgwayi* (Navarro-Sigüenza and Peterson 2004, Wink et al. 2008, Enríquez et al. 2017).

The AZGFD HDMS program follows the US Fish and Wildlife Service in using *G. brasilianum cactorum* as described in the 1957 AOU checklist (AOU 1957).

DESCRIPTION: A small owl approximately 17 cm (6.75 in) long with a 14.3-16.0 in (36.32-40.64 cm) wingspan (Monson 1998, USFWS 2021). Males average 58 to 66 g (2.0-2.3 oz) and females average 70 to 75 g (2.4 to 2.6 oz) (Proudfoot and Johnson 2000, Johnsgard 1988). Reddish brown overall, with white spots on upper wing coverts and outer primaries. Cream-colored belly streaked with reddish brown. Some individuals may be more grayish brown (Proudfoot and Johnson 2000). A pair of dark brown or black spots ringed in white occur on the nape. The species lacks obvious ear tufts and has yellow eyes and a greenish-yellow beak. The tail is reddish brown with darker brown bars. The reddish bands between dark bars are paler on males than on females (USFWS 2021a). Pygmy-owls have relatively large feet and talons (USFWS 2021a).

AIDS TO IDENTIFICATION: Similar to Northern Pygmy-Owl (*Glaucidium gnoma*). However, Northern Pygmy-owls have white barring on the tail, and slower cadence to their call (Brandt 1951).

ILLUSTRATIONS:

Color drawing (Monson 1998: plate 36)
Color photos (USFWS 2021a)

TOTAL RANGE: Two populations. Western population occurs from central Arizona south through Michoacán. Eastern population occurs from southern Texas south through Nuevo Leon, and Tamaulipas, Mexico (USFWS 2021a).

RANGE WITHIN ARIZONA: The historical boundaries of distribution in Arizona are New River in the north, the confluence of the Gila and San Francisco rivers to the east, and the desert of southern Yuma County to the west (Fisher 1893, Phillips et al. 1964, Monson and Phillips 1981, Hunter 1988). From about the 1990's on, the pygmy-owl has been found only in portions of Pima and Pinal Counties (Corman and Wise-Gervais 2005). Owls are known to occupy locations in the Altar Valley, Avra Valley, Organ Pipe Cactus National Monument, Ironwood Forest National Monument, and Tohono O'odham Nation (USFWS 2021a). Surveys in 2020 resulted in detections only in Pima County, with most detections occurring in the Altar Valley (USFWS 2021a).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Primarily diurnal with crepuscular tendencies, regardless of seasonality. Typically inactive during the middle of the day and the middle of the night, though Cactus Ferruginous Pygmy-owls may remain active on nights with bright moonlight (Flesch and Steidl 2007, USFWS 2021a). Vocalizations indicate breeding activity, usually September to April (Monson 1998). It is normally silent in the summer. The principal vocalization is a rapid, monotonous repeated and shrill hooting (Monson 1998). The hoots are uttered at the rate of about 2 per second, or 120-150 per minute, and may be repeated as many as 100 times without pause (Monson 1998).

Although non-migratory, a study of radio-tagged individuals in Texas suggests that pygmy-owls may show seasonal variation in areal use and habitat association (Proudfoot 1996). Post-nesting males showed a 3.4-fold increase in mean-areal use over nesting males, and used areas with considerably less understory than areas used while nesting (USFWS 2021a).

Cactus Ferruginous Pygmy-owls are most susceptible to nest predators, but are also vulnerable to predation during and shortly after fledging (Abbate et al. 1996). Documented and likely predators in Texas and Arizona include raccoons (*Procyon lotor*), Great Horned Owls (*Bubo virginianus*), Cooper's Hawks (*Accipiter cooperii*), Harris' Hawks (*Parabuteo unicinctus*), Western Screech Owls (*Megascops kennicottii*), bull snakes (*Pituophis catenifer sayi*), and domestic cats (*Felis domesticus*) (Abbate et al. 1999, Proudfoot and Johnson 2000).

Climbing snakes such as the coachwhip (*Masticophis flagellum*) and gopher snake (*Pituophis catenifer*) may pose a threat to nests of pygmy-owls (USFWS 2021a). The average lifespan is believed to be 3 to 5 years, however, lifespans of 7 to 9 years in the wild and 10 years in captivity have been documented (USFWS 2021a).

REPRODUCTION: Likely monogamous, these owls can breed in their first year, and typically mate for life (USFWS 2021a). If mates are available, pair bonds can begin to form as early as the fall after fledging. Males begin to make territorial calls early in spring (February), about 2 to 3 months before egg-laying. Nesting occurs in cavities in trees and columnar cacti, with saguaros being the most common nest tree in Arizona (Abbate et al. 1996, USFWS 2021a). Nest boxes may be used by Cactus Ferruginous Pygmy-owls (Proudfoot 1996).

Clutch size ranges from 2 to 7 white eggs, averaging 3.3 (Johnsgard 1988). Incubation is 28 days, and hatching is asynchronous, with one egg hatching every 20-26 hours (USFWS 2021a). The female typically stays in the cavity with the young for the first week, while the male delivers food. After the first week, both parents provide food. Nestlings fledge in 21 to 30 days after hatching, but depend on their parents for food for up to eight weeks post-hatch. Hatching begins around mid-May, with fledging occurring from late May through June. Dispersal occurs about eight weeks after fledging. Dispersal distances range from 2.5 km to 20.9 km (1.6 to 13.0 mi) in Arizona (Abbate et al. 2000). Dispersal is a key factor in maintaining pygmy-owl numbers, occupancy, and genetic diversity, especially in areas that function similar to metapopulations (USFWS 2021a).

A unique issue regarding breeding behavior of Cactus Ferruginous Pygmy-owl's breeding ecology in Arizona is that multiple incestuous pairings have been documented in the state (Abbate et al. 1999, Abbate et al. 2000). Incest in raptors is considered rare, with only about 20 documented cases representing nine species reported (Carlson et al. 1998, Stewart et al. 2007). Incestuous pairing in these owls may be a result of dispersal behavior (especially as impacted by habitat loss, fragmentation, and barriers to dispersal) and small population sizes resulting in low numbers of available mates (Abbate et al. 1999, USFWS 2021a).

FOOD HABITS: Generalist predator capable of killing prey twice their own size (Terres 1980). Hunting behavior generally consists of perch-to-prey strikes, though this owl will also inspect tree and saguaro cavities for nesting birds. Diet includes lizards, large insects, reptiles, birds, small mammals, and amphibians (Oberhosler 1974, Abbate et al. 1999, Proudfoot and Johnson 2000). Prey remains may be cached in a tree, cavity, or ball of mistletoe (Abbate et al. 1996, Proudfoot 1996).

HABITAT: Found in a variety of vegetation communities across their range, including Sonoran desertscrub, semidesert grasslands, thornscrub, dry deciduous forests, Tamaulipan brushland, and live oak forests. Regardless of vegetation community, this owl is a creature of edges found in semi-open areas of thorny scrub and woodlands in association with suitable nest trees (König et al. 1999). Often found at the edges of riparian and xeroriparian drainages and even habitat edges created by human settlements (Proudfoot and Johnson 2000, Abbate et al. 1999). Vegetation structure is likely more important to this owl than specific vegetation

composition (Cartron et al. 2000). Important habitat characteristics for this owl include: presence of suitable cavities, patches of fairly dense thickets or woodlands, presence of large trees or columnar cacti (predator avoidance, thermoregulation, nesting cavities, and foraging habitat), and Mid- and lower story vegetation (predator avoidance, increases prey diversity) (USFWS 2021a).

ELEVATION: In Arizona, 1,000 - 4,000 ft (300 - 1,220 m) (USFWS 2021a).

PLANT COMMUNITY: In Arizona, Pygmy-owls were historically documented in cottonwood-mesquite forests and mesquite woodlands along Gila and Salt rivers and major tributaries, other cottonwood and mesquite riparian woodlands, and Sonoran desertscrub (Bendire 1888, 1892; Breninger 1898, Gilman 1909, Phillips et al. 1964, Johnson et al. 1987). Currently most Arizona owls are found in Sonoran desertscrub communities. Also located in semidesert and Sonoran savanna grasslands with xeroriparian washes. Associated species include saguaro (*Carnegiea gigantea*), palo verde (*Cercidium* spp.), mesquite (*Prosopis* spp.), acacia (*Acacia* spp.), and ironwood (*Olneya tesota*) in Sonoran desertscrub and mesquite, ash (*Fraxinus* spp.), and hackberry (*Celtis* spp.) in riparian areas (Millsap and Johnson 1988, USFWS 2021a).

POPULATION TRENDS: It is difficult to determine changes in abundance of Cactus Ferruginous Pygmy-owls in Arizona, as historical records provide no basis for consistent interpretation, and there is no quantifiable information on which to base trends in populations (USFWS 2021a). However, early records give an idea of the historical distribution of the pygmy-owl in Arizona, and this distribution has unquestionably been reduced when compared to current distribution (USFWS 2021a).

Recent (as of 2020) nest monitoring in the state resulted in detection of 57 active nest sites with a pair present, and 12 sites occupied by a single bird (USFWS 2021a).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LT (USDI, FWS 2023)
 [PT (USDI, FWS 2021b)]
 [NW (USDI, FWS 2011)) as *Glaucidium
 ridwayi cactorum*]
 [UR (USDI, FWS 2008) as *Glaucidium
 ridwayi cactorum*]
 [PTN (Center for Biological Diversity and
 Defenders of Wildlife 2007)]
 [DL (USDI, FWS 2006)]
 [PDL (USDI, FWS 2005)]
 [PCH (USDI, FWS 2002) AZ Pop.]
 [CH designation vacated (*National
 Association of Home Builders et al. v.
 Norton*, Civ.–00–0903–PHX–SRB)]

[CH (USDI, FWS 1999)]
 [PCH (USDI, FWS 1998)]
 [LE (USDI, FWS 1997)]
 [PE (USDI, FWS 1996)]
 [PE (USDI, FWS 1994b)]
 [UR (USDI, FWS 1993)]
 [C1 (USDI, FWS 1991, 1994a)]
 [C2 (USDI, FWS 1989)]
 1 (AZGFD, AWCS 2022)
 [1B (AGFD SWAP 2012)]
 [WSC (AGFD, WSCA 1996 in prep) at full species level]
 [Endangered (AGFD, TNW 1988) at full species level]
 Bureau of Land Management Sensitive (USDI, BLM AZ 2008, 2010, 2017)
 Forest Service Sensitive (USDA, FS Region 3 1999, 2007, 2013)
 Texas Parks and Wildlife Department – Threatened.
 None. (NORMA Oficial Mexicana NOM-059-SEMARNAT-2010).
 [A (Diario Oficial de la Federacion 1994), listed as full species.]

STATE STATUS:**OTHER STATUS:**

MANAGEMENT FACTORS: Influences on Pygmy-owl viability include drought and climate change, habitat loss and fragmentation (due to urbanization, invasive species invasion, agricultural development and wood harvesting, improper livestock grazing, border issues, and OHV use), human activities and disturbance (such as ecotourism, outdoor recreation, and wildlife research, window and vehicle strikes), and small population size.

Environmental compliance has been waived occasionally to frequently by the U.S. Department of Homeland Security in construction of border infrastructure following the implementation of the 2005 Real ID Act (USFWS 2021a).

Likely threats: degradation and loss of habitat and urban development in saguaro-ironwood forests (near Tucson).

Management needs: refine breeding survey protocols and conduct surveys; determine habitat needs; manage grazing and other land uses to maintain and enhance important occupied or potentially occupied habitats. (AGFD 1996 in prep).

PROTECTIVE MEASURES TAKEN: Some local conservation mechanisms such as habitat conservation plans, are in development in southern Arizona (USFWS 2021a). Protected under the Migratory Bird Treaty Act. This act prohibits take, but does not prevent

habitat destruction unless direct mortality of an individual or destruction of an active nest occurs (USFWS 2021a). Although listed as a species of concern in Arizona, there are currently no provisions under Arizona state statute addressing destruction or alteration of Cactus Ferruginous Pygmy-owl habitat (USFWS 2021a). The owl's distribution primarily on federal lands in Arizona offers some protection, but many threats are still present on these lands (USFWS 2021a).

A comprehensive survey effort was coordinated by AZGFD in 2020 to inform development of the Species Status Assessment. This was perhaps the most exhaustive assessment of the wild population in Arizona to ever occur (USFWS 2021a). Nest box studies in 1998 and 2006 did not result in use by pygmy-owls, though research in Texas has demonstrated successful use of artificial nest structures (Proudfoot et al. 1999, USFWS 2021a). A captive breeding program was established in 2006 at Wild At Heart, a raptor care facility in Cave Creek, Arizona, and a second program was established at the Phoenix Zoo when it entered into partnership with AZGFD and the U.S. Fish and Wildlife Service in 2017 (USFWS 2021a).

SUGGESTED PROJECTS: Territory monitoring and surveys are needed to continue monitoring of the pygmy-owl in Arizona, and to determine abundance and distribution to inform management actions. Continued nest box trials in Arizona. Augmentation of wild populations through release of captive bred birds. Conservation planning focused on protecting and improving pygmy-owl habitat and maintaining habitat connectivity (USFWS 2021a).

LAND MANAGEMENT/OWNERSHIP: BIA - Tohono O'odham Nation; BLM - Tucson Field Office; FWS - Buenos Aires and Cabeza Prieta National Wildlife Refuges; NPS - Organ Pipe Cactus National Monument and Saguaro National Park; USFS - Coronado and Tonto National Forests; State Land Department; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

“The name *Glaucidium* is derived from the Greek *glau*, which implies that this bird is an owl because it has glaring eyes (Choate 1985); *brasilianum* refers to Brazil, where this small diurnal owl was discovered. The subspecific epithet for the race occurring in Arizona, *cactorum*, alludes to cactus, a vegetation that it frequently associates with in the northern portion of its range. The term *ferruginous* refers to the rusty red tail and upper side of the outer vanes of the flight feathers.” (Monson 1998).

Revised: 1992-01-17 (JGH)
1995-03-21 (LZW)
1997-03-05 (SMS)
1998-03-02 (SSS)
2001-06-08 (SMS)
2022-04-25 (KSL)
2022-12-29 (MBL)
2023-07-20 (MSB)

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