ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** ARACF15050
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Uma rufopunctata*
COMMON NAME: Yuman Desert Fringe-toed Lizard, Cowles Fringe-toed Lizard, Sonoran Fringe-toed Lizard
SYNONYMS: *Uma notata rufopunctata*; *Uma notata cowlesi*
FAMILY: Sauria: Iguanidae

AUTHOR, PUBLICATION: *Uma rufopunctata* Cope, 1895, Amer. Nat., Vol. 29: 939 (also *in* Norris, 1958, Bull. Am. Mus. Nat. Hist. 114(3): 251-326). *Uma notata cowlesi* Heifetz, Copeia 1941(2): 99-111.

TYPE LOCALITY: "Arizona," = Monument 200. Yuma Desert, Yuma County, Arizona.

TYPE SPECIMEN: Univ. Illinois Mus. Nat. Hist. 407750. 15-16 May 1894. E.A. Mearns. San Diego Natural History Museum reports Holotype at CAS (53370) and USNM (4124), and Paratypes at SDSNH 16460-16464.

TAXONOMIC UNIQUENESS: There are four species in the genus *Uma*. *U. rufopuntata* occurs only in Arizona and northwestern Sonora, Mexico. *U. scoparia* is found in both Arizona and California. The other two species, *U. inornata* is found only in California, and *U. notata*, occurs in California and northern Baja, Mexico.

DESCRIPTION: A medium-sized (up to 120 mm or 4.75" from snout to vent), cream, tan, or reddish-brown colored lizard with a relatively flat body and a flattened tail. Coloration usually closely matches the sand on which the lizard lives. The back is marked with small orange spots surrounded by a network of black reticulations. On the neck and shoulders the spots are in rows and the black reticulations form lines. The underside is plain pale cream with a conspicuous dark spot on each side of the belly. The underside of the tail is marked with distinct, black crossbars. There are thin, dark lines on the throat. During the mating season (spring) the lips often become orange-red and an orange wash appears on the throat, limbs, and each side of the belly (Brennan 2016)

AIDS TO IDENTIFICATION: Its straight, thin lines on the throat, orange coloration on the belly during breeding season, and dark lines on the neck and shoulders distinguish this lizard from the similar looking Mohave Fringe-toed Lizard (Brennan 2016). In the Coachella Valley Fringe-toed Lizard (Uma inornata), the black belly spots are absent or reduced to one or several small dots. (Stebbins 2003).

ILLUSTRATIONS:

Color drawing (Stebbins 1985: Pl. 23)
Color drawing (Stebbins 2003: Pl. 29)
Color photo (Behler and King 1979: Pl. 343)
Color photo: http://www.reptilesofaz.org/Lizards-Subpages/h-u-rufopunctata.html.
Color photo: http://www.californiaherps.com/noncal/southwest/swlizards/pages/u.rufopunctata.html.
Color photo: http://www.mindenpictures.com/search/preview/yuman-desert-fringe-toed-lizard-uma/0_90011427.html.

TOTAL RANGE: Extreme southwestern Arizona and adjacent Mexico.

RANGE WITHIN ARIZONA: Southwestern corner of the state, south of the Gila River, mainly in the Mohawk and Yuma dune systems of Yuma County, and the Pinta Sands of Pima County.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: A diurnal lizard that is inactive in cold temperature and extreme heat. *Uma rufopunctata* is well adapted to living in sand. The fringes on the toes act like "snowshoes" to stop the feet from sinking. When fleeing from predators, the species may run bipedally on their hind legs. They "swim" into the sand (head first) to avoid capture, and to escape extreme heat or cold. The setback lower jaw, scaly flaps over the ear, overlapping eyelids, and valves in the raer-facing nostrils all serve to keep out sand while the lizard is burrowing. (Behler 1979). The lizard's sand-like pattern makes them cryptic, which allows them to avoid predators.

According to Turner and Schwalbe (1998), environmental variables of temperature and humidity play critical roles in the lives of these lizards. Temperatures affect morning emergence from the sand and mid-day burrowing into the sand, thus influencing the number of lizards visible on the surface during a census operation. In addition, temperatures affect all physiological processes, including egg development and seasonal events such as the onset of and emergence from hibernation. Relative humidity may influence survival in many species and may be an important proximal cue for seasonal activity patterns of many lizards and their prey.

Often encountered basking on the warm sand in the mid-morning sun. Hibernates underground during the cold months of winter and late fall. A speedy, ground-dwelling lizard that runs on its hind limbs at top speeds. When threatened it often runs a short distance and then wriggles under the sand chisel-shaped snout first. It also uses existing burrows for shelter.

Home range studies reveal that males have much larger ranges than females; on the order of 2x larger. One study showed that adult males occupied an average of 530 m^2, another 1040 m^2. Immatures and juveniles occupied smaller home ranges, respectively. Territories for all males combined from the two studies ranged from 403 – 584 m^2, and all females combined ranged from 192 – 271 m^2. When adjusted for sampling bias, average home ranges for males were 1446 m^2, and 974 m^2 for females. There was little overlap in home ranges (Turner and Schwalbe 1998).

REPRODUCTION: This lizard mates in spring and lays one or more clutches of eggs in spring and summer. Before coupling the male vibrates his head in a series of rapid bobs, performs push-ups, and flattens his body from side-to-side. The female crawls under the male's chin with her tail elevated. During coupling the male bites the female's back. Clutch size ranges from 1 to 5 eggs. Eggs are buried in a shallow, moist nest within the sand (Brennan 2016). There is a report that adults are sensitive to food levels and may not reproduce in times of scarcity. A study by Turner and Schwalbe (1998) found that survivorship was very high, ranging from 0.82 to 0.92 %.

FOOD HABITS: Chiefly insects, spiders, other small lizards, leaves, flowers, and some buds. Captive specimens have been observed to eat their own shed skin (Brennan 2016). Forty-nine percent of their diet volume was plant material (Turner and Schwalbe 1998).

HABITAT: Restricted to sparsely vegetated fine, windblown sand dunes, flats, riverbanks and washes of very arid desert. Vegetation is sparse, consisting of creosote bush (*Larrea tridentata*), burroweed, croton, mesquite, or other scrubby growth.

ELEVATION: The elevation range is from sea level to around 700 feet (213 m). Based on collection and observation records in Arizona, elevation ranges for this species are from 160 - 900 ft (49-275 m).

PLANT COMMUNITY: Based on a study conducted in the Mohawk Dunes (Turner and Schwalbe 1998), "Dominant perennial species on the crests included *Ambrosia dumosa*, *Aristida californica*, *Hilaria rigida*, *Ephedra trifurca*, and *Psorothamnus emoryi*. The swales had a similar suite of species, with the addition of *Larrea tridentata* and a strong reduction in *Psorothamnus emoryi*." Available ground cover was formed by four perennial species, including *A. dumosa*, *E. trifurca*, *H. ridgida*, and *P. emoryi*, along with dead woody debris formed primarily by the annual *Dicorea canescens*. For those lizards that used cover, *A. dumosa* was the most commonly used type while *E. trifurca* assumed less importance. A couple of observations southeast of Somerton and near the Mexico border have been observed in loose sand with big galleta grass (*Hilaria rigida*) dominated habitat.

POPULATION TRENDS: Unknown for Arizona. A study conducted by Turner and Schwalbe (1998), used several methods including line transects and two mark-recapture techniques to estimate population size. Based on the results of these efforts, and stratifying the land to estimate the actual usable habitat in the Mohawk Dunes (4584 ha), they estimate a total

population of 68,760 for 1995, and 77,928 for 1996. These figures equate to a population density (just for the Mohawk Dunes) of 15 and 17 animals per hectare, respectively.

There are 22 element occurrences mapped in Arizona, although several of these may be close enough to be considered separate source features of the same occurrence (AGFD HDMS Program data). Pouch (1977) mapped seven distinct occurrences in Sonora, Mexico. NatureServe (2016) states that the total adult population is unknown, but is likely to be at least a few thousand. Turner and Schwalbe (1998) projected a total population for the Mohawk Dunes to be in the range of 70,000 individuals between 1995 and 1996.

Because of its limited distribution and restriction to fragile Aeolian sand habitats, *U. rufopunctata* is considered to be imperiled in Arizona. Threats to its habitat are considered as "medium" but the short term trend is relatively stable. Over the longer term, the species' extent of occurrence, area of occupancy, number of locations, and population size probably have not declined more than 25% compared to the historical situation, but better information on trend is needed (NatureServe 2016).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS:
SC (USDI, FWS 1996)
[C2 USDI, FWS 1991, 1994]
[C2 USDI, FWS 1989]
[3C USDI, FWS 1985]

STATE STATUS:
2 (AZGFD, AWCS 2022)
[1B (AGFD SWAP 2012)]
[WSC (AGFD, WSCA 1996 in prep)]
[State Candidate, AGFD, TNW 1988]

OTHER STATUS:
NT (near threatened) (IUCN Red List 2007)
Not Forest Service Sensitive (USDA, FS Region 3 2007)
[Forest Service Sensitive (USDA, FS Region 3 1999)]
Bureau of Land Management Sensitive (USDI, BLM AZ 2008, 2010)
[None (USDI, BLM AZ 2005)]
[Bureau of Land Management Sensitive (USDI, BLM AZ 2000)]
P, Determined Endangered in Mexico (Proyecto de Norma Oficial Mexicana 2010)
[Full Species Listed Threatened Secretaría de Desarrollo 1994]

MANAGEMENT FACTORS: Significant threats include restricted habitat, limited distribution, off-road vehicle (ORV) activity, commercial, residential and agricultural development. A potential threat is posed by the non-native annual mustard (*Brassica*), which recently invaded southwestern Arizona; it forms thick carpets and may degrade habitat.

The results of the study by Turner and Schwalbe (1998) supported previous findings that found correlations between declines in *Uma* population density and loss of dune vegetation due to off-road vehicle use. In addition, their study reinforced previous evidence that *Uma* are rarely found away from sandy substrata with a narrow range of grain sizes, and thus are found in isolated populations restricted to certain sand dune systems. This makes them vulnerable to local extirpation due to human disturbance.

Their primary recommendation was that dunes occupied by *Uma* species be protected from off-road vehicle use. The three major Arizona populations of *U. rufopunctata* are officially closed to recreational vehicular use, but their protection varies functionally. The Pinta Sands and Yuma Dunes populations receive almost no vehicular use, due to physical isolation and agency restrictions. Off-road activities by the Border Patrol are likely the major exception.

The Mohawk Dunes, while subject to vehicle closures by both the military and the Bureau of Land Management, are easily accessible and rarely patrolled, resulting in a low but noticeable level of trespass vehicular use, especially at its northern end. Some form of monitoring for such use would allow determination of any growth of this problem. A possible avenue would be the addition of dune surveys to the existing overflights done for Sonoran pronghorn or desert bighorn. Higher levels of ground patrol by BLM or AGFD agents might also serve as a deterrent. The authors support continued military management of the Yuma and Mohawk Dunes in preference to a return to BLM multiple-use management, so long as they continue to avoid ground operations in those areas. The military presence there has had very little negative impact while preventing the civilian damage documented in parts of the Algodones Dunes. Similar civilian damage would quickly follow if the Yuma and Mohawk Dimes were opened to motorized recreational use (Turner and Schwalbe 1998).

PROTECTIVE MEASURES TAKEN: Considered a Species of Concern under the Endangered Species Act administered by the USFWS; NT (near threatened) by IUCN; Endangered by Mexico; and as a Sensitive Species by the BLM. Mohawk Dunes designated State Natural Area; military closure protects much habitat.

Per the IUCN, "Listed as Near Threatened since the species depends on areas of wind-blown sand, and so its area of occupancy is probably not much greater than 2,000 km², and the extent and quality of its habitat is declining, thus making the species close to qualifying for Vulnerable under criterion B2ab(iii)," Hammerson et al, 2007.

SUGGESTED PROJECTS: Use monitoring protocols as presented in Turner et al, 1997.

LAND MANAGEMENT/OWNERSHIP: BLM – Yuma Field Office; BOR – Yuma Area; DOD – Barry M. Goldwater Air Force Range; FWS – Cabeza Prieta National Wildlife Refuge; State Land Department; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

Uma is named after Fort Yuma located in Yuma, Arizona, a location that served as a shipping point for natural history specimens back in the 1800s.

Revised: 1991-04-08 (???)
1995-06-15 (DBI)
1997-03-06 (SMS)
2003-04-17 (SMS)
2016-07-19 (BDT)
2023-05-05 (MBL)