ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** AAABB01110

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Anaxyrus microscaphus* (Cope, 1867)
COMMON NAME: Arizona Toad

SYNONYMS: *Bufo microscaphus* (Cope, 1867 "1866")
Bufo microscaphus microscaphus (Cope, 1867 "1866")
Bufo woodhousii microscaphus (Cope, 1867)

OTHER COMMON NAMES: Southwestern Toad
Western Toad
Small Spaded Toad
Fort Mojave Toad
Cope Toad

FAMILY: Bufonidae

AUTHOR, PLACE OF PUBLICATION: Frost, D. R., T. Grant, J. Faivovich, R. H. Bain, A. Haas, C. F. B. Haddad, R. O. de Sá, A. Channing, M. Wilkinson, S. C. Donnellan, C. J. Raxworthy, J. A. Campbell, B. L. Blotto, P. Moler, R. C. Drewes, R. A. Nussbaum, J. D. Lynch, D. M. Green, and W. C. Wheeler. 2006. The amphibian tree of life. Bulletin of the American Museum of Natural History. 297:1–370.

TYPE LOCALITY: "...Arizona ...near the parallel of 35° and along the valley of the Colorado from Fort Mojave to Fort Yuma," restricted to Fort Mohave, Mohave County, Arizona by Shannon (1949).

TYPE SPECIMEN: USNM 4106 (now lost) and lectotype – USNM 4184, H. B. Möllhausen, date of collection unknown.

TAXONOMIC UNIQUENESS: There are 25 species in the genus *Anaxyrus* (Frost 2025). Twenty-two occur in the United States (Nicholson 2025), with six occurring in Arizona (Holycross et al. 2022).

This species was formerly placed in the genus *Bufo* (Price and Sullivan 1988, Crother et al. 2000). Frost et al. (2006) proposed splitting the genus *Bufo* into smaller monophyletic taxa to resolve long-recognized problems with paraphyly in the traditional treatment of *Bufo* and

placed the species in the genus *Anaxyrus*. This proposed change was met with some resistance and alternative proposed taxonomic solutions (Smith and Chiszar 2006, Pauly et al. 2009). Although some references continued to use the long-established *Bufo*, the use of *Anaxyrus* was adopted by Crother (2008) and has predominated in scientific and popular literature.

This species formerly included *B. mexicanus* and *B. californicus* as subspecies (Price and Sullivan 1988, Collins 1990), but Gergus (1998) concluded that they should be recognized at the species level. Shannon (1949) regarded it as a subspecies of *A. woodhousii*. See Sullivan (1986), Sullivan and Lamb (1988), Malmos et al. (2001), and Schwaner and Sullivan (2009) for information on hybridization with *A. woodhousii* in central Arizona.

DESCRIPTION:

Adults: The Arizona Toad is a small to medium-sized toad with oval-shaped, widely separated parotoid glands (Holycross et al. 2022). Cranial crests are absent or very poorly defined (Murphy 2019). Breeding males have a round and pale vocal pouch when inflated (Degenhardt et al. 1996). The dorsum varies in color, depending on age and region, from greenish gray to buff, brown, or salmon, with the color blending with the surrounding soil and rocks (Stebbins 2003). The sacral humps and the anterior half of parotoid glands and eyelids tend to be pale in color, and toads lack a pale middorsal stripe (Degenhardt et al. 1996). Arizona Toads have a buff coloring below, often lacking spots, with a whitish belly (Murphy 2019). Both sexes have a pale-colored throat (Stebbins 2003). Males tend to be up to 70 mm (2.8 in), while females are slightly larger at up to 86 mm (3.4 in) (Murphy 2019).

Juveniles: Juveniles are ash-white, light olive, or salmon with red-tipped warts (Sredl 1993).

Larvae: Tadpoles reach a size of about 38.1 mm (1.5 in). They are black when small, but their dorsal body color lightens and the tail becomes spotted or speckled as they develop (Nigro and Rorabaugh 2023).

AIDS TO IDENTIFICATION: The Arizona Toad can be distinguished from other North American bufonids in Arizona by weak to absent cranial crests, a relatively smooth dorsum with little or no dark spotting, relatively smooth skin, elongate and nearly parallel parotoids (length approximately 1.7x the width), and a light band across and between the eyes (Price and Sullivan 1988). Arizona Toads also lack a stripe down the middle of the back (Sredl 1993). Arizona Toads can be distinguished from Woodhouse's Toad (*A. woodhousii*) by the presence of a prominent middorsal stripe and parotoid glands, which are in contact with heavy cranial crests (Degenhardt et al. 1996). Great Plains Toads (*A. cognatus*) have large dark spots on the back and cranial crests that join on the snout (Degenhardt et al. 1996). Advertisement calls also can be used for identification, although temperature changes can impact the duration, frequency, and pulse rate (Sullivan and Lockwood 1991, Gergus et al. 1997).

ILLUSTRATIONS

Color photo (Behler and King 1979, plates 223 and 235)
Color photo (Degenhardt et al. 1996, plate 12)
Color illustration (Stebbins 2003, plate 14)
Color photos (Elliott et al. 2009, pages 170–171)
Color photos (Clark 2011, pages 14–15)
Color photo (Murphy 2019, page 30)
Color photo (Holycross et al. 2022, page 39)

TOTAL RANGE: Found from the Colorado and Virgin River basins in southeastern Nevada and southwest Utah and through Arizona, mostly below the Mogollon Rim, into the Mogollon Plateau of southwestern New Mexico (Sullivan 1993, Murphy 2019). Frequently occur along waterways of the Gila and San Francisco river drainages. An isolated population also lies along the headwater of Rio Aguanaval in northwestern Zacatecas, Mexico (Degenhardt et al. 1996).

RANGE WITHIN ARIZONA: East to west central Arizona, canyons and flood plains south of the Mogollon Rim but also found in East Clear Creek and the Virgin River basin (Sullivan 1993, see Fig. 1 for map). Occurs in Apache, Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Navajo, and Yavapai counties (Holycross et al. 2022).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Adults are nocturnal, spending the day in sandy burrows (Schwaner and Sullivan 2005). Arizona Toads presumably are in torpor September–February (Murphy 2019, Holycross et al. 2022). The vocal call is a trill, averaging between 8 and 12 seconds in duration with a rising pitch (Sullivan 1992, Elliott et al. 2009). Trills typically begin softly, with a slight increase in pitch at first, before growing louder and more consistent (Elliott et al. 2009). Within their home range, males are reported to move less than 185 m and females around 460 m along streams between February to June (Schwaner and Sullivan 2005). Dispersal is assumed to be limited by the presence of mesic habitats and sufficient rainfall (Oyler-McCance et al. 2024).

Predators include Killdeer (*Charadrius vociferus*), gartersnakes (*Thamnophis* sp.), raccoons (*Procyon lotor*), and small mammals (Schwaner and Sullivan 2005, Murphy 2019). Brattstorm (2019) also observed Common Ravens (*Corvus corax*) and Turkey Vultures (*Cathartes aura*) feeding on juvenile toads in Mohave County, Arizona. The parotoid glands produce steroids, likely making them unpalatable to predators (Duellman and Trueb 1986). Their eggs are thought to be distasteful to snakes (Schwaner and Sullivan 2005).

Chytridiomycosis, a skin infection from the fungus *Batrachochytrium dendrobatidis* (Bd), has caused widespread amphibian population declines (Kilpatrick et al. 2010). Although Bd has been reported in Arizona Toads (Ryan et al. 2014a), this disease may have limited impact on Arizona Toads. Ryan et al. (2017a) reported that no Arizona Toads from nine different locations tested positive for Bd, although the report noted a change from two previous trials of this study, which had one positive test in 2013 and two in 2014.

Helminth parasites documented from Arizona Toads include one species of trematode (*Glypthelmins quieta*), one species of cestode (*Distoichometra bufonis*), and five species of nematodes (*Aplectana incerta*, *Aplectana itzocanensis*, *Rhabdias americanus*, *Physaloptera* sp., and *Physocephalus* sp.) (Goldberg et al. 1996). Ectoparasites include mites and leeches (Ryan et al. 2016a).

REPRODUCTION: Breeding occurs in a four to eight week period in early spring when males call from streamside habitats to attract females (Forzley et al. 2021). In Arizona, breeding begins as early as late February at lower elevations but does not commence at higher altitudes until several weeks later (Schwaner and Sullivan 2005). Breeding cues are not dependent on rainfall, as with many other species of toad, but are triggered by warm temperatures (Forzley et al. 2021).

The clutch size averages around 4,500 eggs (Blair 1955). Egg strands are laid on the bottom of pools and hatch in 3 to 6 days, depending on water temperature (Schwaner and Sullivan 2005). Tadpoles typically metamorphose in 1–3 months at about 38 mm (1.5 in) in length, but development can be slower in cooler water or at higher elevations because the development period of tadpoles before metamorphosis depends largely on water temperature (Schwaner and Sullivan 2005).

FOOD HABITS: The diet of Arizona Toads is not well studied but likely includes a variety of invertebrates, including insects, small arthropods, crickets, beetles, true bugs, moths, and ants (Degenhardt et al. 1996, Holycross et al. 2022). Ryan et al. (2016b) reported predation on *Aspidoscelis* lizards and evidence of cannibalism in New Mexican specimens. Scavenging behavior has been observed (Ryan and Bartholomew 2024). Tadpoles likely feed on detritus, algae, and decomposing organic matter (Sredl 1993, Murphy 2019).

HABITAT: Arizona Toads are generally found in preserved riparian habitats, permanent ponds, and shallow rocky streams in forests and meadows (Degenhardt et al. 1996, Holycross et al. 2022). The species inhabits rocky or sandy substrates from deserts around 300 ft. elevation to pine-oak belts around 7,000 ft. elevation; it is associated with rocky streams and canyons in the pine-oak belt (Sredl 1993). At high elevations, around 6,500 feet (2,000 m) or above,

toads may move more widely in associated forests during summer rains but are still associated with riparian communities (Elliott et al. 2009). Using habitat suitability models, Albuquerque et al. (2024) reported that habitat suitability was most strongly associated with precipitation of the wettest quarter, solar radiation, topography, and proximity to streams. Suitability declined rapidly with increasing distance from streams and extreme solar radiation. High suitability areas were concentrated in northeastern and central Arizona, parts of southwestern Colorado, southwestern New Mexico, and southeastern Nevada, often along riparian corridors (Albuquerque et al. 2024).

The Arizona Toad prefers to lay eggs in flowing water of a perennial or intermittent stream rather than in still ponds and lakes like many other toads (Dahl et al. 2000). Dahl et al. (2000) reported a preference to lay eggs in open canopy pools containing photosynthetic algae with raised dissolved oxygen levels rather than closed canopy regions with heavy leaf litter that consume oxygen. However, a later study in Arizona observed a preference for closed canopy cover for temperature mitigation (Montgomery 2023). Montgomery et al. (2024) reported that occupancy was best predicted by bioclimatic factors at the broad scale, declining in areas with extremely high temperatures and altered precipitation regimes. At the fine scale, larval toads selected habitats with high riparian canopy cover, shallow water, pebble substrates, and algae presence and avoided deeper, more open stream sections with woody debris. Riparian complexity and shaded microhabitats were consistently associated with toad presence, highlighting the importance of intact riparian forests (Montgomery et al. 2024).

ELEVATION: Based on records from the Heritage Data Management System, elevation ranges from 400–7,400 ft (121–2,255 m) (AZGFD, unpublished data accessed 2025).

PLANT COMMUNITY: Upland Sonoran Desertscrub, Mohave Desertscrub, Rocky Mountain Montane Forest. *Populus fremontii*, *Salix* spp., and *Baccharis* spp. are commonly associated with lower elevation riparian areas used for breeding. The Arizona Toad generally inhabits areas of sycamore and cottonwood in riparian ecosystems and pinion-juniper and ponderosa pine in grasslands (Degenhardt et al. 1996).

POPULATION TRENDS: The long-term trend is uncertain, but distribution and abundance are slowly declining (Schwaner and Sullivan 2005), and three historic sites in central Arizona are no longer occupied (Sullivan 2005). The population size of the Arizona Toad is believed to be decreasing at a slow rate, likely due to human disturbance of habitat, replacement by and hybridization with Woodhouse's Toad (*Anaxyrus woodhousii*), climate change, drought, wildfire, disease, and invasive species (IUCN SSC Amphibian Specialist Group 2022, Oyler-McCance et al. 2024). Increased drought prevalence and severity associated with climate change are expected to reduce habitat availability (Driver et al. 2023). Habitat fragmentation has also notably increased restrictions on population levels (Sullivan 2005).

Occupancy surveys in Arizona from 2021–2022 found relatively low occupancy rates with high detection probability (Montgomery et al. 2024).

SPECIES PROTECTION AND CONSERVATION

Status definitions: https://hdms.azgfd.com/species-list/columns
Heritage Network Conservation Status Rank definitions:
https://hdms.azgfd.com/species-list/columns/#SRANK

AGENCY STATUS

AZGFD:	2 (AZGFD, AWCS 2022)
USFWS (Endangered Species Act):	UR (USDI, FWS 2015)
U.S. Forest Service:	None (USDA, FS Region 3 2013)
Bureau of Land Management:	Sensitive (USDI, BLM AZ 2017)

OTHER STATUS:

Heritage Network Status:	G4
	S3
IUCN:	LC (IUCN SSC Amphibian Specialist Group 2022)

PREVIOUS STATUS

AGENCY STATUS

AZGFD:	1B (AZGFD SWAP 2012)
USFWS (Endangered Species Act):	None (USDI, FWS 1996)
	C2, as *Bufo microscaphus microscaphus* (USDI, FWS 1989, 1991, 1994)
U.S. Forest Service:	Sensitive, as *Bufo microscaphus* (USDA, FS Region 3 2007)
	Sensitive, as *B. microscaphus microscaphus* (USDA, FS Region 3 1999)

MANAGEMENT FACTORS: Arizona Toads are absent from some historical locations due to habitat alteration of riparian corridors caused by the damming of rivers (Sullivan 1986, 1993). Changes in hydrology and climate change induced drought result in restricted habitat availability and breeding lands for Arizona Toads (Oyler-McCance et al. 2024). For example, Ryan et al. (2017b) reported that Arizona Toads had been extirpated from the Burro Mountains and Rocky Canyon, New Mexico, likely due to habitats being converted to agriculture fields and the elimination of forest cover in the area, which resulted in proliferation of slow or non-moving bodies of water. Species distribution models suggest there will be a decrease in habitat suitability as the average annual temperatures are predicted

to rise an additional 10°C as a result of climate change (Driver et al. 2023). Anthropogenic water diversions and manipulations such as damming along the Agua Fria River as well as other urban development practices result in habitat loss and fragmentation (Green et al. 2013). Populations in central Arizona are threatened by habitat destruction and interspecific competition and hybridization (Murphy 2019). Future management strategies should prioritize conserving and enhancing the resilience of smaller, more ephemeral habitats (Driver et al. 2023).

Hybridization with Woodhouse's Toad is a major threat to the Arizona Toad that is possibly facilitated by dam construction (Wooten et al. 2019). Habitat destruction has reduced lotic habitats favored by this species and increased lentic environments favored by the similar Woodhouse's Toad, facilitating a niche overlap and hybridization between the two species (Sullivan 1986, 1993). In some areas, genetically uncontaminated Arizona Toad populations no longer occur (Schwaner and Sullivan 2005), and Arizona Toads are being displaced by Woodhouse's Toad in some areas of central Arizona (Sullivan and Lamb 1988). However, one study showed no obvious trend toward replacement of Arizona Toad by Woodhouse's Toad, even after several decades of hybridization (Schwaner and Sullivan 2009), and Ryan et al. (2017a) found no hybridization between the two species in New Mexico.

Another primary threat to Arizona Toads is fire-induced habitat loss or degradation in upland and wintering areas. Fire damage, particularly high-severity fire, can indirectly stop Arizona Toads from using certain drainages for breeding, effectively removing those areas from their available habitat (Ryan et al. 2014b).

Climate change will substantially reduce suitable habitat for Arizona Toads, primarily through altered precipitation regimes affecting stream breeding habitats (Albuquerque et al. 2024). Future projections of habitat suitability models under climate change scenarios indicate a 37–49% loss of high habitat suitability, especially along the northern and southern margins of the species' range, while gains in new suitable areas will be limited (~20%) and spatially restricted. All climate scenarios predicted overall contraction, with the greatest losses under intermediate and high‑emissions pathways (Albuquerque et al. 2024). Climatic stressors on toads can be exacerbated by long-term drying trends and short-term drought conditions (Ryan et al. 2014b).

Occupancy models suggest that, on a broad scale, Arizona Toads prefer to avoid extreme high temperatures and precipitation, but further research is needed on fine-scale variables that determine toad habitat preference to enable more accurate management in specific locations (Montgomery et al. 2024). Arizona Toad habitat selection is strongly scale dependent. Climate change-driven warming, altered precipitation, and stream dewatering threaten both broadscale suitability and fine‑scale breeding habitat. Maintaining complex, shaded riparian corridors

with shallow, low-velocity stream habitats is critical for sustaining Arizona Toad populations, particularly under increasing water scarcity in the Southwest (Montgomery et al. 2024).

Based on an examination of genetic connectivity and population structure, Arizona Toad populations are not uniformly connected across their range (Oyler-McCance et al. 2024). Arizona Toads form two major, genetically distinct groups separated by the Colorado River: a northwestern group (Virgin River, Beaver Dam Wash, Meadow Valley Wash in Utah and Nevada) and a southern group (central and eastern Arizona and New Mexico drainages) with Grand Canyon representing a major barrier between the two. Genetic connectivity between these two groups is low, suggesting they function as separate management units (Oyler-McCance et al. 2024). Climate change, drought, altered hydrology, and loss of headwater streams may further reduce connectivity, especially in low-elevation desert systems. Oyler-McCance et al. (2024) recommend region-specific management, protection of high-elevation riparian corridors, and use of genetic data to guide translocations or assisted migration where populations are small or declining.

PROTECTIVE MEASURES TAKEN: The Arizona Game and Fish Department (AZGFD) initiated a state-wide survey effort to assess the species' status by collecting information to assess the Arizona Toad's distribution and site occupancy and to evaluate potential threats (Ryan et al. 2022).

The Center for Biological Diversity (2012) included Arizona Toad in a petition to list 53 amphibians and reptiles as threatened or endangered under the Endangered Species Act submitted to U.S. Fish and Wildlife Service (USFWS) on 11 July 2012. USFWS (2015) released a 90-day finding in response to the petition that determined listing may be warranted and initiated a status review for the species.

SUGGESTED PROJECTS: Some potential mitigation measures to prevent further population decline could be to introduce eggs and tadpoles from nearby populations to develop a metapopulation in native occupied streams (Ryan and Latella 2014). Annual population monitoring through surveys at key locations and direct focus efforts on conserving the smaller, more ephemeral habitats may also help to increase population resilience to changing climatic conditions (Ryan et al. 2017b, Driver et al. 2023). Albuquerque et al. (2024) recommend using habitat suitability models to prioritize monitoring, protect riparian flow regimes, maintain connectivity, and guide proactive conservation and recovery planning for stream-dependent amphibians in arid landscapes.

LAND MANAGEMENT/OWNERSHIP[1]

AZGFD – Alamo Wildlife Area and Page Springs Fish Hatchery; Alamo Lake State Park; Lake Pleasant County Park
Arizona State Land Department
BLM – Arizona Strip, Kingman, Phoenix, and Safford Field Offices
TNC – Hassayampa River Preserve
Tribal – Fort Apache, Hualapai, San Carlos, and Yavapai-Apache Reservations
USFS – Apache-Sitgreaves, Coconino, Prescott, and Tonto National Forests
USFWS – Havasu and Bill Williams National Wildlife Refuges
Private

SOURCES OF FURTHER INFORMATION

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[1] The list is based on where HDMS has records for the species and potentially may not be complete.

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EXTERNAL LINKS:

Arizona Wildlife Conservation Strategy
Online Field Guide to The Reptiles and Amphibians of Arizona
NatureServe Explorer
iNaturalist

ADDITIONAL INFORMATION:

The name *Anaxyrus* is from the Greek *anax* meaning "lord" or "king." *Anaxyrus* means "noble toad" or "lordly toad," indicating its perceived prominence or stature among North American toads. The specific epithet *microscaphus* is from the Greek *micra* meaning "small" and *scaph* meaning "boat" or "hull," possibly referring to the relatively small and narrow head or body shape compared to related toads (Center for North American Herpetology 2025).

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