ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code**: **AAABC02080**
Data Sensitivity: **No**

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Hyla wrightorum* Taylor, 1939
COMMON NAME: Arizona Treefrog

SYNONYMS: *Dryophytes wrightorum* (Taylor, 1939)
Hyla eximia wrightorum Taylor, 1939
Hyla regilla wrightorum Taylor, 1939

OTHER COMMON NAMES: Mountain Treefrog
Sonora Treefrog
Wrights' Treefrog
Wrights' Mountain Treefrog
Sonoran Tree-toad
Madrean Treefrog
Sonora Hyla
Baid's Mexican Hyla

FAMILY: Hylidae

AUTHOR, PLACE OF PUBLICATION: Taylor, E. H. 1938. The University of Kansas Science Bulletin 25(19):421-445.

TYPE LOCALITY: Eleven miles south of Springerville, Apache County, Arizona, U.S.A.

TYPE SPECIMEN: Holotype: UMMZ-83074. I.J. Cantrall, 11 Aug 1935. Paratype: FMNH-10822 (Field# UMMZ 79141(3)).

TAXONOMIC UNIQUENESS: *Hyla wrightorum* is 1 of 6 hylidae species that occurs in Arizona (Murphy 2019). There are no recognized subspecies (Nicholson 2025).

Hyla wrightorum was formerly regarded as a synonym of *Hyla eximia* (Crother et al. 2000), but Duellman (2001) recognized *H. wrightorum* as a distinct species. This treatment was adopted by Crother et al. (2003) and Crother (2008). Duellman et al. (2016) resurrected the genus *Dryophytes* from synonymy under *Hyla*, and treated the species as *D. wrightorum*. This change was not adopted by Crother (2017) because the acceptance of this taxonomy within

the community was not clear at the time. However, Frost (2021, 2024), the Integrated Taxonomic Information System (2022), Murphy (2019), and Nicholson (2025) subsequently adopted the use of *Dryophytes* as the genus. There are 21 species in the genus *Dryophytes* (Frost 2024), with 10 species occurring in the U.S. (Nicholson 2025).

Holycross et al. (2022a) retained the use of *Hyla* in the interest of stability because *Hyla* (*senus lato*) is monophyletic and there are no morphological characters that can be used to distinguish the two clades recognized by Duellman et al (2016). HDMS follows Holycross et al. (2022a) in using *Hyla* for this species.

DESCRIPTION:

Adults: The Arizona Treefrog is a small frog with adults ranging in size from 24–57 mm (0.94–2.25 in) (Wright and Wright 1933, Holycross et al. 2022b). The dorsum is green to brownish with a dark eye stripe that extends beyond the shoulder, sometimes to the groin. Toward the rear, the stripe may break up into spots posteriorly (Holycross et al. 2022b). There is a thin white line that separates the stripe from the back color. Spotting on the head and upper back is usually scarce or absent (Stebbins 2003). Some individuals have a spot on each upper eyelid and dark lengthwise bars or spots on the lower back and some completely lack such markings. The posterior surfaces of the groin and thighs are orange or gold with a greenish tint. Males have a tan or greenish throat, while the throat is typically white in females (Degenhardt et al. 1996). The toe pads are distinct but small (Behler and King 1979), and the webbing is reduced (Taylor 1938). Arizona Treefrogs from the Huachuca Mountains and Canelo Hills region of southeastern Arizona are smaller than those of the Mogollon Rim in central Arizona (USDI, Fish and Wildlife Service (USDI, Fish and Wildlife Service (USFWS) 2014a)

Larvae: Arizona treefrog tadpoles are brown dorsally with minute silvery-gold flecks; dark ventrally and tinged pale gold (Stebbins, 2003). The base of the tail may have dark specks. Tadpole lengths range from 4.9–5.2 cm (1.9–2.04 in), with the tail length ranging from about half to more than two-thirds of their body length (Degenhardt et al. 1996).

AIDS TO IDENTIFICATION: The keys in differentiating the Arizona Treefrog from others are in the distinctive green coloration, dark lateral stripe, and extended toe tips. Although Canyon Treefrog (*H. arenicolor*) has similar toe tips it lacks the dark lateral stripe and green coloration (Degenhardt et al. 1996). The Pacific Chorus Frog (*Pseudacris regilla*) has an eye strip that does not extend beyond the shoulder (Holycross et al. 2022b).

ILLUSTRATIONS:

Color photo (Behler and King 1979: plate 150)
Color photo (Degenhardt et al. 1996, plate 18)

Color photo (Stebbins 2003: plate 64)
Color photos (Bezy et al. 2011, pages 110-113)
Color photo (Green et al. 2013, page 60)
Color photo (Bezy and Cole 2014, page 100)
Color photo (Murphy 2019, page 39)
Color photo (Holycross et al. 2022b, page 43)
Color photo (Rorabaugh 2023, https://live-reptilesofaz.pantheonsite.io/turtle-amphibs-subpages/h-h-wrightorum/)
Color photos (Arizona Game and Fish Department 2025, https://www.azgfd.com/species/arizona-treefrog/)

TOTAL RANGE: The range of the Arizona Treefrog extends from the mountains of central Arizona southeast into west-central New Mexico, and south into Mexico. In Mexico, it occurs in the Sierra Madre Occidental in northwestern Mexico, and throughout the southern part of the Mexican Plateau, the Sierra Madre Occidental, and Cordillera Volcana in central Mexico (Degenhardt et al. 1996, Duellman 2001, Frost 2024). An isolated disjunct population is present in the Huachuca Mountains and adjacent Canelo Hills in southeastern Arizona (Rorabaugh 2023).

RANGE WITHIN ARIZONA: In Arizona, the Arizona Treefrog occurs in the forested central plateau north of the Mogollon Rim, with disjunct, isolated populations in the Huachuca Mountains and adjacent Canelo hills in southeastern Arizona (Rorabaugh 2023). DNA evidence suggests that the disjunct Huachuca Mountains and Canelo Hills (HMCH) populations have been genetically isolated from other populations since the late pleistocene (Mims et al. 2016). Based on genetic, call, and morphological differences, these disjunct populations may be a separate species (Gergus et al. 2004). There are over 30 known localities in the HMCH populations (USFWS 2016).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The Arizona Treefrog is nocturnal, and during daylight can often be found in trees and under rocks or logs near moist areas (USFWS 2014a). In the Huachuca Mountains, they take refuge during the day under rocks and logs in mesic oak groves near breeding sites (Holm and Lowe 1995). During the colder winter and hotter summer months they hibernate (aestivate), and become active with the onset of summer rains (Holycross et al. 2022b). Arizona Treefrogs likely are prone to desiccation away from water (Bagne and Finch 2013). They are excellent climbers and can ascend to considerable heights in trees (Chapel 1939)

Male calls are a series of short, low-pitched nasal notes produced as distinct, metallic clacks or quacks (Holycross et al. 2022b, Stebbins 2003). The call consists of two to twelve or more notes in succession, which may be sped up toward the end of the call (Wright and Wright 1933). The dominant frequency of their call is inversely proportional to their snout-vent length and negatively correlated with male body size (Sullivan 1986).

Exotic species that are predators of the Arizona Treefrog include bullfrogs (*Rana catesbeiana*), crayfish, and centrarchid fish (*Lepomis* sp.) (Holm and Lowe 1995, Jones and Timmons 2010) Native predators for the Arizona Treefrog include Mexican Gartersnakes (*Thamnophis eques*), other gartersnakes (*Thamnophis* sp.), giant water bugs (*Lethocerus* sp.), and Arizona Tiger Salamanders (*Ambystoma mavortium nebulosum*) (Sredl and Collins 1992, Holm and Lowe 1995, Collins 1996, Lannoo 2005) These predators may decrease the extent of ponds Arizona Treefrogs may inhabit (USFWS 2014a). Collins (1996) reported that no Arizona Treefrog larvae from the Mogollon Rim populations were found in permanent aquatic habitats occupied by exotic fish (*Lepomis* sp., *Pimephales* sp.), bullfrogs, or crayfish, and that temporary aquatic habitats were more likely to be inhabited by larvae and have higher densities.

Limb deformities have been observed in Arizona Treefrogs. Although the cause is unknown, trematode parasites, microbes, UV-B radiation, pesticide contamination, genetic mutation, and predation can result in limb deformations like those observed (USFWS 2014a). Deformities such as these in other frog species across the western United States are often caused by the trematode *Ribeiroia ondatrae*, possibly interacting with toxins or introduced fish (Johnson et al. 2002, Johnson and Sutherland 2003, Johnson and Lunde 2005).

Arizona Treefrogs have a depauperate helminth fauna and are parasitized by different species than other Arizona amphibians. Helminths that infected Arizona treefrogs include *Cylindrotaenia americana*, *Cosmocercella haberi*, and larvae of *Physalopteras*, but treefrog populations do not appear to be adversely affected by the presence of helminths (Goldberg et al. 1996).

The skin is toxic and can severely irritate the eyes and nose of humans after handling (Degenhardt et al. 1996, Holycross et al. 2022b).

The HMCH population is geographically, morphologically, and genetically isolated from the rest of the range (Gergus et al. 2004). Due to concerns over the limited range and declining observations of the species within the isolated HMCH portion of its range, these populations are of special conservation concern. The HMCH populations have distinct mDNA haplotypes making them distinct from other populations of Arizona Treefrog (Bezy and Cole 2014). Additionally, the HMCH populations have different calls and morphology than other

populations of Arizona Treefrogs, and may represent a different subspecies or species (Rorabaugh 2023). HMCH populations generally have small effective population sizes that are variable within and among populations over time (Moore and Mims 2024).

REPRODUCTION: The Arizona Treefrog breeds sporadically from June through August, during and after rains, in shallow pools, ponds, ciénegas, tanks, slow moving streams, and flooded areas (Chapel 1939, Degenhardt et al. 1996, Holycross et al. 2022b). In the Huachucas, frogs congregate at breeding ponds beginning around dusk, where they often remain until dawn (Holm and Lowe 1995). Arizona Treefrogs mostly breed in waters lacking fish and other predators, but often share breeding locations with Tiger Salamanders (*Ambystoma mavortium*) (Holycross et al. 2022b). The mating success of males appears to be unrelated to size (Bezy et al. 2011).

Breeding dates may vary from year to year; the determining factor is heavy summer rains. Breeding choruses typically last for only 2-3 days following rainfall events, after which most frogs leave the breeding habitats, but some males may continue calling for an additional 2–4 days (Chapel 1939). Egg masses are laid in small clusters attached to vegetation just below the water (Behler and King 1979, Holycross et al. 2022b). Tadpoles metamorphose in about 6-11 weeks, when they reach about 38 mm (1.5 in).

FOOD HABITS: Very little is known of the food habits of Arizona Treefrogs, although beetles, spiders, earthworms, flies, bark beetles, other invertebrates, and grass particles have been seen in the stomach contents of Arizona species (Chapel 1939, Holycross et al. 2022b, Rorabaugh 2023). Arizona Treefrogs forage in grassy areas near standing water (Holycross et al. 2022b). Larvae likely eat algae, organic debris, and plant tissue (NatureServe 2025).

HABITAT: In Arizona, Arizona Treefrogs occur in montane and submontane regions occupying pine–oak and mixed-conifer woodlands, montane meadows, and riparian corridors (Collins 1996, Bagne and Finch 2013, Holycross et al. 2022b). Arizona Treefrogs can be found on the ground or in shrubs and trees near ponds, pools and streams within a variety of forests such as douglas fir, ponderosa pine, oak and pine-oak. Within these forests they usually inhabit water catchment areas or other areas with a consistent water source, and can be found along small streams and in wet meadows, cienegas, and temporary roadside ditches (Degenhardt et al. 1996, Rorabaugh 2023). Populations on the Mogollon Rim and in the White Mountains occur within a continuous high-elevation plateau dominated by ponderosa pine and mixed-conifer forest interspersed with wet meadows, marshes, and cienegas (Collins 1996, Holycross et al. 2022b). Occupied habitats include pine–oak uplands and riparian woodlands adjacent to breeding waters, where frogs use moist soils, leaf litter, and logs for shelter (Behler and King 1979; Sredl and Wallace 2000). In contrast, HMCH populations occupy smaller, isolated basins embedded within Madrean oak woodland, grassland, savannah, and riparian forest

(Holm and Lowe 1995, Bezy et al. 2011, Bezy and Cole 2014, Bagne and Finch 2013, USFWS 2016, Holycross et al. 2022b). Adults seem to prefer more mesic oak groves and wet seeps during the day, with both adults and juveniles found under logs and rocks in nearby moist areas (Holm and Lowe 1995).

Shallow ponds filled during summer monsoon rains appear to be the preferred breeding habitat for the Mogollon Rim populations (Collins 1996). The HMCH population breeds only in shallow, rain-filled pools and tanks with abundant aquatic vegetation available for male calling sites (Lannoo 2005), relying primarily on intermittent ponds with variable availability where inundation often does not occur every year (Mims et al. 2023, Moore and Mims 2024).

In New Mexico, Arizona Treefrogs occur in ponderosa pine and Douglas fir forests at high elevations, generally above 6,562 ft (2,000 m). They have been found in bromeliads growing on pine trees in Mexico (Duellman 2001).

ELEVATION: 3,000 – 9,500 feet (915 – 2,898 m). A large proportion of occurrences in Arizona occur above 5,000 feet (1,524 m) (Rorabaugh 2023).

PLANT COMMUNITY: Madrean Evergreen Woodland and Rocky Mountain Montane Forest (Holycross et al. 2022b)

POPULATION TRENDS: Little is known about Arizona Treefrog population trends; there is insufficient data to estimate if populations are declining (Arizona Game and Fish Department (AZGFD) 2022). The HMCH population appears to have increased since 2015. Arizona treefrogs were only known to occur at a handful of breeding sites prior to 2015 despite the extensive attention in that region, and had been confirmed extant at only half of previously reported locations (USFWS 2013a). The population seemed to expand in 2015 with occurrences throughout the Huachucas. Since then, individuals have been recorded to the north at the Appleton-Whittell Research Ranch and to the west in the San Rafael Valley and one site in the northern Patagonia Mountains. However, it is unclear if this increase was a chance event or a new geographic paradigm for the population (Tom Jones, personal communication, 2025-08-06)

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:	3, full species (AZGFD, AWCS 2022)
	1, HMCH population (AZGFD, AWCS 2022)
USFWS (Endangered Species Act):	None (USDI, FWS 2016)
U.S. Forest Service:	Sensitive, HMCH population (USDA, FS Region 3 2013)
Bureau of Land Management:	

OTHER STATUS

Heritage Network Status:	G3G4
	S3S4
IUCN:	LC (IUCN, IUCN SSC 2021)

PREVIOUS STATUS

AZGFD:	1C, full species (AZGFD, SWAP 2012)
	1A, HMCH population (AZGFD SWAP 2012)
USFWS (Endangered Species Act):	C - H/C Hills DPS (USDI, FWS 2007-2012, 2013b, 2014b, 2015)

MANAGEMENT FACTORS: Sredl and Collins (1992) report that the presence of *Ambystoma tigrinum* larvae strongly affected the survival of tadpoles. When salamanders were absent, survival was nearly 5 times greater than when salamanders were present. Invasive species such as American bullfrogs, green sunfish (*Lepomis cyanellus*), and crayfish limit the areas in which Arizona treefrogs can successfully breed and inhabit (Collins 1996, Jones and Timmons 2010, USFWS 2014a).

Hydrologic alteration, livestock grazing, and reduced monsoon precipitation have fragmented available habitat and reduced site persistence (Holm and Lowe 1995, AGFD 2022, Bagne and Finch 2013). The most significant threats to the Arizona treefrog are high severity wildfires that result in habitat loss or direct mortality; drought; floods; introduced predators; habitat loss; and habitat degradation caused by livestock grazing, off-highway vehicles, and environmental contamination (Jones and Timmons 2010, USFWS 2014a). These threats are likely to increase with climate change causing increased frequency or intensity in high severity wildlife, drought, and floods (Bagne and Finch 2013). Climate change may also increase habitat decline and physiological stress due to drought and drying (USFWS 2014a).

An additional concern is the alteration of monsoon timing causing reproductive failure, particularly if rainfall arrival is late or there is a reduction in rainfall quantity (Bagne and Finch 2013). Recruitment in the HMCH metapopulation could be negatively affected by reduced hydroperiods or a lack of water during the breeding season due to the elimination of breeding habitat as a result of reduced precipitation, sedimentation of ponds, or higher temperatures causing increased evaporation rates (Mims et al. 2023). Using a spatially explicit individual based model to simulate response of the Arizona Treefrog HMCH population to reductions in breeding habitat availability, Mims et al. (2023) found that climate-driven reductions in breeding habitat resulted in predicted mean population declines of 65%-85%. These simulations suggest that reductions in breeding habitat could lead to the HMCH population transitioning from a metapopulation to a few isolated populations, increasing the risk of regional extinction (Mims et al. 2023).

Although deformations resulting from trematodes or other causes have not yet been documented in the HMCH population, they are a potential threat (USFWS 2014a). Arizona Treefrogs from the Mogollon Rim can be infected by *Chytridiomycosis* in the laboratory, but generally appear to avoid infection in the wild (Miera et al. 2005, in USFWS 2014a). Although Chytrid has been documented in other frog species in the Huachucas, it is not known whether the HMCH population of Arizona Treefrog contracts the disease or is affected by it (USFWS 2014a).

The HMCH populations tend to be small, with breeding populations typically consisting of two to thirty frogs (Gergus et al. 2005) having small effective population sizes (Mims et al. 2016). Small populations are more subject to extirpation from stochastic events and random variations (Wilcox and Murphy 1985), which may threaten the long-term survival of these populations. DNA evidence suggests that the disjunct HMCH populations have been genetically isolated from other populations since the late pleistocene (Mims et al. 2016). Gergus et al. (2004) found that the HMCH population exhibited the lowest genetic diversity of the three geographic groupings of the Arizona Treefrog, with a single, unique haplotype in the population. Although Mims et al. (2016) found little evidence of recent genetic bottlenecks in the HCH populations, Moore and Mims (2024) identified a concerning decline in allelic richness across populations sampled in 2014, 2018/2019, and 2021. These findings heighten the concern that small populations and low genetic diversity may make the HMCH population more vulnerable to identified threats (USFWS 2014a).

Treefrog habitats can be protected by forest management to reduce the risk of high intensity wildfires. Additional management that would be beneficial is management that promotes isolating temporary pools from sources of predators and competitors (Bagne and Finch 2013). The conflicting needs of species requiring more permanent waters may require a multispecies approach to management. Surface water and aquatic predator population projections,

proximity to current treefrog populations, and potential for dispersal should be considered when evaluating potential suitable habitat (Bagne and Finch 2013). Management actions related to stock tanks should consider impacts and benefits to this species including the potential for breeding and disease transmission (Bagne and Finch 2013).

The HMCH populations occur in isolated wetland clusters connected by periodic dispersal, forming a metapopulation structure maintained through recolonization after local extinctions (Mims et al. 2016; Parsley et al. 2020; Moore and Mims 2024). Local extinctions, colonizations, and exchange of individuals may be influenced by the spatial and temporal availability of breeding habitat (Mims et al. 2016). Stream networks and stream distance appear to be the primary driver of functional connectivity in the HMCH population of Arizona Treefrogs (Parsley et al. 2020). Distance between ponds is also a strong driver in connectivity in this population (Mims et al. 2016, Parsley et al 2020). Management actions such as invasive species removal and manipulation of hydrology usually occurs at the scale of ponds and pond-level restoration. Management of the species focused on improving hydrologic connectivity between sites while maintaining current local management action is likely to have a positive effect on species conservation (Parsley et al. 2020).

PROTECTIVE MEASURES TAKEN: Due to concerns over the limited range and declining observations of the species within the isolated HMCH portion of its range, these populations are of special conservation concern. The USFWS (2007) identified the Arizona Treefrog HMCH population as a Distinct Population Segment discrete from populations in the Mogollon Rim population of Arizona and New Mexico and the Sierra Madre Occidental population, and placed the HMCH population on the Endangered Species Act candidate list with a listing priority number of three. It remained on the Candidate List until 2016, when USFWS (2016) removed the HMCH from the Candidate List because it was determined not to meet the requirements regarding recognition of Distinct Vertebrate Population Segments.

AZGFD continues to consider the HMCH population separate from the northern Arizona and Sierra Madre populations because it occurs in a relatively small geographic area and is completely isolated from the other two populations (Tom Jones, personal communication, 2025-08-06). Consequently the HMCH population was assigned a Tier 1 Species of Greatest Conservation Need status whereas the species as a whole was a Tier 3 species (AZGFD 2022). A valid Arizona fishing or combination license is required to take any frog in Arizona, but no Arizona Treefrog may be taken in Cochise or Santa Cruz counties, thus protecting the HMCH population (AZGFD 2022).

Fort Huachuca adopted the monitoring and protective management actions recommended by Sredl and Wallace (2000) into their Integrated Natural Resources Management Plan (INRMP). The Greater Huachuca Mountains Fire Management Group has developed a fire management

plan for the Huachuca Mountains area that is expected to reduce the likelihood of severe fire (USFWS 2014a). Bullfrogs have been eliminated from Scotia Canyon, and work is underway to remove them within a five-mile radius of the canyon (USFWS 2014a).

SUGGESTED PROJECTS: Distribution, habitat, population and life history studies are needed. Continued monitoring of the species, particularly the HMCH populations, is recommended. To restore or expand populations, there is a need to know if predator removal would be effective to increase suitable habitats. A related question that needs study is if the current use of temporary pools is a recent response to increased predation, or are permanent waters unsuitable for other reasons (Bagne and Finch 2013). These questions have implications for effective management of this species.

LAND MANAGEMENT/OWNERSHIP[1]

BLM - Las Cienegas National Conservation Area

DOD - Fort Huachuca Military Reservation, Navajo Army Depot

State - AZGFD Fool Hollow Lake and AGFD Sipe White Mountain Wildlife Areas, AZGFD Pinetop Regional Office, Fort Verde State Historic Park, State Trust Land, Verde River Greenway State Natural Area

Tribal - Camp Verde and Fort Apache Reservations, Hopi Trust Land, White Mountain Apache and Yavapai Apache Indian Reservations

USFS - Apache-Sitgreaves, Coconino, Coronado, Kaibab, and Tonto National Forests

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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ADDITIONAL INFORMATION:

The genus comes from the Greek *Hylas*, a companion of Hercules in Greek mythology who was dragged into a spring by water nymphs enchanted by his beauty while on the Argonaut's expedition. The etymology of the name is often erroneously given as derived from the Greek hylē, meaning wood or forest (Myers and Stothers 2006). The specific epithet honors Albert and Anna Wright, noted for their foundational work on North American amphibians (Center for North American Herpetology 2025).

The Arizona Treefrog is the official Arizona state amphibian (Bezy et al. 2011).

External Links:

Arizona Wildlife Conservation Strategy
Arizona Wildlife Conservation Strategy - HMCH population
Online Field Guide to the Reptiles and Amphibians of Arizona
NatureServe Explorer
iNaturalist

Revised: 1993-01-26 (SSS)
1998-01-29 (SMS)
2005-07-01 (TAB)
2007-12-10 (TFH)
2013-11-08 (BDT)
2022-12-16 (MBL)
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