

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

**Animal Abstract**

**Element Code:** AAABC06010

**Data Sensitivity:** No

**CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE**

**NAME:** *Smilisca fodiens* (Boulenger)

**COMMON NAME:** Lowland Burrowing Treefrog, Northern Casque-headed Frog, Northern Casquehead Frog, Northern Burrowing Treefrog

**SYNONYMS:** *Pternohyla fodiens*, *Hyla rudis*

**FAMILY:** Anura: Hylidae

**AUTHOR, PLACE OF PUBLICATION:** Faivovich, J., C.F.B. Haddad, P.C.A. Garcia, D.R. Frost, J.A. Campbell and W.C. Wheeler. 2005. Systematic review of the frog family Hylidae, with special reference to Hyliinae: Phylogenetic analysis and taxonomic revision. Bulletin of the American Museum of Natural History 294:1-240.

**TYPE LOCALITY:** "Presidio, W. Mexico" (Sinaloa, Mexico)

**TYPE SPECIMEN:** Holotype, British Museum of Natural History 1947.2.24.26, collected by Alphonso Forrer (not seen by author).

**TAXONOMIC UNIQUENESS:** Species *fodiens* is the only species of the genus *Smilisca* found in North America, north of Mexico. Previously placed in the genus *Pternohyla* (Trueb 1969, Crother 2000). Faivovich et al. (2005) included *Pternohyla* in the synonymy of *Smilisca* to avoid paraphyly.

**DESCRIPTION:** A medium sized frog averaging 2.54-6.35 cm (1.0-2.5 in.) snout to vent. The skin of the head is partially co-ossified (very hard) and firmly attached. This factor, coupled with its specialized limbs has allowed it to adapt to a fossorial existence. There is a prominent ridge between the eye and nostril, and a fold of skin at the back of the head. The toes are slightly webbed, and the toe pads are small but distinct. A single large whitish tubercle is located on each hind foot. Juveniles are bright green (Sullivan et al. 1996), while adults are dark brown to light tan above with large dark brown blotches (sometimes longitudinal lines) outlined with pale yellow; plain white below.

**AIDS TO IDENTIFICATION:** Dorsum dark brown to light tan color with large brown blotches edged with pale yellow. Prominent fold of skin is present at back of head.

**ILLUSTRATIONS:** Color drawing (Stebbins 1985)

Color photo (Behler and King 1979, reprint 1992: Plate 186)

B&W line drawing (ASDM 2000,

[http://www.desertmuseum.org/books/casqueheaded\\_frog.html](http://www.desertmuseum.org/books/casqueheaded_frog.html))

Color photo of tadpole (Ronn Altig 1998, AmphibiaWeb)

**TOTAL RANGE:** South-central Arizona south into western mainland Mexico, from Sonora to Michoacan.

**RANGE WITHIN ARIZONA:** San Simon Wash between Sells and Ajo, north to near Hickiwan, Pima County. Also reported from Vekol Valley, Maricopa County.

## **SPECIES BIOLOGY AND POPULATION TRENDS**

**BIOLOGY:** A terrestrial, burrowing, nocturnal frog that migrates between breeding and nonbreeding habitats. They are inactive for more than 10 months each year, only emerging to reproduce and forage, “following intense rainfall events during the summer ‘monsoon’ season” (Sullivan et al. 1996). If not for its explosive breeding behavior, this frog would rarely be observed. The males voice is an unmistakable loud honking metallic, duck-like quack. Vocalization may be heard from June through August to early September.

By day, *Smilisca fodiens* takes refuge in self-dug holes and rodent burrows in hard clay soils where humidity is high. “After burrowing underground, this species sheds several layers of its epidermis that form a virtual “cocoon” around the entire body and probably reduce dehydration in the dry season. In addition, this species uses its head to block the opening to its burrow. This reduces water loss from the frog’s body, and may protect it from some predators.” (ASDM 2000). This species is also an accomplished climber. For example, females have been found in trees as high as 5 feet.

**REPRODUCTION:** Breeds in temporary pools following summer rains from July-August. Oviparous (egg laying) species.

**FOOD HABITS:** Arthropods

**HABITAT:** Although tropical in origin, in Arizona this species is most often associated with xeric environments, where it lives in burrows in low open mesquite grasslands, usually associated with major washes and arroyos that help form the large mesquite bosques it seems to prefer. In Mexico, it is also found in tropical scrub forests.

**ELEVATION:** Near sea level to about 4,900 ft. (1,495 m). The range in Arizona is 1,930 - 2,480 ft (589 - 756 m) (AGFD, unpublished records accessed 2003).

**PLANT COMMUNITY:** Mesquite grasslands.

**POPULATION TRENDS:** Unknown

## **SPECIES PROTECTION AND CONSERVATION**

**ENDANGERED SPECIES ACT STATUS:** None

**STATE STATUS:**

2 (AGFD, AWCS 2022)  
 1B (AGFD SWAP 2012)]  
 [WSC (AGFD, WSCA 1996 in prep)] as  
*Pternohyla fodiens*  
 [Candidate (AGFD, TNW 1988)] as  
*Pternohyla fodiens*

**OTHER STATUS:**

Bureau of Land Management Sensitive  
 (USDI, BLM AZ 2008, 2010, 2017) as  
*Pternohyla fodiens* in 2008  
 Not Forest Service Sensitive (USDA, FS  
 Region 3, 1999, 2013)  
 [Forest Service Sensitive USDA, FS Region  
 3 1988] as *Pternohyla fodiens*

**MANAGEMENT FACTORS:**

**PROTECTIVE MEASURES TAKEN:** Arizona fishing license required to take any  
 amphibian.

**SUGGESTED PROJECTS:** Distribution, habitat, population, and life history studies.

**LAND MANAGEMENT/OWNERSHIP:** BIA – Tohono O’odham Reservation; BLM –  
 Phoenix Field Office.

**SOURCES OF FURTHER INFORMATION****REFERENCES:**

- Arizona Game and Fish Department. 1988. Threatened native wildlife in Arizona. Arizona  
 Game and Fish Department Publication. Phoenix, Arizona. p. 10.
- Arizona Game and Fish Department. In prep. Wildlife of special concern in Arizona. Arizona  
 Game and Fish Department Publication. Phoenix, Arizona. p. 10.
- Arizona Game and Fish Department. 2012. Arizona’s State Wildlife Action Plan 2012-2022.  
 Arizona Game and Fish Department, Phoenix, Arizona. 233 pages.
- Arizona Game and Fish Department. 2022. Arizona Wildlife Conservation Strategy: 2022-  
 2032. Arizona Game and Fish Department, Phoenix, Arizona. 378 pages.
- Arizona-Sonora Desert Museum (ASDM). 2000. Northern Casque-headed frog (*Pternohyla*  
*fodiens*). Arizona-Sonora Desert Museum Web Publication,  
[http://www.desertmuseum.org/books/casqueheaded\\_frog.html](http://www.desertmuseum.org/books/casqueheaded_frog.html). Accessed: 4/16/2003.
- Behler, J.L. and F.W. King 1979. The Audubon Society field guide to North American  
 reptiles and amphibians. Reprint 1992. Alfred A. Knopf, New York, New York. p. 416.
- Chrapiwiy, P.S. and K.L. Williams. 1957. A species of frog new to the fauna of the U.S.:  
*Pternohyla fodiens* Boulenger. Natural History Miscellanea, Chicago Academy of  
 Science. 160:1-2.

- Crother, B.I., J. Boundy, J.A. Campbell, K. de Queiroz, D.R. Frost, R. Highton, J.B. Iverson, P.A. Meylan, T.W. Reeder, M.E. Seidel, J.W. Sites, Jr., T.W. Taggart, S.G. Tilley, and D.B. Wake. 2000 [2001]. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. Society for the Study of Amphibians and Reptiles, Herpetological Circular No. 29. 82 pp.
- Duellman, W.E. 1970. The hylid frogs of Middle America. Monograph of the Museum of Natural History, University of Kansas, Number 1. Two volumes. 753 pages + plates. <https://doi.org/10.5962/bhl.title.2835>
- Faivovich, J., C.F.B. Haddad, P.C.A. Garcia, D.R. Frost, J.A. Campbell and W.C. Wheeler. 2005. Systematic review of the frog family Hylidae, with special reference to Hyalinae: Phylogenetic analysis and taxonomic revision. Bulletin of the American Museum of Natural History 294:1-240. [https://doi.org/10.1206/0003-0090\(2005\)294\[0001:SR0TFF\]2.0.CO;2](https://doi.org/10.1206/0003-0090(2005)294[0001:SR0TFF]2.0.CO;2)
- Frost, D. R., R. W. McDiarmid, and J. R. Mendelson III. 2008. Anura: Frogs. IN B. I. Crother (ed.), Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, pp. 2-12 SSAR Herpetological Circular 37. Integrated Taxonomic Information System (ITIS). Retrieved 4/16/2003 from ITIS, <https://www.itis.gov/>.
- Lowe, C.H. 1964. The vertebrates of Arizona. University of Arizona Press, Tucson, Arizona. pp. 156-157.
- NatureServe Explorer: An online encyclopedia of life [web application]. 2002. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: <https://explorer.natureserve.org>. (Accessed: April 16, 2003).
- Smith, H.M. 1978. A guide to field identification of amphibians of North America. Golden Press, New York, New York. p. 26
- Stebbins, R.C. 1954. Amphibians and reptiles of western North America. McGraw-Hill Book Company, Inc., New York, New York. p. 535.
- Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Second edition, revised. Houghton Mifflin Company, Boston, Massachusetts. p. 78.
- Sullivan, Brian K., Robert W. Bowker, Keith B. Malmos, and Erik W. A. Gergus. 1996. Arizona distribution of three Sonoran Desert anurans: *Bufo retiformis*, *Gastrophryne olivacea*, and *Pternohyala fodiens*. The Great Basin Naturalist 56(10):38-47. <https://www.jstor.org/stable/41712924>
- Trueb, L. 1969. *Pternohyala* Boulenger, burrowing treefrogs - *Pternohyala*, *P. dentata*., *P. fodiens*. Catalog of American Amphibians and Reptiles. 77:1-4.
- USDA, Forest Service Region 3. 1988. Regional Forester's sensitive species list.
- USDA, Forest Service Region 3. 1999. Regional Forester's sensitive species list.
- USDA, Forest Service Region 3. 2013. Regional Forester's sensitive species list.
- USDI, Bureau of Land Management Region 2. 2008. Arizona BLM sensitive species list. Bureau of Land Management, Arizona State Office, Phoenix, Arizona.
- USDI, Bureau of Land Management Region 2. 2010. Arizona BLM sensitive species list. Instruction memorandum No. AZ-IM-2011-005. Bureau of Land Management, Arizona State Office, Phoenix, Arizona.

USDI, Bureau of Land Management. 2017. Arizona BLM sensitive species list. Instruction memorandum No. AZ-IM-2017-009. Bureau of Land Management, Arizona State Office, Phoenix, Arizona. 6 pages.

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**ADDITIONAL INFORMATION:**

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