

ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract

Element Code: ARADB36110Data Sensitivity: Yes**CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE****NAME:** *Thamnophis rufipunctatus***COMMON NAME:** Narrow-headed Gartersnake, Narrowhead Garter Snake**SYNONYMS:** *Natrix rufipunctatus*, *Thamnophis angustirostris***FAMILY:** Serpentes: Colubridae**AUTHOR, PLACE OF PUBLICATION:** Cope, 1875.**TYPE LOCALITY:** Originally noted as “Southern Arizona” but Webb and Axtell (1986) later corrected this to “the vicinity of Fort Apache, Arizona.”**TYPE SPECIMEN:** HOLOTYPE: 8600 (formerly 1097), southern Arizona, H. W. Henshaw, September 1874 (Cochran, 1961).**TAXONOMIC UNIQUENESS:** A member of the family *Colubridae*, the genus *Thamnophis* ranges from southern Canada to Costa Rica in Central America, and from the Pacific to the Atlantic coasts (Stebbins, 1985). There are more than 21 species that make up the genus *Thamnophis*, and *rufipunctatus* has been subjected to controversial classification status in the past. Lowe (1955) proposed reassigning *rufipunctatus* (as *angustirostris*) to the genus *Natrix* (= *Nerodia*), water snakes, due to the use of only one apparent diagnostic character—the divided anal plate, found in only some specimens. Since then, substantial research has been done to support this reclassification (Degenhardt, et al., 1996), yet it remains in the genus *Thamnophis*. Most herpetologists believe that this snake acts as a bridge between the two genera (Shaw and Campbell, 1974), and it may someday be placed in a separate genus.**DESCRIPTION:** A medium-sized snake, reaching an average length of 112 cm (44 in). Females grow larger than males. Ground color olive, brown or tan, with distinct blackish, dark brown, dull brick-red, or orange paired spots on back and sides of body, fading toward the tail. Brownish gray below, paling on throat. Venter brownish-gray, or cream colored, often with two rows of blackish wedges, fading posteriorly. Scales keeled, usually 21 rows at mid-body. Anal plate usually single, but may be divided. Eight upper labials with dark bars on labial scales. Young have a dull yellowish belly, and often a cream-colored throat.

Because of their drab coloring and high set eyes, this species more closely resembles *Nerodia* (water snakes) than *Thamnophis*. Also, the head is narrow and more elongated than other *Thamnophis*.

AIDS TO IDENTIFICATION: No well-developed stripes or pale crescent behind corner of mouth as in other species of gartersnakes. Eyes high on blunt-nosed, elongated head separates this species from other gartersnakes in Arizona (Rosen 1988).

ILLUSTRATIONS:

Color drawing (Stebbins 1985: Pl. 43)

Color drawing (Stebbins 2003: Pl. 48)

Color photo (Behler and King 1979: Pl. 548)

TOTAL RANGE: In the U. S., range includes the mountains of central and eastern Arizona and west-central New Mexico in Mogollon Rim area; a disjunct population from those in Mexico. Range in Mexico includes Northern Sonora and Chihuahua, south in the Sierra Madre Occidental to central Durango.

RANGE WITHIN ARIZONA: Upland drainages from central and eastern Arizona from the White Mountains along the Mogollon Rim into Oak Creek Canyon at elevations from about 2,200-8,000 ft (Brennan, 2008). Counties include Apache, Coconino, Gila, Graham, Greenlee, Navajo, and Yavapai. Healthiest populations found in Oak Creek Canyon, and the East Verde River.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Regarded as one of the most aquatic of all garter snakes (Conant 1963). Found primarily in rocky stretches of canyon-bound headwater streams with perennial or nearly perennial flows. Found in or beside well-lit portions of clear, rocky streams where permanent water exists. May require large streams and rivers (Rosen and Schwalbe, 1988), lined with shrub-sized saplings and sheltered with broadleaf deciduous trees (alder, cottonwood, sycamore) in pinyon-juniper, oak-pine, or ponderosa pine communities. The narrow-headed gartersnake forages under water, seeking cover under rocks and boulders in the streambed when disturbed (Stebbins 1985). This snake basks on rocks, boulders and vegetation along stream banks, seeking shelter in crevices and under rocks (Degenhardt, et al., 1996).

Diurnal and evening crepuscular, snake is inactive in cold temperatures and extreme heat. Almost strictly aquatic, they are rarely seen more than a meter from water. However, hibernation takes place well above the flood line, in rocky outcroppings, during late fall and winter (Brennan, 2008). Rosen and Schwalbe (1998) found one gravid female more than 15 meters from the stream in July, and it is believed that they spend much of the gestation period on higher ground for sufficient thermoregulation. Research findings based on radio-telemetry data in Oak Creek, Arizona indicated that the species hibernates from November to April, and that the snakes do not likely travel more than 0.8km (0.5 mi) from their hibernation sites (USGS, 2006).

REPRODUCTION: Viviparous/ovoviviparous (live-bearing). 8-18 young are born in late July-early August, and likely earlier in the lower elevations. Males mature at about 2.5 years, Females at 2 years (Rosen and Schwalbe, 1988).

FOOD HABITS: Narrow-headed gartersnakes are only found in areas of high native fish concentration and primarily consume fish, including native fish species and soft-rayed nonnative fish species (USDI, FWS 2021), but specimens from Mexico have been known to eat ambystomatid salamander larvae (Stebbins, 1985).

HABITAT: Narrow-headed gartersnakes require perennial streams or spatially intermittent streams with pools and riffles. Cobble and boulder substrate with low amounts of fine substrate are preferred by the species. Structural features such as cobble bars, rock piles, boulders, logs, stumps, aquatic vegetation, vegetated islands, and debris jams are necessary in the stream channel to allow for basking, thermoregulation, shelter, protection from predators, and the maintenance of the aquatic prey base (USDI, FWS 2021). Hydrologic and geomorphic connection between the active stream channel and its adjacent terrestrial habitat is important for the species (USDI, FWS 2021). Important components of bank vegetation include shrub-sized and sapling Arizona alder (the most conspicuous species), velvet ash, willows and canyon grape. (Rosen and Schwalbe, 1988). In Arizona, this species is found in streams in pinyon-juniper and pine-oak woodland into ponderosa pine forest.

ELEVATION: 2,300 to 8,200 feet (700 to 2,500 meters) (USDI, FWS 2021)

PLANT COMMUNITY: Pinyon-juniper and oak-pine belts into forests of ponderosa pine.

POPULATION TRENDS: Many populations are declining. Believed to be extirpated from Flagstaff and Wall Lake, areas where it was formerly abundant. Snake is also becoming more difficult to find in historical strongholds like Oak Creek Arizona.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LT with CH (USDI, FWS 2021)
LT (USDI, FWS 2014)
[None USDI, FWS 1996]
[C2 USDI, FWS 1991, 1994]
[C2 USDI, FWS 1985, 1989]

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

OTHER STATUS: Bureau of Land Management Sensitive
(USDI, BLM 2008, 2017)

[Not Bureau of Land Management Sensitive (USDI, BLM AZ 2010)]
Forest Service Sensitive (USDA, FS Region 3 1988, 1999, 2007, 2013)

MANAGEMENT FACTORS: Threats to this species include lowering the water table, habitat modification, grazing along streambeds and increased recreational use in riparian areas. Other threats consist of the introduction of predators, such as bullfrogs, crayfish and predatory fishes (such as species of the families Centrarchidae and Ictaluridae), as well as habitat fragmentation.

PROTECTIVE MEASURES TAKEN: The Narrow-headed Gartersnake was listed as Threatened under the Endangered Species Act in July 2014. Critical habitat was designated in October of 2021.

This species is protected under Commission Order 43: Reptiles; it is illegal to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect it.

SUGGESTED PROJECTS: Research into the life history.

LAND MANAGEMENT/OWNERSHIP: BIA – Fort Apache and San Carlos Reservations; USFS – Apache-Sitgreaves, Coconino, Prescott, and Tonto National Forests; Red Rock State Park; AGFD Chevelon Canyon Ranches; Private.

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. 12.
- Arizona Game and Fish Department. 1996, in prep. Wildlife of special concern in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. 32 pages.
- Arizona Game and Fish Department. 2012. Arizona's State Wildlife Action Plan 2012-2022. Phoenix, AZ.
- Arizona Game and Fish Department. 2022. Arizona Wildlife Conservation Strategy: 2022-2032. Arizona Game and Fish Department, Phoenix, Arizona. 378 pages.
- Behler, J.L. and F.W. King. 1979. The Audubon Society field guide to North American reptiles and amphibians. Alfred A. Knopf, New York. P. 672.
- BISON, Biota Information System of New Mexico web site, <http://nmmhp.unm.edu>.
- Brennan, T. C. "Narrow-headed Gartersnake: *Thamnophis rufipunctatus*." *Reptiles and Amphibians of Arizona*. Ed. Thomas C. Brennan. 2008. 09 March 2009. <http://www.reptilesfaz.com/Snakes-Subpages/h-t-rufipunctatus.html>
- Cochran, D. M. 1961. *Type Specimens from the U.S. National Museum*. Retrieved March 6, 2009 from Internet Archive, Text

- Archive, Biodiversity Heritage Library. Web site:
http://www.archive.org/stream/bulletinunitedst2201961unit/bulletinunitedst2201961unit_djvu.txt
- Degenhardt W. G, C. W. Painter, and A. H. Price. 1996. Amphibians & Reptiles of New Mexico. University of New Mexico Press, Albuquerque, NM. xvii + 431 p.
- Emmons, I.A. and E.M. Nowak. 2012. *Thamnophis rufipunctatus* (narrow-headed garter snake). Range Extention. Note in Herpetological Review, 43(2):310.
- Fitzgerald, L.A. 1986. A comparison of the systematics and general biology of *Thamnophis rufipunctatus* and *Nerodia harteri*. Unpublished report to US Fish and Wildlife Service, Albuquerque, New Mexico.
- Fleharty, E.D. 1967. Comparative ecology of *Thamnophis elegans*, *T. cyrtopsis*, and *T. rufipunctatus* in New Mexico. The Southwestern Naturalist 12(3): 207-230.
- Fowle, J.A., M.D. 1965. The snakes of Arizona. Azul Quinta Press, Fallbrook, California. P. 126.
- Hibbitts, T.J., C.W. Painter and A.T. Holycross. 2009. Ecology of a population of the narrow-headed garter snake (*Thamnophis rufipunctatus*) in New Mexico: Catastrophic decline of a river specialist. The Southwest Naturalist, 54(4): 461-467.
- Lowe, C.H. 1964. Amphibians and reptiles. The vertebrates of Arizona. University of Arizona Press. Tucson, Arizona. P. 167.
- NatureServe Explorer: an online encyclopedia of life [web application]. 2001. version 1.6 Arlington Virginia, USA: NatureServe. <https://explorer.natureserve.org/>
- Nowak, E.M. and M.A. Santana-Bendix. 2002. Status, distribution and management recommendations for the Narrow-headed Garter snake (*Thamnophis rufipunctatus*) on Oak Creek Canyon, Arizona. Final Report to the Arizona Game and Fish Department, Phoenix, AZ. 56 p.
- Nowak, E. 2006. Monitoring surveys and radio-telemetry of narrow-headed gartersnakes (*Thamnophis rufipunctatus*) in Oak Creek, Arizona. Final Report to Arizona Game and Fish Department, Phoenix, AZ. USGS Southwest Biological Science Center, Colorado Plateau Research Station at Northern Arizona University, Flagstaff, AZ. 40 p.
- Rosen, P.C. and C.R. Schwalbe. 1988. Status of the Mexican and Narrow-headed Garter Snakes (*Thamnophis eques megalops* and *Thamnophis rufipunctatus rufipunctatus*) in Arizona. Unpublished report from Arizona Game and Fish Department (Phoenix, Arizona) to U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- Shaw, C.E. and S. Campbell. 1974. Snakes of the American west. Alfred A. Knopf, New York. P. 136.
- Stebbins, R.C. 1954. Amphibians and reptiles of western North America. McGraw-Hill Book Company, Inc., New York. Pp. 411-414.
- Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Second edition, revised. Houghton Mifflin Company. Boston, MA. Pp. 199.
- Tanner, W.W. 1959. A new *Thamnophis* from Western Chihuahua with notes on four other species. Herpetologica 15(4): 165-172.
- 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. 2007. Regional Forester's List of Sensitive Animals.
- USDA, Forest Service Region 3. 2013. Regional Forester's List of Sensitive Animals.
- USDI, Bureau of Land Management Region 2. 2008. Arizona BLM Sensitive Species List.
- USDI, Bureau of Land Management Region 2. 2010. Arizona BLM Sensitive Species List.
- USDI, Fish and Wildlife Service. 1985. Endangered and Threatened Wildlife and Plants; Review of Vertebrate Wildlife; Notice of Review. Federal Register 50(181): 37963.
- USDI, Fish and Wildlife Service. 1989. Endangered and Threatened Wildlife and Plants; Animal Notice of Review. Federal Register 54(4): 559.
- USDI, Fish and Wildlife Service. 1991. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 56(225): 58813.
- USDI, Fish and Wildlife Service. 1994. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species; Proposed Rule. Federal Register 59(219): 58994.
- USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 61(40): 7596-7613.
- USDI, Fish and Wildlife Service. 2014. Endangered and Threatened Wildlife and Plants; Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake. Final Rule. Federal Register 79(130):38678-38746.
- USDI, Fish and Wildlife Service. 2021. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Narrow-Headed Gartersnake. Final Rule. Federal Register 86(201):58474-58523.
- USGS. 2006. Narrow-headed Garter snake (*Thamnophis rufipunctatus*). Fact Sheet 2006-3059. USGS, Southwest Biological Center, Colorado Plateau Research Station, Flagstaff, AZ. 2 p.
- Webb, R. T. and R. W. Axtell. 1986. Type and type-locality of *Sceloporus jarrovi* Cope, with travel-routes of Henry W. Henshaw in Arizona in 1873 and 1874. J. Herpetol. 20(1): 32-41.
- Wright, A.H. and A.A. Wright. 1957. Handbook of snakes of the United States and Canada. Vol.I. Comstock Publishing Associates, Ithaca, New York. Pp. 762-766.
- Woodin, W.H. III. 1950. Notes on Arizona species of *Thamnophis*. Herpetologica 6: 39-41.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

- Phil Rosen - University of Arizona, Tucson.
- Erika M. Nowak – Colorado Plateau Research Station, Northern Arizona University, Flagstaff, AZ.

ADDITIONAL INFORMATION:

Revised: 1993-08-23 (SSS)
1995-03-24 (JMH)
1997-03-06 (SMS)

2002-11-07 (RHB)

2009-03-09 (TFH)

2012-07-20 (BDT)

2021-11-03 (KSL)

2023-05-03 (MBL)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 20XX (= **year of last revision as indicated at end of abstract**). X...X (= **taxon of animal or plant**). Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.