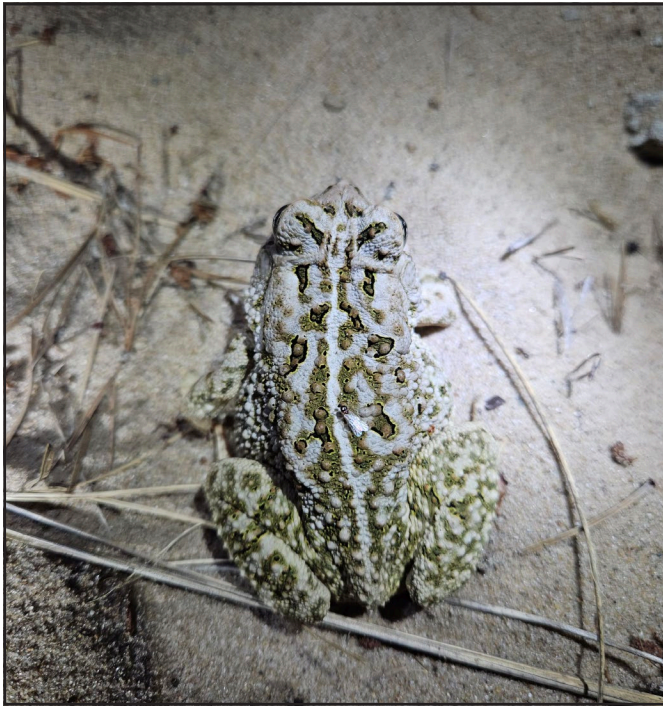
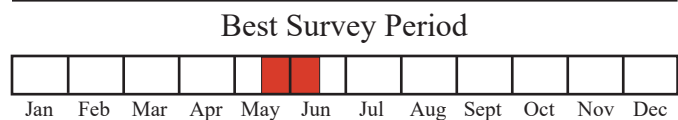
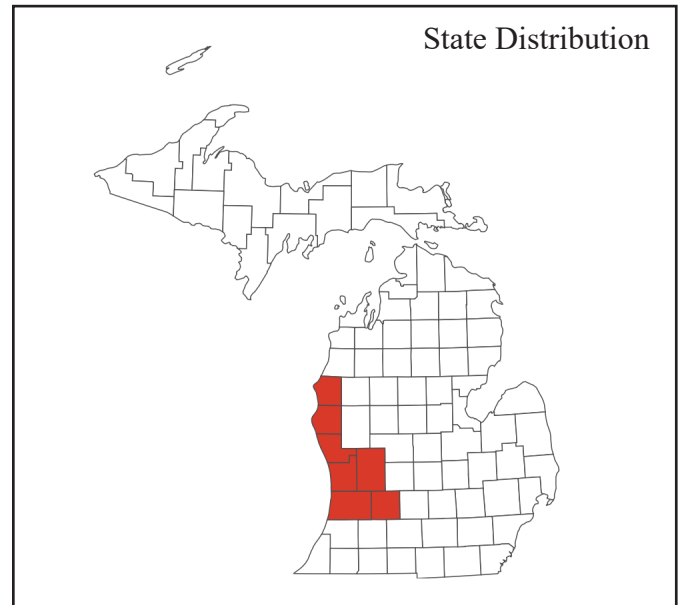


Photo by Justin Florkowski, [CC BY-NC](#)

Status: State special concern

Global and State Rank: G5 (Secure) / S3S4 (Vulnerable to Apparently Secure)

Family: Bufonidae (true toads)

Synonyms: *Bufo fowleri* (Hinckley 1882), *Bufo woodhousii fowleri* (Smith 1934).

Taxonomy: Frost et al. (2006) split the genus *Anaxyrus* from the genus *Bufo* and placed the Fowler's toad in the genus *Anaxyrus*. However, taxonomy within the genus *Bufo* remains controversial and many references still use the genus *Bufo* for this and other toad species (NatureServe 2026). Pauly et al. (2009) proposed retaining the genus *Bufo* for all toad species that was placed in the genus *Anaxyrus* and recognizing *Anaxyrus* as a subgenus for these species instead, which would promote taxonomic stability and preserve phylogenetic information. Masta et al. (2002) provided evidence for recognizing *A. fowleri* as a separate species from *A. woodhousii* and noted (as did Smith and Green 2004) that at the molecular level there are multiple, distinct mitochondrially-recognizable

populations in *A. fowleri* (Crother 2017, Mendelson et al. 2025, Nicholson 2025, NatureServe 2026). The Fowler's toad hybridizes with the American toad (*Anaxyrus* [*Bufo*] *americanus*) in some areas (Green and Parent 2003, NatureServe 2026).

Total Range: The Fowler's toad is found from eastern Texas to southeastern Iowa, east to Georgia through Massachusetts, and north to western Michigan and southern Ontario (Powell et al. 2016).

State Distribution: In Michigan, the Fowler's toad is found most abundantly in the southwestern portion of the Lower Peninsula but ranges north along the western edge to Manistee County and has a patchy distribution across the south-central and southeastern parts of the state (Holman 2012). Occurrences have been reported for Allegan, Barry, Kent, Mason, Muskegon, Oceana, and Ottawa counties (MNFI 2026). Potential exists for this species to occur in additional counties with suitable habitat as systematic surveys for this species have not been conducted throughout the state.

Recognition: Fowler's toads are medium-sized, earth-toned toads, occurring in a variety of colors



from **gray, olive green, reddish brown, brown, and tan**. Adults are usually 4.5-8.2 cm (1.8-3.2 in) SUL (snout-urostyle length [i.e., length from the anterior tip of the snout to the posterior end of the urostyle, a long bone formed from fused vertebrae at the base of the vertebral column in frogs and toads]) (Dodd 2023). Fowler's toads have dry, **warty skin** and **their back has large, dark black to olive green spots that generally contain more than two warts**. These warts are smaller and more numerous than those of the American toad, whose spots typically only contain 1-2 warts each. They may have a lightly colored, uniformly narrow vertebral stripe running down the back. This stripe is wider, irregular, and broken when present in the American toad. The **ventral (belly) color** of Fowler's toads varies from **white to cream to light yellow** with variable spotting that ranges from **unspotted to singularly spotted (i.e., one central spot)** to possessing spots in the anterior third of the venter (Dodd 2023). The ventral spotting is generally more sparse than the spotting of the American toad. **The low, narrow, and unpronounced cranial crests (two L- or J-shaped raised ridges on top of the head that start at the nostril region, run more or less parallel between the eyes, and then turn at right angles to run behind the back of the eyes) and parotoid glands (two oval or kidney bean-shaped raised glands behind the eyes that produce a toxin that helps defend the toad from predators) on either side of the head are usually separated by the length of the parotoid glands (i.e., distance between the two cranial crests and the distance between the two parotoid glands is equal to the length of the parotoid gland)** (Dodd 2023). **The post-orbital crests (i.e., the part of the cranial crest that runs along the back of the eyes) of the Fowler's toad lack a posterior knob and are in broad, direct contact with the anterior edge of the parotoid glands** (Dodd 2023). This is unlike the American toad whose cranial crests have posterior knobs and are typically separated from and not touching their parotoid glands, although some posterior knobs contact the glands (Pope 1944). Fowler's toads also **lack enlarged warts on their tibia**, which are

present in American toads. Fowler's toads are more alert than American toads and jump in a more frog-like fashion, moving in quick, far hops (Ruthven et al. 1928). The call of the Fowler's toad is "an eerie, mournful 'waaaaaaaaa,' lasting 2-7 seconds (Holman 2012). Ruthven et al. (1928) called the sound disagreeable and likened it to a screaming baby.

Tadpoles are small and dark brown to black. Some metallic or reddish flecking may be present on dorsum. It may be impossible to visually distinguish the tadpoles of the Fowler's toad from the American toad (Dodd 2023). The eggs have a black dorsum and tan-yellow venter and are contained within continuous gelatinous strings, enclosed in a single membrane with no intercellular partition between eggs (Livezey and Wright 1947, Dodd 2023). These strings of eggs occasionally occur in pairs. These are differentiable from the eggs of American toads, which are enclosed in a double membrane with intercellular partitions between eggs (Holman 2012).

Best Survey Time/Phenology: Although Fowler's toads are visible throughout their active season, the best survey technique is to conduct auditory surveys during their breeding period while males are calling (Graeter et al. 2013). They breed from mid-May to mid-June, with a peak in breeding activity from late May to early June (Holman 2012, Harding and Holman 2015). Auditory surveys are best conducted during warm (>13°C/55°F) evenings with winds under 8 mph (Sargent 2000). Visual surveys for adult Fowler's toads, especially at night during or after warm rains, also can be effective in the spring and summer (Graeter et al. 2013). Surveyors should walk slowly through suitable habitat looking for individuals on the move and check under cover objects.

Habitat: Adult Fowler's toads typically prefer open habitat with sandy soils, including beaches, coasts, lake shores, riverbanks, dry forests, oak savannas, sand prairies, and meadows (Wright and Wright 1949, Holman 2012). Fowler's toads are a characteristic species of sand dunes and dune and swale habitat in western Michigan, though they are



also found frequently in riparian areas and in both agricultural and suburban areas (Holman 2012). Natural communities in which they may be associated include coastal plain marsh, dry sand prairie, dry southern forest, dry-mesic northern forest, dry-mesic prairie, dry-mesic southern forest, emergent marsh, floodplain forest, Great Lakes marsh, interdunal wetland, intermittent wetland, lakeplain oak openings, lakeplain wet-mesic prairie, mesic northern forest, mesic sand prairie, mesic southern forest, oak barrens, oak openings, oak-pine barrens, open dunes, pine barrens, sand and gravel beach, southern wet meadow, submergent marsh, wet-mesic sand prairie, and wooded dune and swale complex (MNFI 2026).

Biology: Fowler's toads are active in Michigan generally from April to October. Fowler's toads are usually nocturnal, but can be active at any time of day, especially during warm rains. Peak activity usually occurs shortly after nightfall (Clarke 1974). During this active period, Fowler's toads prefer to wait for prey to on the warmest substrates available (Clarke 1974). During periods of inactivity, they shelter in burrows, root hollows, under cover, or in the substrate itself (Green and Yagi 2018). A study on the southern shore of Lake Michigan used radio-active isotopes to track three adult Fowler's toads for ten days and estimated home ranges between 103 and 1,245 m² (0.03-0.31 ac) (Clarke 1974).

Adult fowler's toads are ambush predators that primarily eat beetles and ants, along with other insects, spiders, and invertebrates. (Bush and Menhinick 1962, Clarke 1974, Harding and Holman 2015). The tadpoles feed on detritus, algae, and other plant materials (NatureServe 2026). Fowler's toads are well camouflaged with their cryptic coloration and patterning and are also poisonous. Their skin produces toxins in granular glands that are distributed throughout the dorsal skin but concentrated in the parotoid glands and warts. When confronted with a threat, toads will sometimes inflate themselves and angle their body to get the toxins closer. Their primary predators are garter snakes and eastern hognose snakes, which are immune to

the poison of the toads, with other snakes, snapping turtles, birds, and mammals also preying on them (Green 1989, Dodd 2023).

Fowler's toads breed in the shallow water of ponds, ditches, interdunal swales, floodplains, lake edges, and river shores (Wright and Wright 1949, Holman 2012). Males migrate to breeding sites as early as late April or early May, but peak breeding is late May and June (Holman 2012). This is usually after the peak of American toad breeding. Most toads breed at their natal pools (Breden 1987). During breeding, the male toad typically grasps the female toad from behind with his front legs (known as amplexus), which can last for hours or days. The male fertilizes the eggs as they are deposited in tangled strings around vegetation in shallow water. The females lay 7-10 thousand eggs in strings, which hatch in 2-7 days (Holman 2012). The tadpoles live and develop for 30-40 days before metamorphosing into toadlets, which become sexually mature after 1-3 years (Holman 2012). Very few toadlets survive to adulthood. A study at the Indiana Dunes National Lakeshore marked 8,539 newly metamorphosed toadlets and only recaptured 37 as adults (Breden 1987).

Fowler's toads have no freezing resistance and must burrow below the frost line but remain above the water table for overwintering (COSEWIC 2010). Oftentimes they will overwinter in sand underneath leaf litter and other debris (Green 1989). Emergence from overwintering sites in the spring is associated with warming temperatures, low winds, little rain, and a gibbous moon (Green et al. 2016).

Conservation/Management: Habitat destruction, alteration, and fragmentation are major threats to Fowler's toads, along with pesticides, agricultural runoff, and intense recreational use. Roads may be used by some toads as migration pathways between breeding sites and active season habitat, potentially resulting in high mortality (Timm and McGarigal 2014). While the Fowler's toad has been shown to be somewhat resilient to urbanization, declines in amphibian populations and species richness in



urban/suburban areas are well-documented (Barrett and Guyer 2008, Sutherland et al. 2010, Barrett et al. 2010). Vegetative succession and invasive species, such as *Phragmites*, can lead to a loss of breeding habitat, resulting in reduced population growth despite intact terrestrial habitat (Greenberg and Green 2013). Fowler's toads are known to hybridize with American toads, but it is not thought that hybridization with the American toad currently poses a threat to the species, although climate change could increase hybridization by changing breeding phenology (Masta et al 2002, Vogel and Johnson 2008).

Protecting extant populations and maintaining suitable habitat are critical for Fowler's toad conservation. Conservation efforts should strive to protect and maintain multiple, viable populations in different parts of the species' range within the state. Fowler's toads require aquatic breeding habitat, terrestrial active season habitat, suitable overwintering sites, and connectivity between these habitats to facilitate movement between them. Increasing dispersal corridors between occupied sites within and between extant populations would help facilitate connectivity and dispersal, maintain or increase gene flow and genetic diversity, and support population resiliency. Avoiding construction of new roads that would bisect or fragment habitat, closing or reducing traffic on existing roads that fragment habitat and cause toad mortality, and installing barrier fencing along the road or an ecopassage that would allow toads to safely cross under a road would reduce toad mortality and facilitate connectivity between habitats. Preventing or controlling invasive species in occupied habitats would reduce the potential for adverse impacts on Fowler's toads. Minimizing the use of pesticides, herbicides, and other chemicals within and adjacent to occupied habitats would help maintain sufficient densities of prey (e.g., beetles and ants) and reduce potential adverse impacts on populations of this species.

Research Needs: Systematic, statewide surveys are needed to assess and determine the species' current status and distribution in the state. Long-term

studies are needed to identify robust populations and monitor population sizes and trends throughout Michigan. The specific factors contributing to the species decline in Michigan should be investigated. Genetic diversity and differentiation within and between extant populations across the state should be examined to assess the species' status and threats and inform management efforts. Monitoring the impact and effectiveness of management actions would help facilitate adaptive management and inform management of additional populations.

Related Abstracts: coastal plain marsh, dry sand prairie, dry southern forest, dry-mesic northern forest, dry-mesic prairie, dry-mesic southern forest, emergent marsh, floodplain forest, Great Lakes marsh, interdunal wetland, intermittent wetland, lakeplain oak openings, lakeplain wet-mesic prairie, mesic northern forest, mesic sand prairie, mesic southern forest, oak barrens, oak openings, oak-pine barrens, open dunes, pine barrens, sand and gravel beach, southern wet meadow, submergent marsh, wet-mesic sand prairie, and wooded dune and swale complex

Selected References

- Barrett, K. and C. Guyer. 2008. Differential responses of amphibians and reptiles in riparian and stream habitats to land use disturbances in western Georgia, USA. *Biological Conservation* 141:2290–2300.
- Barrett, K., C. Guyer, and D. Watson. 2010. Water from urban streams slows growth and speeds metamorphosis in Fowler's toad (*Bufo fowleri*) larvae. *Journal of Herpetology* 44:297–300.
- Breden, F. 1987. The effect of post-metamorphic dispersal on the population genetic structure of Fowler's toad, *Bufo woodhousei fowleri*. *Copeia* 1987:386–395.
- Bush, F. M. and E. F. Menhinick. 1962. The food of *Bufo woodhousei fowleri* Hinckley. *Herpetologica* 18:110–114.



- Clarke, R. D. 1974. Activity and movement patterns in a population of Fowler's toad, *Bufo woodhousei fowleri*. The American Midland Naturalist 92:257–274.
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2010. COSEWIC assessment and status report on the Fowler's toad *Anaxyrus fowleri* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 58 pp.
- Crother, B. I. 2007. Standard language (insert language of choice) names versus common names. Herpetological Review 38:143.
- Dodd, K. C. 2023. Frogs of the United States and Canada. Johns Hopkins University Press, Baltimore, MD.
- Frost, D. R., T. Grant, J. Faivovich, R. H. Bain, A. Haas, C. F. B. Haddad, R. O. De Sa, 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.
- Graeter, G. J., K. A. Buhlmann, L. R. Wilkinson, and J. W. Gibbons, editors. 2013. Inventory and monitoring: recommended techniques for reptiles and amphibians. Partners in Amphibian and Reptile Conservation Technical Publication IM-1, Birmingham, AL.
- Green, D. M. 1989. Fowler's toad, *Bufo woodhousei fowleri*, in Canada: biology and population status. The Canadian Field-Naturalist 103:486–496.
- Green, D. M. and C. Parent. 2003. Variable and asymmetric introgression in a hybrid zone in the toads, *Bufo americanus* and *Bufo fowleri*. Copeia 2003:34–43.
- Green, D. M. and K. T. Yagi. 2018. Ready for bed: pre-hibernation movements and habitat use by Fowler's Toads (*Anaxyrus fowleri*). The Canadian Field-Naturalist 132:46–52.
- Green, T., E. Das, and D. M. Green. 2016. Spring-time emergence of overwintering toads, *Anaxyrus fowleri*, in relation to environmental factors. Copeia 104:393–401.
- Greenberg, D. A. and D. M. Green. 2013. Effects of an invasive plant on population dynamics in toads. Conservation Biology 27:1049–1057.
- Harding, J. H. and J. A. Holman. 2015. Michigan frogs, toads, and salamanders: a field guide and pocket reference. Second edition. Michigan State University Extension, Lansing, MI.
- Hinckley, M. H. 1882. On some differences in the mouth structure of tadpoles of the anurous batrachians found in Milton, Mass.. Proceedings of the Boston Society of Natural History 21: 307–314.
- Holman, J. A. 2012. The amphibians and reptiles of Michigan: a quaternary and recent faunal adventure. Wayne State University Press, Detroit, MI.
- Livezey, R. L. and A. H. Wright. 1947. A synoptic key to the salientian eggs of the United States. The American Midland Naturalist 37:179–222.
- Masta, S. E., B. K. Sullivan, T. Lamb, and E. J. Routman. 2002. Molecular systematics, hybridization, and phylogeography of the *Bufo americanus* complex in eastern North America. Molecular Phylogenetics and Evolution 24:302–314.
- Mendelson, III, J. R., D. R. Frost, E. M. Lemmon, and M. A. Donnelly. 2025. Anura – Frogs. Pages 1–9 in K. E. Nicholson, editor. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with



comments regarding confidence in our understanding. Ninth Edition. Society for the Study of Amphibians and Reptiles.

Michigan Natural Features Inventory (MNFI). 2026. Michigan Natural Heritage Database. Lansing, MI.

NatureServe. 2026. NatureServe Explorer: An on-line encyclopedia of life. NatureServe, Arlington, Virginia, USA. <<http://www.natureserve.org/explorer>>. Accessed 10 February 2026.

Nicholson, K. E., editor. 2025. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. Ninth Edition. Society for the Study of Amphibians and Reptiles. 87 pp. Online database available at: <https://cnaah.org/SSARnames.aspx>.

Pauly, G. B., D. M. Hillis, and D. C. Cannatella. 2009. Taxonomic freedom and the role of official lists of species names. *Herpetologica* 65(2):115-128.

Pope, C. H. 1944. *Amphibians and Reptiles of the Chicago area*. Chicago Natural History Museum, Chicago, IL.

Powell, R., R. Conant, and J. T. Collins. 2016. *Peterson field guide to reptiles and amphibians of eastern and central North America*. Fourth edition. Houghton Mifflin Harcourt, Boston, MA.

Ruthven, A. G., H. T. Gaige, and C. Thompson. 1928. *The herpetology of Michigan*. University of Michigan, Ann Arbor, MI.

Sargent, L. 2000. Frog and toad population monitoring in Michigan. *Journal of the Iowa Academy of Science* 107:195-199.

Smith, H. M. 1934. The amphibians of Kansas. *American Midland Naturalist* 15: 377-516.

Smith, M.A. and D. M. Green. 2004. Phylogeography of *Bufo fowleri* at its northern range limit. *Molecular Ecology* 13:3723-3733.

Sutherland, R. W., P. R. Dunning, and W. M. Baker. 2010. Amphibian encounter rates on roads with different amounts of traffic and urbanization. *Conservation Biology* 24:1626-1635.

Timm, B. C. and K. McGarigal. 2014. Fowler's toad (*Anaxyrus fowleri*) activity patterns on a roadway at Cape Cod National Seashore. *Journal of Herpetology* 48:111-116.

Vogel, L. S. and S. G. Johnson. 2008. Estimation of hybridization and introgression frequency in toads (Genus: *Bufo*) using DNA sequence variation at mitochondrial and nuclear loci. *Journal of Herpetology* 42:61-75.

Wright, A. H. and A. A. Wright. 1949. *Handbook of frogs and toads of the United States and Canada*. Third edition. Cornell University Press, Ithaca, NY.

Abstract Citation

Florkowski, J. T. and Y. Lee. 2026. Species Abstract for *Anaxyrus fowleri* (Fowler's toad). Michigan Natural Features Inventory, Lansing, Michigan, USA.

Copyright 2026 Michigan State University Board of Trustees.



Funding for this project was through the Michigan Department of Natural Resources' State Wildlife Grant T-9-T in cooperation with the U.S. Fish and Wildlife Service, Office of Conservation Investment.

