

# Lake Koshkonong Monitoring - Amphibians and Reptiles

Wisconsin Department of Natural Resources  
Bureau of Natural Heritage Conservation

## Background

Lake Koshkonong and the surrounding area provide a variety of habitat types that are suitable for amphibians and reptiles. Nine species of amphibians (8 frogs, 1 salamander) and seven species of reptiles (3 turtles, 4 snakes) have been reported from Lake Koshkonong and the surrounding area (Table 1). For comparison, there are 19 species of amphibians (12 frogs, 7 salamanders) and 36 species of reptiles (21 snakes, 4 lizards, 11 turtles) recorded from Wisconsin.

Table 1. Amphibian and reptile species previously reported from Lake Koshkonong and the surrounding area. \*

Frogs	American Bullfrog ( <i>Lithobates catesbeianus</i> ) American Toad ( <i>Anaxyrus americanus</i> ) Boreal Chorus Frog ( <i>Pseudacris maculata</i> ) Cope's Gray Treefrog ( <i>Hyla chrysoscelis</i> ) Gray Treefrog ( <i>Hyla versicolor</i> ) Green Frog ( <i>Lithobates clamitans</i> ) Northern Leopard Frog ( <i>Lithobates pipiens</i> ) Spring Peeper ( <i>Pseudacris crucifer</i> )
Salamanders	Tiger Salamander ( <i>Ambystoma tigrinum</i> )
Turtles	Blanding's Turtle ( <i>Emydoidea blandingii</i> ) – Species of Special Concern Painted Turtle ( <i>Chrysemys picta</i> ) Snapping Turtle ( <i>Chelydra serpentina</i> )
Snakes	Common Gartersnake ( <i>Thamnophis sirtalis</i> ) Common Watersnake ( <i>Nerodia sipedon</i> ) Dekay's Brownsnake ( <i>Storeria dekayi</i> ) Queensnake ( <i>Regina septemvittata</i> ) – State Endangered

\* Data were compiled from the Natural Heritage Inventory (NHI) database, local project reports, the Wisconsin Frog and Toad Survey, the Wisconsin Turtle Conservation Program, and citizen reports and do not constitute a full species inventory for the area.

American bullfrogs, American toads, boreal chorus frogs, Cope's gray treefrogs, gray treefrogs, green frogs, northern leopard frogs and spring peepers have been reported from the Lake Koshkonong area. Of the frog species that have been reported, two species (American bullfrog, green frog) require permanent water for breeding (Vogt 1981, Dodd 2013). The larval stage of these two species takes two-three years to metamorphose into adult frogs and thus requires a single permanent water location for both breeding and overwintering. The American bullfrog and green frog are commonly found in habitats with fish, however the other six species (American toad, boreal chorus frog, Cope's gray treefrog, gray treefrog, northern leopard frog, spring peeper) typically prefer fishless wetlands for breeding (fish are a primary predator of larva; Vogt 1981, Dodd 2013). An increase in water levels could significantly impact the larval frog age class (tadpoles) by altering the structure and types of predators present in breeding wetlands.

Only one species of salamander, the tiger salamander, has been reported from the Lake Koshkonong area. Tiger salamanders may inhabit a wide variety of habitat types, including marshes, floodplain forests, grasslands, lakes and streams (Vogt 1981, Petranka 1998). Tiger salamanders breed in standing water in the

spring and then move to the uplands to forage in the summer and overwinter. Salamanders are not often reported due to their fossorial and secretive nature so additional species (e.g., blue spotted salamander, central newt, four-toed salamander, mudpuppy) may be present in the Lake Koshkonong area. An increase in water levels may not significantly impact the adult salamander age class, but could significantly impact the larval salamander age class by altering the structure and types of predators present in breeding ponds or wetlands.

The Blanding's turtle, painted turtle and snapping turtle are commonly associated with permanent water bodies and have been reported from the Lake Koshkonong area (Vogt 1981, Ernst and Lovich 2009). For overwintering, they are likely utilizing Lake Koshkonong and adjacent deep water wetlands that don't freeze solid (> 3 ft. in depth). The painted turtle and snapping turtle remain fairly close to water throughout the year. However, the Blanding's turtle forages the furthest from water of any turtle species in Wisconsin, often traveling several miles from a wetland or waterbody. All three species nest from late May through early July in open canopy areas with well drained soils near wetlands or waterbodies. If nesting occurs in very low areas, an increase in water levels (direct level increase and as a result of increased wave action) could negatively impact turtle nesting, however adult turtle age classes will not likely be significantly impacted by an increase in water levels.

The state endangered queensnake, which primarily utilizes stream habitats and some adjacent wetlands, was recorded from the Lake Koshkonong area in 1894. Although systematic surveys have not been conducted for queensnakes on Lake Koshkonong, and none have been reported since the original sighting, the installation of the dam and subsequent habitat changes likely converted this area into unsuitable habitat for the queensnake. The common gartersnake, common watersnake and brownsnake have also been reported from the Lake Koshkonong area. The common gartersnake and brownsnake utilize a wide variety of habitats, including wetlands (Vogt 1981, Rossman et al. 1996, Ernst and Ernst 2003). The common watersnake utilizes a wide variety of waterbodies and wetlands and remains close to water throughout the year (Vogt 1981, Ernst and Ernst 2003). Although the common gartersnake, common watersnake and brownsnake utilize habitats that could be impacted by water level increases, their daily activities and critical life history stages (breeding and overwintering) would likely not be significantly impacted by water level increases.

Lizards, which typically prefer drier habitats than those present near the lake, have not been recorded within the immediate Lake Koshkonong area.

### **Evaluation of Impacts**

Of all the amphibians and reptiles (i.e., frogs, salamanders, turtles, snakes, lizards), frogs will likely be impacted the most by changing water levels at Lake Koshkonong due to their life history requirements and susceptibility to environmental changes.

Several survey methods (calling surveys, visual encounter surveys, drift fences/pitfall traps, larval surveys) were considered for monitoring frog populations at Lake Koshkonong (Heyer et al. 1994, Paloski et al. 2014). However after examining survey methodology and drafting survey protocols, it was determined that although surveys at Lake Koshkonong would provide some data on frog populations, it would not be possible to determine population trends or cause and effect relationships between the frog populations and water level changes due to the short timeline to collect baseline data (<1 year) and short length of the project (10 years). Due to natural annual fluctuations in amphibian populations and metapopulation dynamics, baseline amphibian surveys of 5-20 years are generally required in order to determine future statistically significant trends and cause and effect relationships.

Due to the inability to conduct a scientifically defensible study in the timeframe provided, the Bureau of Natural Heritage Conservation has decided to not conduct amphibian or reptile surveys at Lake Koshkonong.

## Literature Cited

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