Bone Lake Management District
Polk County, Wisconsin

Fisheries and Wildlife

Fact Sheet

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OVERVIEW

Bone Lake is known for abundant wildlife and a healthy fishery. Observing wildlife is a frequent pastime of many lake residents (68%), according to the Bone Lake Property Owner Survey. The wildlife around Bone Lake is plentiful. Animals ranging from whitetail deer (*Odocoileus virginianus*) to the majestic bald eagle (*Haliaeetus leucocephalus*) are found in the area. Common species include wild turkeys, ring-neck pheasants, grouse, woodcock, mallards, wood ducks, geese, coyotes, fox, black bear, raccoon, beavers, otters, fishers, mink, muskrats, songbirds, snakes, frogs, and turtles.

DNR High-Quality Waters

Bone Lake is on the DNR list of high-quality waters because of its fish and wildlife habitat. High-quality waters (HQW) are defined as lakes, rivers, and streams that meet at least two of three categories: unique and rare natural communities, attaining water quality standards, and good-to-excellent biotic integrity. Bone Lake and Fox Creek meet two of the three standards: Unique & Rare Resources (as a wild rice water) and Biotic Integrity (for aquatic plant diversity).

Wildlife Habitat

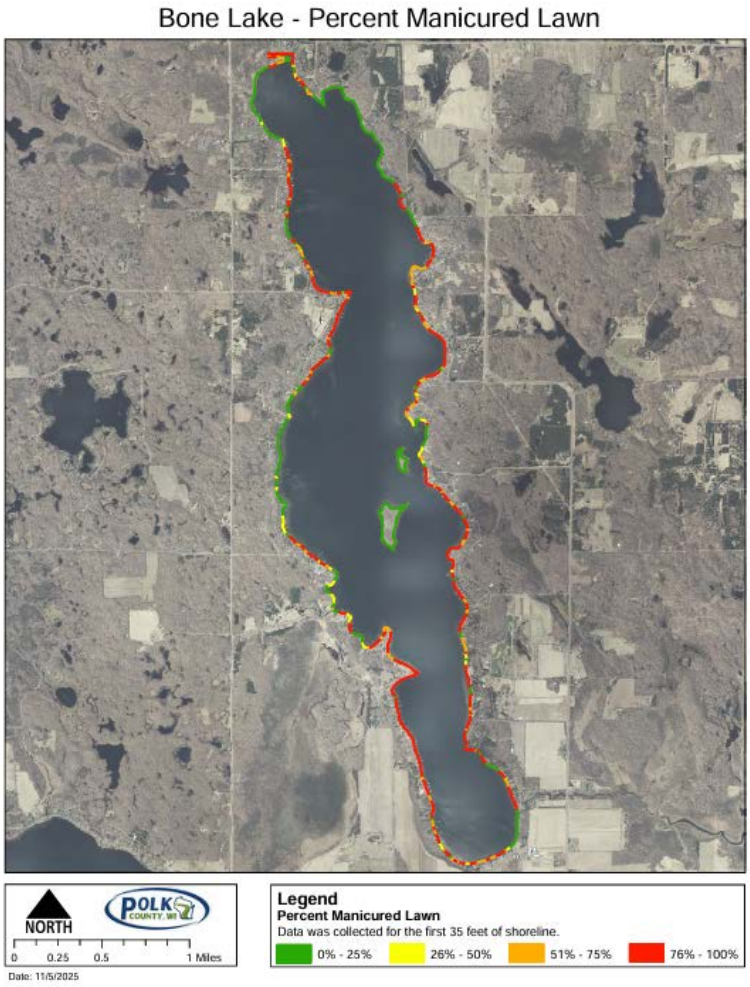
One reason for the wildlife diversity around Bone Lake and its watersheds is the habitat diversity. This geographic area contains various types of wetlands, open grasslands, upland and lowland woodlands, and agricultural areas - key habitats to the wildlife in the area.

Shoreline Vegetation

The Polk County Land and Water Resources Department completed a shoreland habitat survey along the Bone Lake shoreline in 2025. Vegetation in the nearshore area (on the land and in the water) provides critical habitat for fish and wildlife. Remarkably, 80 percent of the plants and animals on the state's endangered and threatened species list spend all or part of their life cycle within the nearshore zone. In addition, as much as 90 percent of the living things in lakes and rivers are found along the shallow margins and shores (WDNR).

Shoreline surveys completed in 2008, 2018, and 2025 provide a progress report for Bone Lake. In all three surveys, natural vegetation was the predominant ground cover at the water's edge, with the amount of natural vegetation increasing each year since 2008.

However, when considering the entire area from the water's edge to 35 feet from it (the riparian buffer zone), the amount of natural ground cover increased from 2008 to 2018 then decreased from 2018 to 2025. Conversely, the amount of lawn in the riparian buffer zone decreased from 2008 to 2018 and increased from 2018 to 2025.



A high percentage of the Bone Lake riparian buffer zone (first 35 feet from the water's edge) is lawn. Buffer zones for lots indicated in red consist of at least 76% lawn – a cover that provides little habitat benefit.

Wildlife Surveys

The Bone Lake Wildlife and Natural Beauty Committee guided multiple wildlife studies around Bone Lake. These projects were supported by grants from the Wisconsin Department of Natural Resources.

Bird Survey Results

The general geographic area surrounding and including Bone Lake is a biologically diverse, valuable mosaic of high-quality terrestrial and aquatic habitats. Extremely bird-rich, a total of 101 species of birds have been detected during the June breeding season surveys of 2011 and 2022, of which 94 species are breeding bird species and 7 species are transient or migrant.

The forested look of Bone Lake's well-populated shoreline is as appealing to birds as it is to people. Bone Lake's areas of residential development are very beneficial to a variety of wildlife species in that large trees remain healthy and standing. Verge vegetation and buffer plantings prevent damage to the quality of the lake. Areas of verge vegetation and the quality, age, and continuous canopies of older trees are of great importance to many forest species of birds and birds of thickets and edges. Many acres of second growth mixed deciduous forests, free of residential development, provide additional habitats required by more sensitive species. An exceptional example of northern lowland habitats occurs in the northwestern section of Bone Lake and includes northern wet sedge meadow, alder swamp, and tamarack swamp. These wetland habitats contribute to the occurrence of unique and rare bird species on Bone Lake, especially the golden-winged warbler. Mature white pine and eastern cottonwood trees are of great importance to nesting and roosting bald eagles and are key to the abundance of eagles, enjoyed by Bone Lake residents and visitors. Bone Lake residents clearly take pride in the quality of the lake's terrestrial habitats and the birds that rely on them.

Bird habitat was divided into the following classes: residential woodlot, second growth deciduous forest, transitional habitats, and tamarack lowland. Several recommendations for improving and maintaining bird populations were included in the report.

Recommendations

- Allow standing dead wood and large, old trees to remain for habitat for red-headed woodpeckers and other cavity nesting birds.
- Maintain (and potentially expand) large parcels of second growth forest to support red-shouldered hawk, least flycatcher, ovenbird, rose-breasted grosbeak, scarlet tanager, and veery.
- Create a no-wake zone surrounding the DNR-owned tamarack swamp along the northwest corner of the lake to support common loons, sandhill cranes, and golden-winged warbler.
- Decrease use of lead sinkers to protect bald eagle, trumpeter swan, and common loon.
- Install nest boxes for a variety of species including blue bird (which declined on Bone Lake between 2011 and 2022), purple martin, and chimney swift.
- Pursue opportunities for citizen-based monitoring such as eBird (http://www.ebird.org/).
- Maintain and expand natural shoreline vegetation next to the lake.

Frogs and Toad Study Results

Bone Lake is home to seven frog and toad species. True frogs present include the green frog, leopard frog, and wood frog. Tree frogs present include the gray tree frog, spring peeper, and western chorus frog. The American toad is also present. Descriptions of each species and the habitat which supports it are included for each along with a map of where the frogs and toads were detected in the 2012 survey report. The frog and toad survey was updated in 2021 with results included in the 2021-22 sensitive area assessment report.

Recommendations

- Maintain a wide buffer of natural shoreline vegetation for green frogs.
- Protect forested wetlands and small, temporary pools for tree frogs and toads.
- Protect identified sensitive areas in Bone Lake especially beds of hardstem bulrush for green frogs and leopard frogs.
- Maintain quality of Bone Lake's oxygen-rich feeder streams for green frogs and leopard frogs.

Green Frog (Rana clamitans)
Photo by Brian M. Collins

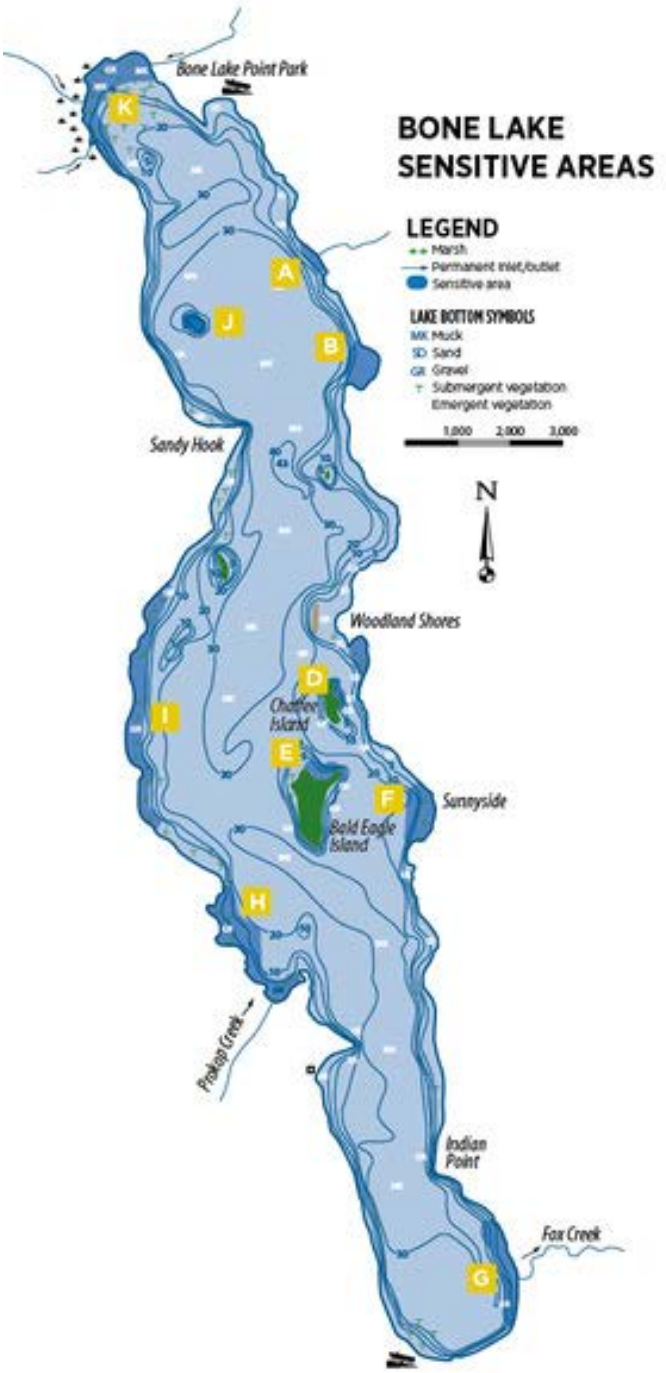
Sensitive Area Survey

The Wisconsin Department of Natural Resources designated sensitive areas for Bone Lake in 1988 and 1989. These sensitive areas are labeled A through K. Sensitive areas contain aquatic plant communities that provide important game fish, forage fish, macroinvertebrate, and wildlife habitat as well as important shoreline stabilization functional values. Native plant populations also help to prevent the introduction of Eurasian water milfoil and other invasive plants. Sensitive areas are now classified as critical habitat areas by WDNR.

Specific recommendations for chemical, mechanical, and hand removal of aquatic vegetation were provided for each area in the report. Where there is developed property adjacent to the sensitive area, the following recommendations were included:

- Prevent erosion from developments.
- Strictly enforce shoreland and wetland ordinances.

The WDNR Sensitive Area Report is found on the Bone Lake Management District web site www.bonelakewi.com.



2021-22 Sensitive Area Assessment

This survey evaluated the aquatic plant species present within each sensitive area, the diversity and sensitivity of aquatic plants present, and counted three major groups of zooplankton. Macroinvertebrates were identified to family level with a Shannon Diversity Index calculation. Reptile and mammal observations were made within the sensitive areas, with an emphasis on furbearers. Results were compiled by sensitive area and for each parameter.

Survey results provide baseline information about each sensitive area, measuring their ecological significance and allowing for the evaluation of changes in the future. All sensitive areas on Bone Lake are important critical habitat and efforts should be taken to preserve these areas.

Arguably, the most significant contributor of critical habitat in a lake is aquatic vegetation which provides habitat for nearly all aquatic organisms from plankton, fish, amphibians, reptiles, birds, and mammals. Therefore, the most important component for protection for any critical habitat in a lake is the aquatic vegetation, especially floating and emergent plants, which provide cover and help stabilize lake sediments.

Few turtles were found and that was explained by few fallen trees found in the sensitive areas.

Recommendations

Recommendations for lake users/riparian owners from the sensitive area assessment:

- Refrain from removing or reducing aquatic vegetation, especially floating and emergent species.
- Leave coarse woody habitat that falls into the water.
- Leave snag or cavity trees standing (if they do not pose a threat to property).
- Restore manicured lawn/developed shoreline to native vegetation.
- Familiarize yourself with the sensitive areas (critical habitat) in Bone Lake and their importance.
- Do not disturb herptiles, birds, or mammals utilizing various habitats around Bone Lake.

Bone Lake Fishery

The fish community in Bone Lake consists of muskellunge, largemouth bass, bluegill, pumpkinseed, black crappie, yellow perch, northern pike, smallmouth bass, walleye, white sucker, bullheads, and golden shiner. All fish present in Bone Lake depend to some degree upon aquatic vegetation for survival and life processes. Stands of aquatic vegetation provide cover from predatory fish as well as forage areas for fish to feed on small organisms.

Bone Lake is well known for its muskellunge fishery. The Wisconsin DNR currently stocks 1,600 large fingerling muskellunge every other year, and the lake is managed as a trophy lake for muskellunge with a 50-inch minimum length limit regulation. The abundance and size structure of muskellunge has decreased in recent years according to WDNR muskellunge surveys. The abundance of adult muskellunge was at an all-time high in 1999 when it was 0.99 fish/acre, but due to concerns of intra-specific competition and poor condition, stocking was reduced and the lake has been managed as a lower-density fishery since then. As a result, the population density in 2005 was only 0.55 adult fish/acre, and it has continued to decrease with 0.42 fish/acre in 2011, 0.35 fish/acre in 2017, and 0.22 fish/acre in 2024. The population now resembles the mean density (0.22 fish/acre) for A1 muskellunge lakes across Wisconsin. The stocking rate of 1 large fingerling/acre on an alternate year basis should continue to maintain the population within the target population density range of 0.2 – 0.4 adults/acre.

According to results of a 2024 spring electrofishing survey, Bone Lake features a productive fishery for a variety of gamefish and panfish species. Largemouth bass have moderate abundance with a low size structure. Bluegill and pumpkinseed offer moderate abundance and low size structure. Yellow perch and black crappie were sampled in low abundance in this survey, but electrofishing surveys typically do not adequately sample these species.

The Bone Lake Management District provided funds for a smallmouth bass stocking program in Bone Lake from 2010 - 2012. The Fishery Committee stocked 12,500 smallmouth bass in each of these years under the guidance of the WDNR. The goal was to establish a fishable population of smallmouth bass in Bone Lake. Smallmouth bass were not mentioned in the 2024 fish survey results.

Coarse Woody Habitat

Fish and aquatic organisms use fallen trees as habitat. Over time, humans have greatly reduced the number of fallen trees along the shorelines of lakes. Undeveloped lakes have nearly 900 logs per mile of shoreline. The shoreland habitat survey located 238 pieces of wood along the shoreline of Bone Lake, or about 17 pieces of wood per mile of shoreline.

Woody debris for fish habitat increased through implementation of the 2009 lake management plan recommendations. The fisheries committee oversaw installation of three fish stick complexes consisting of over 100 trees. Additional woody habitat consisting of 80 half log structures was also installed.

Tribal Fishing

Lake residents have raised concerns regarding the impact of tribal fishing on Bone Lake fish populations. A review of tribal fishing rights and tribal fishing on Bone Lake is included to better understand this issue.

Tribal fishing rights are accorded as a matter of federal treaty. Prior to the arrival of Europeans in North America, Indian tribes were independent, sovereign nations. Although the Chippewa tribes ceded their land in the northern one-third of Wisconsin to the United States government in the Treaties of 1837 and 1842, they reserved their off-reservation rights to hunt, fish, and gather within the Ceded Territory. The maintenance of these rights is comparable to a conservation easement or the retention of mineral rights by someone selling real estate.

In 1983, in what is commonly referred to as the Voigt case, the United States Court of Appeals for the Seventh Circuit affirmed that the off-reservation hunting, fishing, and gathering rights are part of the sovereign rights that the Chippewa Tribes of Wisconsin have always had and that they have never been voluntarily given up nor terminated by the federal government. The courts defined the scope of these rights between 1985 and 1991. As a result, the Chippewa Tribes of Wisconsin are allowed to legally harvest walleyes and muskellunge using a variety of high efficiency methods, including spearing and gillnetting, on lakes within the Ceded Territory.

Tribal Harvest

The six Chippewa Tribes of Wisconsin are legally able to harvest walleyes using a variety of high efficiency methods, but spring spearing is the most frequently used method. In spring each tribe declares how many walleyes and muskellunge they intend to harvest from each lake. Harvest begins shortly after ice-out, with nightly fishing permits issued to individual tribal spearers. Each permit allows a specific number of fish to be harvested, including one walleye between 20 and 24 inches and one additional walleye of any size. All fish that are taken are documented each night with a tribal clerk or warden present at each boat landing used in a given lake. Once the declared harvest is reached in a given lake, no more permits are issued for that lake and spearfishing ceases.

Sources

Broadway, Kyle J. Wisconsin Department of Natural Resources. *Muskellunge Survey Report for Bone Lake, Polk County, Wisconsin 2024–2025. WATERBODY IDENTIFICATION CODE: 2628100.*

Broadway, Kyle J. Wisconsin Department of Natural Resources. Fisheries Information Sheet. Bone Lake. Polk County. 2024.

Collins, Brian Michael. *A Comparison of Bird Communities Between Years on the Shores of Bone Lake, Polk County, Wisconsin*. Changes and Resilience in Bird Communities from 2011 to 2022 Surveys. July 2022.

Collins, Brian M and Matthew S. Berg. *A Survey of Bone Lake's Frogs and Toads in 2012*. October 2012.

Ecological Integrity Service. *Sensitive Area (Critical Habitat) Survey: Evaluation of macrophytes, zooplankton, macroinvertebrates, herptiles, and mammals. Bone Lake, Polk County Wisconsin 2021-22*.

Hayden, Lauren. Wisconsin Department of Natural Resources. Watershed Protection Coordinator. Email communication. January 27, 2026.

Mark, Eric. Wisconsin Department of Natural Resources Wildlife Biologist, Balsam Lake. Email communication. January 2006.

Sorensen, Colton & Katelin Anderson. Polk County Land and Water Resources Department. *Bone Lake Shoreline Inventory Report, 2025*.

Wisconsin Department of Natural Resources. Water Explorer Web Application. Accessed January 16, 2026. https://dnr-wisconsin.shinyapps.io/WaterExplorer/?stationid=493126

Wisconsin Department of Natural Resources. Critical Habitat Web Page. Accessed January 27, 2026. https://dnr.wisconsin.gov/topic/lakes/criticalhabitat

Wisconsin Department of Natural Resources. Ceded Territory safe and tribal harvest | Fishing Wisconsin | Wisconsin DNR. https://dnr.wisconsin.gov/topic/Fishing/ceded/tribalharvest.html

Wisconsin Department of Natural Resources. Modeling and Identification of Watersheds (Healthy Watersheds) and Water Bodies (High-Quality Waters) for Water Resources Protection Purposes in Wisconsin. April 2022.