-6-
FISHERY

"I never drink water because of the disgusting things fish do in it."

-- W.C. Fields, American comedian and actor

6-1 VALUE AND ROLE OF FISHERY

Fisheries play a central role in maintaining a healthy lake ecosystem through their interactions with other biological communities. They are important not only for recreation, but as biotic indicators of environmental quality. For example, declines in native fish populations can be an early sign of water quality or habitat degradation, and are often accompanied by declines in other wildlife species. Water quality changes, non-native species introductions, and loss of natural habitat are common factors leading to such declines. These ecological disruptions can, in turn, create food-web imbalances and cascading effects that can materially alter the structure and composition of the entire fishery.

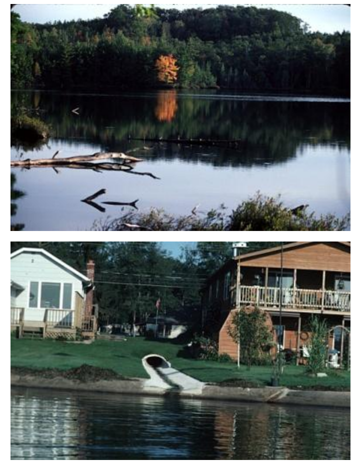
Bluegill (above) are preyed upon by bass and other large gamefish. They can easily over-populate, become stunted, and even contribute to algal blooms in the absence of this predator-prey dynamic.

Fishery composition and behavior can influence a lake's condition, and vice versa. Normal predator-prey dynamics, for example, function to keep populations in check, which controls overcrowding and over-competition that causes fish stunting and other problems. Changes in the amount and type of available plant cover can favor certain species over others, thereby affecting growth rates and the redistribution of nutrients and food resources. For instance, a lake dominated by small bluegill might signify the absence or reduced effectiveness of top predators, like bass or walleye.

Excessive gamefish harvests, reduced water clarity, or overly dense plant beds that favor small bluegill are among the plausible factors that would precipitate such a situation. As a result, bluegills might overgraze on zooplankton (the tiny organisms that feed on algae), depleting the fish's own food stock while eliminating the lake's natural control on algal growth. Bluegills then become stunted, while algal blooms begin to occur with greater frequency and intensity. Recognizing these types of interrelationships is a critical first step in diagnosing problems and finding solutions, especially in the context of larger management goals. It is also the basis for the following discussion and subsequent recommendations.

6-2 HABITAT REQUIREMENTS

The principal feature of a healthy fishery is the availability of suitable habitat, and each fish species has different requirements. Therefore, ideal habitat is that which supports the various life-cycle needs of native fish populations. Important habitat components include water chemistry, clarity, temperature levels, dissolved oxygen concentrations, spawning or foraging substrate, cover from predators, and access to sufficient food resources. If any one of these requirements is found to be in short supply, habitat quality is reduced and the lake's fish community can be negatively affected, beginning with the most sensitive or habitat-specific species.

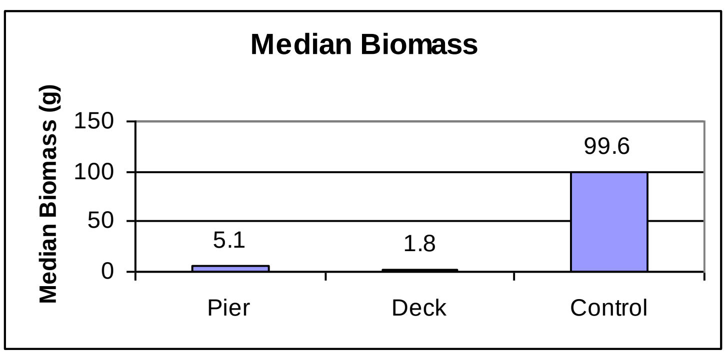


Lakes with well vegetated shorelines and an abundance of coarse woody habitat (top) tend to support healthier fisheries than lakes without these features (bottom).

All else being equal, lakes with good water quality, well-vegetated shorelines, and thriving native aquatic plant communities are usually best positioned to support healthy fish populations. Alternatively, problems are often quick to develop in lakes with poor water quality, heavily developed watersheds and shorelines, and an absence of quality shoreland and aquatic vegetation.

A 2005 Lake Ripley study found significant shading under piers and a corresponding reduction in aquatic plant abundance, as well as a shift in community composition to one dominated by shade-tolerant species (see Figure 46). Shading and the resulting loss of plant habitat under piers translated into a reduction in macroinvertebrates (a source of food for young fish), and declines in the catch rates of a number of small fish species. Results suggest that the proliferation of piers and other near-shore structures may be contributing to the degradation of littoral zone habitat and biological diversity.[1]

A diverse mix of native aquatic plants offer important habitat for fish. Plants provide shelter, food, oxygen and other necessities.



[1] Cicero, Patricia, Dearlove, P., Garrison, P., Marshall, D., and Stremick-Thompson, L. 2005. Effects of Pier Shading on Littoral Zone Habitat. Wisconsin Department of Natural Resources, Lake Ripley Management District, and Jefferson County Land & Water Conservation Department.

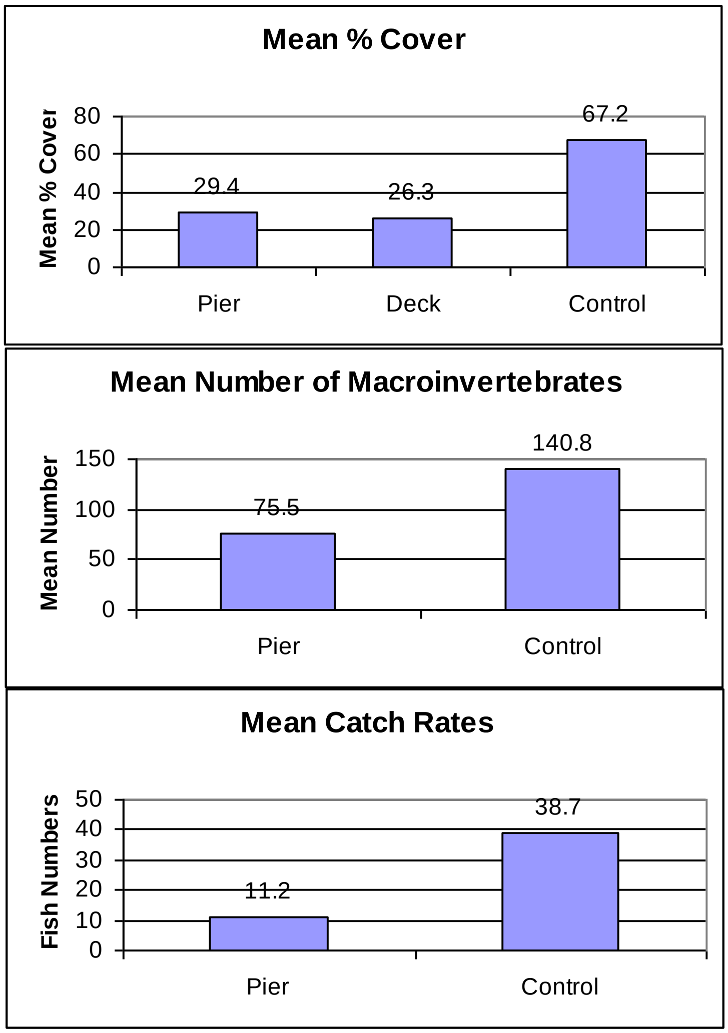


Figure 1: Impacts of Pier-Shading on Lake Ripley Aquatic Plants, Macroinvertebrates and Fish

6-3 HISTORICAL OVERVIEW

In 1927, northern pike, walleye, largemouth bass and "calico" (white) bass were all reported to be native to Lake Ripley, while bluegill, sunfish, catfish, yellow perch, bowfin, gar and carp were thought to have been either introduced or had worked their way up the Koshkonong Creek.[2] It was further reported that extensive stocking of largemouth bass, perch eggs and walleye fry occurred from 1937-1945, in addition to the stocking of 17,000 "walleyed pike" fry in 1929.[3]

A 1946 survey by the former Wisconsin Conservation Department (WCD) showed bluegill, walleye, northern pike, largemouth bass, yellow perch, crappie, and bullhead as major contributors to the sport fishery.[4] Sunfish, rock bass, longnose gar, bowfin, common sucker, bluntnose minnow, and top minnows were also documented in the lake at this time. During the 1950s and early 1960s, the former WCD removed native bowfin and longnose gar from Lake Ripley as "rough fish." Fisheries managers have since come to appreciate the importance of these native species for maintaining aquatic diversity and controlling slow-growing panfish and young carp.[5]

A June 1970 survey obtained similar results as in 1946, except for the apparent disappearance of the black crappie (re-inventoried in later surveys) and a large increase in carp.[6] Rough fish, especially carp, have periodically been considered a problem in Lake Ripley, prompting state crews to come to the lake to periodically remove them. For example, an estimated 26,700 pounds of carp and 400 pounds of bowfin were removed from the lake between 1952 and 1956.[7]

Walleye fingerlings have been stocked in Lake Ripley about every two years since 1985 by the Wisconsin DNR (see Table 33). Stocking was not conducted in 2007 or 2008 due to the unavailability of DNR resources as a consequence of emergency VHS testing around the state. The objective of the walleye-stocking program is to supplement any natural reproduction (albeit extremely limited) and help control the stunting of the yellow perch population. However, recent electrofishing data suggest that perch remain undersized despite this attempt at biomanipulation. These data are summarized in the next section.

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[2] Chase, Wayland and Lowell Noland. The History and Hydrography of Lake Ripley. Trans. Wisconsin Academy of Sciences, Arts and Letters, vol. 23, 1927.
[3] Burris, John E. 1971. A Study of Man's Effects on Lake Ripley. University of Wisconsin-Madison. Zoology 518 Report.
[4] Mackenthun, Kenneth M. and Kenneth Flakas. 1946. A Biological Survey of Lake Ripley. Wisconsin Conservation Department. Fisheries Biology Section. Investigative Report No. 580.
[5] Wisconsin Department of Natural Resources, and Lake Ripley Management District. 1994. Lake Ripley Water Resources Appraisal.
[6] Druckenmiller, Howard S. 1970. Basic Inventory Survey of Lake Ripley. Wisconsin Department of Natural Resources.
[7] Poff, R.J., R. Piening and C.W. Threinen. 1968. Surface Water Resources of Jefferson County. Wisconsin Department of Natural Resources.

Table 1: Wisconsin DNR fish-stocking records for Lake Ripley (1985-2009)

Year	Species	Strain (Stock)	Age Class	Number Fish Stocked	Average Fish Length (Inches)
1985	SMALLMOUTH BASS	UNSPECIFIED	FINGERLING	8,620	3.00
1985	WALLEYE	UNSPECIFIED	FINGERLING	28,104	2.00
1986	WALLEYE	UNSPECIFIED	FINGERLING	5,917	4.00
1987	WALLEYE	UNSPECIFIED	FINGERLING	63,270	2.00
1989	WALLEYE	UNSPECIFIED	FINGERLING	22,496	2.00
1995	WALLEYE	UNSPECIFIED	FINGERLING	3,808	5.00
1995	WALLEYE	UNSPECIFIED	YEARLING	400	5.60
1997	WALLEYE	UNSPECIFIED	LARGE FINGERLING	22,874	1.60
1997	WALLEYE	UNSPECIFIED	SMALL FINGERLING	45,748	1.60
1999	WALLEYE	UNSPECIFIED	SMALL FINGERLING	21,000	1.30
2000	WALLEYE	UNSPECIFIED	SMALL FINGERLING	21,000	1.40
2002	WALLEYE	MISSISSIPPI HEADWATERS	SMALL FINGERLING	21,000	1.40
2003	WALLEYE	ROCK-FOX	SMALL FINGERLING	23,784	1.30
2004	WALLEYE	MISSISSIPPI HEADWATERS	SMALL FINGERLING	10,250	1.20
2005	WALLEYE	ROCK-FOX	SMALL FINGERLING	1,350	2.70
2006	WALLEYE	ROCK-FOX	LARGE FINGERLING	4,180	7.70
2009	WALLEYE	ROCK-FOX	SMALL FINGERLING	14,630	1.00

6-4 RECENT TRENDS AND CURRENT STATUS

Lake Ripley has long been considered one of Wisconsin's finest largemouth bass lakes, and is famous for producing the state record in 1940. In addition to largemouth bass, a 1982 Wisconsin fish distribution study found the lake to support as many as 33 other fish species.[8] However, several of these species failed to turn up during recent seining surveys, indicating a possible loss in species richness since seining was originally performed in 1974.[9] The pugnose shiner (*Notropis anogenus*), a Wisconsin Threatened Species, and the least darter (*Etheostoma microperca*), a Wisconsin Species of Special Concern, are among those that appear to have disappeared from the lake. Both species are sensitive to turbidity and loss of native aquatic plant habitat. However, similar declines were seen on the other study lakes, despite often minimal changes in water quality conditions over the study period. For this reason, declines in these sensitive species are thought to be related to the removal or alteration of critical near-shore habitat as a consequence of shoreline development.

Shoreline fish seining was conducted in 1974 and again in 2004 to assess the status of non-game species and juvenile gamefish. These types of fish inhabit the shallow zones of the lake, and are often missed during fall electrofishing surveys. Declines of small darters and minnows can reveal problems in lakes before gamefish growth rates and abundance are impacted. Table 34 lists species type and total numbers collected during the 1974 and 2004 seining surveys, while Table 35 compares changes in species richness among all study lakes. Results reveal the change

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[8] Fago, Don. 1982. Distribution and Relative Abundance of Fishes in Wisconsin: Greater Rock River Basin. Technical Bulletin No. 136. Wisconsin Department of Natural Resources.
[9] Lyons, John. 2004. A comparative analysis of fish-seining records from 1974 and 2004. Wisconsin Department of Natural Resources.

in status of native, rare and intolerant fish species over the course of the study period. Intolerant species are fish that are more sensitive to environmental changes than popular gamefish. Over the 30-year study period, seining results indicate a possible loss of seven native species (from 18 to 11), and declines in both rare and intolerant species (pugnose shiner, blackchin shiner, blacknose shiner and least darter).

Table 2: Lake Ripley seining surveys (1974-75 and 2004)

Lake Ripley, Jefferson County, WDNR seining surveys - comparison of 1970's and 2004 surveys of same sites with same gear and effort. In the 1970's catch counts for a particular species at a particular site were truncated at 99; an asterisk indicates totals that include one or more truncated counts. In 2004 all captured fish were counted but for comparative purposes totals have been calculated with counts truncated at 99, indicated by an asterisk. The actual 2004 totals are given in parentheses.

	Pooled catch, all sites	
Species	1 June 1974; 13, 27 June, 6 July 75	23 July 2004
Lake Ripley (8 sites)		
Golden shiner	17	3
Pugnose shiner	17	0
Blackchin shiner	15	0
Blacknose shiner	3	0
Bluntnose minnow	152*	500* (1833)
Fathead minnow	1	1
Central mudminnow	1	0
Banded killifish	45	0
Brook silverside	19	69
Rock bass	1	0
Green sunfish	3	0
Pumpkinseed	64	0
Bluegill	171	318* (324)
Smallmouth bass	0	44
Largemouth bass	153*	398* (783)
Black crappie	58	60
Unspecified crappie	0	6
Iowa darter	0	25
Least darter	3	0
Johnny darter	2	17
Yellow perch	316*	89
Total native species	18	11
Total native fish	1041*	1528* (3252)

Table 3: Changes in selected fish assemblage variables from 1974 to 2004 for all fish-seining study lakes

Changes in selected fish assemblage variables from the 1970's to 2004 for the study lakes. Only data from sites sampled in both time periods are included, and catches of individual species from each site are truncated at 99 (totals with truncated catches are indicated by an asterisk). Data for Upper Phantom Lake and Lower Phantom Lake and for Upper Nemahbin Lake and Lower Nemahbin Lake are presented separately and for both the upper and lower lake combined (L + U). Intolerant species for this dataset are pugnose shiner, blackchin shiner, blacknose shiner, spottail shiner, mottled sculpin, rock bass, longear sunfish, smallmouth bass, rainbow darter, Iowa darter, and least darter. Rare species are pugnose shiner (threatened), pugnose minnow (special concern), lake chubsucker (special concern), cisco (special concern), banded killifish (special concern), starhead topminnow (endangered), longear sunfish (threatened), and least darter (special concern).

NUMBER OF SPECIES

	Native species			Intolerant species			Rare species		
Lake	1970s	2004	Change	1970s	2004	Change	1970s	2004	Change
Beulah	23	14	-9	7	4	-3	5	2	-3
Big Cedar	12	9	-3	2	2	0	1	0	-1
Camp	21	18	-3	3	5	2	3	4	1
Geneva	29	17	-12	6	4	-2	3	2	-1
Long	16	15	-1	6	4	-2	1	2	1
Nemahbin, Lower	21	12	-9	6	3	-3	4	1	-3
Nemahbin, Upper	13	12	-1	4	4	0	2	0	-2
Nemahbin, L + U	23	17	-6	7	5	-2	4	1	-3
Oconomowoc	22	14	-8	7	5	-2	3	3	0
Okauchee	18	14	-4	5	2	-3	3	2	-1
Phantom, Lower	17	7	-10	1	1	0	2	0	-2
Phantom, Upper	21	10	-11	5	2	-3	4	2	-2
Phantom, U + L	23	13	-10	5	2	-3	4	2	-2
Pike	11	14	3	6	4	-2	3	2	-1
Ripley	18	11	-7	5	2	-3	3	0	-3
Rock	17	17	0	6	6	0	3	2	-1
Silver	15	14	-1	2	3	1	1	1	0

More recent inventories have been performed through electrofishing methods by the Wisconsin DNR. Sampling was limited to waters four feet deep or less, and within three sampling areas, comprising 14,000 feet or about 50% of the total lake shore. Areas sampled consisted of South Bay (from the scout camp to the marina, and including Vasby's Channel), East Bay (including the inlet), and the lake's northeast shore. Each area was representative of different bottom substrates and degrees of aquatic plant growth.

Between 1992 and 2009, fall electrofishing surveys revealed an average species-richness of 16.9. Species diversity was found to range from a 1993 low of 10 to a 2009 high of 23, but without any clear trends during the period of record (see Figure 47). Table 36 lists the 28 different species of fish that were documented during one or more of the fall surveys. The timing and method of capture of these surveys can affect results, leaving a reasonable probability that some species may have been present but overlooked during sampling.

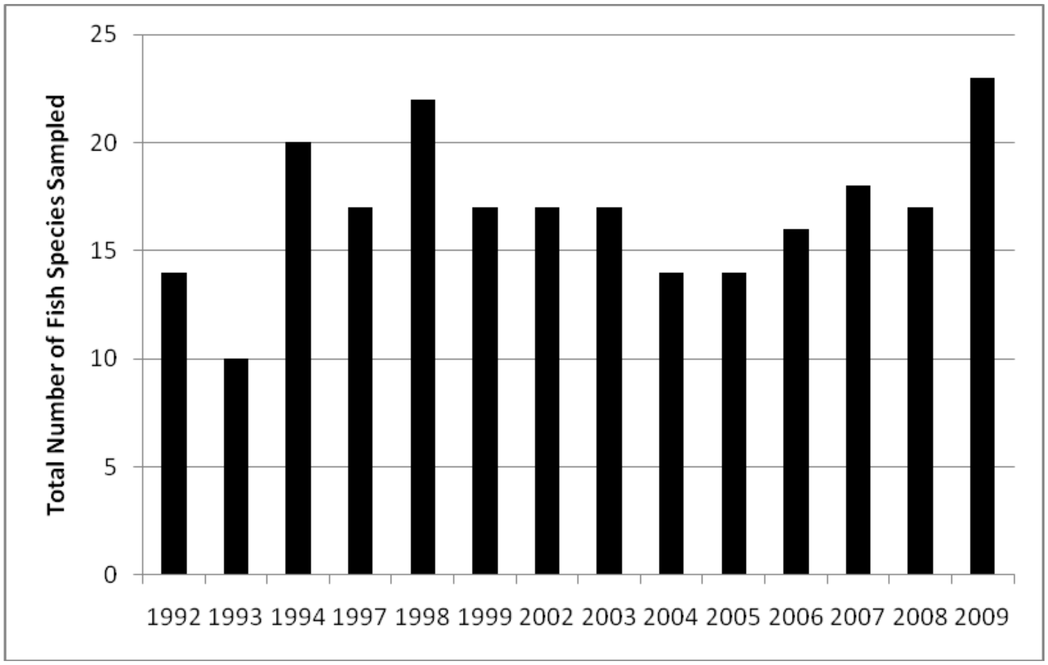


Figure 2: Species Richness as Determined by Fall Electrofishing Results (1992-2009)

Table 4: Documented fish species (1992-2009 fall electrofishing surveys)

Species	Fall 1992	Fall 1993	Fall 1994	Fall 1997	Fall 1998	Fall 1999	Fall 2002	Fall 2003	Fall 2004	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009
Longnose gar *Lepisosteus osseus*	X	X	X	X	X	X	X	X	X	X		X	X	X
White crappie *Pomoxis annularus*													X	
White sucker *Catostomus commersoni*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Carp *Cyprinus carpio*	X		X	X	X	X	X		X		X	X		X
Bigmouth buffalo *Ictiobus cyprinellus*														X
Brook silverside *Labidesthes sicculus*	X	X	X	X	X	X	X	X		X	X	X	X	X
Yellow bullhead *Ameiurus natalis*			X	X	X	X	X	X			X	X	X	X
Golden shiner *Notemigonus crysoleucas*	X	X	X		X	X							X	X

Common shiner *Luxilus cornutus*												X		
Lake chubsucker***** *Erimyzon sucetta*	X	X	X		X	X	X			X	X			X
Green sunfish *Lepomis cyanellus*	X		X			X					X	X		
Bowfin *Amia calva*			X	X	X	X	X	X	X	X		X	X	X
Bluntnose minnow *Pimephales notatus*	X		X	X	X	X								X
Pumpkinseed sunfish *Lepomis gibbosus*	X		X	X	X		X	X	X			X	X	X
White bass *Morone chrysops*			X	X	X		X	X			X			
Black bullhead *Ameiurus melas*			X		X								X	X
Brown bullhead *Ameiurus nebulosus*														X
Grass pickerel *Esox americanus vermiculatus*			X		X		X		X	X	X	X	X	X
Rock bass *Ambloplites rupestris*									X	X	X	X		X
Central mudminnow *Umbra limi*				X	X									X
Johnny darter *Etheostoma nigrum*				X	X									
Emerald shiner *Notropis atherinoides*						X								
Burbot *Lota lota*					X									
Yellow perch *Perca flavescens*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Black crappie *Pomoxis nigromaculatus*			X	X	X	X	X	X	X	X	X	X	X	X
Bluegill *Lepomis macrochirus*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Northern pike *Esox lucieus*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Walleye *Stizostedion vitreum*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Largemouth bass *Micropterus salmoides*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Smallmouth bass *Micropterus dolomieui*							X	X	X	X	X	X	X	X
Species diversity:	14	10	20	17	22	17	17	14	14	14	16	18	17	23

* = Wisconsin Special Concern Species. This species could become threatened or endangered.

Fall electrofishing survey results are summarized for largemouth bass, walleye, northern pike and bluegill in Figures 48-51 below. Graphs depict minimum, maximum and average lengths found during the 1992-2009 survey period, as well as the number of fish caught per hour of sampling, referred to as Catch Per Unit of Effort (CPUE, or CPE). Size-frequency distributions were representative of similar lakes found in Southern Wisconsin, and with no unusual trends evident.

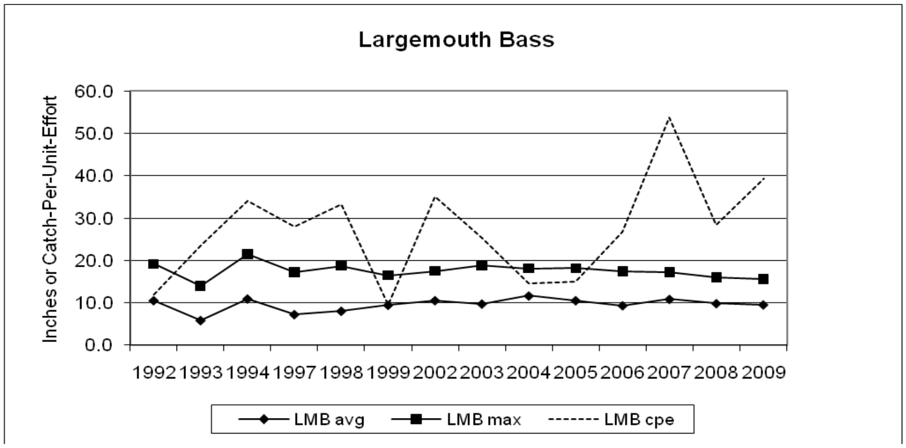


Figure 3: Fall Electrofishing Results for Largemouth Bass (1992-2009)

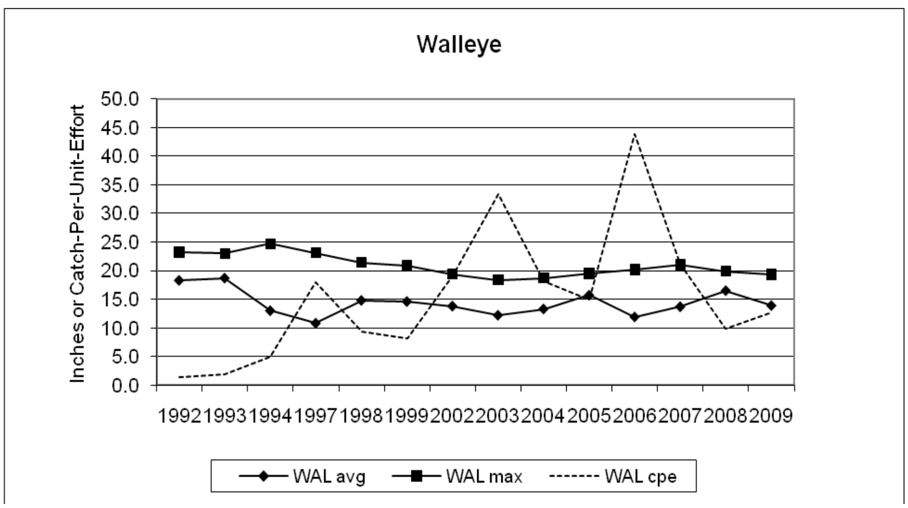


Figure 4: Fall Electrofishing Results for Walleye (1992-2009)

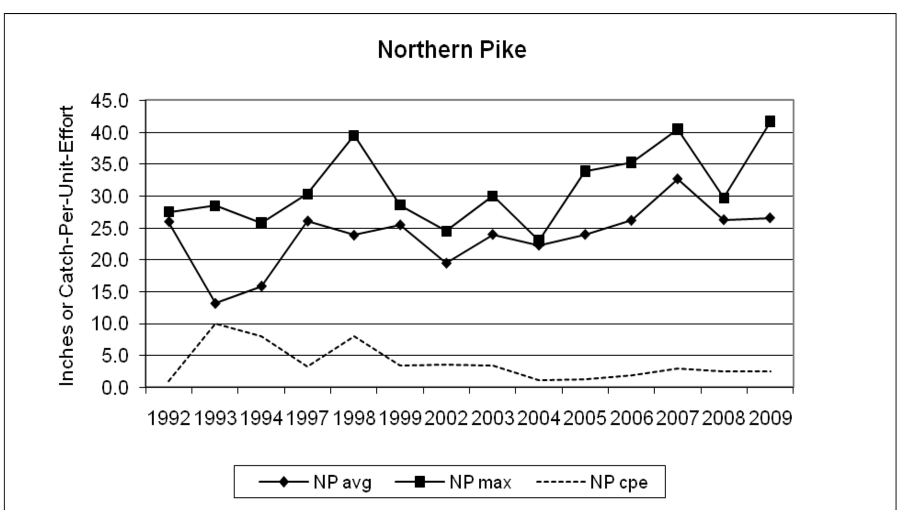


Figure 5: Fall Electrofishing Results for Northern Pike (1992-2009)

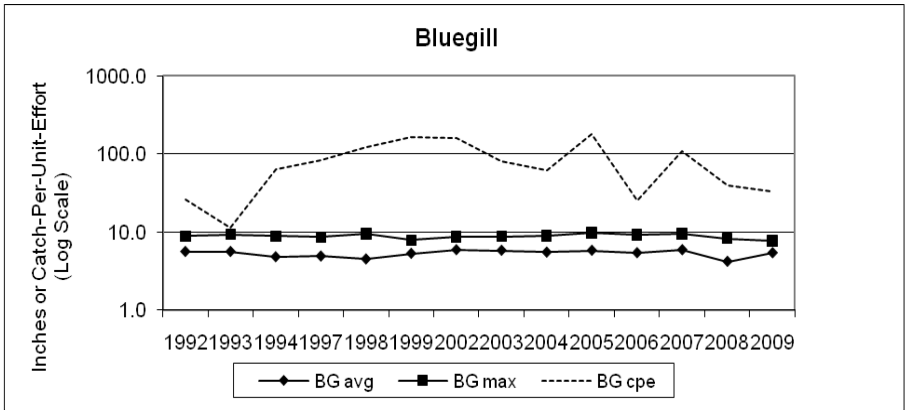


Figure 6: Fall Electrofishing Results for Bluegill (1992-2009)

Algis Byla, fisheries biologist with the Wisconsin DNR, analyzed mean lengths, catch per unit of effort (an estimate of relative population abundances), and proportional stock density (a measure of species size structure) of the largemouth bass and bluegill populations in Lake Ripley using data from 1994-2004. Because fluctuations in the three statistical measures are natural and to be expected, only long-term trends should be used for analysis purposes. Fluctuations can be caused by such variables as type of sampling gear and methods employed, as well as the weather which can make capturing certain species more or less difficult. As a result of the analysis, Byla concluded that there were no significant trends in any of three metrics that would indicate a noteworthy change in the status of these two dominant populations.

6-5 FISHES OF LAKE RIPLEY

Based on inventory data collected since the mid-1970s, a total of 39 different species of fish have been documented in Lake Ripley. Each species is described below, with most descriptions borrowed from the Fish of Wisconsin Field Guide.[10] Fish illustrations are mostly borrowed from http://pond.dnr.cornell.edu and are not to scale.

Common Name: **Banded killifish**
Scientific Name: ***Fundulus diaphanous***

Family: Killifish (*Cyprinodontidae*)
U.S. Nativity: Native
Habitat: Prefer the quieter portions of still water and slower-moving areas of

[10] Bosanko, Dave. 2007. Fish of Wisconsin Field Guide. Adventure Publications, Inc. Cambridge, MN.

	streams; may dig into sandy or fine-gravel bottoms when threatened
Food:	Killifish feed at the surface, mid-water and near the bottom on midge larvae and insects. The larger fish consume insects, mollusks and worms.
Reproduction:	Spawns in water of about 70°F
Average Size:	2-4 inches

Common Name:	**Black bullhead**
Scientific Name:	***Ameiurus melas***
Family:	Catfish (*Ictaluridae*)
U.S. Nativity:	Native
Habitat:	Prefers shallow, slow-moving streams and backwaters; lakes and ponds; tolerates extremely turbid (murky) and low-oxygen conditions
Food:	A scavenging opportunist that feeds mostly on animal material (living or dead), but will also eat plant matter; stirs up the lake bottom and uproots vegetation in search of food
Reproduction:	Spawns between April and July when water temperatures reach 70-77°F; builds nest in shallow water with a muddy bottom
Average Size:	8-10 inches

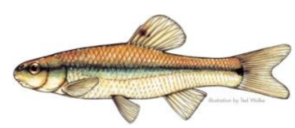
Common Name:	**Blackchin shiner**
Scientific Name:	***Notropis heterodon***
Family:	Minnow (*Cyprinidae*)
U.S. Nativity:	Native
Habitat:	Found in cool, clear, and shallow sections of lakes and slow regions of streams with weedy vegetation, very little siltation, and a sandy substrate; appears to be intolerant of silt and salt, and is becoming uncommon over much of its range; an indicator of good water quality
Food:	Feeds on a variety of prey, half of which is from open water and the other half from vegetation, the lake surface, and the bottom; may feed on cladocerans and flying midges taken from the surface of the water.
Reproduction:	Spawn from May to the end of July
Average Size:	2-3 inches

Common Name:	**Black crappie**
Scientific Name:	***Pomoxis nigromaculatus***
Family:	Sunfish (*Centrarchidae*)
U.S. Nativity:	Native
Habitat:	Prefers quiet, clear water of streams and mid-sized lakes; often associated with weed growth but may roam deep, open basins and flats, particularly during winter
Food:	Small fish, aquatic insects, zooplankton
Reproduction:	Spawns in shallow weed beds from May to June when water temperatures reach the high 50s; male sweeps out circular nest, typically on fine gravel

	or sand; can overpopulate a lake and become stunted
Average Size:	7-12 inches

Common Name:	**Blacknose shiner**
Scientific Name:	***Notropis heterolepis***
Family:	Minnow (*Cyprinidae*)
U.S. Nativity:	Native
Habitat:	Lives in small creeks and in the weedy shallows of lakes and ponds; becoming rare in many parts of its range due to loss of habitat and deterioriating water quality; requires clean, cool, well-oxygenated streams and lakes with abundant aquatic vegetation; intolerant of turbid water and pollution
Food:	Small aquatic insects, crustaceans, midge larvae and algae; Feeds primarily along the bottom, and small individuals feed on vegetation
Reproduction:	Spawns in early summer
Average Size:	2.5 inches

Common Name:	**Bluegill**
Scientific Name:	***Lepomis macrochirus***
Family:	Sunfish (*Centrarchidae*)
U.S. Nativity:	Native
Habitat:	Mid-size streams and most warm-water ponds, lakes and rivers with weedy bays or shorelines; can tolerate very warm water, but are susceptible to winterkill
Food:	Insects, insect larvae, small fish, fish eggs, leeches, snails, zooplankton and algae; has acute daytime vision for feeding on small prey, but sees poorly in low light
Reproduction:	Spawns from late May to early August, or as soon as water temperatures approach 67°F; male excavates nest in gravel or coarse sand, often in shallow weeds, in colony of up to 50 other nests; can overpopulate a lake and become stunted due to dense cover or the absence of top predators
Average Size:	5-7 inches



Common Name:	**Bluntnose minnow**
Scientific Name:	***Pimephales notatus***
Family:	Minnow (*Cyprinidae*)
U.S. Nativity:	Native
Habitat:	Utilizes and tolerates a wide variety of habitat conditions; found in every water body capable of supporting fish life and thrive in turbid, nutrient rich waters; equally at home in small streams to the largest rivers and lakes; can become abundant in disturbed habitats when the numbers of competitor species more sensitive to increased turbidities, siltation of instream substrates, or increased water temperatures decline

Food: Algae, insect larvae, diatoms, small crustaceans, and rarely fish eggs or small fish
Reproduction: Spawns spring to late summer
Average Size: 1.5-3.5 inches

Common Name: **Bowfin**
Scientific Name: ***Amia calva***
Family: Bowfin (*Amiidae*)
U.S. Nativity: Native
Habitat: Deep waters associated with weed beds in warm-water lakes and rivers; an air breather that can survive in oxygen-depleted waters
Food: A voracious predator that prowls shallow weed beds for fish and crayfish; once thought harmful to game fish, it is now considered an asset in controlling rough fish and stunted game fish populations
Reproduction: When water warms past 61 degrees in spring, male removes vegetation on sand or gravel bottom; one or more females deposit up to 5,000 eggs in nest; male guards until young reach about 4 inches in length
Average Size: 12 to 24 inches

Common Name: **Brook silverside**
Scientific Name: ***Labidesthes sicculus***
Family: Silversides (*Atheridae*)
U.S. Nativity: Native
Habitat: Surface of clear lakes and large streams
Food: Aquatic and flying insects, spiders
Reproduction: Spawns in late spring and early summer in aquatic vegetation
Average Size: 3-4 inches

Common Name: **Brook stickleback**
Scientific Name: ***Culaea inconstans***
Family: Stickleback (*Gasterosteidae*)
U.S. Nativity: Native
Habitat: Shallows of cool streams and lakes
Food: Small aquatic animals and occasionally algae
Reproduction: Spawns in water temperatures from 50-68°F; male builds a golf ball-sized, globular nest of sticks, algae and other plant matter on submerged vegetation
Average Size: 2-4 inches

Common Name: **Brown bullhead**
Scientific Name: ***Ameiurus nebulosus***
Family: Catfish (*Ictaluridae*)

U.S. Nativity: Native
Habitat: Warm, weedy lakes and sluggish streams; can tolerate very turbid (murky) and low-oxygen water; prefers clean and weedy lakes with soft bottoms
Food: A scavenging opportunist; feeds mostly on insects, fish, fish eggs, snails and leeches, but will also eat plant matter; stirs up the lake bottom and uproots vegetation to find food
Reproduction: Spawns in early summer in shallow water with a sand or rocky bottom, and often in cover offering shade
Average Size: 8-10 inches

Common Name: **Bigmouth buffalo**
Scientific Name: ***Ictiobus cyprinellus***
Family: Sucker (*Catostomidae*)
U.S. Nativity: Native
Habitat: Prefers soft-bottomed shallows of large lakes, sloughs and oxbows; slow-flowing streams and rivers
Food: Small mollusks, insect larvae, zooplankton
Reproduction: Spawns in April or May in clear, shallow water when water temperatures reach the low 60s
Average Size: 18-20 inches

Common Name: **Burbot**
Scientific Name: ***Lota lota***
Family: Cods (*Gadidae*)
U.S. Nativity: Native
Habitat: Deep, cold and clear lakes and streams of the north
Food: A voracious predator; primarily feeds on small fish but will attempt to eat virtually anything, including fish eggs, clams and crayfish
Reproduction: Spawns in mid to late winter, under the ice, over sand or gravel bottoms, usually in less than 15 feet of water
Average Size: 20 inches

Common Name: **Central mudminnow**
Scientific Name: ***Umbra limi***
Family: Mud minnow (*Umbridae*)
U.S. Nativity: Native
Habitat: Prefer cool bogs and mashes, weedy ponds and ditches, and small, slow-moving streams that have soft bottoms (but not deep silt); can breathe air and may adapt to periods of low water by “burrowing” into soft sediments
Food: A bottom feeder that preys on small snails and clams, copepods, water fleas, insect larvae, and even other small fish
Reproduction: Spawns in the spring when water temperatures are 50-59° F, usually in flooded areas where there is plenty of vegetation
Average Size: 3 inches

Common Name: **Common carp**
Scientific Name: ***Cyprinus carpio***
Family: Minnow (*Cyprinidae*)
U.S. Nativity: Non-native
Habitat: Warm, shallow, quiet and well-vegetated waters of both streams and lakes
Food: Prefers insects, crustaceans and mollusks, but sometimes eats algae and other plants; stirs up the lake bottom and uproots plants in search of food
Reproduction: Spawns from late spring to early summer in very shallow water at stream and lake edges
Average Size: 16-18 inches

Common Name: **Common shiner**
Scientific Name: ***Luxilus cornutus***
Family: Minnow (*Cyprinidae*)
U.S. Nativity: Native
Habitat: Lakes, rivers and streams
Food: Small insects, algae and zooplankton
Reproduction: Spawning begins in late May; males prepares a nest of small stones and gravel at the head of a stream riffle
Average Size: 4-12 inches

Common Name: **Emerald shiner**
Scientific Name: ***Notropis atherinoides***
Family: Minnow (*Cyprinidae*)
U.S. Nativity: Native
Habitat: A mid-water or near-surface species that usually lives in large- or moderate-sized schools; found near the surface at night and retreats to deeper water during the day; does not appear to use or have any preference for a particular type of substrate; avoids areas with dense vegetation
Food: Zooplankton, insects, insect larvae, small fish
Reproduction: Spawns in the late spring or early summer, sometimes as late as mid-August, when water temperatures are around 75°F
Average Size: 2.5-4 inches

Common Name: **Fantail darter**
Scientific Name: ***Etheostoma flabellare***
Family: Perch (*Percidae*)
U.S. Nativity: Native
Habitat: Riffle areas of streams where there are cobbles and gravel; can tolerate low oxygen levels for short periods
Food: Midge larvae, isopods, amphipods and other aquatic insects

Reproduction: Spawns late April to mid-June when water temperatures reach 60°F
Average Size: 2 inches

Common Name: **Fathead minnow**
Scientific Name: ***Pimephales promelas***
Family: Minnow (*Cyprinidae*)
U.S. Nativity: Native
Habitat: Streams, ponds and lakes, particularly shallow, weedy or turbid areas lacking predators; a hardy species that can tolerate low oxygen levels
Food: Primarily herbivorous, but will eat insects and copepods
Reproduction: Spawns in spring through August when water temperatures reach 60°F; male prepares nest under sticks and rocks
Average Size: 3-4 inches

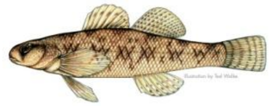
Common Name: **Golden shiner**
Scientific Name: ***Notemigonus crysoleucas***
Family: Minnow (*Cyprinidae*)
U.S. Nativity: Native
Habitat: Prefers quiet, clear waters of lakes, ponds, sloughs and ditches; infrequently found in the quietest parts of rivers; often found near dense mats of vegetation; can tolerate pollution, turbidity, low oxygen and very warm water temperatures
Food: Zooplankton, insects, crustaceans, plants and algae
Reproduction: Spawns in the spring when water temperatures reach about 70°F and ceases when temperatures exceed 80°F
Average Size: 3-5 inches

Common Name: **Grass pickerel**
Scientific Name: ***Esox americanus vermiculatus***
Family: Pike (*Esocidae*)
U.S. Nativity: Native
Habitat: Most common in clear waters with an abundance of dense aquatic vegetation; found in slow moving streams, permanent wetlands, and natural lakes; intolerant of turbidity (muddy water) and areas that have been extensively channalized or ditched for drainage purposes
Food: Primarily eats fish, but also crayfish, frogs and insect larvae
Reproduction: Spawns in the spring when water temperatures range from 43 to 53°F; will migrate upstream, sometimes long distances, in search of shallow backwaters with dense vegetation
Average Size: 6-10 inches

Common Name: **Green sunfish**
Scientific Name: ***Lepomis cyanellus***
Family: Sunfish (*Centrarchidae*)
U.S. Nativity: Native
Habitat: Warm, weedy, shallow lakes and the backwaters of slow-moving streams; very tolerant of high siltation and low oxygen levels
Food: Aquatic insects, crustaceans, small fish
Reproduction: Spawning begins in May when water temperatures are between 60-80°F; male fans out nest on gravel bottom, often in less than one foot of water, near weeds or other cover beneath overhanging limbs; highly prolific and can overpopulate a lake and become stunted
Average Size: 5 inches

Common Name: **Iowa darter**
Scientific Name: *Etheostoma exile*
Family: Perch (*Percidae*)
U.S. Nativity: Native
Habitat: Prefers cool, clear to slightly turbid (cloudy), slow-moving vegetated brooks and weedy portions of glacial lakes, marshes and ponds
Food: Copepods, water fleas and midge larvae
Reproduction: Spawns late April to early June in shallow water among submerged vegetation
Average Size: 2 inches

Common Name: **Johnny darter**
Scientific Name: ***Etheostoma nigrum***
Family: Perch (*Percidae*)
U.S. Nativity: Native
Habitat: Found in most rivers, streams and lakes



Food: Water fleas, insect larvae
Reproduction: Spawns in May and June; males migrate to shorelines to establish breeding areas
Average Size: 2-4 inches

Common Name: **Lake chubsucker***
Scientific Name: ***Erimyzon sucetta***
Family: Sucker (*Catostomidae*)
U.S. Nativity: Native
Habitat: Prefers clear, quiet or sluggishly flowing waters of all types; most abundant where the bottom is soft and organically rich, and in areas of dense aquatic vegetation; intolerant of turbid (murky) and silty waters
Food: Aquatic insects, fish eggs, crustaceans, algae and other plants found on the lake bottom
Reproduction: Spawns in small tributary streams from mid-May to early July when water temperatures are between 59-72°F
Average Size: 8-10 inches

Common Name: **Largemouth bass**
Scientific Name: ***Micropterus salmoides***
Family: Sunfish (*Centrarchidae*)
U.S. Nativity: Native
Habitat: Warm, shallow, fertile, weedy lakes and river backwaters; found in thick weed beds, shallow woody cover and around docks; not usually found in water deeper than 20 feet; susceptible to winterkill
Food: Small fish, frogs, crayfish, insects and leeches; often feeds near the surface
Reproduction: Spawns from late April until early July when water temperatures reach 60°F; male builds large, solitary nest in shallow water, usually on firm bottom in weedy cover
Average Size: 12-20 inches

Common Name: **Least darter**
Scientific Name: ***Etheostoma microperca***
Family: Perch (*Percidae*)
U.S. Nativity: Native
Habitat: Found in clear, quiet and well-vegetated lakes, headwaters, pools, creeks and streams
Food: Midge larvae, small crustaceans
Reproduction: Spawns starting in late April when water temperatures reach 56-60°F
Average Size: 1-1.5 inches

Common Name: **Longnose gar**
Scientific Name: ***Lepisosteus osseus***
Family: Gar (*Lepisosteidae*)
U.S. Nativity: Native
Habitat: Floodplain lakes and backwaters of large rivers; can breathe air at the surface through a modified swim bladder, allowing it to survive in hot, oxygen-poor shallows; prefers warm, deep water but will school near the surface
Food: Minnows and small fish; an efficient predator that controls rough fish populations
Reproduction: Spawns in weedy shallows of lakes or tributaries when water temperatures reach the high 60s
Average Size: 24-36 inches

Common Name: **Northern pike**
Scientific Name: ***Esox lucius***
Family: Pike (*Esocidae*)
U.S. Nativity: Native
Habitat: Lakes, ponds, streams and rivers; often found near weeds; small pike tolerate water temperatures up to 70°F, but larger fish prefer cooler water, 55°F or less
Food: Small fish, crayfish, and occasionally frogs
Reproduction: Spawns in late March or early April in shallow tributaries and marshes at 34-40°F water temperatures
Average Size: 18-24 inches

Common Name: **Pugnose shiner**
Scientific Name: ***Notropis anogenus***
Family: Minnow (*Cyprinidae*)
U.S. Nativity: Native
Habitat: An increasingly rare species that prefers clear, weedy shoals of glacial lakes and streams of low gradient over sand, mud, gravel or marl; extremely intolerant to turbidity (muddy water), siltation, and vegetation removal
Food: Grazes on plants, consuming filamentous algae and cladocerans
Reproduction: Spawns mid-June through mid-July
Average Size: 1-1.5 inches

Common Name: **Pumpkinseed sunfish**
Scientific Name: ***Lepomis gibbosus***
Family: Sunfish (*Centrarchidae*)
U.S. Nativity: Native
Habitat: Weedy ponds, clear lakes, reservoirs and slow-moving streams; prefers

cover, like aquatic vegetation or submerged brush, and slightly cooler water than bluegill; often schools around docks and sunken logs

Food: Insects, insect larvae, snails, crustaceans, mollusks, small fish, leeches and small amounts of vegetation; feeds along deep weed beds during the day and settles to the bottom at night

Reproduction: Spawns late May to August starting when water temperatures reach 55-63° F; male builds nest on gravel bottom among weeds in shallow water; can become overly abundant and stunted due to dense vegetation or lack of top predators

Average Size: 6-8 inches

Common Name: **Rock bass**

Scientific Name: ***Ambloplites rupestris***

Family: Sunfish (*Centrarchidae*)

U.S. Nativity: Native

Habitat: Vegetation on firm to rocky bottom in clear-water lakes and medium-size streams

Food: Prefers crayfish, but eats aquatic insects and small fish

Reproduction: Spawns in spring at water temperatures from high 60s to 70s; solitary nester; male fans out a nest on coarse gravel bottom in weeds less than three feet deep

Average Size: 8-10 inches

Common Name: **Smallmouth bass**

Scientific Name: *Micropterus dolomieu*

Family: Sunfish (*Centrarchidae*)

U.S. Nativity: Native

Habitat: Clear, swift-flowing streams and rivers; clear lakes with gravel or rocky shorelines

Food: Small fish, crayfish, insects and frogs

Reproduction: Spawns in May and June when the water temperature reaches the mid to high 60s; male sweeps out nest in gravel bed, typically in 3-10 feet of water near a log or boulder

Average Size: 12-20 inches

Common Name: **Walleye**

Scientific Name: ***Stizostedion/Sander vitreus***

Family: Perch (*Percidae*)

U.S. Nativity: Native

Habitat: Clear to fertile lakes and streams; abundant in very large lakes and rivers; prefers cooler water

Food: Mainly small fish, but also eats insects, crayfish, leeches and other small prey as opportunity permits; a nocturnal feeder that can feed in low-light conditions
Reproduction: Spawns between mid-April and early May in tributary streams, flooded wetlands, or rocky lake shoals when water temperatures reach 45-50°F
Average Size: 14-17 inches

Common Name: **White bass**
Scientific Name: ***Morone chrysops***
Family: Temperate bass (*Moronidae*)
U.S. Nativity: Native
Habitat: Large lakes, rivers and impoundments with relatively clear water; fish school in large groups near the surface
Food: Small fish
Reproduction: Spawns in late spring to early summer at water temperatures of 55-79°F, and in open water over gravel beds or rubble 6-10 feet deep
Average Size: 18 inches

Common Name: **White crappie**
Scientific Name: ***Pomoxis annularus***
Family: Sunfish (*Centrarchidae*)
U.S. Nativity: Native
Habitat: Slightly silty rivers, streams and mid-size lakes; prefers warmer, less weedy, deeper and more turbid water than black crappie; usually found in open water
Food: Aquatic insects, small fish and zooplankton; actively feeds at night and during the winter
Reproduction: Spawns on firm sand or gravel bottom in May and June when water temperatures are between 61-68°F; builds nest colonies in deeper water than other sunfish; can overpopulate a lake and become stunted
Average Size: 6-12 inches

Common Name: **White sucker**
Scientific Name: ***Catostomus commersonii***
Family: Sucker (*Catostomidae*)
U.S. Nativity: Native
Habitat: All permanent waterbodies that can sustain fish; widespread and tolerant of a range of water conditions
Food: Insects, crustaceans and plant matter
Reproduction: Migrates up tributaries in April and May to spawn in riffles; spawning may occur along shoreline shallows over gravel or coarse sand bottoms in larger lakes
Average Size: 12-18 inches

Common Name: **Yellow bullhead**
Scientific Name: ***Ameiurus natalis***
Family: Catfish (*Ictaluridae*)
U.S. Nativity: Native
Habitat: Warm, weedy lakes and sluggish streams
Food: A scavenging opportunist; feeds on insects, crayfish, snails, small fish and plant material; locates food by following chemical trails through the water
Reproduction: Spawns late spring to early summer; males and females build nests in shallow water with some vegetation and a soft bottom; less likely than other bullheads to overpopulate a lake and become stunted
Average Size: 8-10 inches

Common Name: **Yellow perch**
Scientific Name: ***Perca flavescens***
Family: Perch (*Percidae*)
U.S. Nativity: Native
Habitat: Found in most glacial lakes, ponds and streams; prefers clear and fertile Water with moderate vegetation, but can adapt to a variety of conditions, including turbidity and a wide temperature range; can survive low oxygen
Food: Small fish, insects, zooplankton, snails, leeches and crayfish
Reproduction: Spawns at night in shallow, weedy areas after ice-out when water warms to 44-52°F; can become stunted in smaller inland lakes where top predators are overfished or due to over-competition for food
Average Size: 7-10 inches

6-6 FACTORS AFFECTING MANAGEMENT DECISIONS

Adding or removing species, instituting fish-harvest limits, and altering or enhancing habitat to benefit a particular fish community can each be used to manipulate fisheries. On Lake Ripley, one of the main objectives of management is to sustain a healthy largemouth bass population, which is considered the primary gamefish in the lake. Management efforts are also directed toward protecting shoreland wetlands to enhance northern pike spawning. In addition, mechanical harvesting is used by the District to control Eurasian watermilfoil and other invasive weeds that threaten to displace native plant beds. Harvesting activities predominantly target dense, monotypic stands of milfoil, and may be used to create edge habitat and fish-cruising lanes in approved locations.

According to past fishery inventories, the most diverse species assemblage is consistently found in Lake Ripley's South Bay area. This particular area is also believed to provide the best largemouth bass habitat in the lake.[11] It is characterized by a relatively diverse native plant

[11] Bush, Donald M. 1994. Electrofishing Report: Lake Ripley, Jefferson County, Wisconsin. Wisconsin Department of Natural Resources.

community and comparatively less shoreline development than other parts of the lake. It is also largely protected from motorboat disturbance through slow-no-wake and no-motor regulations. The presence of submersed, floating-leaved and emergent vegetation is a key element providing cover, spawning sites and structure for fish. Water lilies are particularly abundant within the bay, with rhizomes providing the firm substrate needed for bass nesting.

Due in part to these unique, high-quality habitat features, most of South Bay is designated as a Critical Habitat Area by the Wisconsin Department of Natural Resources. "Attempts to protect the plant community of [South Bay] and its attending fishery by limiting development and imposing 'no wake' ordinances etc. are justified. This justification is based on a judgment that a disruption of the fishery community of this bay may upset the balance in the bass population and ultimately change the fishery resource of the entire lake."[12] Similar designations can be found in East (Inlet) Bay, and along a small stretch of wetland-dominated shoreline on the lake's southwest side. Conversely, Lake Ripley's more developed and sparsely vegetated northeast shore was found to generally support fewer numbers of fish and at lower species diversity.

The condition of the landscape draining to the lake is another important factor affecting the condition of the fishery. Development and land-use activities have the potential of generating polluted runoff that can bury fish-spawning sites in sediment. Polluted runoff can also supply excess phosphorus to the lake that fuels algal blooms and nuisance weed growth. Studies show that watersheds with as little as 10-12% connected impervious surface (i.e., roads, parking lots, rooftops, etc.) generally start to experience fish species declines and other problems.[13] The Lake Ripley watershed is currently at this critical threshold.

Shoreline development, in particular, often results in the systematic removal of near-shore, aquatic vegetation—the same vegetation for which species like largemouth bass are intimately linked. In fact, the level of shoreline development largely dictates largemouth bass and black crappie nesting success. It also contributes to the proliferation of seawalls, patios, sand beaches, piers, swim rafts and boat-docking stations which can alter, fragment or eliminate natural fish habitat.

Unlike bass, carp are frequently associated with a relative absence of vegetation. Carp are known to negatively impact water clarity and native aquatic plant growth, namely through their feeding habits that stir up the lake bottom and recycle nutrients for algal growth. As a lake's Trophic State Index (TSI) increases, due in part to carp activity, total number of species (and particularly fish species sensitive to water quality changes) eventually declines after an initial increase. The percentage of gamefish also decreases with increasing TSI, while carp abundance actually increases until the lake becomes hypereutrophic. The occurrence of northern pike,

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[12] Ibid

[13] Wang, L., J. Lyons, P. Kanehl, and R. Bannerman. 2001. Impacts of Urbanization on Stream Habitat and Fish Across Multiple Spatial Scales. Springer Series in Environmental Management, Vol. 28, No. 2, pp. 255-266.

Clausen, J.C., G. Warner, D. Civco, and M. Hood. 2003. NEMO Impervious Surface Research – Final Report. University of Connecticut Department of Natural Resources Management and Engineering.

largemouth bass, walleye and yellow perch all decline starting at a TSI of about 50.[14] These findings are of concern for Lake Ripley, which has a mean summer TSI that is hovering at this exact level.

6-7 MANAGEMENT RECOMMENDATIONS

MONITORING

- Support the continuation of long-term trends monitoring on Lake Ripley by the Wisconsin Department of Natural Resources. This includes regular monitoring of water quality, fish populations and aquatic plant conditions.

- Continue using Wisconsin DNR electrofishing surveys and other methods to track fish recruitment (or the number of fish surviving to a certain size or age each year). Evaluate potential causes of variability, including weather during the spawning period, availability and quality of nursery cover, condition of the forage base, water quality changes, and harvest pressure.

- Continue tracking the status of the lake chubsucker (*Erimyzon sucetta*), a Wisconsin Species of Special Concern. In addition, continue monitoring for the pugnose shiner (*Notropis anogenus*) and least darter (*Etheostoma microperca*), two Wisconsin Threatened Species that appear to have disappeared from the lake. Another rare and sensitive species that appears to have disappeared from the lake is the banded killifish (*Fundulus diaphanous*). Rediscovery of these species using effective capture methods could be an early indicator of water quality improvements or successful habitat recovery.

- Examine length-frequency trends for northern pike using spring fyke netting to determine the effect of 1995 length limit changes.[15]

- Assess the resident carp population and determine if the Koshkonong Creek outlet is a source of recruitment.

- Evaluate the smallmouth bass population to see if it is increasing in size, to identify the conditioning factor in these fish, and to learn if the fish are affecting the forage base.[16]

- Monitor changes to the lake's aquatic plant community, particularly with respect to problem species like milfoil and curly-leaf pondweed.

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[14] Schupp, D.H. 1992. An Ecological Classification of Minnesota Lakes with Associated Fish Communities. Minnesota Department of Natural Resources, Division of Fisheries. Completion Report, F-29R(P)-11, Study 4, Job 417.
[15] Byla, Algis B. 2005. A Decade of Centrarchid Data from Lake Ripley, Wisconsin. Wisconsin Department of Natural Resources' summary report for the period 1994-2004.
[16] Ibid

- Continue monitoring shoreline development activities, especially those that could impact Critical Habitat Areas. Use video documentation to track changes over time and to support necessary enforcement actions.

MANAGEMENT INTERVENTION

- Work with DNR fisheries biologists to determine if the Koshkonong Creek outlet is a source of carp recruitment. If so, investigate the feasibility of obtaining a Chapter 30 permit and installing a carp gate or similar barrier. Possible locations are where the outlet crosses through the Ripley Road or STH 18 culverts. An experimental, temporary barrier can be considered to help expedite the Chapter 30 permit approval process.

- Continue working with lakefront property owners to restore native shoreline and aquatic vegetation, and to install "treefalls" at the lake edge to serve as coarse woody habitat. Utilize outreach programs, cost-sharing incentives, demonstration projects, and technical/permitting guidance to encourage landowner participation.

- Continue conducting erosion- and pollution-control projects within the watershed in accordance with approved management plans. Higher clarity after nutrient input reduction or inactivation may allow gamefish predators to more effectively forage on prey species, favorably changing the size distribution of both over time.

- Continue using mechanical weed harvesting in accordance with state permit conditions and approved management plans. Harvesting should target dense stands of Eurasian watermilfoil and other non-native, invasive species, while avoiding high-quality native plant beds.

- Consider use of spot herbicide treatments to suppress isolated colonies of invasive weeds that are not yet widely distributed throughout the lake. Avoid lake-wide plant control projects that have limited probability of eliminating invasive weeds, but pose a risk to damaging non-target plants or animals.

- Since natural reproduction is minimal, continue the walleye-stocking program sponsored by the Wisconsin DNR.[17] Walleye has become a popular sport fish that can help keep panfish (planktivore) populations in check, and without displacing or negatively impacting other gamefishes.

- Protect designated Sensitive Areas, now called Critical Habitat Areas, by supporting the Town of Oakland's pier and boating ordinances that affect these locations.

- Work with DNR to revisit bag and size limits for bass, northern pike and walleye to ensure that current policies are maintaining appropriate size distributions.

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[17] Ibid

PUBLIC OUTREACH

- Use multiple media outlets (i.e., newsletters, e-mail bulletins, newspaper articles, signs, website, local cable TV, etc.) to raise awareness about lake and fishery-related issues.

- Utilize public meetings and opinion surveys to assess public perceptions and concerns pertaining to the lake and its fishery.

- Educate boaters and other lake users about aquatic invasive species through postings at the boat landings, and by using the media outlets referenced above. When possible, train and coordinate volunteer groups to monitor the boat landings and conduct watercraft inspections.

- Educate residents and lake users about fish-harvest limits, Critical Habitat Areas, mechanical weed-cutting objectives, shore restorations, fish stocking, aquatic invasive species, fish kills caused by columnaris infections, and other issues that affect the health of the fishery. The public should be made aware that long-term fishery health is ultimately dependent on the availability of good habitat and water quality, whereas stocking and harvest regulations are often short-term fixes that fail to address underlying problems.

- Inform residents and lake users of any fish-consumption advisories due to mercury (if applicable). There are currently no lake-specific advisories in effect for Lake Ripley. However, statewide testing has shown that most of Wisconsin's fish contain at least 0.05 ppm of mercury which has prompted general consumption advisories for at-risk populations. Consumption advice will vary with the species and age of fish, and the person eating the fish.