Lake Puckaway
PROTECTION & REHABILITATION DISTRICT

Fish Fact Sheet

Lake Puckaway is a natural water body on the Fox River lying in a glacially scoured valley. The lake has a surface area of 5,039 acres, a maximum depth of five feet and an average depth of three feet. The lake's bottom is comprised of a mixture of sand, silt and organic debris. The lake is eight miles long and lies in an east to west orientation, making the lake subject to heavy wave action**.** Lake Puckaway contains a very diverse group of fish species. This includes a sport fishery for northern pike, walleye, largemouth bass, catfish, yellow perch, crappie, bluegill and white bass. Its huge forage base provides for excellent growth rates of most species. This outstanding fishery draws many anglers to the lake, for quality fishing, both winter and summer. The lake is open to fishing for game fish year around.

This shallow natural water body has gone through many changes over the years, perhaps most important being the lake's impoundment by the Princeton Dam in the late-1800s. Other changes in land use, weather patterns, water quality, carp populations and both natural and unnatural water level fluctuations, have severely impacted the lake, its fish, and perhaps most importantly its aquatic plant populations.

Aquatic plants provide increased habitat and therefore increase the production of important food organisms.
Photo by Dave Marshall

The health of most any shallow lake and its resident fish can be reflected in the health of the aquatic plant population. Most fish species rely, at least in part, on aquatic plants to survive and prosper. Small species of fish and juveniles of larger species occupy aquatic plant beds for food and protection from predators. This vegetation acts as a sort of aquatic nursery, where invertebrates, small water creatures like worms, insects or mollusks are born and grow. It is these invertebrates which provide food for a variety of fish species.

Largemouth bass fry seek shelter among rooted aquatic plants.
Photo by Dave Marshall

Aquatic plant density and variety affects how hard or easy it is for fish to find food. Variety and density of aquatic plants also dictates how different fish species interact with one another. This in turn can have a direct effect on the species and sizes of fish that comprise a lake's fish community.

The ability of predator species like northern pike and largemouth bass to feed is closely related to the number and thickness of aquatic plants. High-density plant beds offer greater protection for prey species like panfish and minnows, since predator fish are less efficient at capturing prey in thick vegetation. So, if a lake has little vegetation, predator species quickly gobble up their prey, leading to their own demise. On the other hand, lakes with a variety of aquatic plant beds help keep a balance of fish species by protecting prey from decimation by predators. Another plus for having many aquatic plants is this vegetation offers cover to large fish targeted by anglers, thereby reducing vulnerability of the fish to angling overharvest.

The majority of fish species present in Lake Puckaway rely on plants for reproductive success. Northern pike broadcast eggs over flooded vegetation early in the spring. Large-mouth bass and panfish species construct nests among stands of submergent vegetation. And nearly all fish species rely on aquatic plants to protect their young once they hatch and begin life on their own. Small insects and other aquatic organisms that live in aquatic vegetation form the basis of the food chain and impact the overall health of the fish community.

Many of the plant species present in Lake Puckaway rely on naturally fluctuating water levels to thrive. Emergent species such as wild rice and bulrush are scarce compared to their dominance in the past. Lush stands of these and other emergent aquatic plants were once present along shallow shorelines and throughout most of the eastern basin. Large areas of diverse beds of submerged plants have also declined. Weather conditions, carp populations, shoreline development and land use changes have all contributed to loss of plant habitat.
Lake managers have very little control over weather patterns and what Mother Nature decides to throw at us in the way of wind and precipitation. Still, there are things within a lake's ecosystem that managers can control.

Rough fish removal efforts, by chemical spot treatment and commercial fishing, have proven to be helpful at keeping carp populations lower. Fishing regulations are another tool for lake managers. Increasing the size limit on northern pike, in order to increase the population of this exciting game fish, so more and larger pike are present in the lake to feed on carp, has also contributed to rough fish control.

Yellow perch often deposit eggs over aquatic vegetation in sheltered areas and bays.
Photo by Dave Marshall

Carp harvested though commercial fishing being loaded into semi-trailer
Photo by Rick Stel

Water level management has proven to be the most controversial part of the effort to try to re-establish and improve aquatic plant, and in turn, fish populations. Most of the valuable plant species that were once dominant on Lake Puckaway, leading to a greater and more diverse fish population, benefit from lower fluctuating water levels. High late spring and early summer water levels may actually benefit carp populations, by providing them access to spawning habitat in fragile aquatic vegetation. Along with many long-term factors the current method of operation of the Princeton Dam has, at times, actually damaged and limited the protection and improvement of aquatic vegetation on Lake Puckaway, thus limiting its fish population.

Water lilies and other aquatic plants provide shade and cover for fish and fish food organisms.
Photo by Dave Marshall

Aquatic plants are the cornerstones of a healthy shallow lake system. They not only directly affect the overall water quality and health of the system, but also provide critical habitat for fish and wildlife. In short, there cannot be one without the other.

For additional information readers may contact the LPPRD at P.O. Box 6, Marquette, WI 53947, or visit the Wisconsin Association of Lakes website at www.wisconsinlakes.org.