

## **Status of the Lake Vermilion Fishery**

### ***2019 Angling Prospects***

The Lake Vermilion fishery continues to be healthy and should provide both catch and harvest opportunities for several species. Walleye abundance is down slightly from recent years and anglers may notice differences in catch and harvest rates between the east and west basins. Compared to recent years, anglers may note a decline in the number of walleyes from 10 to 16 inches in East Vermilion. This is likely due to a weak 2017 year class and favorable catch and harvest rates over the previous two fishing seasons that reduced walleye abundance. However, modest numbers of fish over 16 inches should provide harvest opportunities. Anglers may also notice the strong 2018 year class which are mostly fish under 10 inches. For West Vermilion, solid numbers of fish over 14 inches should provide favorable catch and harvest opportunities.

Anglers seeking smallmouth bass should find good numbers as their abundance continues to increase especially in West Vermilion. However, the West Vermilion fish tend to be mostly under 13 inches compared to East Vermilion which has lower numbers but larger fish. Additionally, largemouth bass can be found in low numbers overall but certain areas, primarily in West Vermilion, provide the best catch opportunities. Above average numbers of yellow perch over 9 inches will provide harvest options. Although low in abundance, northern pike provide harvest opportunities with the possibility to catch fish up to 40 inches. New in 2019, the northeast zone pike regulation applies on Lake Vermilion which is different from the special regulation that was in effect from May 2003 to February 2019. Trophy opportunities exist for muskie anglers as fish over 50 inches are present in the population. Additionally, black crappie and bluegill will provide angling opportunities. Whitefish and cisco (tullibee) offer harvest opportunities primarily during the fall sport gill-netting season.



### ***Fisheries Management***

Lake Vermilion is comprised of two major basins, East Vermilion (area east of Oak Narrows) and West Vermilion (area west of Oak Narrows), that are significantly different in terms of habitat and fish communities. The lake is part of the DNR Large Lake Monitoring Program which includes annual fisheries

population assessments, water quality monitoring, zooplankton monitoring, aquatic invasive species surveillance, and regularly scheduled creel surveys on the 10 largest lakes in Minnesota. Since 1984, standardized fish population assessments have included a variety of sampling gears to collect various fish species at different life stages. The gears include gill nets, trap nets, shoreline seines, and electrofishing boats. Fisheries assessments are standardized so that the sampling gear is used at the same locations during the same time of year to best track population trends. Length, weight, age, and other data are collected for fishes of management concern.

A new management plan for Lake Vermilion was finalized in March 2018 to guide fisheries management for a six year period, 2017 to 2022, following input from the Lake Vermilion Fisheries Input Group and the general public. This plan is available online at <https://www.dnr.state.mn.us/lakevermilion/index.html>. Northern pike regulations for Lake Vermilion changed for the 2019 fishing season. The special northern pike regulation that had been in place since 2003 was repealed following review and public input in 2018. Therefore, starting on the May 11, 2019 fishing opener, the northern pike population will be managed under Minnesota's northeast zone regulations: Angling regulation: All northern pike from 30-40" must be immediately released. Possession limit two, only one over 40". Dark house spearing regulation: Possession limit two, only one over 26". See Minnesota Fishing Regulations for further details

(<https://www.dnr.state.mn.us/regulations/fishing/index.html>).



## **Walleye**

The DNR's 2018 annual fall gill-net survey had a lakewide walleye catch rate of 11.6 fish/net, falling below the 25th percentile of all surveys dating back to 1984. This was the 3rd lowest catch rate observed in the previous 25 years. The low catch rate was primarily driven by low numbers in East Vermilion that can partially be attributed to a weak 2017 year class. Additionally, anecdotal information from anglers indicated favorable walleye catch and harvest rates over the previous two open water fishing seasons which may have reduced walleye abundance. Finally, a strong cold front during netting on East Vermilion may also have impacted our catch rates. The East Vermilion walleye catch rate of 11.8 fish/net was the lowest catch rate observed since 1994 and fell below the historic 25th percentile. In comparison, the West Vermilion catch rate of 11.3 fish/net was above average for that basin.

The average length of walleyes captured in 2018 was 14.5 inches which was above average. Average length has increased since the implementation of the protected slot regulation in 2006. Historically, fish in East Vermilion have run smaller and their increase in average size over time has not been as dramatic as fish in West Vermilion. Below average numbers of walleyes from 11 to 15 inches were sampled lakewide in 2018. However, above average numbers of walleyes over 16 inches should provide harvest opportunity. In particular, catches of 12 to 15 inch fish were below average in East Vermilion, but average numbers of fish over 16 inches were found. For West Vermilion, catches of fish from 11 to 13 inches were below average, but catches of walleye over 14 inches were well above average.

Walleyes captured in gill nets in 2018 ranged in age from 1 to 17 years. Catch rates of age-2 (2016 year class), age-6 (2012 year class), and age-7 (2011 year class) fish were above historic averages. Catch rates of age-1 fish (2017 year class) were below the 25th percentile. For the first time since 2008, catches of walleyes ages-8 and older fell below the historic average and were a relatively low percentage of the catch (3.5%). The overall lower catch of fish over age-8 was primarily due to a decline in older fish in West Vermilion.

The most recent strong walleye year class lakewide was produced in 2012 and preliminary estimates indicate another strong year class was produced in 2016. A weak year class has not occurred lakewide since 2009, however early indications suggest that the 2017 year class may be weak. In East Vermilion, a strong year class was produced in 2012 and preliminary estimates suggest a strong 2016 year class. Recently, a weak year class was produced in 2014 and preliminary estimates indicate a weak 2017 year class in East Vermilion. In West Vermilion, moderate to strong recruitment has occurred annually since the last weak year class in 2013.

Fall electrofishing provides useful information on abundance and growth of young-of-the-year (YOY) walleyes near the end of their first growing season. In Lake Vermilion, both the catch rate of YOY walleyes and average length of fish captured help predict future year class strength. In 2018, the 227.3 fish/hour lakewide catch rate of YOY walleyes was the highest rate observed since 2007 and was above the historic 75th percentile. The average length of fish captured was 5.4 inches which was near the historic average. Typically, first year growth differences occur between the basins as larger YOY walleye are found in West Vermilion.

DNR continues to operate the walleye spawn take and hatchery at the Pike River. A portion of the walleye fry produced at the Pike River Hatchery will be put back into Lake Vermilion. In the past 10

years, between 5.7 and 15 million fry have been stocked into Lake Vermilion annually. DNR will stock approximately 5 million walleye fry into Lake Vermilion in 2019.

### ***Yellow Perch***

Yellow perch are a primary forage species in Lake Vermilion that also provide some incidental angler harvest. The 2018 lakewide gill-net catch rate of 24.9 fish/net was the highest catch rate since 2014 and was near the lake's historic average. Yellow perch catch rates tend to be extremely variable. The average length of yellow perch captured in 2018 was 7.5 inches, slightly above the historic average. Above average catch rates of fish 9 inches and larger will likely provide harvest opportunity. Fish captured in gill nets ranged from 1 to 9 years of age. The high proportion of fish age-3 and less captured in 2018 (62%) indicate consistent moderate to strong recruitment over the last few years which should continue to bolster abundance.

### ***Smallmouth Bass***

Smallmouth bass are found throughout Lake Vermilion and they provide an important fishery. Spring electrofishing targeting smallmouth bass habitat has been conducted almost annually since 1989. The current management plan calls for electrofishing every three years. In 2018, the lakewide catch rate of smallmouth bass during spring electrofishing was 75.0 fish/hour. This was the highest catch rate ever observed for Lake Vermilion and continues an increasing trend. The high lakewide catch rate was primarily driven by the highest catch ever observed in West Vermilion at 145.0 fish/hour compared to a historic average of 48.5 fish/hour. On the other hand, the East Vermilion catch rate of 40.0 fish/hour was just slightly above average.

The average length of fish sampled in 2018 was 9.2 inches. The number of fish over 12 inches has steadily increased during surveys. East and West Vermilion often display dramatically different length distributions and this was again the case in 2018. The majority of the catch



in West Vermilion was less than 10 inches and no fish over 14 inches were sampled. In contrast, the majority of the East Vermilion catch was over 10 inches and several fish over 14 inches were sampled. Fish ranged in age from 2 to 12 years and each year class was represented indicating consistent recruitment. Recent strong recruitment appears to have come from the 2015 (age-3) and 2012 (age-6) year classes, while poor recruitment was observed for the 2013 year class (age-5).

### ***Largemouth Bass***

Largemouth bass are a minor component of the Lake Vermilion fishery and are predominantly found in specific areas of West Vermilion with preferred habitat. The current spring electrofishing survey does

not target largemouth bass habitat, however, two largemouth bass were sampled during the 2018 assessment in West Vermilion. Creel data indicates the population of largemouth bass may be expanding and fish over 20 inches have been caught.

### ***Northern Pike***

Northern pike have historically been present in relatively low abundance in Lake Vermilion but are an important gamefish for some anglers. Ice-out trap-net assessments have been done to obtain size structure information on adult pike and additional data is collected during annual fall gill-net assessments. In 2018, ice-out trap netting was not conducted, but eleven northern pike (0.6 fish/net) ranging in length from 18.7 to 33.3 inches were captured in gill nets. The gill-net catch rate was below the historic 25th percentile. Beginning on the May 2019 fishing opener, the northern pike population will be managed under the Minnesota's northeast zone regulations.

### ***Bluegill and Black Crappie***

Bluegills provide significant catch and harvest opportunity in Lake Vermilion while black crappies are generally a minor component of the fishery but on occasion produce very good fishing. Trap-net catches indicate greater abundance of both species in West Vermilion. In the past, summer trap-netting targeting panfish occurred annually however it was not conducted in 2018 and has been reduced to once every three years in the new management plan.

### ***Aquatic Invasive Species***

Aquatic invasive species are nonnative animals and plants that do not naturally occur in Minnesota waters and cause varying levels of ecological and economic harm. Lake users should follow Minnesota's Clean, Drain, Dispose laws to help prevent the spread of aquatic invasive species. Several invasive species are present in Lake Vermilion including Chinese mystery snails, curly-leaf pondweed, *Heterosporis sutherlandae*, purple loosestrife, rusty crayfish, and spiny waterfleas.

Spiny waterfleas are an invasive zooplankton first discovered in East Vermilion in 2015. They were sampled for the first time in West Vermilion in 2018, but have not been found west of Niles Bay. Zooplankton biomass has significantly declined in East Vermilion following the discovery of spiny waterfleas. This is similar to severe declines in native zooplankton communities that have been observed in nearby Rainy and Kabetogama lakes following spiny waterflea invasion. How this will affect fish populations remains to be seen.

### ***Double-crested Cormorants***

The double-crested cormorant (DCCO) is a native, fish-eating colonial waterbird. Historically, DCCO and other colonial waterbirds likely used Lake Vermilion for nesting, foraging, and loafing. Following continental declines of DCCO from the late 1800s to the 1970s, DCCO presence on Lake Vermilion was sparse and no nesting colonies were observed. A population resurgence has occurred throughout North America since the 1970s when DCCO began rebounding from decades of human persecution and environmental contamination. However, this resurgence has led to natural resource and societal conflicts of varying degrees. Within the last 15 years, the DCCO population using Lake Vermilion for nesting has increased 10-fold and the relatively rapid growth of the colony generated concern within the

local angling and business community that higher DCCO numbers would negatively impact sportfish populations, specifically yellow perch and walleye.

Cormorants are protected by the Migratory Bird Treaty Act in the United States. However, following increasing resource conflicts in the early 1990s, an Aquaculture Depredation Order and a Public Resource Depredation Order (PRDO) allowed lethal control. The Depredation Orders allowed aquaculture facilities and state, federal, and tribal management agencies to deal with cormorant issues locally under U.S. Fish and Wildlife Service review. Cormorant control measures, including adult culling and egg oiling, were taken from 2013 to 2015 on Lake Vermilion to reduce the DCCO population present



on Potato Island and limit their foraging in Lake Vermilion. However, cormorant control efforts were suspended in 2016 and remain suspended due to a U.S. District Court decision to vacate the PRDO. In 2019, DNR will not conduct DCCO control on Lake Vermilion due to the court decision. However, the cormorant colony will continue to be monitored. Cormorant nest counts from 2013 to 2018 stabilized around 335 nests following the peak of 434 in 2012. No new nesting colonies have been established outside of Potato Island.

The response of walleye and yellow perch populations to cormorant control efforts remains unclear. There was an initial increase in yellow perch catch rates after the first year of control followed by a dramatic decline from 2014 to 2017 despite three consecutive years of DCCO control. In 2018, catches rebounded lakewide to near average. The initial decline in yellow perch catch rates lakewide following DCCO control efforts and subsequent increase in 2018 following 3 years of non-control have made the relationship between the two species increasingly difficult to understand. Clearly there are multiple factors at play in Lake Vermilion perch population dynamics. It is important to recognize that yellow perch are a primary prey source for the walleye population in Lake Vermilion and that these populations are closely linked. Walleye gill-net catches have been at normal to high levels and the size structure has shifted towards larger fish requiring more forage at the same time as DCCO colony expansion and control. We do not have any evidence indicating DCCO are having an impact on the walleye population at this time.

### ***Fishing Tournaments***

Historically, there have been relatively few permitted fishing tournaments on Lake Vermilion. Generally, between two to six tournaments occur each year. The DNR is responsible for regulating fishing tournaments and manages them in a manner that will protect fish populations and minimize conflict with other lake users. DNR permits are required for fishing tournaments that meet certain conditions and permits have been issued for the following tournaments in 2019:

- May 18: City Auto Glass Walleye Classic

- May 19: Minnesota Bass Federation Spring Fest
- June 15: Bass Pro Shop/Cabela's North American Bass Circuit
- July 13: Carpenters North Star Walleye Classic
- July 27: Up North Bass Team Series
- July 28: AIM Weekend Walleye Series
- August 15 and 16: Champions Tour (walleye and bass)
- August 25 and 26: Student Angler Tournament Trail (bass)