

Roberts Lake Yellow Perch and Walleye Rehabilitation Project

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Overview

Roberts Lake has been managed primarily for walleye and muskellunge (musky) going back to the initial introductions of these two species in 1938. Historical survey data is limiting but it appears that both of these species began naturally reproducing in Roberts Lake creating high quality populations of both walleye and musky. By the mid-1990's natural reproduction of walleye had declined substantially, and since 2003 natural reproduction of walleye has been insignificant. Natural reproduction of musky has followed a similar pattern, with no natural reproduction of musky detected since 1998. Yellow perch, a species very commonly associated with quality walleye populations, have always been very abundant in Roberts Lake. However, our survey data shows incredible declines in yellow perch abundance during the same timeframe that walleye and musky populations declined. Populations of all three of these species (walleye, musky, and yellow perch) were shown to be at all-time lows during the last comprehensive survey in 2016-17. While these species have declined, the entire fish community has changed drastically. Most notable are the northern pike and largemouth bass populations which grew to the overabundant levels measured during the 2016-17 survey. Since Forest County has very few successful yellow perch and walleye populations, a project was started in 2019 to bring the entire fish community back to the historic fish community that was present in Roberts Lake from the 1940s through the 1990s, a fish community that would allow yellow perch and walleye to thrive.

Walleye

The walleye population in Roberts Lake was shown to be abundant by 1963, however the population was likely very abundant well before 1963. Thorough walleye population assessments began on Roberts Lake in 1987. From 1987 to 2010 the population was measured 6 times with a mean adult density of 4.24 walleye/acre (Figure 1). During 2017 the adult walleye population had dropped to an all-time low of 1.51 adults/acre.

The major decline in adult walleye abundance was the result of significantly reduced walleye reproduction. From 1975 to 1992 walleye reproduction averaged 43.7 age-0 walleye per mile during electrofishing surveys. Natural reproduction has been greatly reduced from 1996 to the present, with an average of only 0.6 age-0 walleye per mile from 2006-2017 (Figure 2).

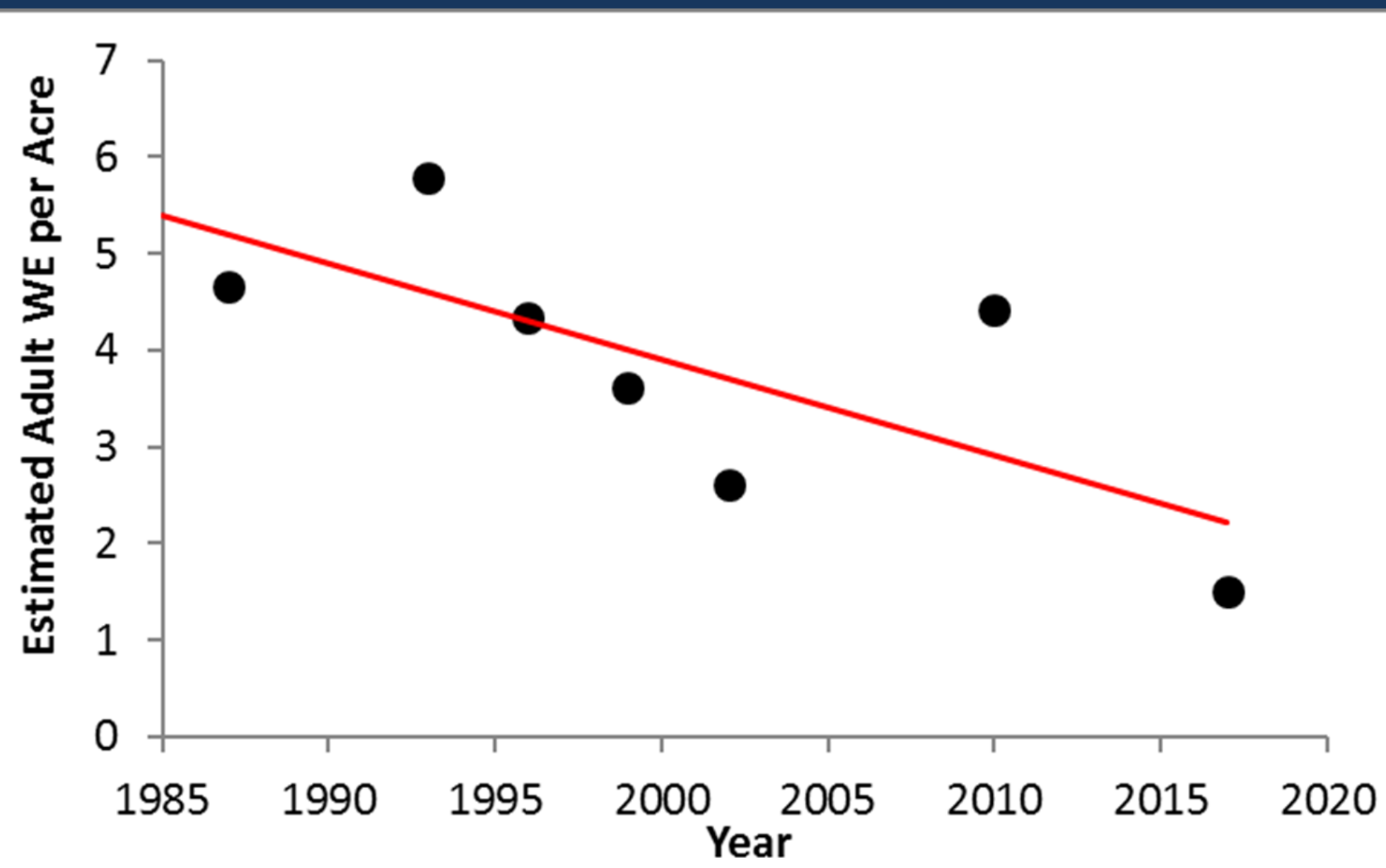


Figure 1. Adult walleye abundance, indexed using mark-recapture population estimation, in Roberts Lake, Forest County, 1987-2017.

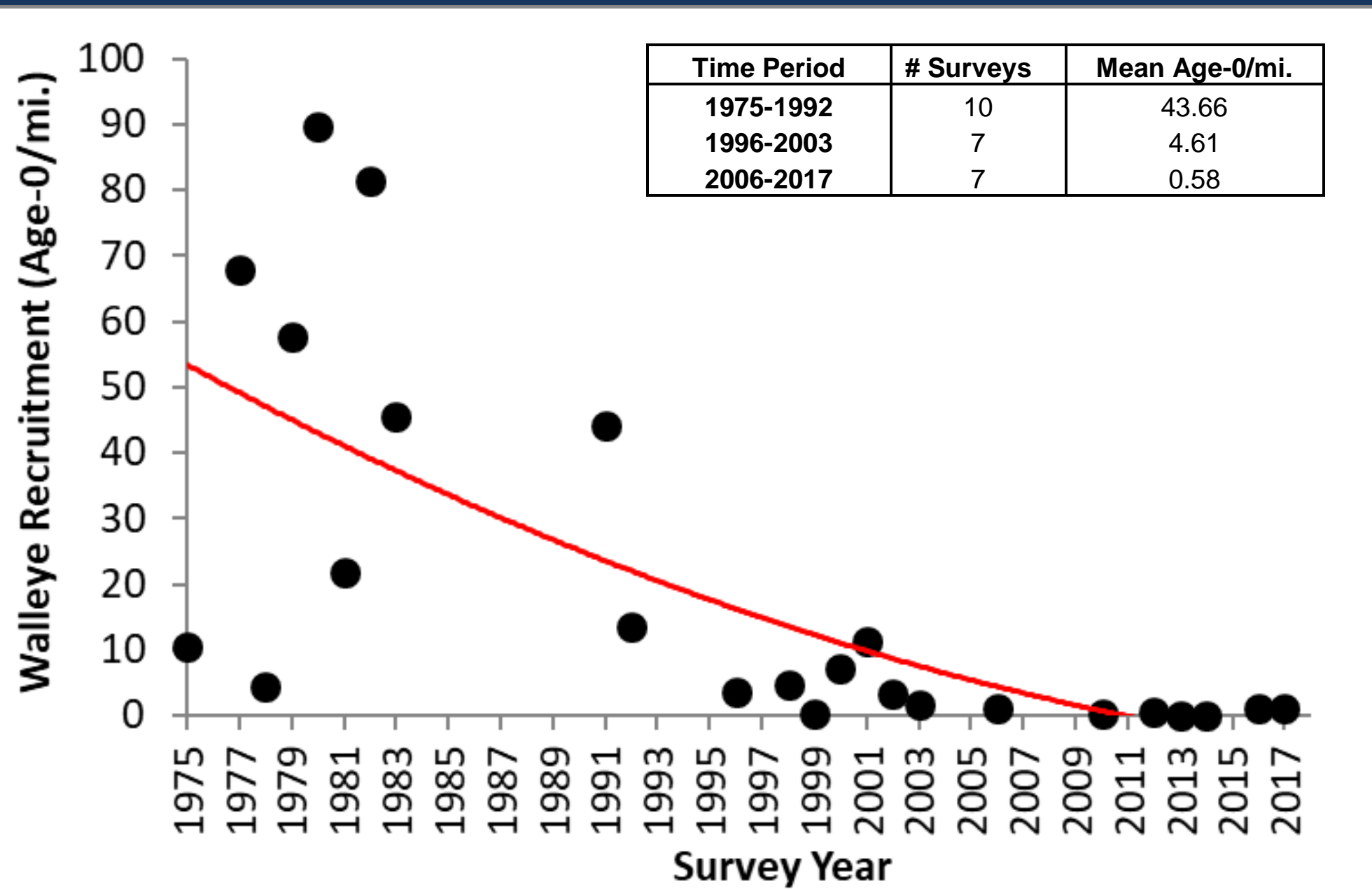


Figure 2. Natural recruitment of walleye, indexed using relative abundance of age-0 walleye during fall electrofishing surveys in years in which stocking of age-0 walleye did not occur prior to the survey, in Roberts Lake, Forest County, 1975-2017.

Yellow Perch

Yellow perch were extremely abundant in Roberts Lake during the first survey in 1942. The population maintained very high abundance through at least 1987 (> 150/net-night). Yellow perch were still considered abundant in 1999 (58/net-night). By 2017, the population was at an all-time low of 1.7 fish/net-night (Figure 3).

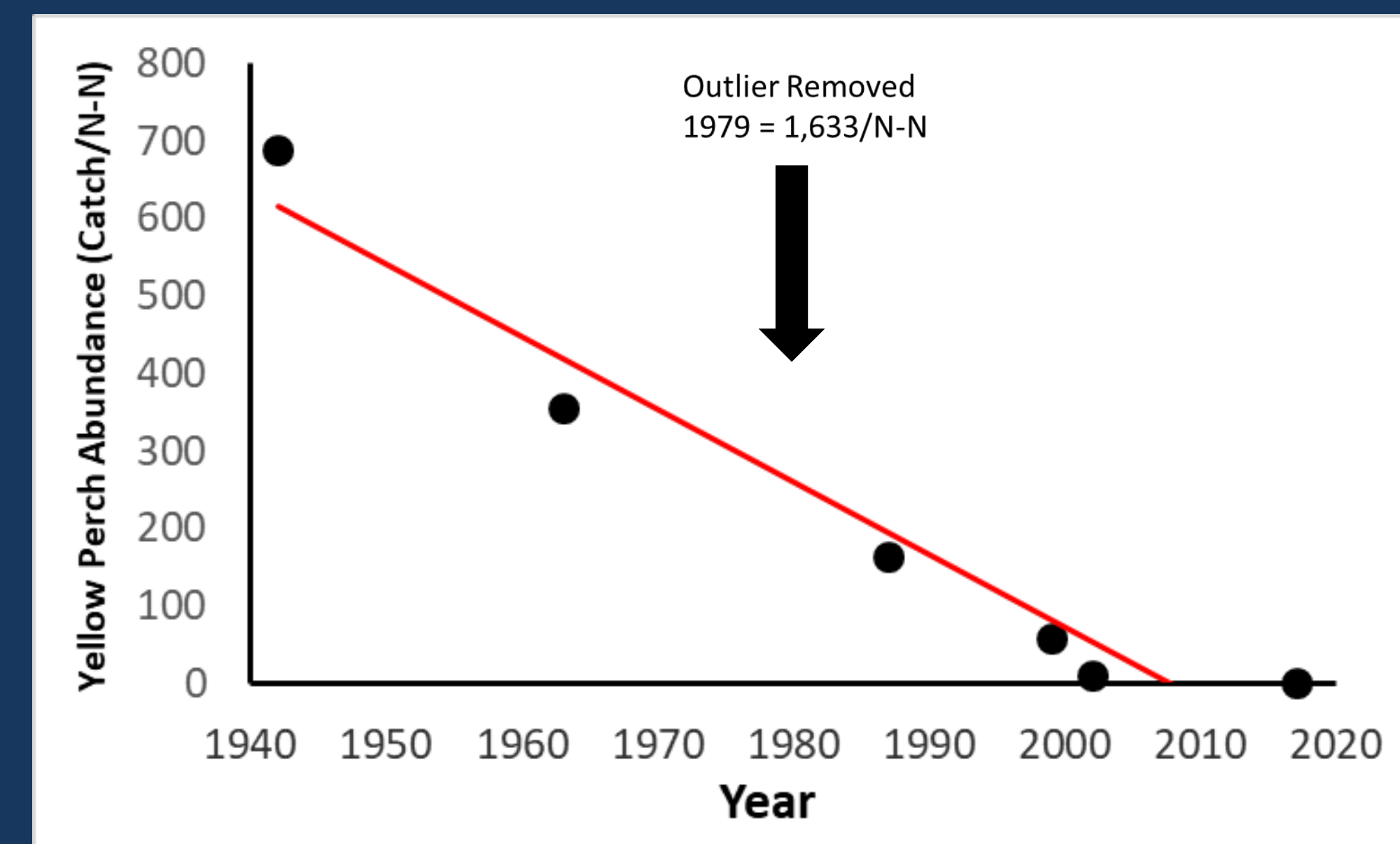


Figure 3. Adult yellow perch abundance, indexed using catch per net-night during early spring surveys, in Roberts Lake, Forest County, 1942-2017.

Muskellunge

While we do not have musky reproduction data prior to 1980, the musky population most likely had significant natural reproduction from the 1940s through 1998, when the last naturally reproduced musky was detected in Roberts Lake. Survey data shows that musky abundance has declined significantly since 1987, reaching an all-time low of 0.09 adults/acre in 2016 (Figure 4). Since 2011 WDNR has been stocking a very low rate of musky to maintain a population in Roberts Lake.

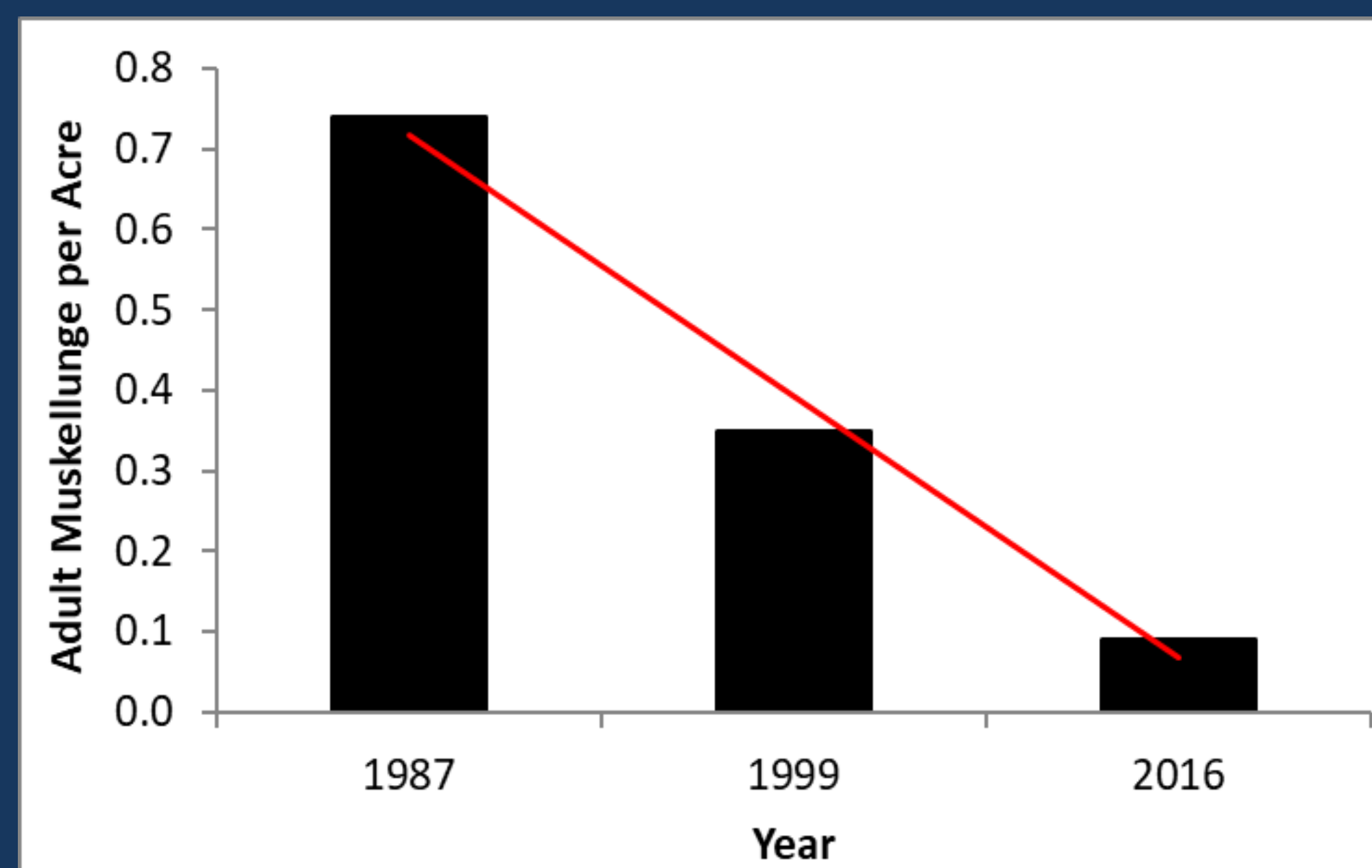


Figure 4. Abundance of adult muskellunge (> 30 inches), indexed using mark-recapture population estimation, in Roberts Lake 1987-2016.

Largemouth Bass

Since the walleye, yellow perch, and musky populations declined, the largemouth bass population has increased 19-fold (Figure 5). The density of adult largemouth was estimated at 9.1/acre in 2016, which is the highest density of largemouth bass of all waters surveyed in Forest and Florence Counties over 100 acres. If this extreme abundance was maintained, growth rates, body condition, and size structure of the population would likely decrease tremendously, leaving an undesirable population.

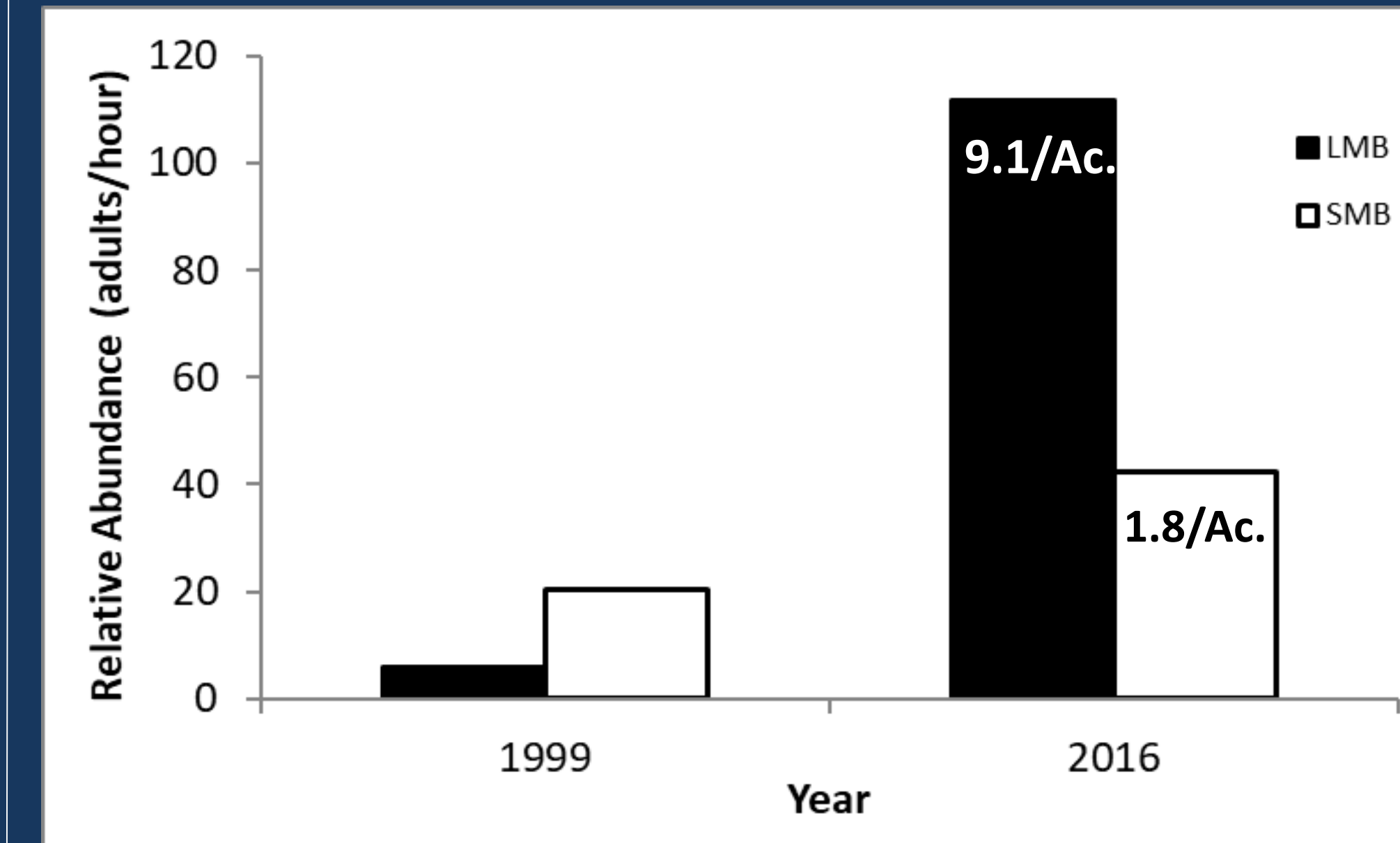


Figure 5. Relative abundance of bass, indexed using adult catch per hour of electrofishing, during late spring electrofishing surveys of Roberts Lake, Forest County, 1999-2016.

Northern Pike

During the time period that walleye, yellow perch, and musky were thriving in Roberts Lake, northern pike were of negligible abundance. The 2017 survey estimated northern pike abundance at 7.4 adults/acre. This is the highest density of northern pike measured in Forest or Florence Counties (Figure 6). The extreme abundance of northern pike has caused the population to become undesirable, with an average length of 16.9 inches.

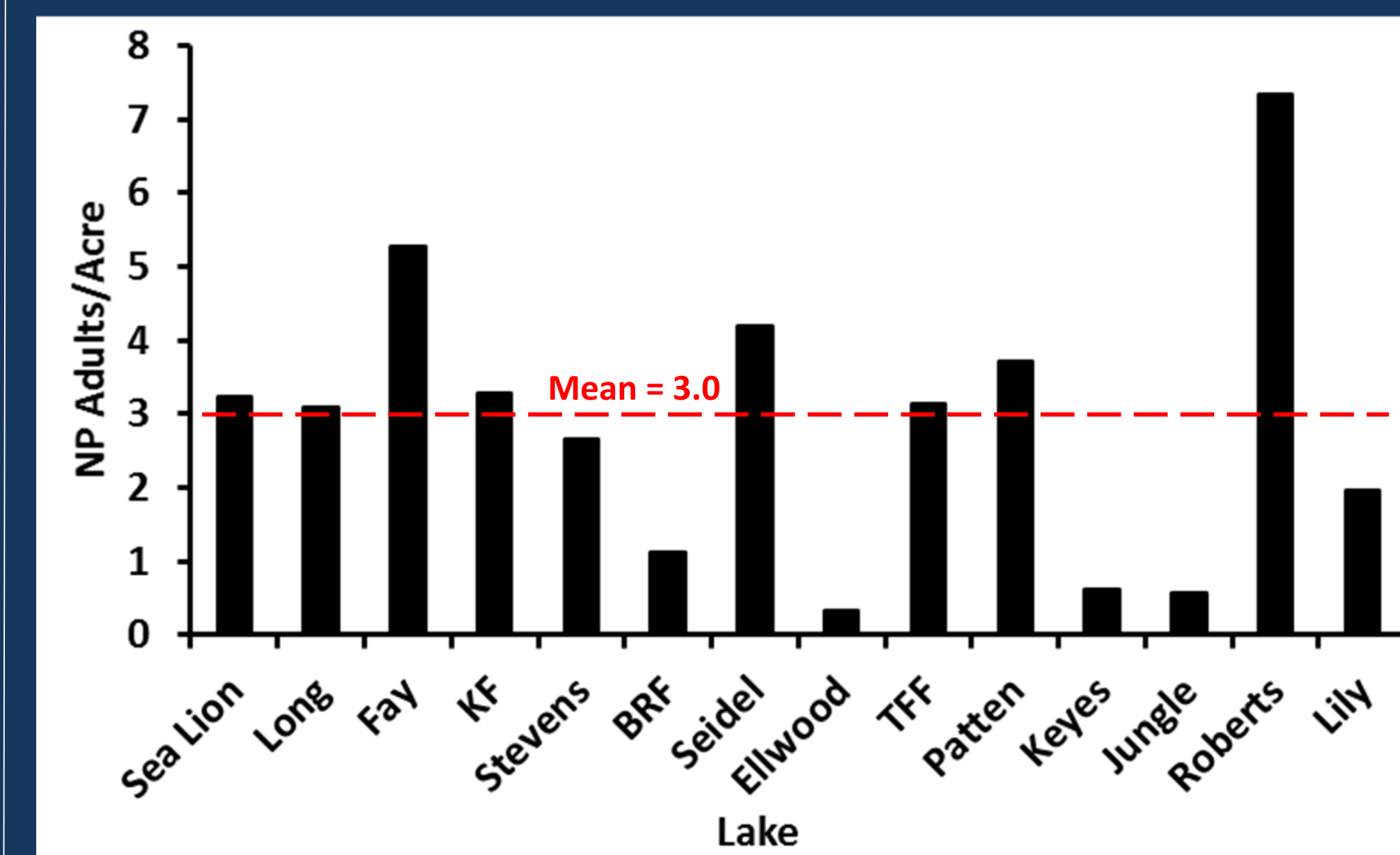


Figure 6. Abundance of northern pike, indexed using mark-recapture population estimation, in all waters that received this type of survey in Forest and Florence Counties, 2011-2017.

Rehabilitation Project

The goal of this project is to manipulate the fish community in order to achieve a fishery where yellow perch and walleye can once again thrive. In order to meet the goal of this project the overabundant populations of northern pike and largemouth bass must be significantly reduced to more "normal" levels. The hypothesis is, if we reduce the amount of predation on yellow perch and walleye their populations will expand. To increase the walleye population quicker the WDNR, Mole Lake Community, and the Roberts Lake Association plan to increase walleye stocking while there is a void created by the removal of largemouth bass and northern pike. We also will attempt to reduce the competition on the yellow perch population, by removing bluegill ≤ 4.9 inches. The bluegill removed are below a catchable/harvestable size for anglers, and by removing these young bluegill the yellow perch population will be able to rebound much quicker.



We are confident we will be able to achieve a significant improvement of the yellow perch population. This will hopefully create a fish community where walleye will be able to once again reproduce at high levels. If we do not see significant improvements to walleye reproduction we should still see significant improvements in the survival of stocked walleye, creating a much better walleye population than Roberts Lake currently has. The project is not an attempt to completely remove the northern pike, largemouth bass, or bluegill populations from the lake. The abundance of these species will be lowered to a more moderate abundance to make room for the desired fish community. This project may also benefit other species, such as smallmouth bass and muskellunge.