2022 COMPREHENSIVE SURVEY REPORT

WATER: ROBERTS LAKE COUNTY: FOREST

INTRODUCTION AND SURVEY OBJECTIVES

The Wisconsin Department of Natural Resources conducted a comprehensive survey of Roberts Lake, Forest County, to analyze the health of its fishery. A comprehensive survey includes surveys designed to assess all the major fish populations within the lake; for species-specific survey details see the table below. The summary that follows will detail the current fishery, as well as the changes observed in this fishery after a major Yellow Perch/Walleye rehabilitation project which started in 2019 in partnership with Mole Lake Tribal Fisheries and the Roberts Lake Association. Roberts Lake is located approximately 6 miles Northwest of Wabeno off of CTY Rd W, with boat access to Roberts Lake off of MacArthur Trail.

Acres: 415 Shoreline Miles: 4.5 Maximum Depth (feet): 31
Lake Type: Drainage Public Access: USFS Boat Landing

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Table 1. Summary of all surveys conducted during 2022

SURVEY INFORMATION				
Species	**Survey Date(s)**	**Gear Used**	**Effort**	**Water Temp. (°F)**
Walleye, Northern Pike, Yellow Perch, Black Crappie	5/2-5/3/2022	Fyke Net	16 Net-Nights	41-43
Walleye	5/3/2022	Boomshocker	5.3 miles	45
Bluegill, Pumpkinseed, Rock Bass	6/8-6/10/2022	Fyke Net	18 Net-Nights	67-68
Largemouth and Smallmouth Bass	6/16/2022	Boomshocker	5.8 miles	67

FISH METRIC DESCRIPTIONS

Population estimate (PE) is estimated by marking a portion of the population, then capturing another sample of fish and using the ratio of new fish to previously marked fish to estimate the number of fish in the population.

Catch per unit effort (CPUE) is the number of fish per mile (electrofishing) or per net-night (netting) and is used to index abundance when we are unable to get a PE.

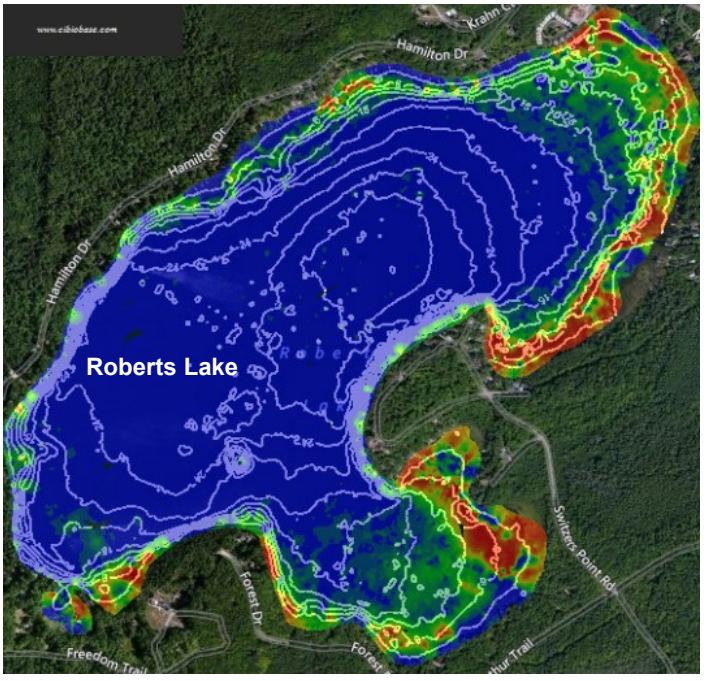
Relative stock density (RSD) is an index used to describe the size structure of fish populations. It is calculated by dividing the number of fish larger than a certain length by the number of stock size fish for a given species. Stock size is a length set for each species and is used to offset potential large year classes of juvenile fish.

Length frequency distribution (LFD) is a graphical representation of the number of fish captured by inch group. Smaller fish (or younger age classes) may not always be represented in the length frequency due to different habitat usage or sampling gear limitations.

Mean length at age is used to index growth. Structures are taken from a subsample of fish captured. These structures can be used to estimate the age of that particular fish. The mean length at each age is then used to characterize the growth of the entire population.

SURVEY METHODS

- Surveys are designed to evaluate each species when they are particularly vulnerable to our gear.
- Standard fyke nets and electrofishing gear is used to capture fish.
- Data is collected from the target species of each survey to gather population metrics.
- Fish metrics are compared to previous surveys of this water, lakes with similar characteristics, other waters in the area or region and all waters of the state.
- Data collected is used to monitor the fishery, determine if stocking is necessary, evaluate fishing regulations, and determine how to improve the fishery.



GEAR USED DURING THIS SURVEY

- **Fyke Nets** are set in areas where we anticipate fish to congregate. Fish traveling along the shoreline will be met by a "lead," which is similar to a fence. The lead directs the fish toward the trap end of the net. Fish travel through a series of funnels and eventually become trapped. Fish are then removed from the net and placed in holding tanks to gather data before being returned to the lake.

Photo Credit: Carl Sundberg

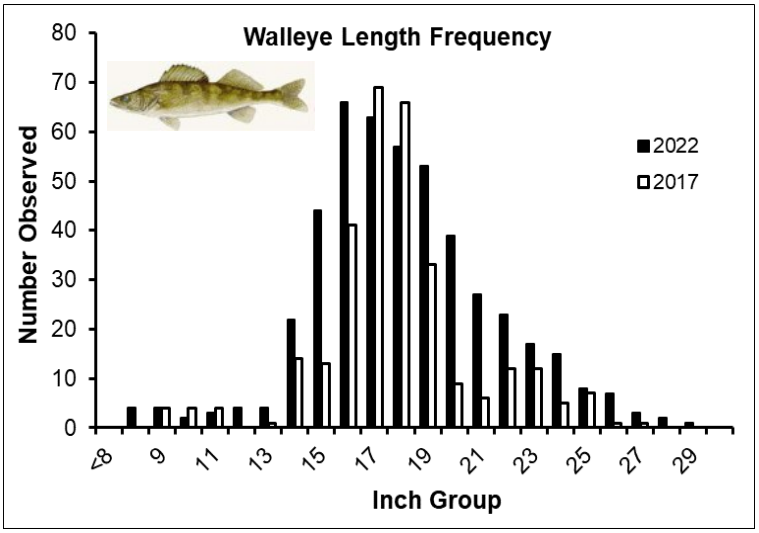
- **Boomshocker** is a specially designed boat that creates an electric current in the water immediately in front of the boat. The boat is driven along the shoreline and shallow areas of the lake. When the boat encounters fish, they are momentarily stunned. Once the fish is stunned, they can be netted out of the lake and placed in a holding tank. After data is collected, the fish are returned to the lake.

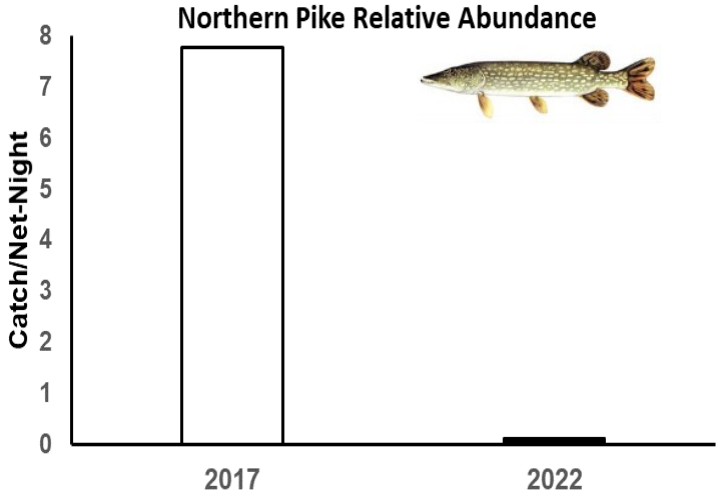
Photo Credit: Wisconsin DNR

WALLEYE

A mark-recapture survey was conducted to estimate the abundance of adult Walleye in Roberts Lake. Over a two-days in May, a total of 468 different Walleye were captured during fyke net and electrofishing surveys. Based on our survey data, we estimate the adult Walleye population in Roberts Lake to be approximately 755 fish (1.82/acre), which is considered an above-average abundance for stocked Walleye populations in this area. The Walleye population has increased by approximately 20.5% since the last survey, conducted in 2017, when the population was estimated at 1.51 adults/acre, which was an all-time low for Roberts Lake. Our hope is that this population will continue to grow through aggressive stocking and a rehabilitation project which is designed to make conditions better for natural recruitment and survival of stocked Walleye.

Every Walleye captured was measured to assess the size structure of the population. The size structure of Walleye in Roberts Lake is very good, with approximately 94.7% being ≥ 15 inches and 31.6% ≥ 20 inches. Walleye size structure has improved since 2017 when 92.3% were ≥ 15 inches and 17.8% ≥ 20 inches. At the time of this survey, 23.6% of the fish were within the 20-24" protected slot, making a total of 71% of the Walleye captured during this survey available for harvest.





NORTHERN PIKE

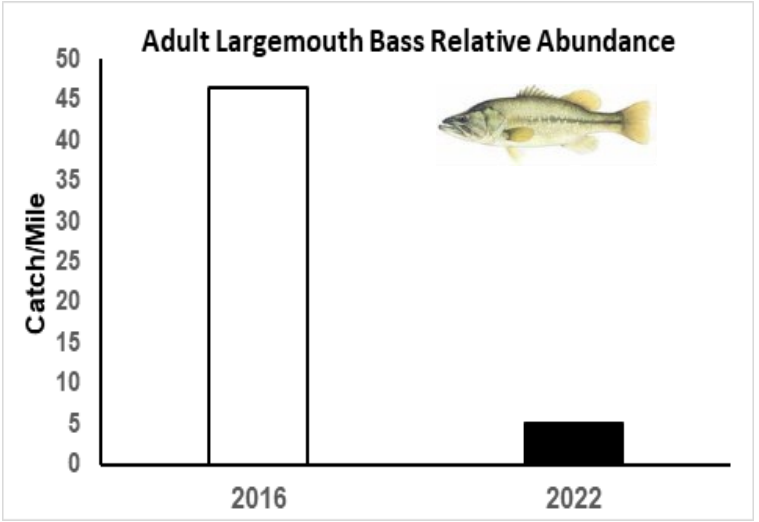
During 2017, before the Yellow Perch/Walleye rehabilitation project, Roberts Lake had the most abundant Northern Pike population in Florence and Forest counties at approximately 7.4 adult Northern Pike per acre. We attempted to assess the Northern Pike population the same way this year but were unable to catch enough pike to conduct a population estimate. In fact, during our early spring netting survey, we only captured two Northern Pike, which was a relative abundance of 0.13 fish/net night. This suggests that pike abundance has dropped approximately 98% over the last five years from a relative abundance of 7.8 fish/net-night. A drop in Northern Pike abundance was expected, as we have been removing them since 2019 as part of the rehabilitation plan. However, we did not expect this drastic of a decrease so quickly. It is our hope that Northern Pike abundance will stay low to give the Walleye and perch populations a good opportunity to rebound.

We did not capture enough pike to assess size structure this year. During 2017, the size structure of the population was extremely poor, with only 18.3% of the pike captured being ≥ 21 inches. If pike abundance is kept low, we anticipate that growth rates will increase and the size structure of the remaining population will become quite good.

LARGEMOUTH BASS

During the last survey, in 2016, before the Walleye rehabilitation project started, we conducted a survey to estimate the abundance of the entire adult Largemouth Bass population. That year, all Largemouth Bass captured during spring fyke net surveys and numerous electrofishing surveys targeting Bass received an identifiable fin clip to estimate the abundance of the Largemouth Bass population (≥ 8.0 inches). From that survey, we estimated the Largemouth Bass population at 3,780 adult fish (9.1/acre), making Roberts Lake the most abundant largemouth population of all the lakes in the area > 100 acres. Just like Northern Pike, the abundant largemouth population became one of the major targets for fish removals in an attempt to rehabilitate the perch and Walleye populations in Roberts Lake. During this year's survey we were not able to conduct a population estimate, but we did perform a bass survey to assess the abundance of adult largemouth, which showed their relative abundance to be 5.2 adults/mile. This suggests that through the removals and the more liberal regulation on largemouth that their abundance has decreased by approximately 89% since 2016, when their relative abundance was 46.5 adults/mile.

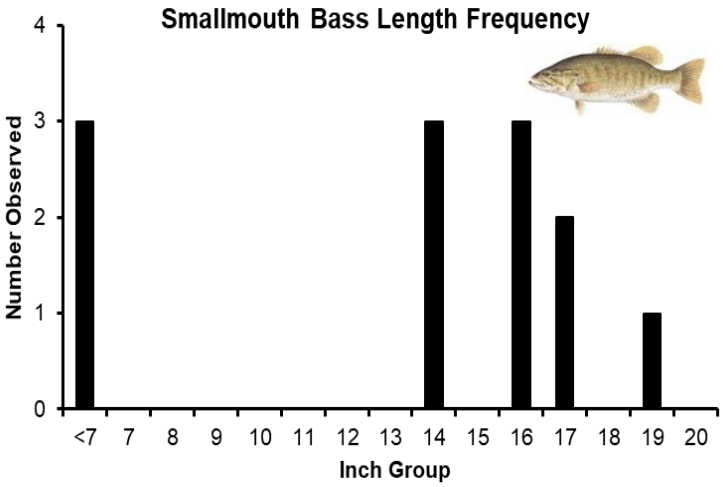
Every Largemouth Bass captured during this year's bass survey was measured to assess size structure, a total of 61 fish. The majority of the fish captured were juveniles and not part of the size structure analysis. Of the 30 largemouth ≥ 8 inches captured during the 2022 survey, approximately 30% were ≥ 15 inches, slightly better than 2016, when 26% were ≥ 15 inches. If we are able to maintain a lower abundance of Largemouth Bass in Roberts Lake we expect that the size structure of the population will continue to get even better.

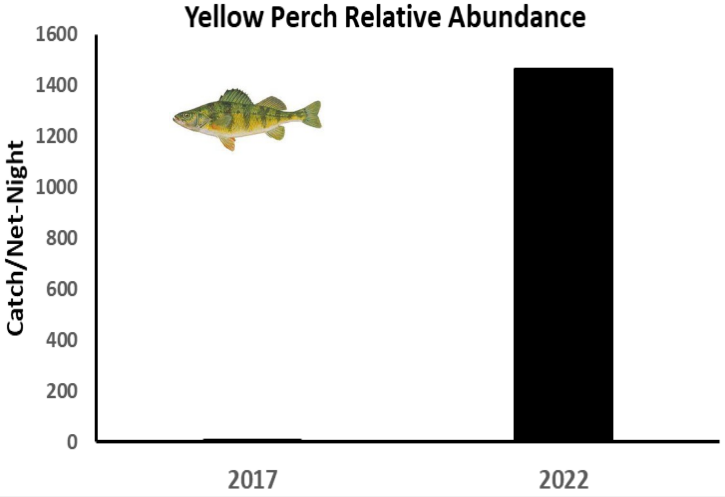


SMALLMOUTH BASS

The Smallmouth Bass population was assessed during the same electrofishing survey conducted for Largemouth Bass. Only 12 smallmouth were captured during that survey, which was a relative abundance of 1.6 adults/mile. However, it is likely that the timing of our survey greatly reduced our catch. Unlike largemouth, the smallmouth tend to spawn on the hard bottom fast breaks in Roberts Lake. In the case of this survey, many smallmouth were observed in water depths that were too deep for us to capture. Future surveys will need to be repeated earlier in the season to accurately assess the smallmouth population.

With such a small sample size, we can't accurately assess size structure. However, the fish that we captured were quite large, with the largest being 19.9 inches in length.





YELLOW PERCH

During the last comprehensive survey, Yellow Perch abundance was 1.7 / net-night which was an all-time low for Roberts Lake. Historically Roberts Lake has had an extremely abundant Yellow Perch Population, averaging approximately 580 fish/net-night from 1942-1999. The low abundance of Yellow Perch and Walleye during the last survey triggered the rehabilitation project, a major removal of Largemouth Bass, Northern Pike and juvenile Bluegill/Pumpkinseed. Only three years after the removals began, the Yellow Perch population is once again extremely abundant with a relative abundance of 1,465 fish/net-night this spring. This tremendous increase in the perch population is an early indication that the perch portion of our rehabilitation project has been successful, and the perch will be a tremendous forage base for all predatory fish species in Roberts Lake.

During the spring netting survey, we measured a subsample of 427 Yellow Perch to assess size structure. Approximately 94.8% of the perch were ≤ 6.9 inches. While we have not looked at structures from these fish to estimate their age, these fish are likely two and three year old fish that have been produced since the start of the rehabilitation project. As these fish grow, it will likely make Roberts Lake a high-quality perch fishery for the years to come.

BLUEGILL

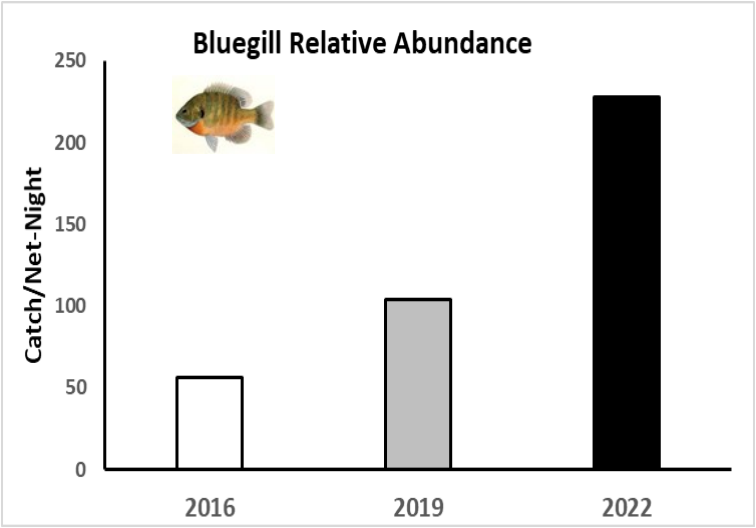
Six nets were set during early to mid-June to assess the Bluegill population in Roberts Lake during 2016, 2019 and 2022. Only three of the net locations were the same during all three surveys, and the data from those specific locations were used to track changes within the Bluegill population.

During the comprehensive survey in 2016-17, we saw that the panfish population in Roberts Lake had transitioned from a Yellow Perch fishery to a Bluegill/Pumpkinseed dominated panfishery. This trend continued from 2016 to 2019 as Bluegill abundance increased by 84% from 56.3/net-night to 103.7/net-night over that 3-year period.

One of the major risks with the perch/Walleye rehabilitation project was that Bluegill/Pumpkinseed abundance would skyrocket in the absence of two major predators (pike and Largemouth Bass). Major increases in Bluegill/Pumpkinseed abundance would likely increase competition with perch, giving the project a lower chance of success. So in 2019, when fish removals started, an incredible amount of effort was put toward removing juvenile Bluegill and Pumpkinseed to control those populations.

As shown in the figure to the right, even with the major effort to remove juvenile Bluegill, the population has continued to increase to a relative abundance of 227.4 fish/net-night in 2022. To further limit the expansion of the Bluegill population, we began removing all Bluegill ≤ 6.9 inches during 2022, which resulted in the removal of 2,996 Bluegill from 3.5-6.9 inches in length.

Every Bluegill captured during the first day of our summer panfish survey was measured to assess the size structure of the population. Bluegill size structure was poor, dropping from 24.9% ≥ 7 inches in 2016 to 11.4% ≥ 7 inches during 2022. Generally, as fish become more abundant, the size structure of the population decreases. Our hope is that we will be able to control Bluegill abundance in Roberts Lake and maintain a moderate size structure in the future.

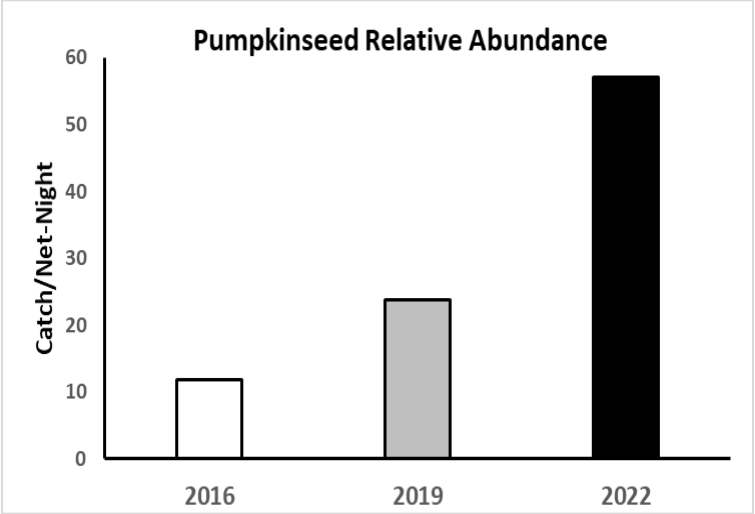


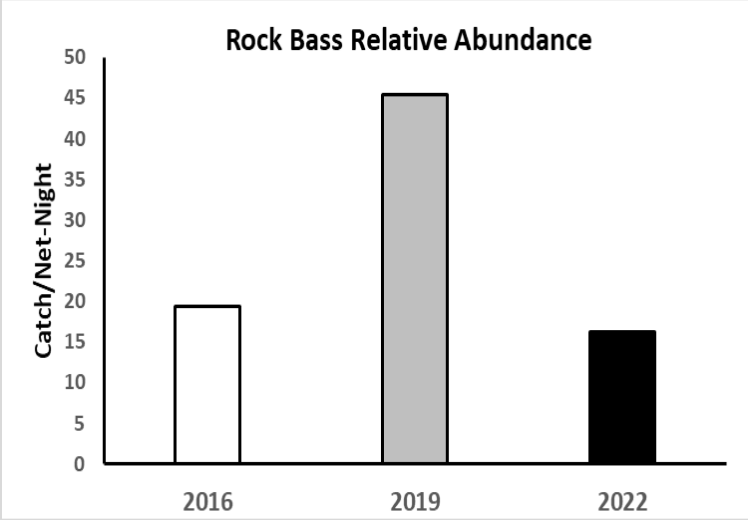
PUMPKINSEED

The Pumpkinseed population was evaluated using the same survey that was used to assess the Bluegill population. This survey showed that Pumpkinseed abundance has increased, similar to Bluegill, over the past six years in Roberts Lake.

As stated in the Bluegill section of this report, an increased abundance of Pumpkinseed would likely reduce the success of the rehabilitation project. The plan to control Pumpkinseed abundance was the same as the plan for Bluegill control. Starting in 2019, juvenile Pumpkinseed removals have been conducted annually, and in 2022, we began removing adult Pumpkinseed as well. A total of 1,469 Pumpkinseed were captured during the 3-day survey to assess the species. All of these fish were removed.

Every Pumpkinseed captured on the first day of our summer panfish survey was measured to assess size structure. Just like the Bluegill population, as Pumpkinseed have become more abundant, their size structure has decreased. During 2016, approximately 20.2% of the fish captured were ≥ 6 inches. This year only 12.5% of our catch was ≥ 6 inches in length.





ROCK BASS

Rock Bass abundance showed the same trend as other summer spawning panfish species in Roberts Lake from 2016 to 2019, increasing from 19.3 fish/net-night to 45.3/net-night. However, unlike Bluegill and Pumpkinseed populations in Roberts Lake, the relative abundance of Rock Bass decreased to 16.2/net-night in 2022. Even though Rock Bass abundance has declined, at a catch rate ≥ 15 fish/net-night, this population is considered to be abundant compared to other waters in this region of Wisconsin.

Every Rock Bass captured on the first day of our summer fyke net survey was measured to assess the size structure of this population. During 2016, Rock Bass size structure was very good, with approximately 58.7% and 4.7% of fish being greater than 7 and 9 inches respectively. Six years later, we see that size structure has become even better, with 52.7% and 13.2% of the fish being greater than 7 and 9 inches.

DISCUSSION & MANAGEMENT RECOMMENDATIONS

This survey afforded us the opportunity to get a short-term look at the impact of the Yellow Perch/Walleye rehabilitation project on the entire fishery. In general, we have seen increases in abundance for nearly all species except Largemouth Bass and Northern Pike (which were manually removed as part of this project). The incredible increase in Yellow Perch abundance in just a few years is almost unbelievable, and really shows that this project has a good chance for success. Natural reproduction of Walleye still occurs annually on Roberts Lake but at levels that are too low to make a substantial positive impact on the population. Part of this project includes the Lake Association stocking genetically appropriate Walleye into Roberts Lake during the years that the DNR does not stock Walleye, and we have high hopes that these stocked fish will survive in good numbers with the current fish community.

The last comprehensive survey of Roberts Lake took place in 2016-17. That survey estimated that Roberts Lake had a total gamefish population of 19.9 adults/acre, with Largemouth Bass (46%) and Northern Pike (37%) accounting for 83% of the total gamefish population. As you have read in this report, both of these populations are down 89% (largemouth) and 98% (pike), thanks to the hard work and dedication from Mole Lake Fisheries. Roberts Lake has lost approximately 75% of its predatory game fish, which has allowed increases in panfish abundance across the board. We plan to fill the void in predators by stocking as many walleye as possible in the upcoming years, and hopefully increase natural reproduction. However, even if we are successful at making Walleye the most abundant game fish, it will take some time for that to happen. So, the focus should be placed on keeping the abundance of Largemouth Bass, Northern Pike, Bluegill and Pumpkinseed down while we wait for the void in predatory fish to be filled.

I recommend continuing to conduct lengthy mini-fyke net removals, which seem to be a good way of controlling recruitment of Largemouth Bass, Bluegill and Pumpkinseed. We are at a point in the project where we have met the removal goals for adult Largemouth Bass and Northern Pike, and we have no plans to conduct large-scale adult panfish removals. So in order to have the best chance of success for the Yellow Perch/Walleye rehabilitation project, it is time for anglers to do their part. We encourage anglers who catch Largemouth Bass, Northern Pike, Bluegill or Pumpkinseed to harvest fish if they will put them to good use. Keeping those populations under control while we wait for Walleye to fill the predator void is the best thing that can be done at this stage of the project.

I would like to thank the Mole Lake Tribe and Mole Lake Fisheries for the tremendous amount of effort they have put into this project. Without the dedication they have shown, this project would never have been attempted. I would also like to thank the Roberts Lake Association, not only did they support this unique project, but they have stepped up to the plate financially by purchasing Walleye to fill the predatory void in Roberts Lake as quickly as possible.

Everyone involved in this project has high hopes for success. We will continue to monitor the fishery to gauge the long-term success of this project.