

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

**Big Arbor Vitae Lake
2023-2024 Creel Survey Report**

Vilas County



Treaty Fisheries Publication



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Introduction

Fish populations can fluctuate due to a variety of factors including natural forces like climate, reproductive success, predation and competition. Human activities such as fish harvest, stocking, habitat change and invasive species introduction can also have significant impacts. The Wisconsin Department of Natural Resources (DNR) fisheries crews regularly conduct fishery surveys on lakes and reservoirs to gather the information needed to monitor changes, identify concerns, evaluate past management actions and to prescribe fishery management strategies. Netting and electrofishing surveys are used to gather data on the status of fish populations and communities, measuring such parameters as species composition, population size, reproductive success, size and age distribution and growth rates. Harvest is another key component of fisheries that we need to measure.

On many lakes in the Ceded Territory of northern Wisconsin, harvest of fish is divided between sport anglers and the six Ojibwe bands who harvest fish under rights reserved by federal treaties. The tribes harvest fish primarily using spearing, a highly efficient method, during a relatively short time in the spring. Every fish in the spear harvest is counted and reported, creating a complete census of the harvest.

We also measure the sport angler harvest to assess its impact on the fishery. It would be highly impractical and very costly to conduct a complete census of every angler who fishes on a lake, so we conduct creel surveys instead.

A creel survey is an assessment tool used to sample the fishing activities of anglers on a body of water to make estimates of harvest and other fishery parameters. Creel survey clerks work on randomly-selected days and shifts, forty hours per week. The survey is conducted during daylight hours throughout the open season for gamefish from the first Saturday in May through the first Sunday in

March. Creel surveys are not conducted in November when fishing effort is low and ice conditions are often unsafe.

Creel survey clerks travel their lakes using a boat or snowmobile to count the number of anglers at predetermined times and to interview anglers who have completed their fishing trip. Data are collected on what species they fished for, catch, harvest, lengths of fish harvested, marks (fin clips or tags) and hours of fishing effort. Collecting completed-trip data provides the most accurate assessment of angling activities and it avoids the need to disturb anglers while they are fishing.

A computer program is used to estimate catch and harvest of each species, catch and harvest rates and fishing effort by month, as well as for the year in total. Keep in mind that these are estimates based on the best information available and not a complete accounting of effort, catch and harvest. Accurate estimates require that we sample a sufficient and representative portion of the angling activity on a lake. The accuracy of creel survey results depends on good cooperation and truthful responses by anglers when a creel clerk interviews them.

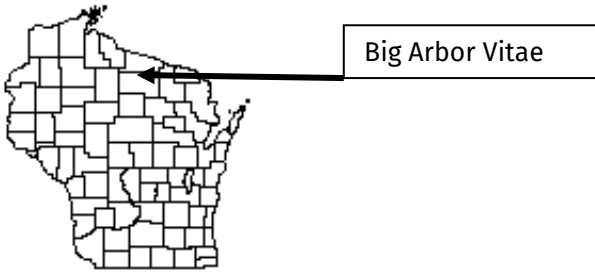
You may have encountered a DNR creel survey clerk on a recent fishing trip. We appreciate your cooperation during an interview. The survey only takes a few minutes of your time and it gives the DNR valuable information needed for management of the fishery.

This report provides estimates of:

1. Overall fishing effort (pressure)
2. Fishing effort directed at each species
3. Numbers of fish caught and harvested
4. Catch and harvest rates

Also included are a physical description of Big Arbor Vitae Lake, discussion of results of the survey and detailed summaries by species of fishing effort, catch and harvest.

General Lake Information



LOCATION

Big Arbor Vitae Lake is located in Vilas County in the town of Arbor Vitae.

PHYSICAL CHARACTERISTICS

Big Arbor Vitae Lake is a 1,090-acre drainage lake with a maximum depth of 41 feet. Littoral substrate consists primarily of sand, gravel and lesser amounts of muck. Big Arbor Vitae Lake contains medium-hard, alkaline, clear water of low to moderate transparency.

SEASONS SURVEYED

The period referred to in this report as the 2023-24 fishing season ran from May 6, 2023 through March 3, 2024. The summer creel survey ran from May 6 through Oct. 31, 2023, and the winter creel survey ran from Dec. 1, 2023 through March 3, 2024.

WEATHER

Ice-out on Big Arbor Vitae Lake was in early May 2023. Fishable ice formed on Big Arbor Vitae Lake in mid-December 2023.

FISHING REGULATIONS

The following seasons, daily bag limits and length limits were in place on Big Arbor Vitae Lake during the 2023-24 fishing season:

SPECIES	SEASON	BAG LIMIT	MIN. SIZE
Largemouth bass	5/06 - 3/03	5*	14"
Smallmouth bass	5/06 - 6/16	Catch & Release	
	6/17 - 3/03	5*	14"
*Bass species have a combined bag limit of 5.			
Muskellunge	5/27 - 12/31	1	40"
	On open water		
Northern pike	5/06 - 3/03	5	None
Walleye	5/06 - 3/03	3	None
		1-14"	
Panfish	Open all year	25	None
Rock bass	Open all year	None	None

Species Catch And Harvest Information

Summaries of angling effort, catch and harvest information for each species are in Table 2 and Figures 1-10, along with a comparison of these statistics with the previous creel survey in Table 2. Information about species with fishing seasons extending beyond March 3, 2024, should be considered minimum estimates. Each species page has up to five graphs depicting the following:

- DIRECTED FISHING EFFORT**
Estimated number of hours during each month that anglers spent fishing for a species.
- TOTAL CATCH AND HARVEST**
Estimated number of fish of the indicated species caught or harvested by all anglers, regardless of targeted species.
- SPECIFIC CATCH AND HARVEST RATES**
Estimated number of hours it takes an angler to catch or harvest a fish of the indicated species. Only information from anglers who were specifically targeting that species is reported.
- LENGTH DISTRIBUTION OF HARVESTED FISH**
All fish of a species that were measured by the clerk during the entire creel survey season.
- LARGEST AND AVERAGE LENGTH OF HARVESTED FISH**
Largest and average (mean) length of a species of fish harvested. Only fish measured by the creel survey clerk are reported.

Creel Survey Results And Discussion

SURVEY LOGISTICS

Due to staffing issues, the winter creel days on Big Arbor Vitae Lake were split with another creel lake. This may have impacted

estimates during the winter months. This was the 10th time the DNR conducted a creel survey on Big Arbor Vitae Lake. The last creel survey took place during 2020-21.

GENERAL ANGLER INFORMATION

Anglers spent 45,223 hours, or 41.5 hours per acre, fishing Big Arbor Vitae Lake during the 2023-24 season (Table 1). That was more than the Vilas County average of 33.5 hours per acre, and less than the fishing effort documented during the 2020-21 creel survey (47.9 hours per acre). June was the most heavily fished month (10,025 hours). Creel clerks were able to conduct 840 interviews throughout the survey.

RESULTS BY SPECIES

WALLEYE (Table 2, Figure 1)

Walleye received the highest fishing effort of any gamefish species during the season. Anglers spent 17,283 hours targeting walleye. Fishing effort for walleye was highest in May (3,259 hours). Total catch of walleye was 1,776 fish, and total harvest was 974 fish. Highest catch (430 fish) occurred in May, and highest harvest (213 fish) occurred in October. Anglers fished an estimated 10 hours to catch, and 17.9 hours to harvest a walleye during the survey. Mean length of harvested walleye was 15.8 inches and the largest measured was a 26-inch fish.

NORTHERN PIKE (Table 2, Figure 2)

Fishing effort directed at northern pike was 9,534 hours during the season. Northern pike fishing effort was greatest in January (2,763 hours). Total catch of northern pike was 863 fish, and total harvest was 129 fish. Anglers fished an estimated 20.6 hours to catch a northern pike during the survey. Mean length of harvested northern pike was 26 inches and the largest measured was a 30.5-inch fish.

MUSKELLUNGE (Table 2, Figure 3)

Anglers spent 9,277 hours targeting muskellunge during the season. Muskellunge fishing effort was greatest in September (2,208 hours). Total catch of muskellunge was 153 fish, and the highest catch (56 fish) occurred in August. Total harvest of

muskellunge was 9 fish in August. Anglers fished an estimated 70.8 hours to catch a muskellunge. Largest measured was 47.8-inches.

SMALLMOUTH BASS (Table 2, Figure 4)

Fishing effort targeted at smallmouth bass was 6,119 hours during the season. Smallmouth bass fishing effort was greatest in June (2,554 hours). Total catch of smallmouth bass was 3,029 fish, with 36 fish harvested. Highest catch (1,143 fish) occurred in July. Anglers fished an estimated 3.2 hours to catch a smallmouth bass during the survey. Mean length of harvested smallmouth bass was 15.6 inches and the largest measured was a 18.5-inch fish.

LARGEMOUTH BASS (Table 2, Figure 5)

Fishing effort directed at largemouth bass was 8,877 hours during the season. Largemouth bass fishing effort was greatest in June (3,351 hours). Total catch of largemouth bass was 7,466 fish, and total harvest was 280 fish. The highest catch (3,422 fish) occurred in June. Anglers fished an estimated 1.5 hours to catch a largemouth bass during the survey. Mean length of harvested largemouth bass was 15.3 inches and the largest measured was a 17.8-inch fish.

YELLOW PERCH (Table 2, Figure 6)

Yellow perch received 13,881 hours of directed fishing effort. Total catch of yellow perch was 24,459 fish, and total harvest was 1,247 fish. Mean length of yellow perch harvested was 8.5 inches.

BLUEGILL (Table 2, Figure 7)

Fishing effort directed at bluegill was 15,500 hours. Total catch of bluegill was 24,824 fish, and total harvest was 3,585 fish. Mean length of bluegill harvested was 7.1 inches.

BLACK CRAPPIE (Table 2, Figure 8)

Black crappie were the most sought after panfish species during the survey. Black crappie received 18,125 hours of directed fishing effort. Anglers caught 11,354 black crappie and harvested 3,608 fish. Mean length of black crappie harvested was 9.8 inches.

PUMPKINSEED (Table 2, Figure 9)

Pumpkinseed received 10,811 hours of directed fishing effort. Anglers caught 6,502 pumpkinseed and harvested 835 fish. Mean length of pumpkinseed harvested was 6.9 inches.

ROCK BASS (Table 2, Figure 10)

Rock bass received 252 hours of directed fishing effort. Anglers caught 3,091 rock bass and harvested 207 fish. Mean length of rock bass harvested was 7.7 inches.

BOWFIN (Table 2)

Anglers caught 24 bowfin, no harvest was observed.

BURBOT (Table 2)

Anglers caught 12 burbot, no harvest was observed.

MOTTLED SCULPIN (Table 2)

Anglers caught 5 mottled sculpin, no harvest was observed.

WHITE SUCKER (Table 2)

Anglers caught 5 white sucker, no harvest was observed.

Acknowledgments

The DNR would like to thank all the anglers who took the time to offer information about their fishing trip to the survey clerk. The survey would not have been possible without their cooperation.

Completion of this survey was possible because of the efforts of the following DNR fisheries management staff: John Kubisiak, Lawrence Eslinger, Jason Halverson, Mark Love, Eric Brown and Bob Consolo. Creel clerks on Big Arbor Vitae Lake during the survey period were Marty Kiepke, Richard Cechal and Ryan Flaherty.

Additional copies of this report and those covering other local lakes, can be obtained from the DNR Woodruff Service Center or online at:

<http://dnr.wisconsin.gov/topic/Fishing/north/trtycrsrvys.html>

Table 1. Sportfishing effort summary, Big Arbor Vitae Lake, 2023-24 season; compared to 2020-21 creel results, Vilas County averages, and Ceded Territory averages.

Month	Number of Angler Party Interviews	Total Angler Hours	Total Angler Hours/Acre	2020-21 Total Angler Hours/Acre	2023-24 Vilas County Average Hours/Acre	Ceded Territory Average Hours/Acre
May	130	6,864	6.3	7.8	5.1	4.7
June	125	10,025	9.2	5.5	6.7	6.0
July	129	6,195	5.7	6.3	7.0	6.4
August	108	4,611	4.2	6.6	6.1	5.1
September	98	4,056	3.7	3.6	4.1	3.1
October	85	2,349	2.2	1.9	1.9	1.4
December	67	3,646	3.3	5.2	0.6	1.0
January	47	3,448	3.2	6.7	1.0	1.7
February	46	3,697	3.4	2.4	1.0	1.6
March	5	334	0.3	1.9	0.2	0.2
Summer Total	675	34,099	31.3	31.7	30.9	26.7
Winter Total	165	11,124	10.2	16.2	2.8	4.5
Grand Total	840	45,223	41.5	47.9	33.5	30.7

Note: Summer is May-October; Winter is December-March

Number of Angler Party Interviews is the number of groups of anglers interviewed by the creel clerk. A party is considered the members of a group who fish together in the same boat, ice shanty or from shore. The clerk fills out one interview form for each group of anglers. The number of individual anglers actually contacted by the clerk is usually much greater than the number of groups listed in this table since most groups consist of more than one angler.

Total Angler Hours is the estimated total number of hours that anglers spent fishing on Big Arbor Vitae Lake during each month surveyed.

Total Angler Hours/Acre is the total angler hours divided by the area of the lake in acres. This is useful in order to compare effort on Big Arbor Vitae Lake to other lakes.

2020-21 Total Angler Hours/Acre is the total angler hours divided by the area of the lake in acres. This is from the previous creel survey that took place on Big Arbor Vitae Lake.

County Average Hours/Acre is the average angler effort in hours per acre for county lakes that have been surveyed since 1990. This value is useful for fishing pressure comparisons with other waters.

Ceded Territory Average Hours/Acre is the average angler effort in hours per acre for inland lakes in the Ceded Territory that have been surveyed since 1990. This value can be used to compare Big Arbor Vitae Lake to other lakes in northern Wisconsin.

Table 2. Comparison of creel survey synopses, Big Arbor Vitae Lake, 2023-24 and 2020-21 fishing seasons.

CREEL YEAR: 2023-24

SPECIES	DIRECTED EFFORT (Hours)	PERCENT OF TOTAL	TOTAL CATCH	SPECIFIC CATCH RATE (Hrs/Fish)	TOTAL HARVEST	SPECIFIC HARVEST RATE (Hrs/Fish)	MEAN LENGTH OF HARVESTED FISH
Walleye	17,283	15.8%	1,776	10.0	974	17.9	15.8
Northern Pike	9,534	8.7%	863	20.6	129	83.9	26.0
Muskellunge	9,277	8.5%	153	70.8	9	981.2	47.8
Smallmouth Bass	6,119	5.6%	3,029	3.2	36	411.9	15.6
Largemouth Bass	8,877	8.1%	7,466	1.5	280	39.2	15.3
Yellow Perch	13,881	12.7%	24,459	0.6	1,247	11.8	8.5
Bluegill	15,500	14.1%	24,824	0.7	3,585	4.5	7.1
Black Crappie	18,125	16.5%	11,354	1.7	3,608	5.1	9.8
Pumpkinseed	10,811	9.9%	6,502	2.2	835	13.8	6.9
Rock Bass	252	0.2%	3,091	2.4	207	11.1	7.7
Bowfin	*	0.0%	24	*	0	*	**
Burbot	*	0.0%	12	*	0	*	**
Mottled Sculpin	*	0.0%	5	*	0	*	**
White Sucker	*	0.0%	5	*	0	*	**

CREEL YEAR: 2020-21

SPECIES	DIRECTED EFFORT (Hours)	PERCENT OF TOTAL	TOTAL CATCH	SPECIFIC CATCH RATE (Hrs/Fish)	TOTAL HARVEST	SPECIFIC HARVEST RATE (Hrs/Fish)	MEAN LENGTH OF HARVESTED FISH
Walleye	15,337	17.5%	735	23.9	298	57.3	18.0
Northern Pike	7,452	8.5%	830	16.1	207	44.6	23.3
Muskellunge	6,126	7.0%	124	56.0	0	*	**
Smallmouth Bass	5,268	6.0%	1,907	3.7	102	74.9	15.0
Largemouth Bass	5,103	5.8%	1,573	4.7	107	57.5	16.9
Yellow Perch	12,163	13.9%	6,218	2.2	969	13.5	8.2
Bluegill	17,409	19.9%	34,092	0.6	6,616	2.7	7.3
Black Crappie	16,267	18.6%	6,673	2.4	3,183	5.1	10.3
Pumpkinseed	1,765	2.0%	2,238	1.0	722	3.1	7.7
Rock Bass	694	0.8%	1,213	1.4	155	5.9	**
Bullhead sp.	0	0.0%	10	*	0	*	**

Note: If a species is not shown in a table, no data was collected by the creel clerks for that species.

* Indicates that no fish of this species were caught or harvested (depending on the column) by anglers who specifically targeted this species.

** Indicates that no fish were measured by the creel clerks for this species.

WALLEYE

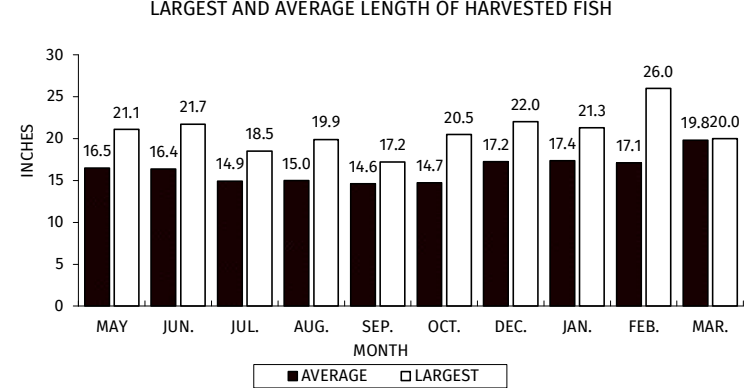
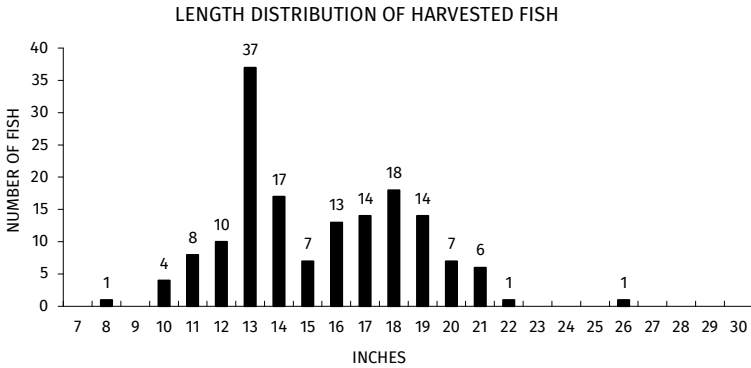
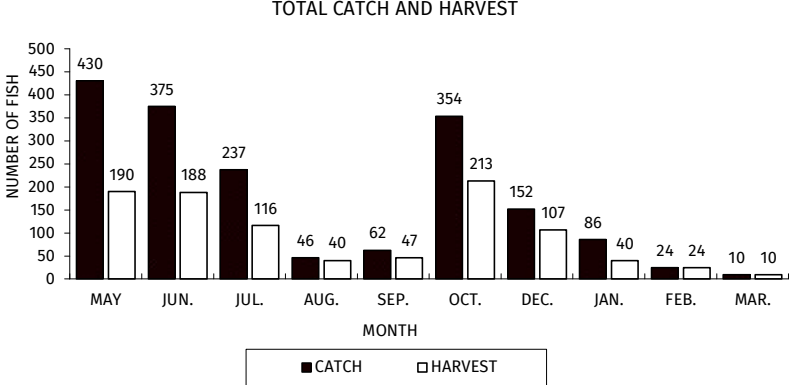
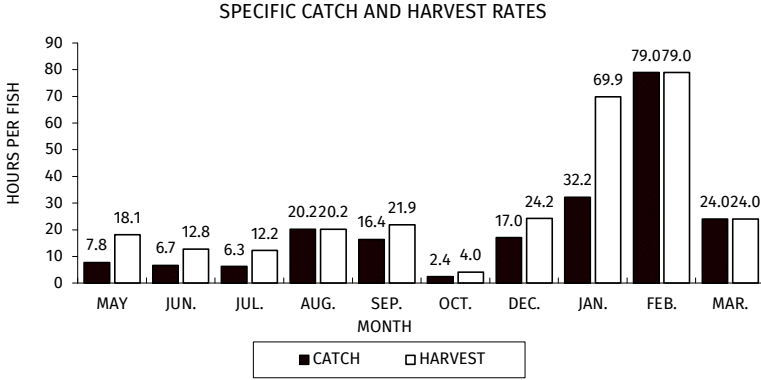
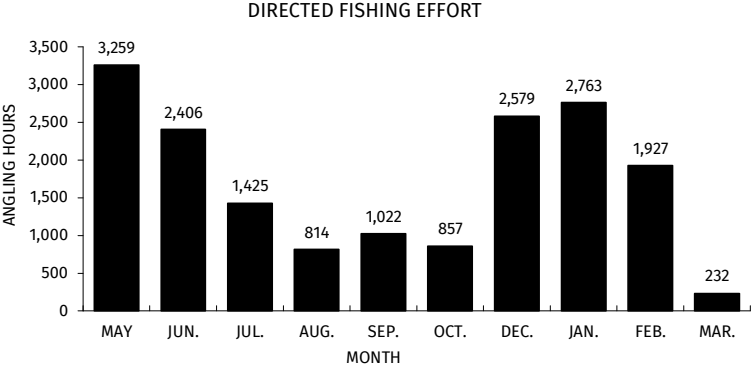
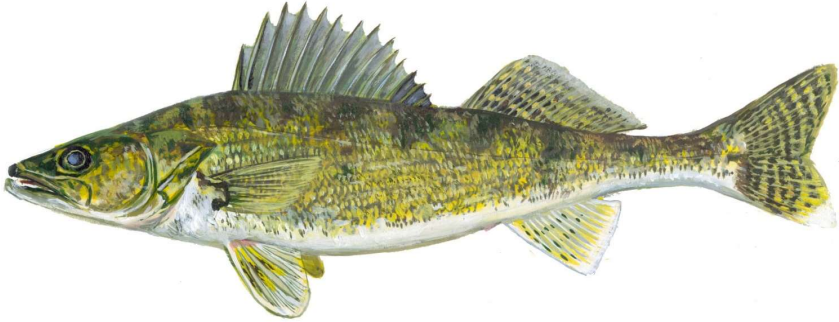
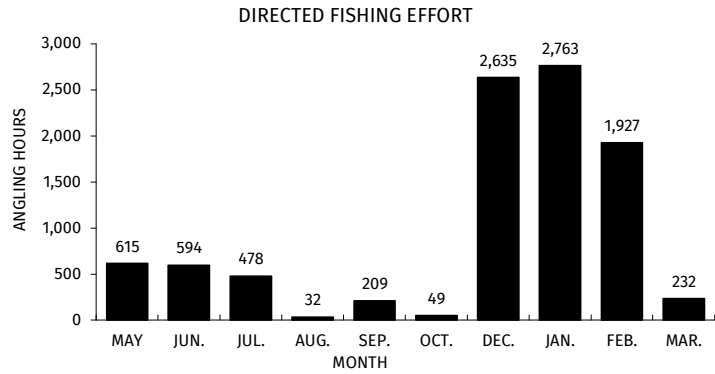


Figure 1. Walleye fishing effort, catch, harvest and length distribution, Big Arbor Vitae Lake, during 2023-24.



NORTHERN PIKE

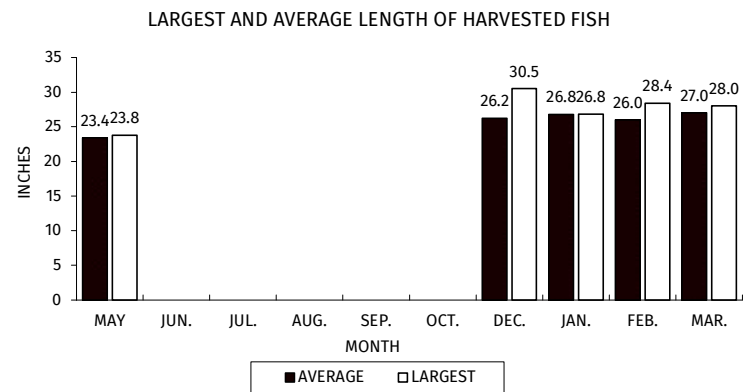
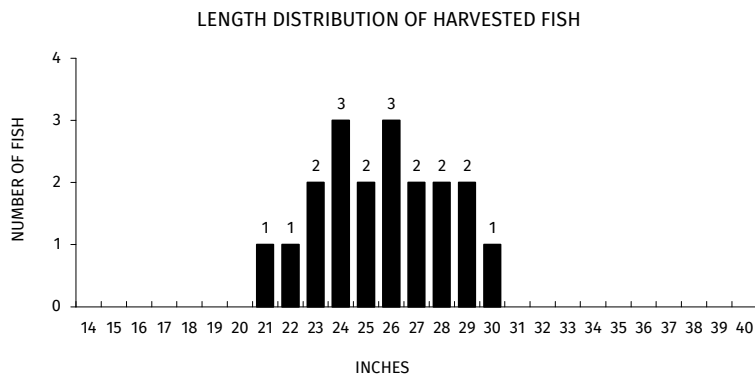
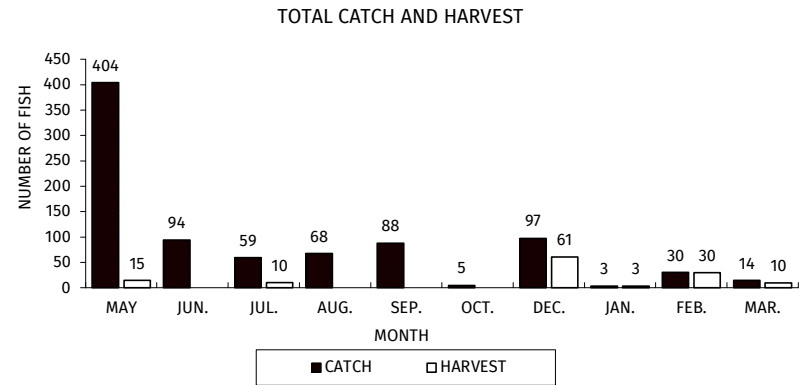
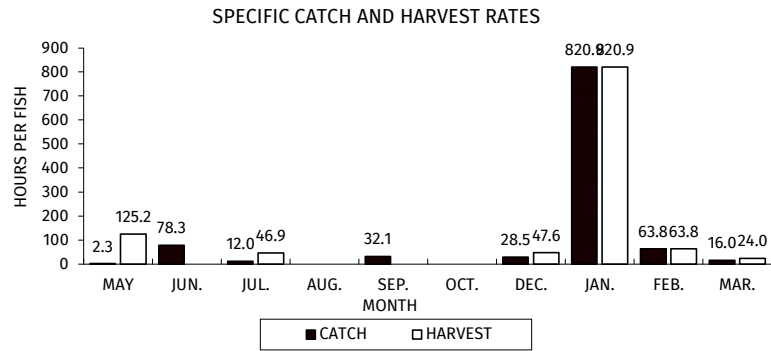


Figure 2. Northern pike fishing effort, catch, harvest and length distribution, Big Arbor Vitae Lake, during 2023-24.

MUSKELLUNGE

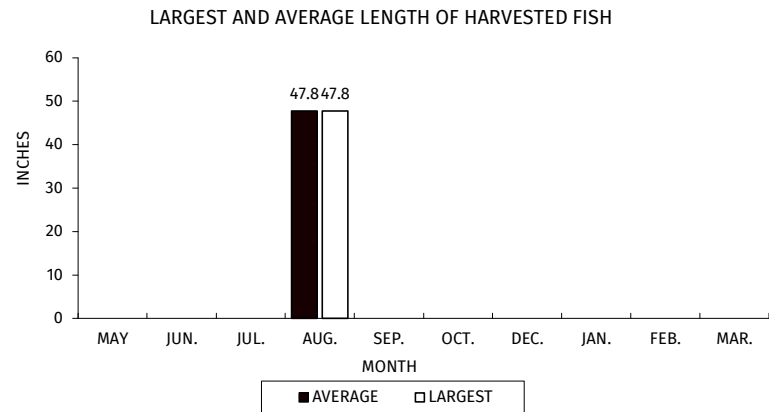
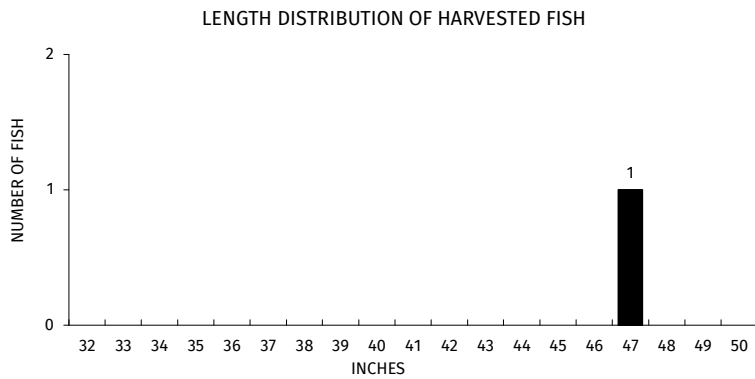
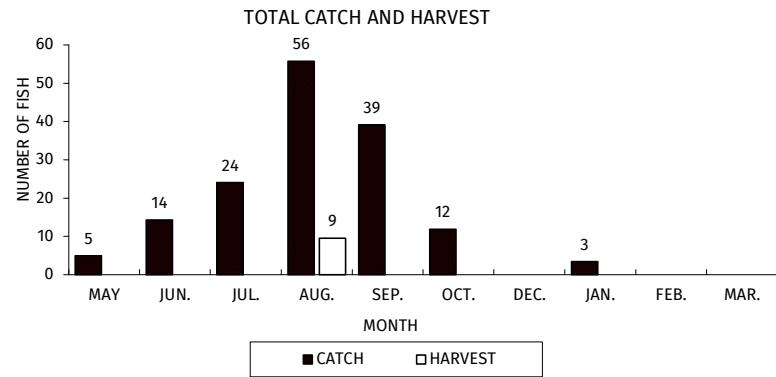
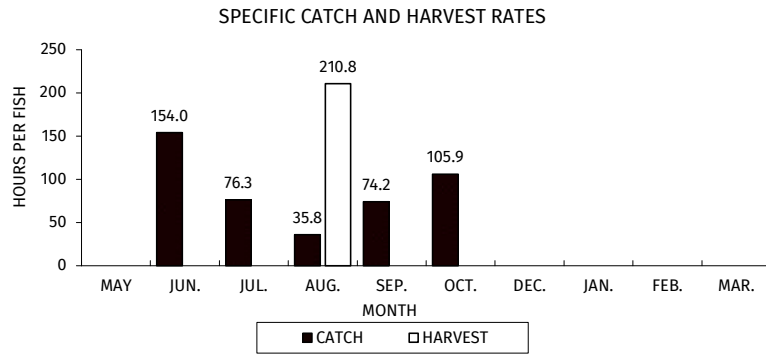
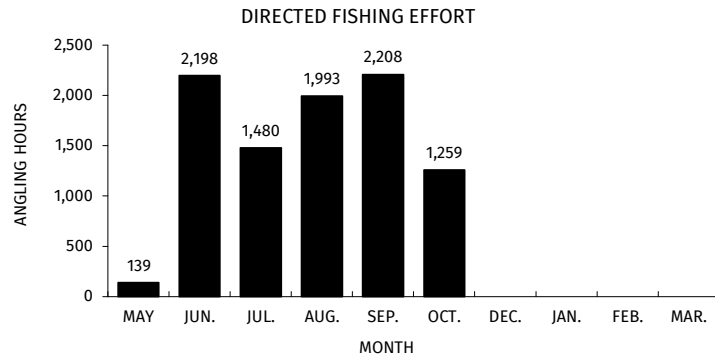


Figure 3. Muskellunge fishing effort, catch and harvest, Big Arbor Vitae Lake, during 2023-24.

SMALLMOUTH BASS

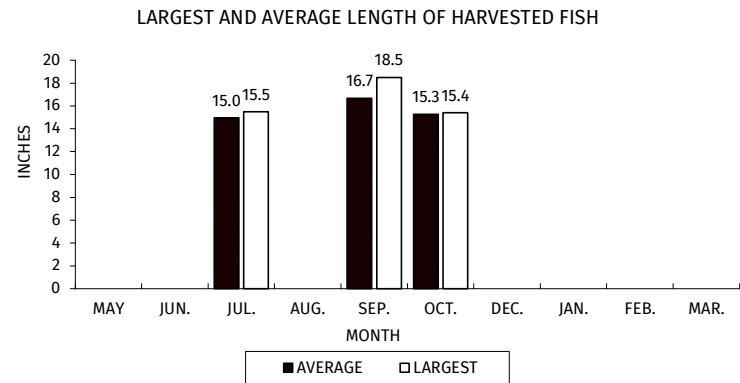
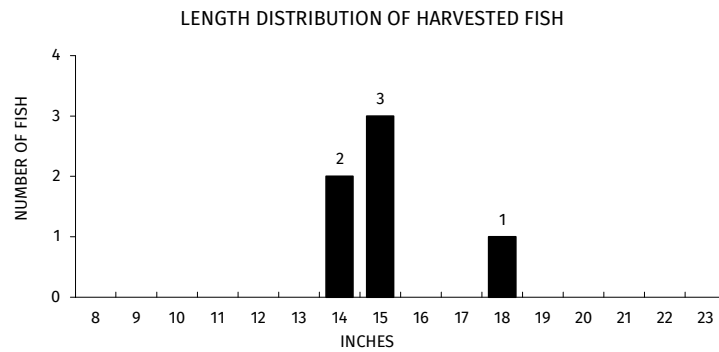
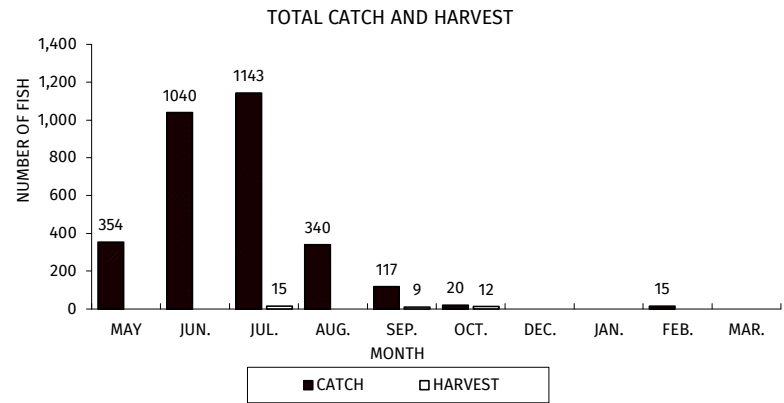
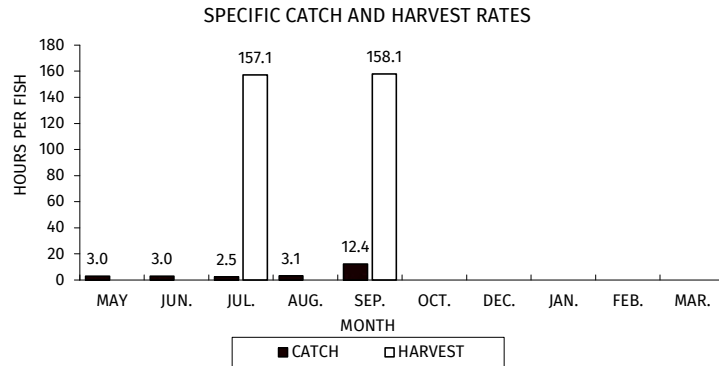
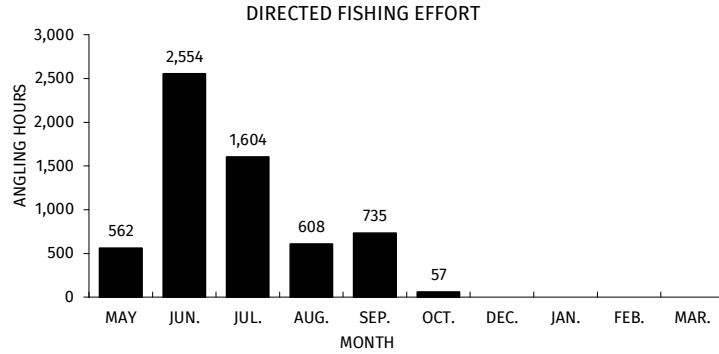


Figure 4. Smallmouth bass fishing effort, catch, harvest and length distribution, Big Arbor Vitae Lake, during 2023-24. 10

LARGEMOUTH BASS

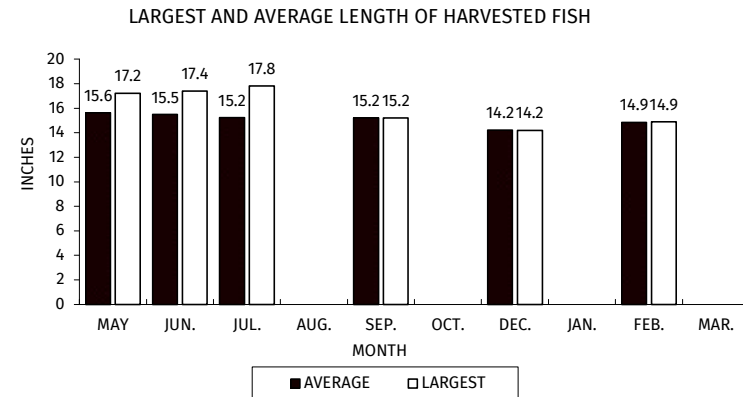
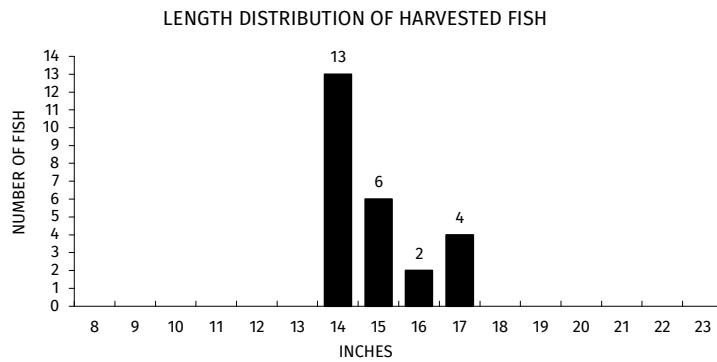
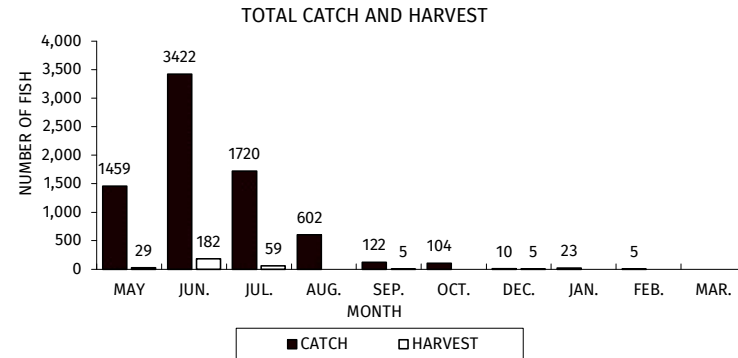
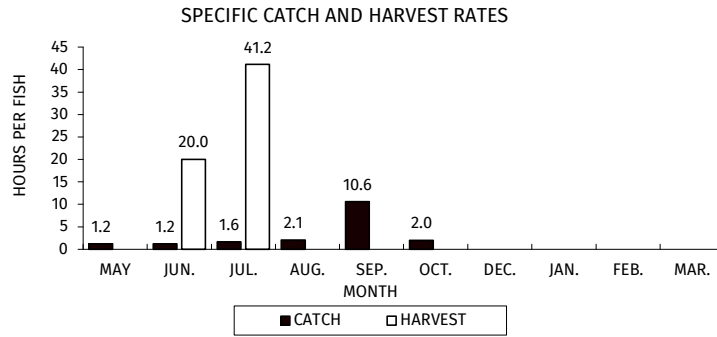
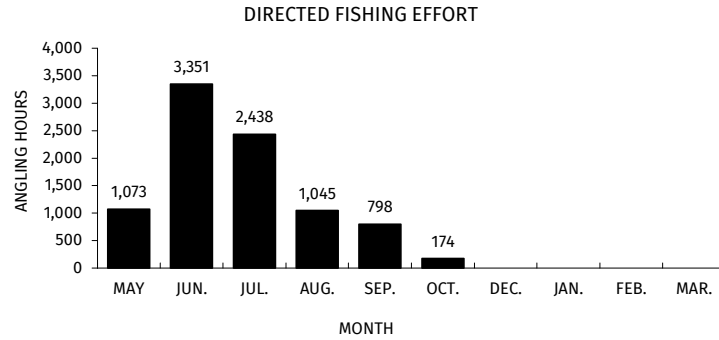
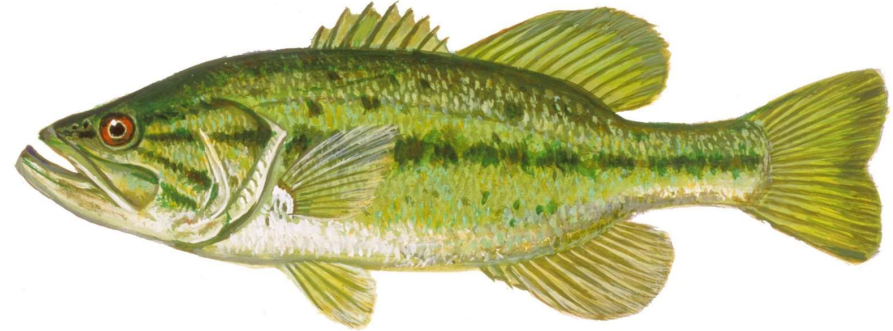


Figure 5. Largemouth bass fishing effort, catch, harvest and length distribution, Big Arbor Vitae Lake, during 2023-24. 11

YELLOW PERCH

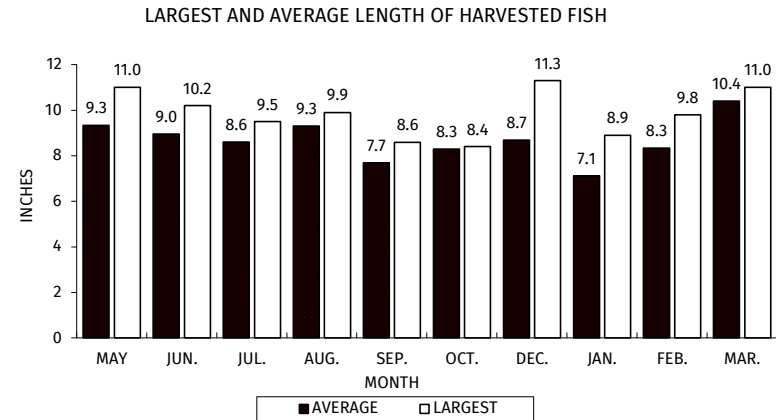
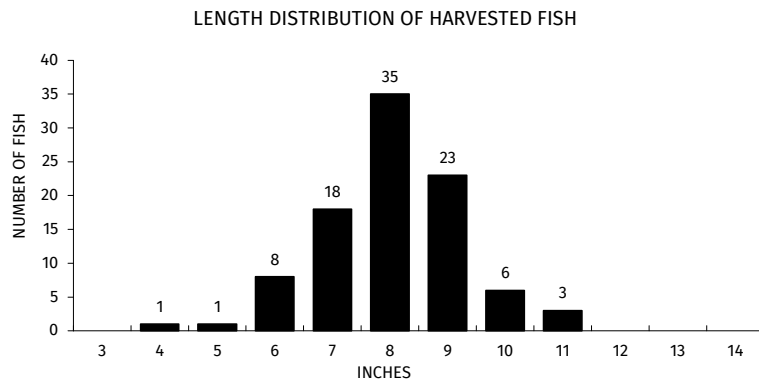
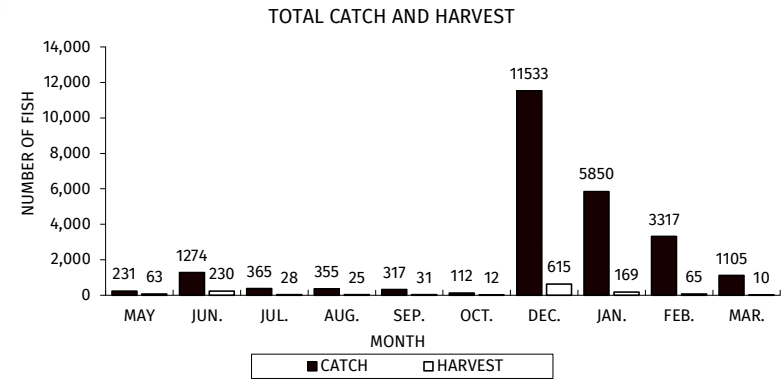
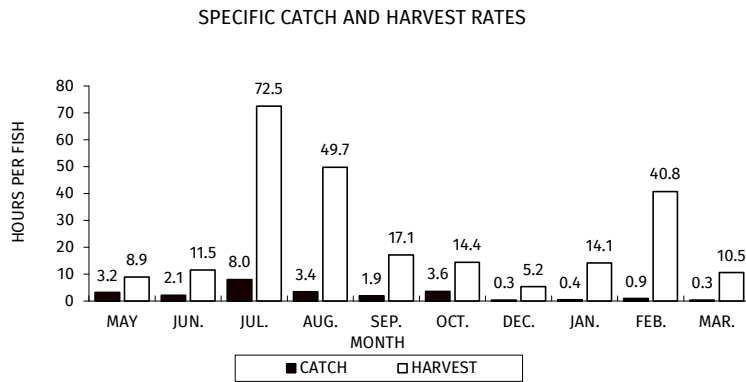
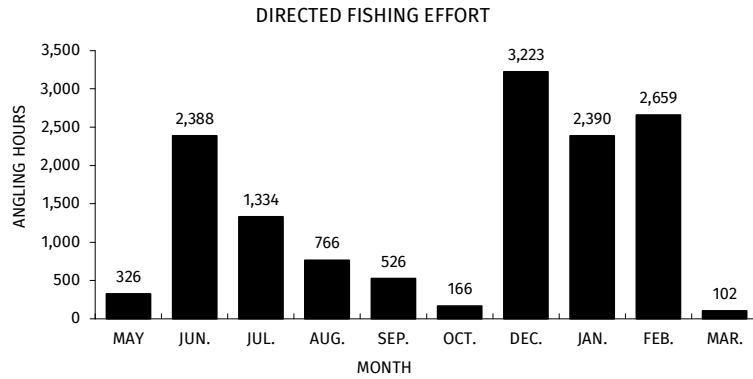
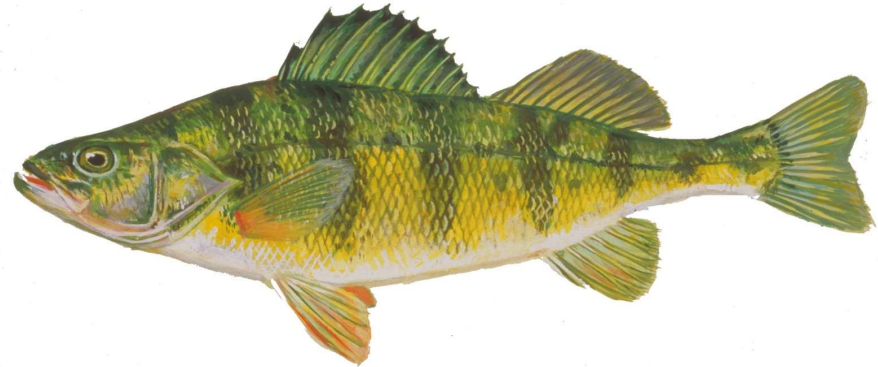


Figure 6. Yellow perch fishing effort, catch, harvest and length distribution, Big Arbor Vitae Lake, during 2023-24.

BLUEGILL

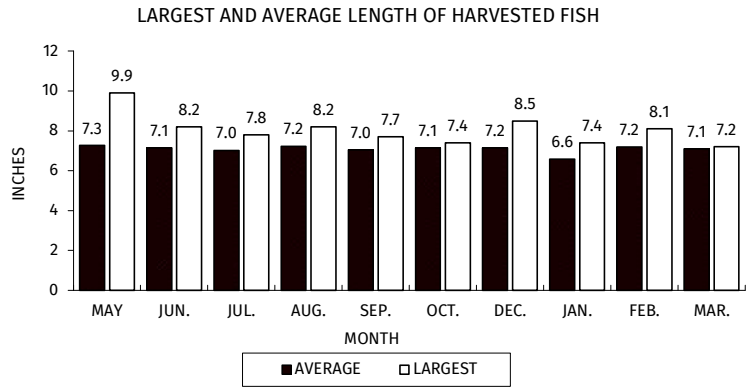
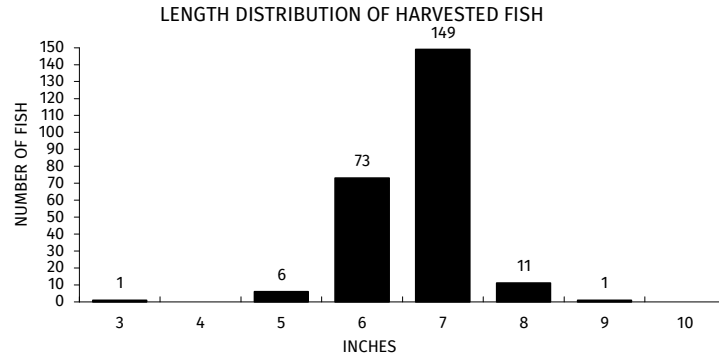
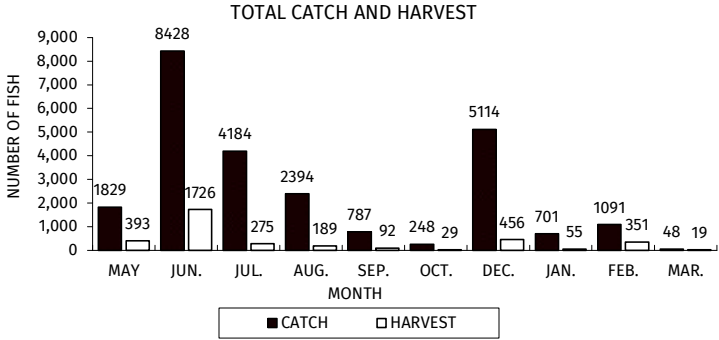
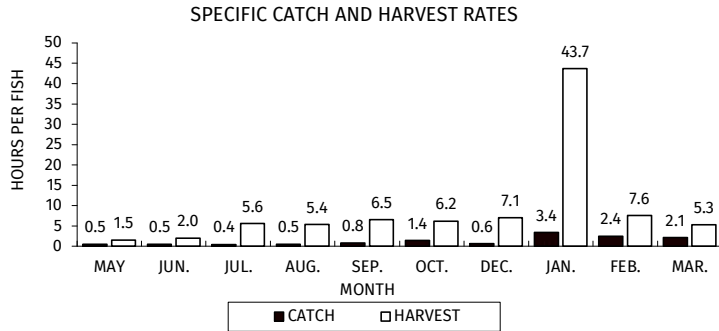
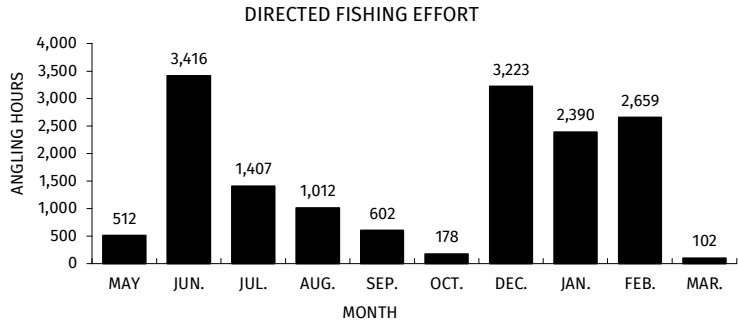
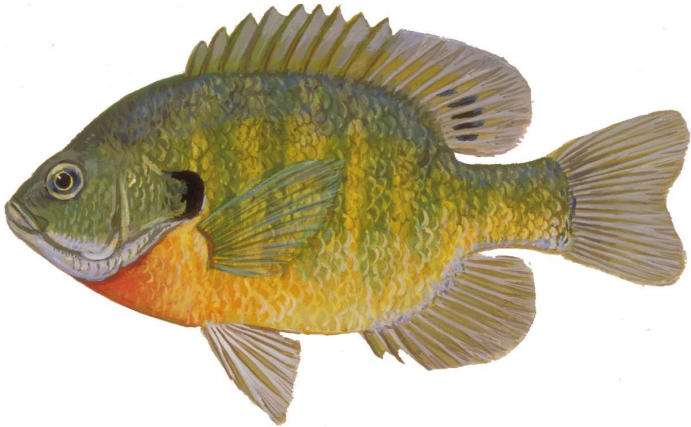


Figure 7. Bluegill fishing effort, catch, harvest and length distribution, Big Arbor Vitae Lake, during 2023-24.

BLACK CRAPPIE

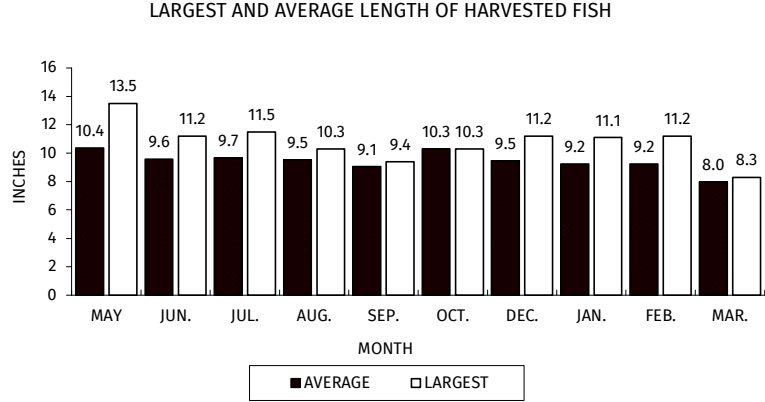
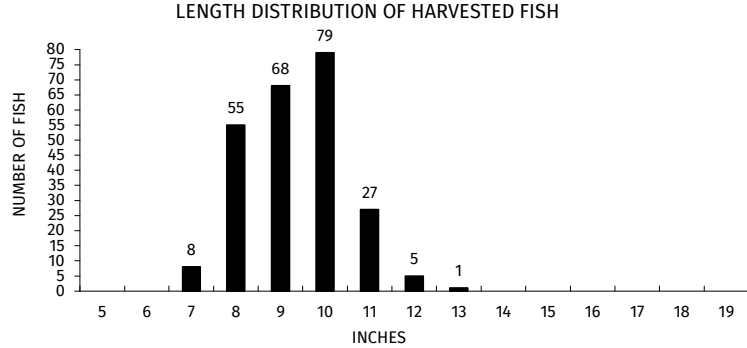
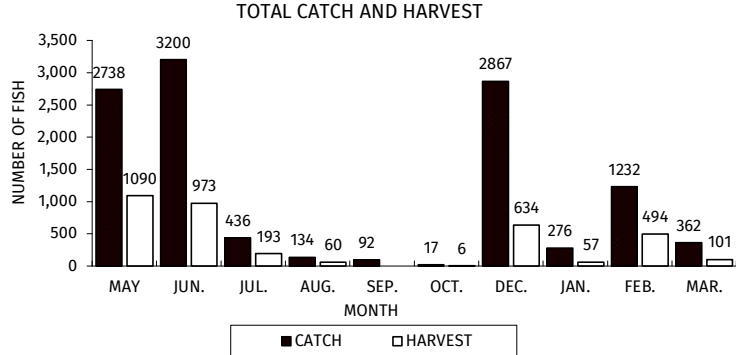
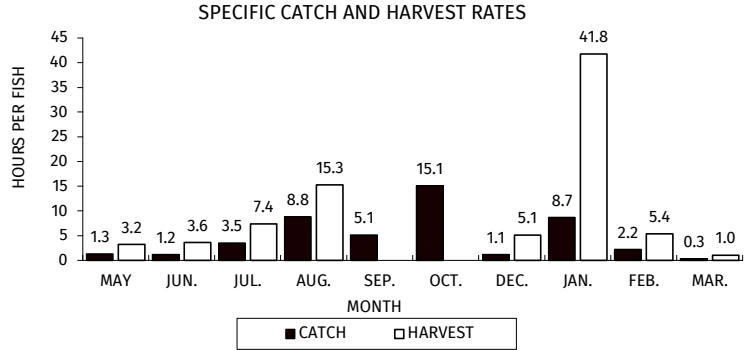
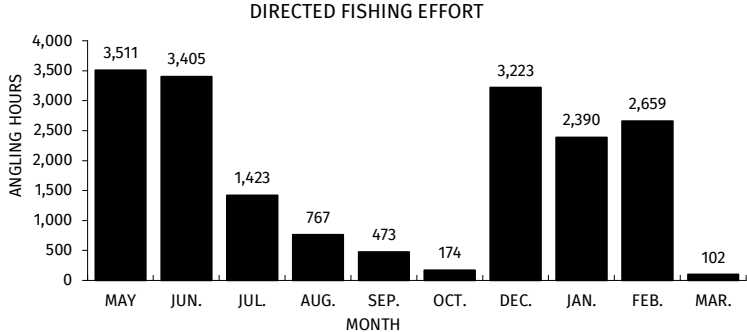
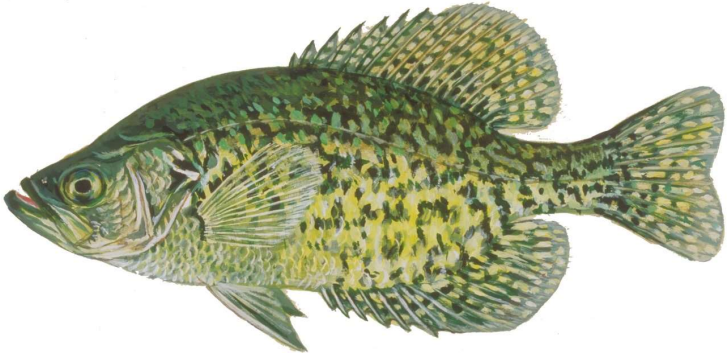


Figure 8. Black crappie fishing effort, catch, harvest and length distribution, Big Arbor Vitae Lake, during 2023-24.

PUMPKINSEED

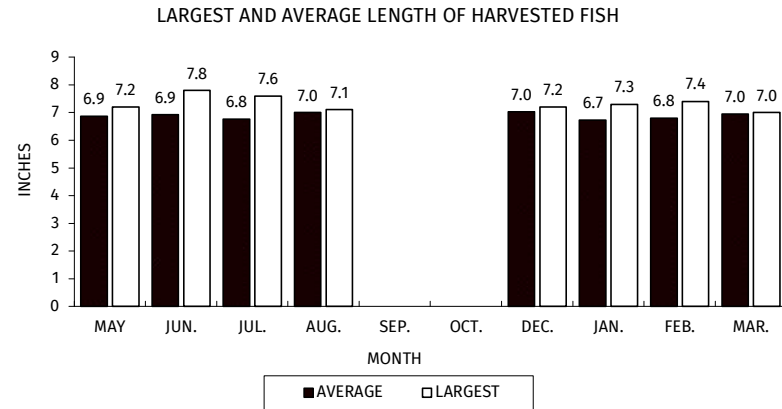
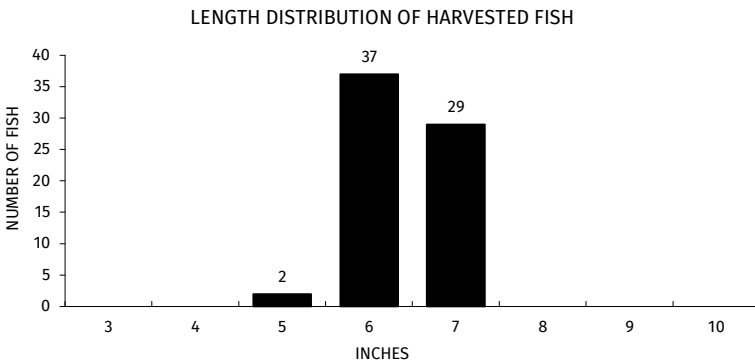
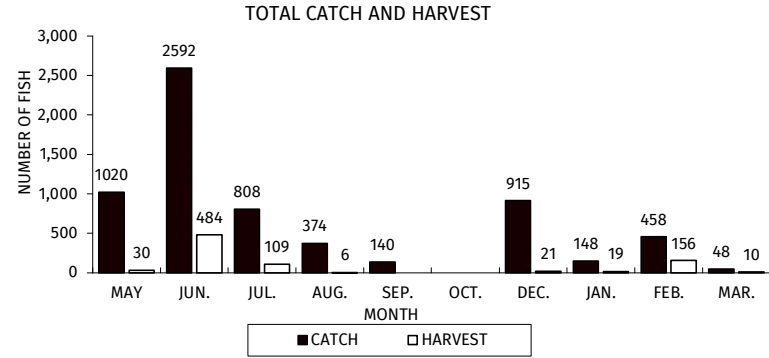
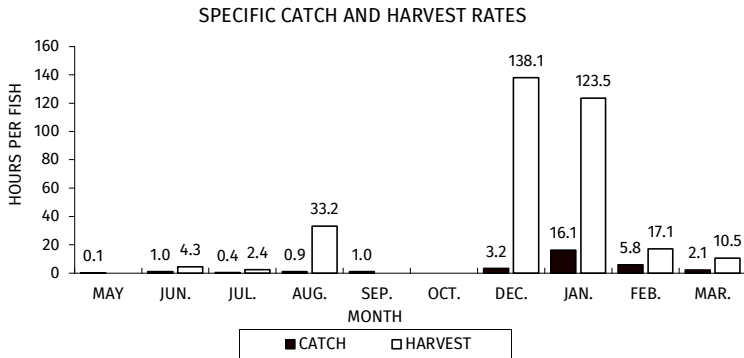
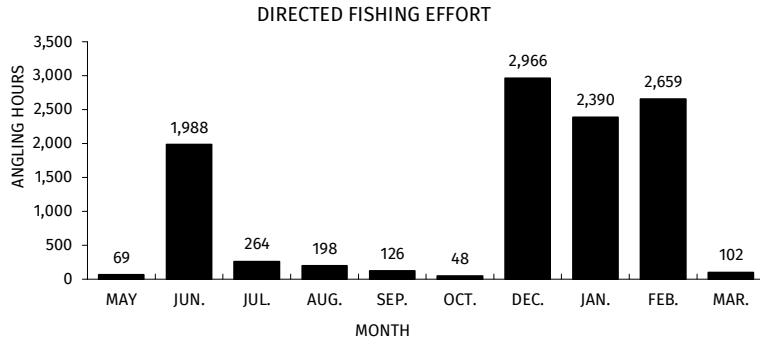
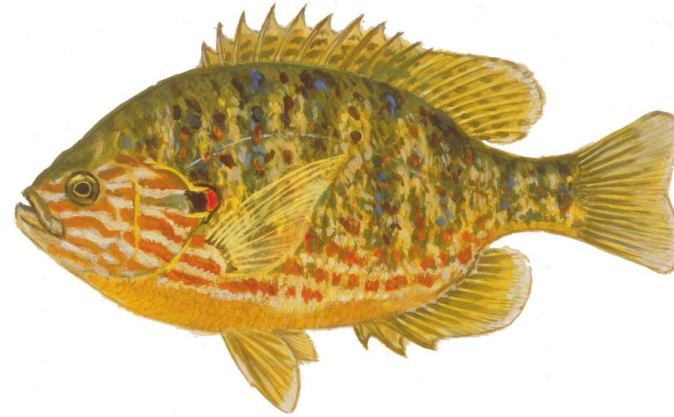


Figure 9. Pumpkinseed fishing effort, catch, harvest and length distribution, Big Arbor Vitae Lake, during 2023-24.

ROCK BASS

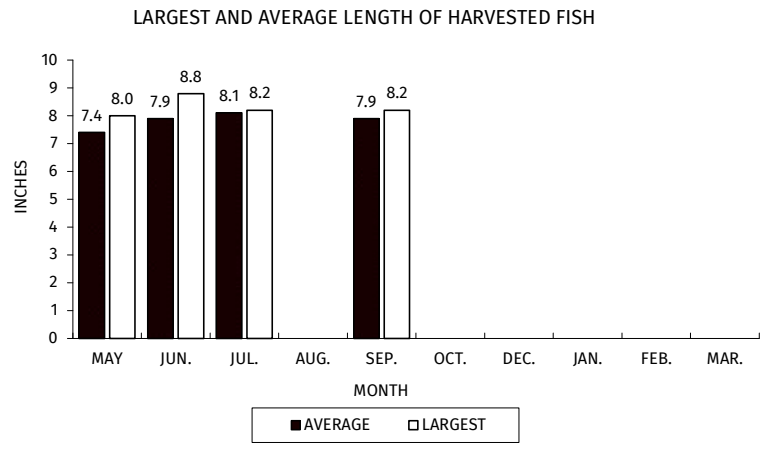
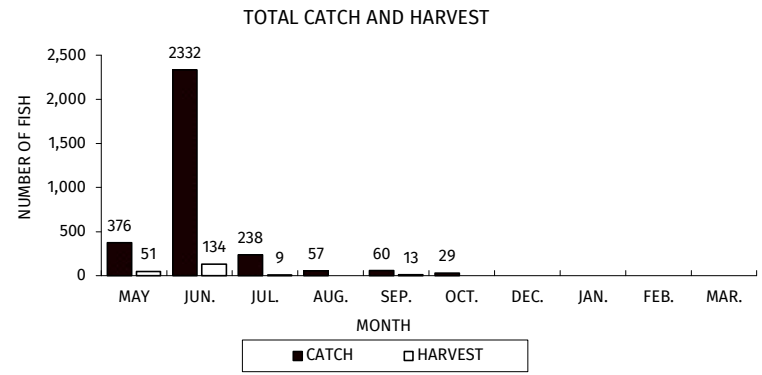
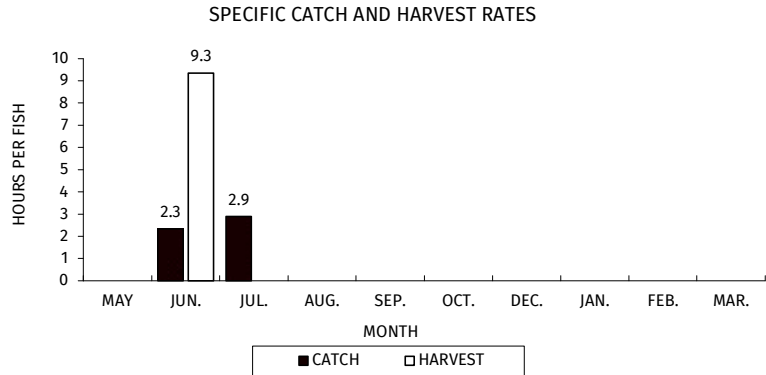
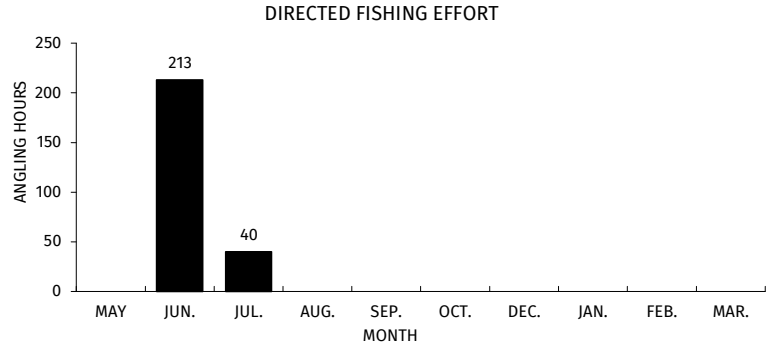
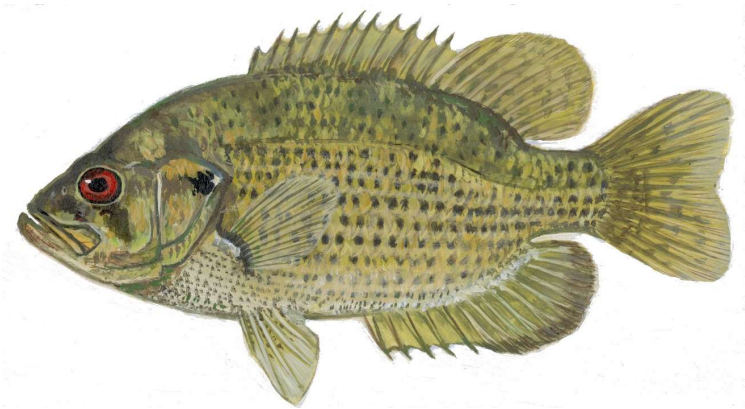


Figure 10. Rock bass fishing effort, catch, harvest and length distribution, Big Arbor Vitae Lake, during 2023-24.