

Ohio's Lake Erie Fisheries

2021 Annual Angler Report



Prepared

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Note: The data and management summaries contained in this report are provisional. Every effort has been made to ensure their correctness. Contact the Division of Wildlife’s Lake Erie office nearest you before using these data or before citing research and management findings. Additional data are available upon request.

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Executive Summary

Ohio's Lake Erie Fisheries 2021 Annual Report

The ODNR-DOW manages sport and commercial fisheries for the 2.24 million acres of water under Ohio's jurisdiction. Within this area, sampling activities are directed at three zones and provide information on how the fisheries and food web respond to changes in the ecosystem.



Fig. Ohio's Lake Erie waters with zones indicated.

Walleye

Walleye fishing was excellent in 2021 thanks to recent strong hatches. In the West Zone, catch of age-0 walleye was the 5th highest since 1988 in the Ohio's 2021 August bottom trawl survey. Similarly, catches of age-0 walleye in the Central and East Zones were among the highest on record, indicating a bright future for the fishery in coming years.

Angler harvest was 2.5 million fish in 2021, slightly lower than the 2.6 million harvested in 2019 (the 2020 estimate was impacted by COVID issues). Angler catch rates continue to be exceptional, with strong contributions from the 2015 and 2018 year-classes.

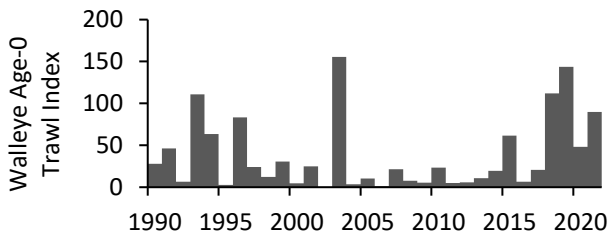


Fig. Ohio's Lake Erie walleye - West Zone hatch index of age-0 fish (catch-per-hectare).

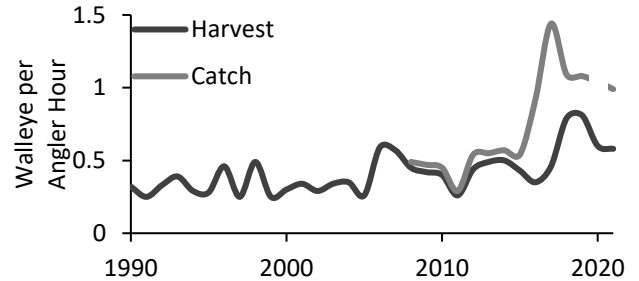


Fig. Ohio's walleye - targeted walleye fishing rates. Recording of catch started in 2008.

Yellow Perch

Yellow perch angler catch rates and harvest in the West Zone had a slight uptick in 2021 but remain below average. Hatches have been near or above average for eight years in this zone, signaling consistent fishing opportunities across multiple year classes. Angler harvest for 2021 was estimated at 1.3 million fish with a harvest rate of 1.96 fish per angler hour.

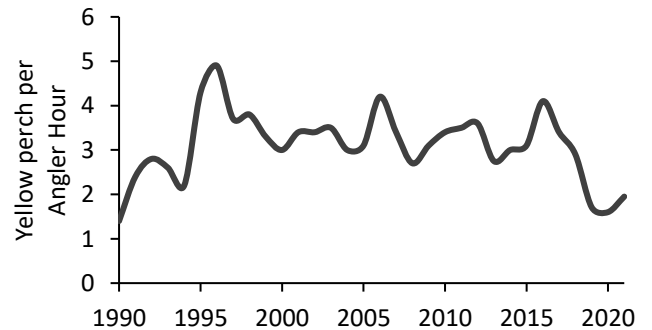
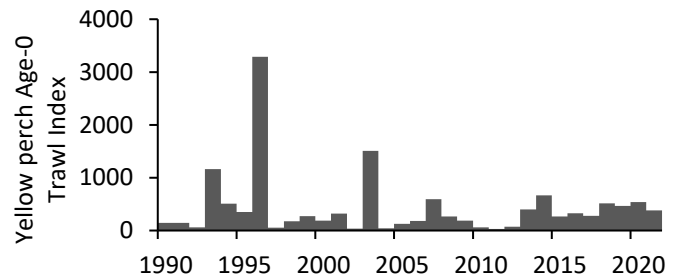


Fig. Ohio's West Zone yellow perch – **Top:** Recruitment index of age-0 fish (catch-per-hectare). **Bottom:** Targeted fishing rates for West Zone yellow perch.

Yellow perch angler catch rates in the Central and East Zones remained low in 2021. Hatch indices have been

below average since 2014. Angler harvest and targeted angler hours in 2021 were among the lowest since the creel survey began 1975.

Ohio's yellow perch commercial fishery experienced increased harvest in the West and East Zones and a decreased harvest in the Central Zone (dictated by lower quota allocations). Harvest rates increased across all zones, but the average angler harvest rate was well below the 10-year average.

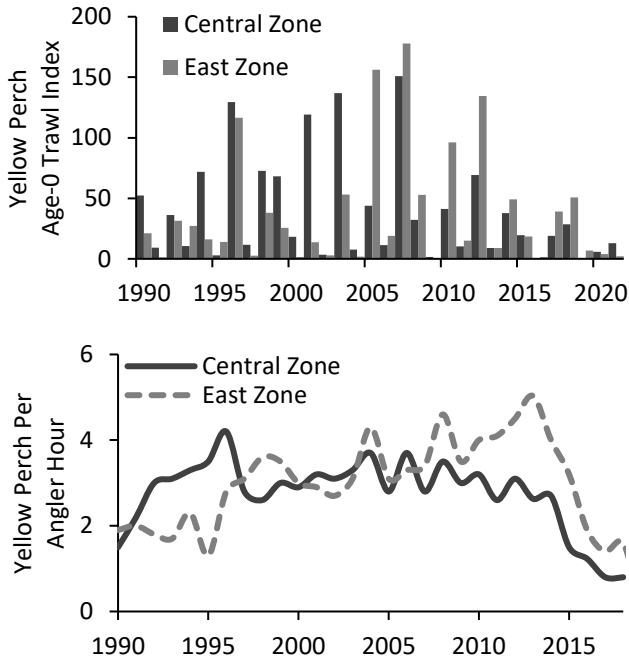


Fig. Ohio's Lake Erie Central and East Zone yellow perch – **Top:** Relative abundance of age-0 fish (catch-per-hectare) **Bottom:** Yellow perch angler harvest rates.

Smallmouth and Largemouth Bass

Smallmouth bass fishing in 2021 remained consistent with recent years. This fishery continues to be a catch and release fishery with angler harvest and catch rates of 0.03 and 0.60 fish per hour, respectively (95% of fish released). The average size of harvested smallmouth bass in 2021 was 16.4 inches long with a weight of 3.1 pounds.

Largemouth bass fishing continued to be strong in 2021. The average length of harvested largemouth bass was 16.5 inches with an average weight of 2.6 pounds in 2021. This fishery continues to provide an exceptional

angler catch rate of 1.19 fish per hour with some trophy fish in nearshore areas and harbors across Ohio's Lake Erie waters.

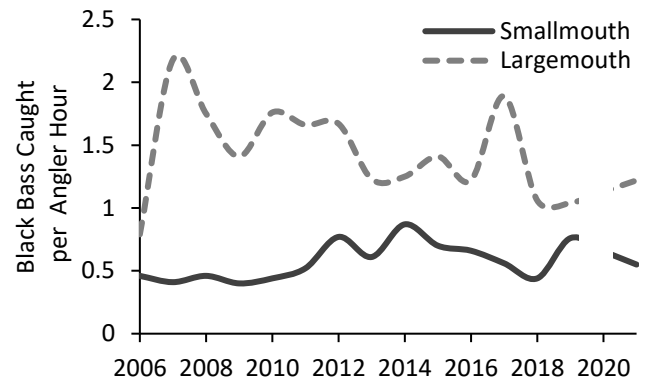


Fig. Smallmouth and largemouth bass angler catch rates.

Steelhead Trout

Tributary and open lake fisheries should remain stable with continued annual stocking of yearling steelhead. In 2021, ODNR-DOW hatchery personnel raised and stocked 499,000 steelhead that were a mix of Shasta and Fish Lake strains. Annual targeted steelhead stocking numbers will remain the same for 2022 (450,000). Stocking locations will also remain the same as previous years. The Lake Erie 2021 open lake recreational harvest was 21 thousand fish, with a angler harvest rate of 0.15 fish per hour.

Forage Fish Community

Forage indices were nearly half of the ten-year average for total forage abundance in the West Zone in August. Catch was dominated by young white perch, yellow perch, freshwater drum, and walleye, with walleye and drum above long-term means. Adult and young emerald shiner abundances remain near zero and have been low since 2015. Central and East Zone forage abundance in October increased in 2021 and was primarily composed of age-0 rainbow smelt and spiny-rayed species. Gizzard shad and round goby abundance decreased from 2020 and were below long-term means. Emerald shiner indices remained among the lowest in the 31-year time series.

Lake Erie Map



Figure 1.1. Map of Ohio's Lake Erie waters (dashed red line) including zones used for yellow perch management. The line between the West and Central Zones is at $82^{\circ} 30.000'$ longitude (near Huron) and the line between the Central and East Zones is at $81^{\circ} 20.000'$ longitude (near Fairport Harbor).

Walleye

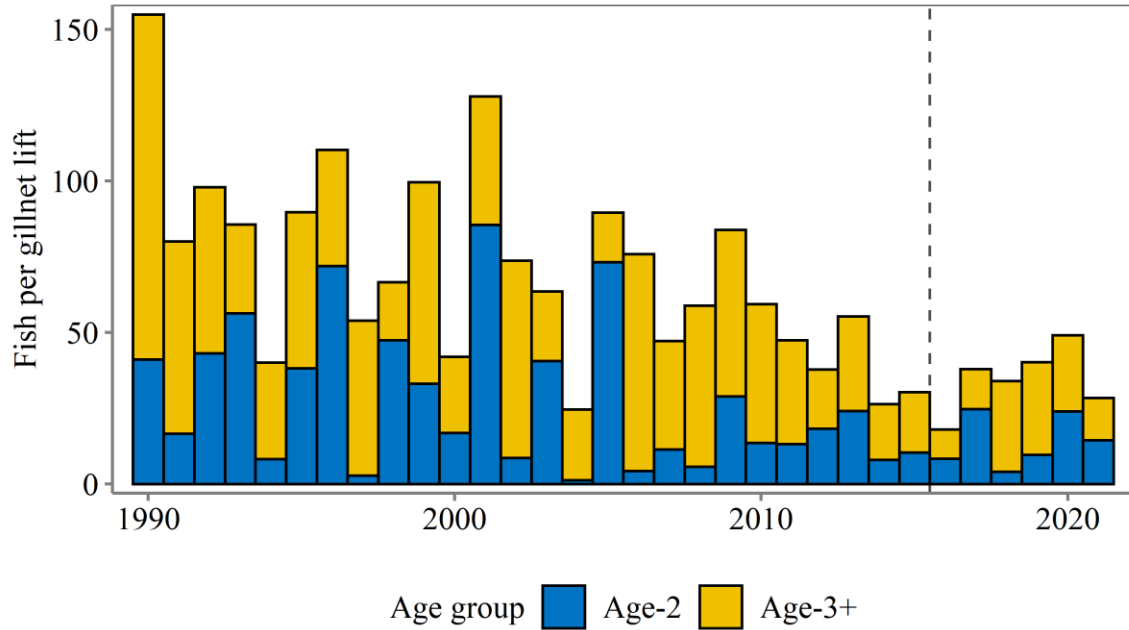


Figure 2.1. Average adult walleye catch from the fall gillnet survey across all Ohio waters split into young (age-2) and older (age-3+) fish. In 2016, this survey switched from multifilament nets to monofilament; pre-2016 catches are not directly comparable to catches from 2016 to the present.

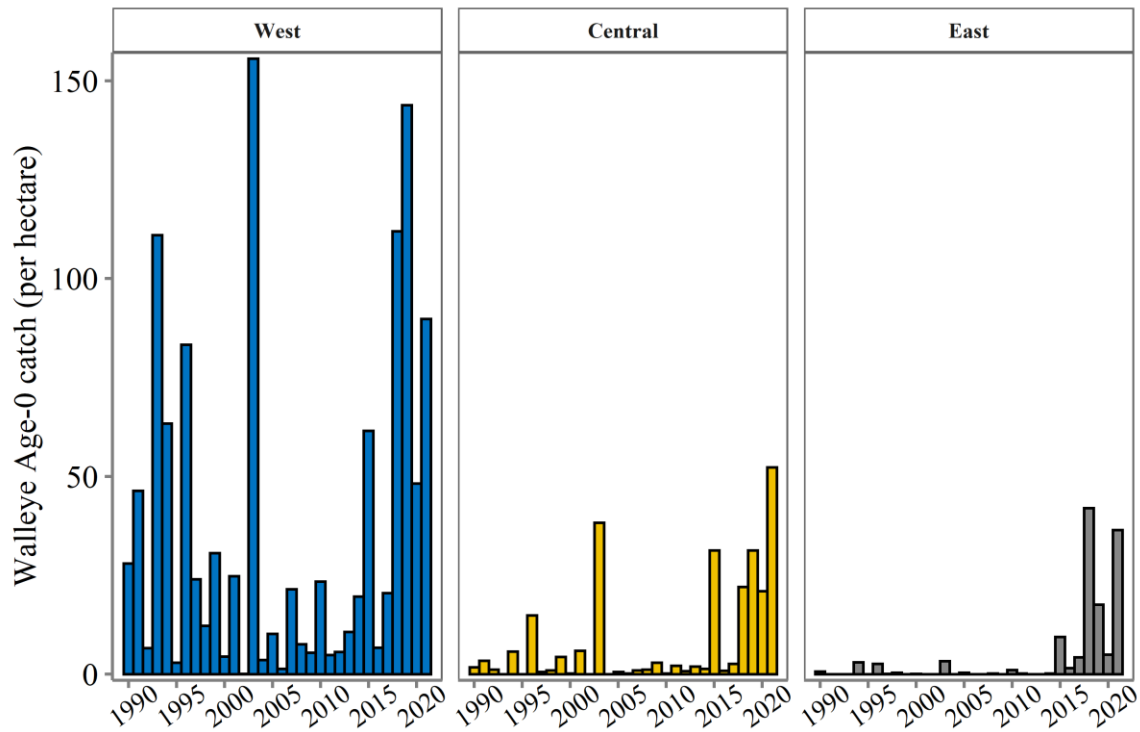


Figure 2.2. Average age-0 walleye density from trawl surveys for each of Ohio’s zones. This “hatch” or recruitment index is used to help determine how many adult walleye can be expected in the future.

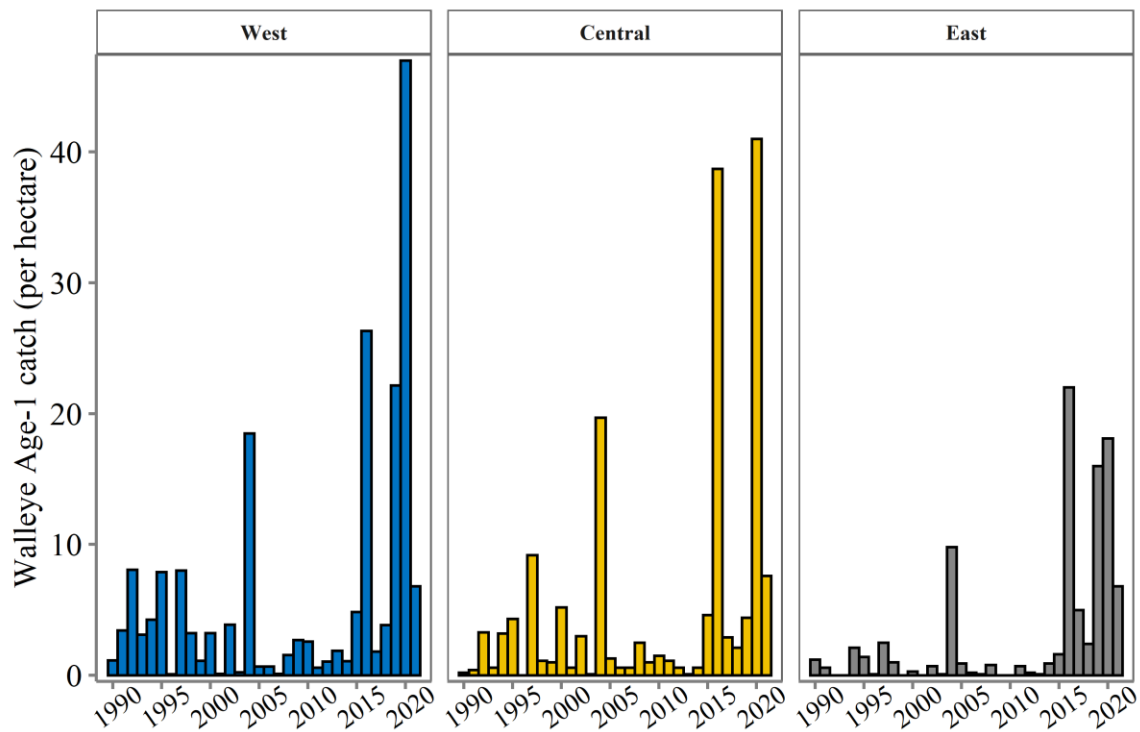


Figure 2.3. Average age-1 walleye density from trawl surveys for each of Ohio’s zones. These data, together with densities of age-0 walleye, help biologists understand how many harvestable walleye may be available in the near-future.

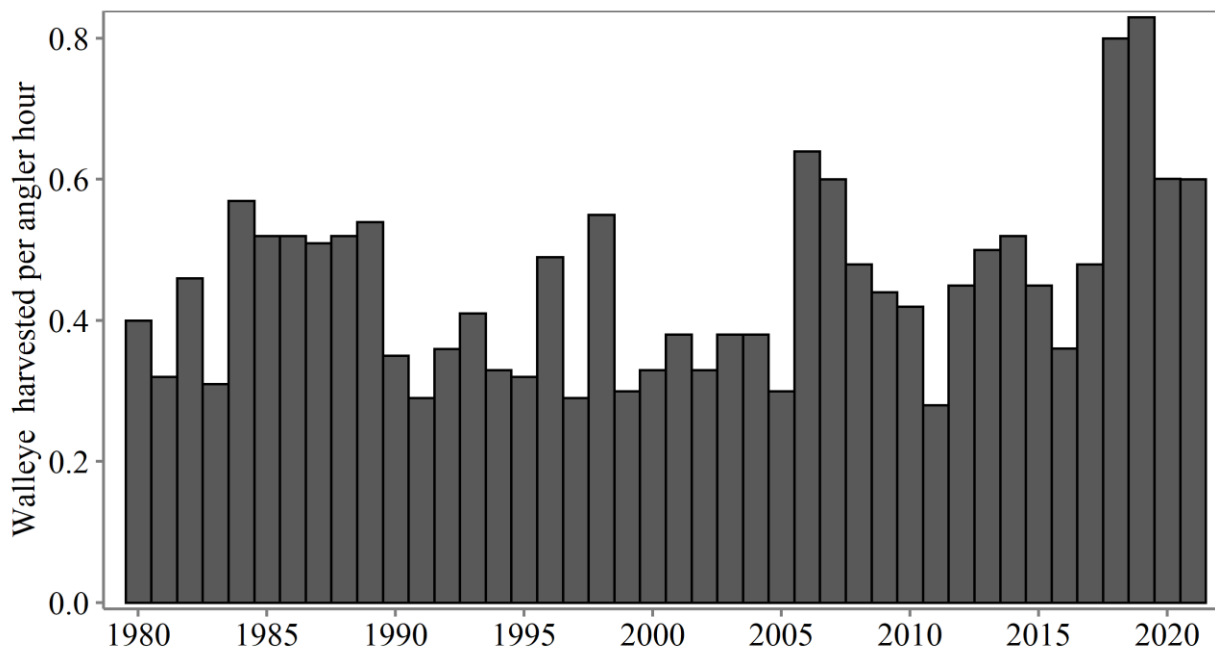


Figure 2.4. Walleye harvest rate (fish harvested per hour per angler) from all of Ohio’s Lake Erie waters. Data come from annual creel surveys (angler interviews).

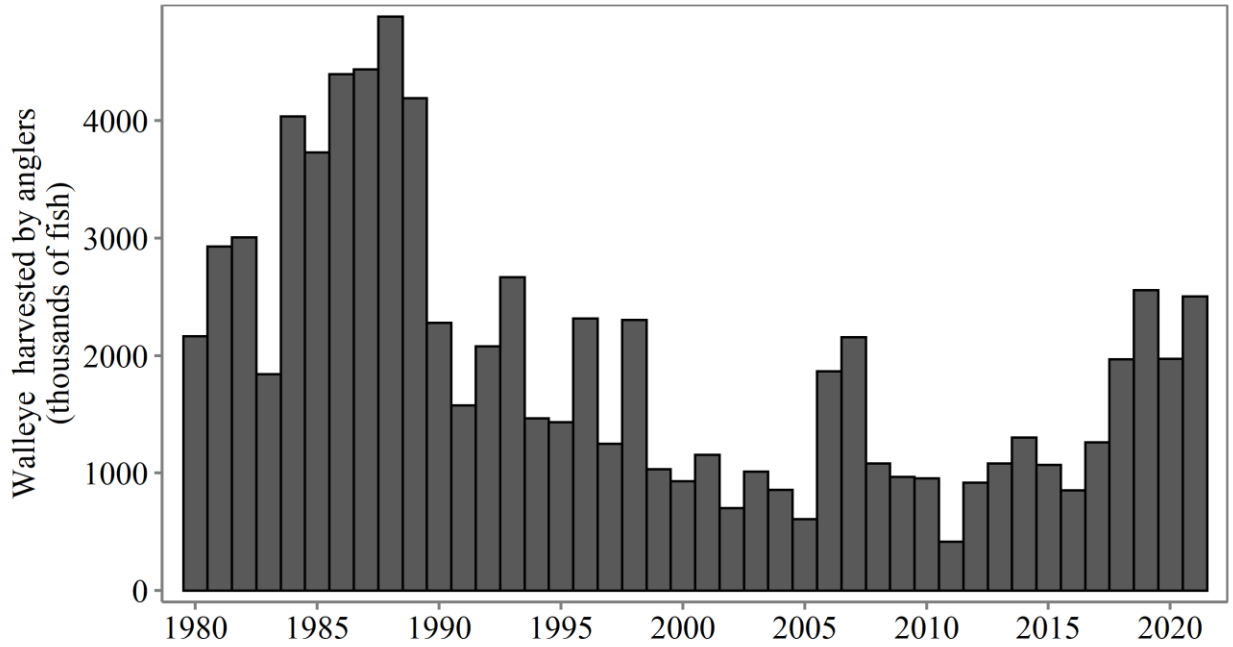


Figure 2.5. Walleye total angler harvest from all Ohio’s Lake Erie waters. Data come from annual creel surveys (angler interviews).

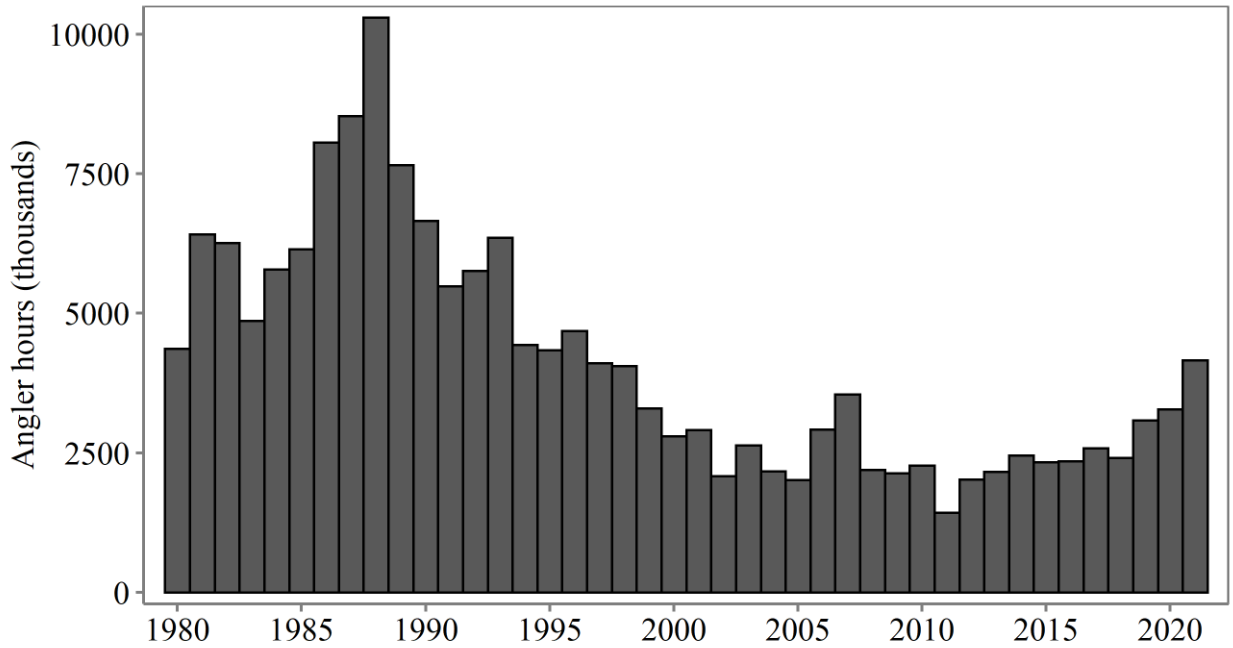


Figure 2.6. Walleye total angler effort (number of hours anglers fished for walleye) for all Ohio’s Lake Erie waters. Data come from annual creel surveys (angler interviews).

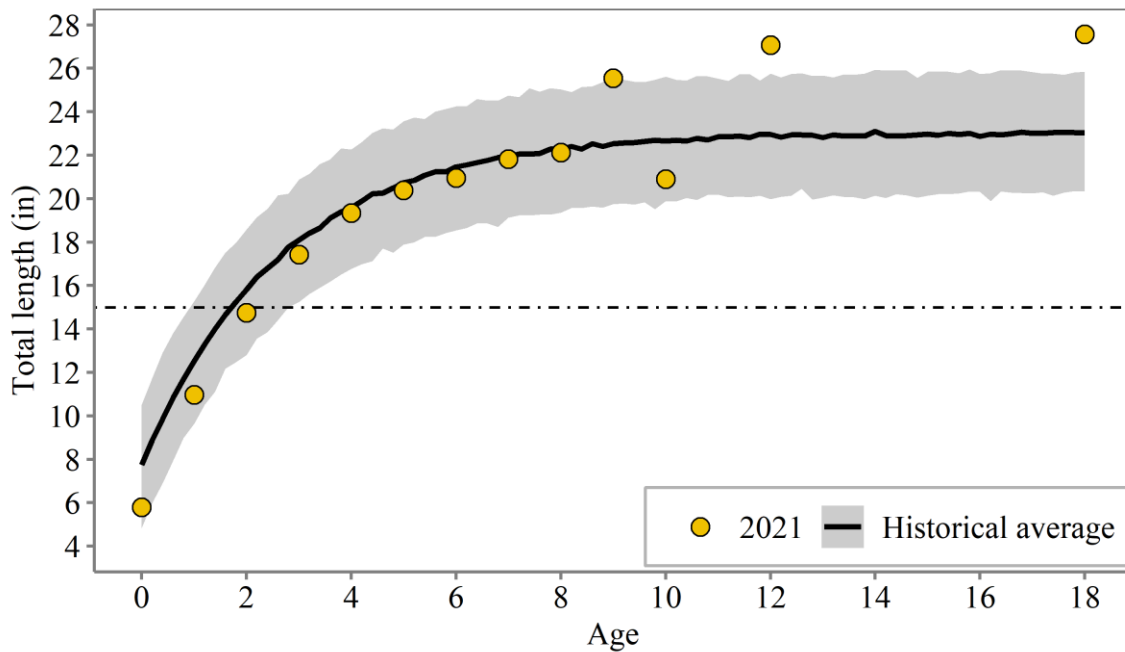


Figure 2.7. Walleye length at age from the fall gillnet survey across all Ohio waters. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year’s average. The black dotted line indicates the legal minimum length (15 inches). This chart can be used to estimate the approximate age of a walleye with a known length.

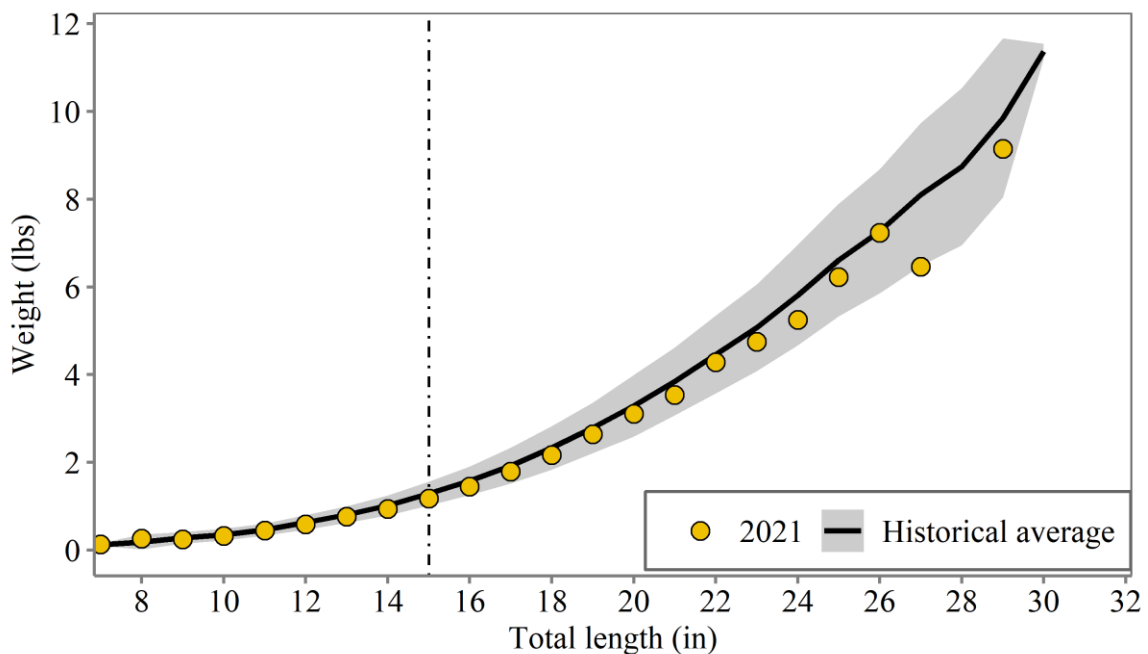


Figure 2.8. Walleye weight at length from the fall gillnet survey across all Ohio waters. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year’s average. The black dotted line indicates the legal minimum length (15 inches). This chart can be used to estimate the weight of a Lake Erie walleye with a known length.

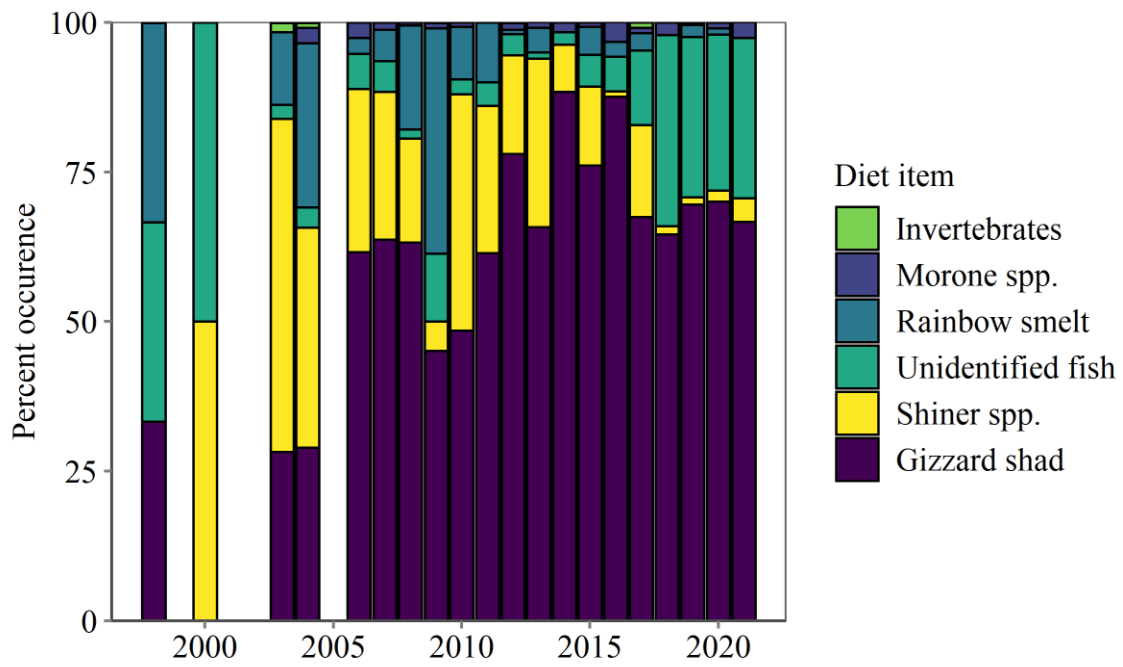


Figure 2.9. Percent occurrence of prey species in walleye diets in the fall across Ohio waters (excluding empty stomachs and unidentified gut contents). These data come from October gillnet surveys; gizzard shad make up the majority of walleye diets in Lake Erie in October, while yellow perch are not observed at this time.

Yellow Perch

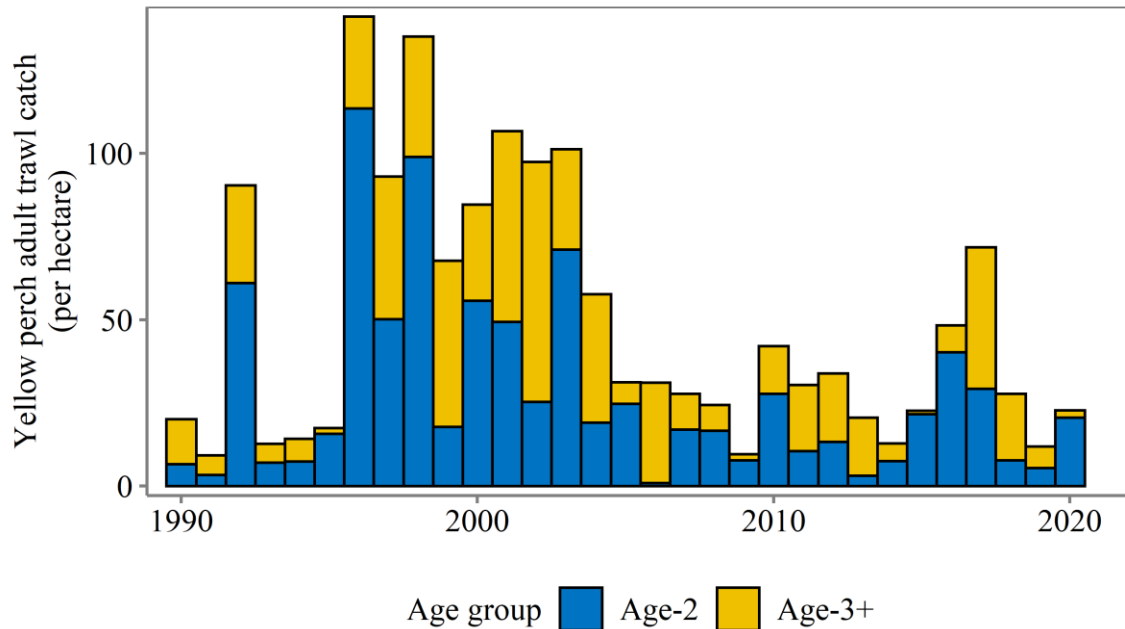


Figure 3.1. Average adult yellow perch catch from the trawl survey for the West Zone (west of Huron) split into young (age-2) and older (age-3+). The fall trawl survey did not take place in 2021 due to vessel issues.

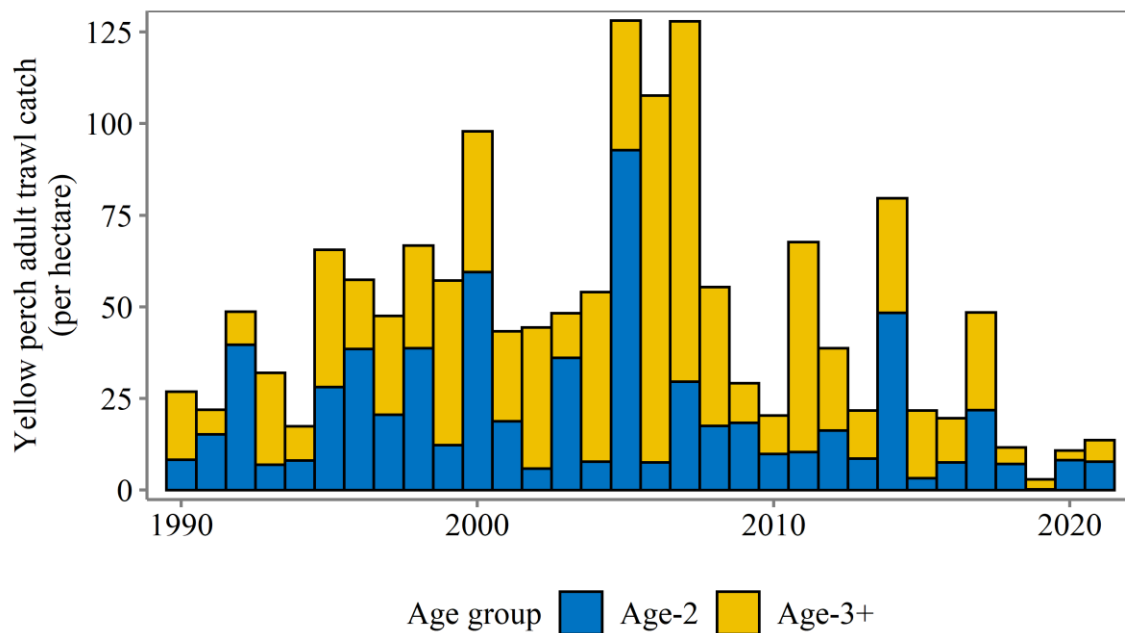


Figure 3.2. Average adult yellow perch catch from the trawl survey for the Central Zone (Huron to Fairport Harbor) split into young (age-2) and older (age-3+).

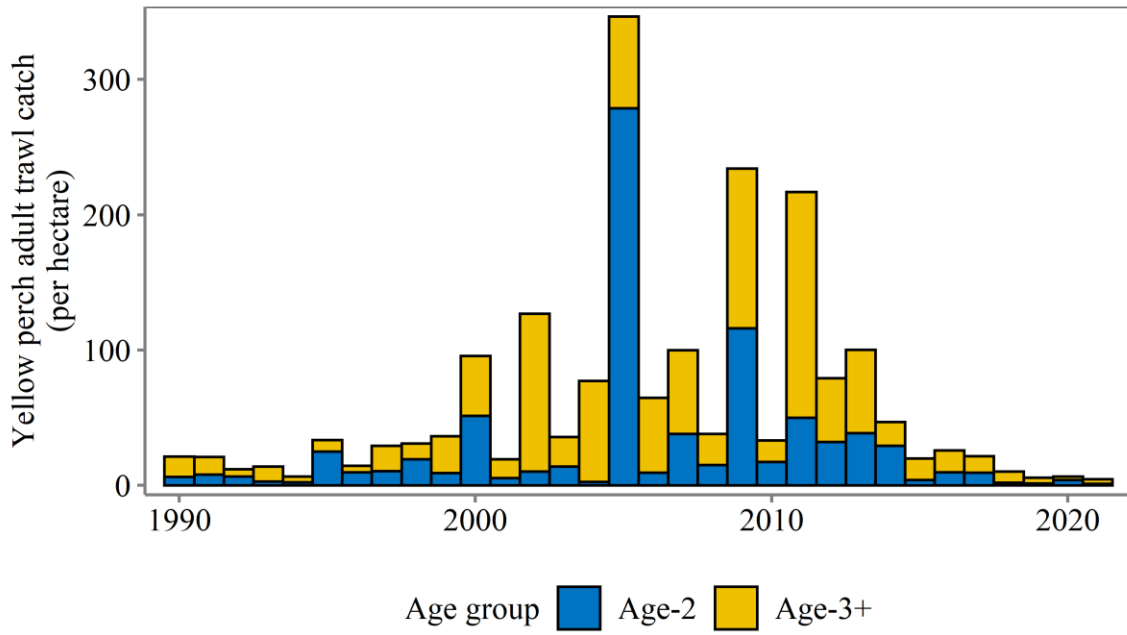


Figure 3.3. Average adult yellow perch catch from the trawl survey for the East Zone (east of Fairport Harbor) split into young (age-2) and older (age-3+).

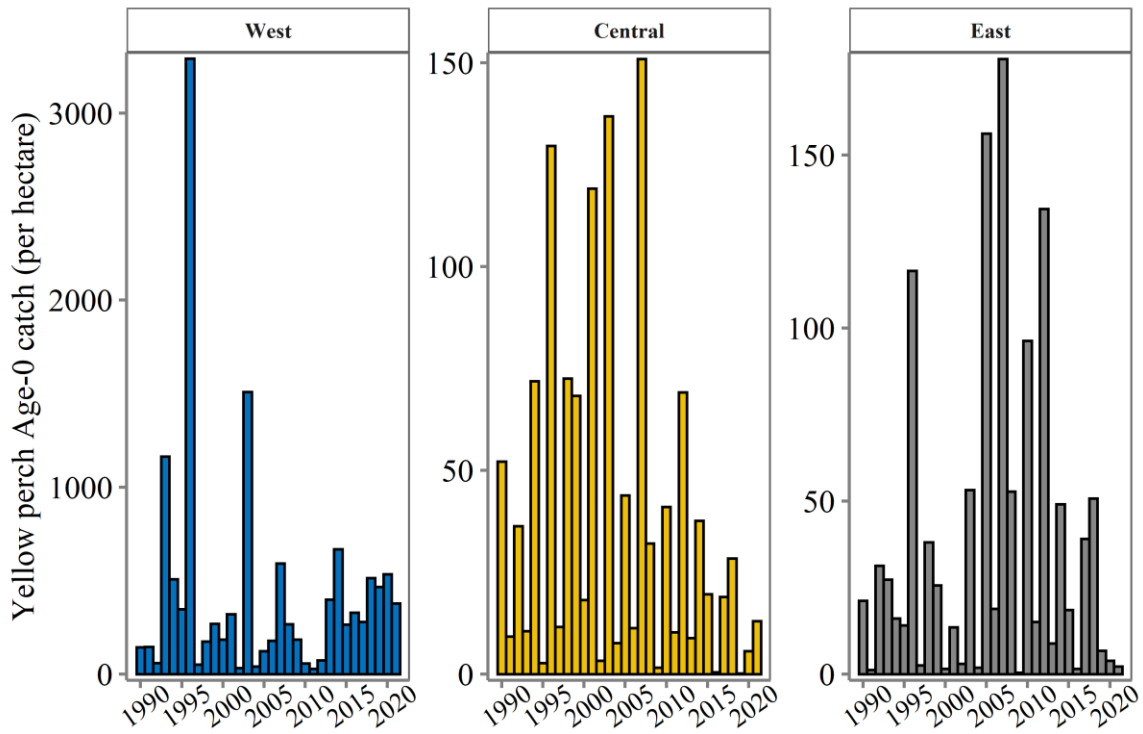


Figure 3.4. Average age-0 yellow perch density from trawl surveys for each of Ohio’s zones. This “hatch” or recruitment index is used to help determine how many adult yellow perch can be expected in the future. Note that the catch-per-hectare scale differs between panels, as West Zone recruitment is occasionally much greater than the other zones.

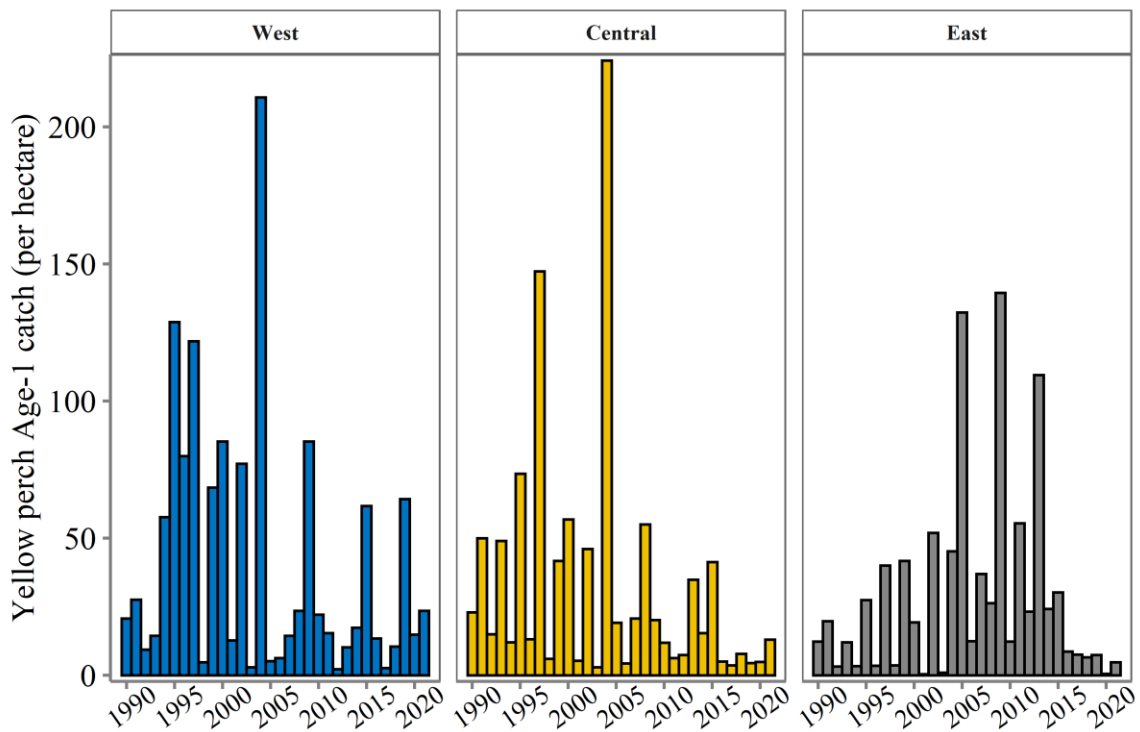


Figure 3.5. Average age-1 yellow perch density from trawl surveys for each of Ohio’s zones. These data are used to help determine what will happen to the yellow perch population in the future.

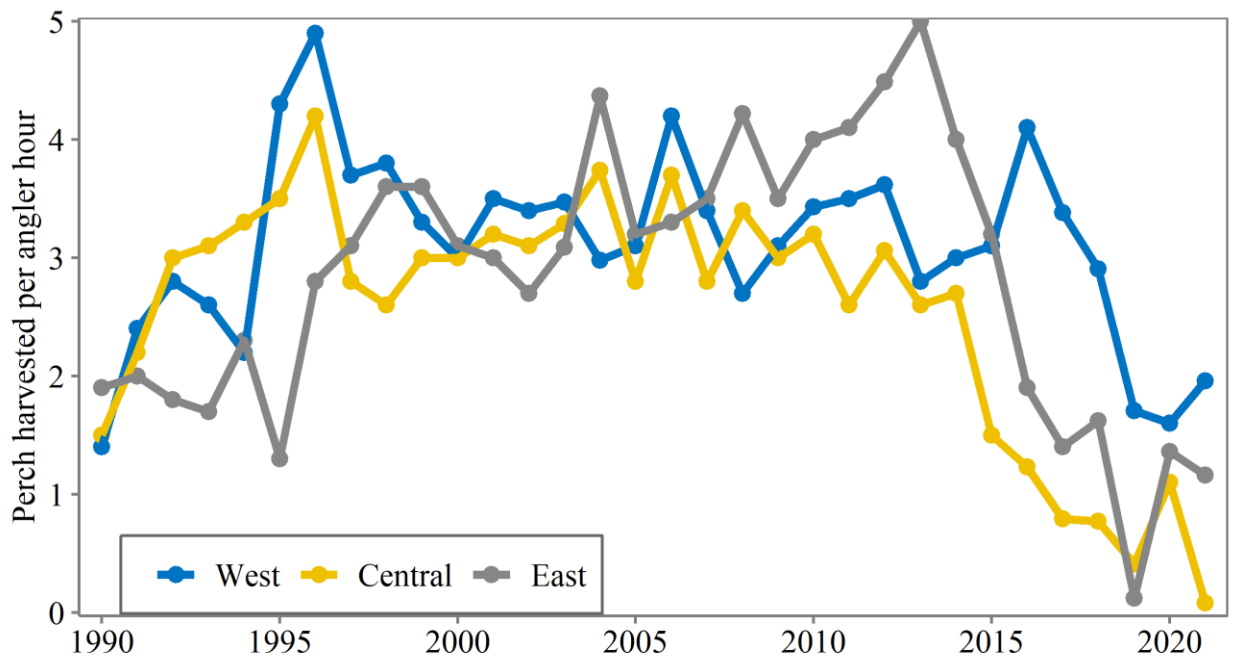


Figure 3.6. Yellow perch harvest rate (fish harvested per hour per angler) for each of Ohio’s zones. Data come from annual creel surveys (angler interviews).

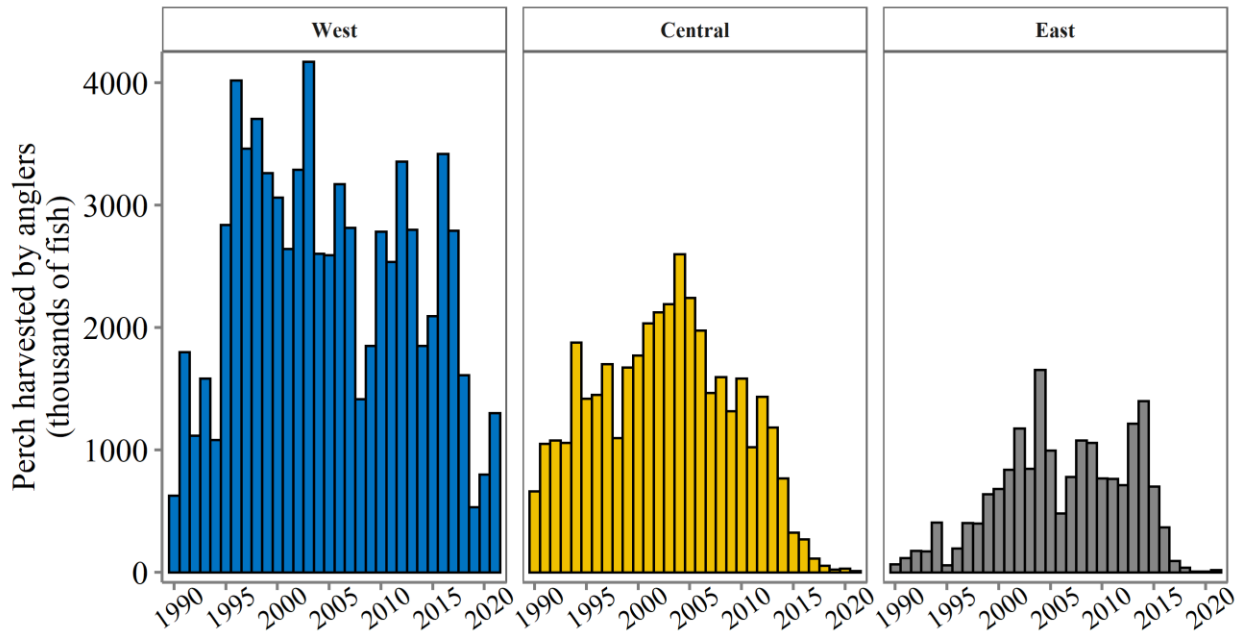


Figure 3.7. Yellow perch total angler harvest for each of Ohio’s zones. Data come from annual creel surveys (angler interviews).

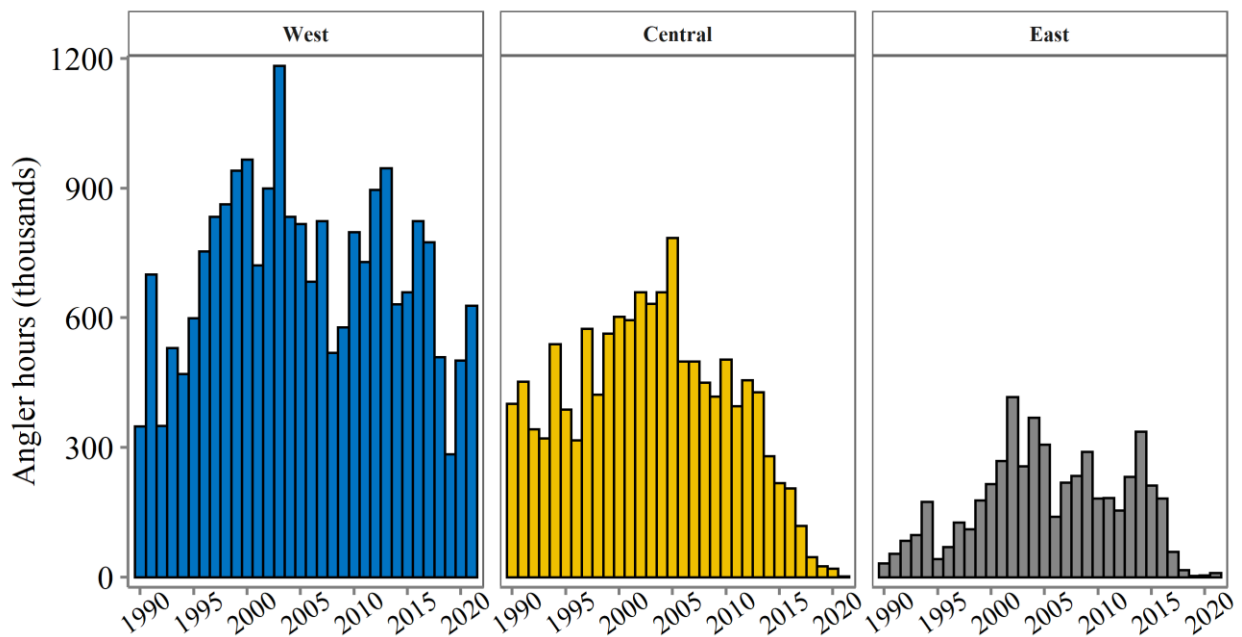


Figure 3.8. Yellow perch total angler effort (number of hours anglers fished for yellow perch) for each of Ohio’s zones. Data come from annual creel surveys (angler interviews).

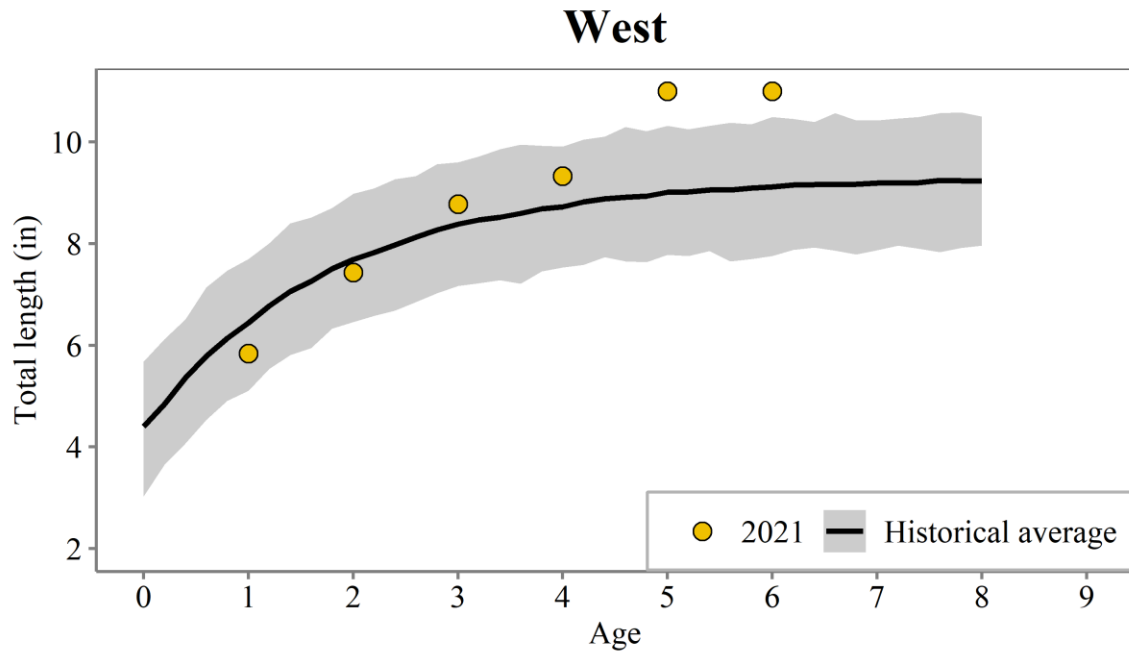


Figure 3.9. Yellow perch length at age from trawl surveys for the West Zone (Toledo to Huron). This chart can be used to estimate the age of a yellow perch with a known length. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year's average.

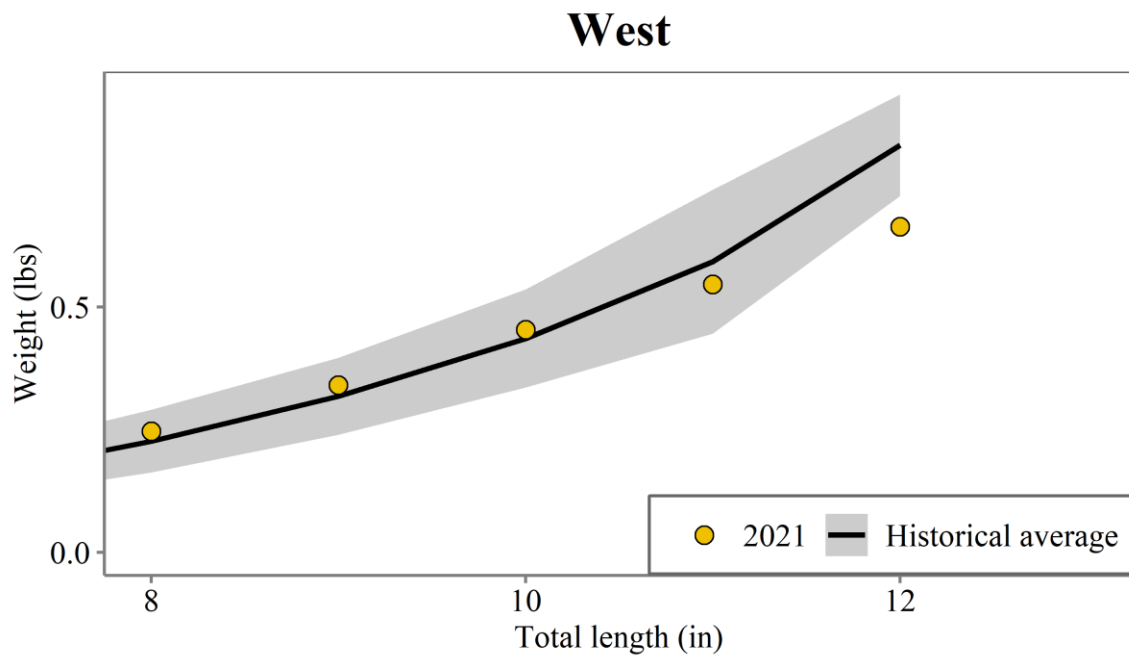


Figure 3.10. Yellow perch weight at length from trawl surveys for the West Zone (Toledo to Huron). This chart can be used to estimate the weight of a yellow perch with a known length. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year's average.

Central

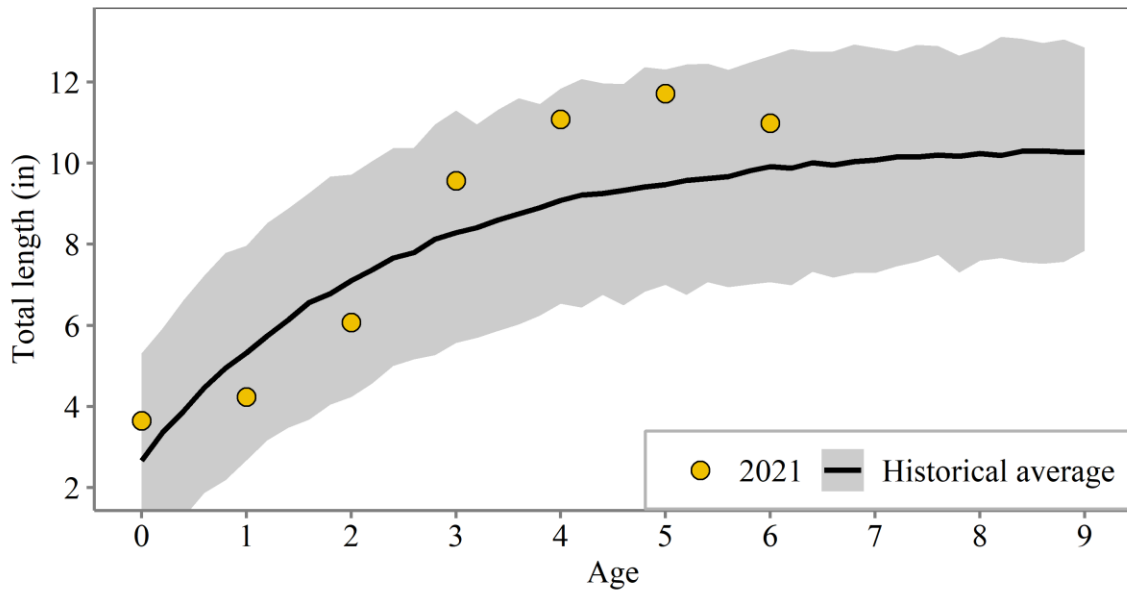


Figure 3.11. Yellow perch length at age from trawl surveys for the Central Zone (Huron to Fairport Harbor). This chart can be used to estimate the age of a yellow perch with a known length. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year's average.

Central

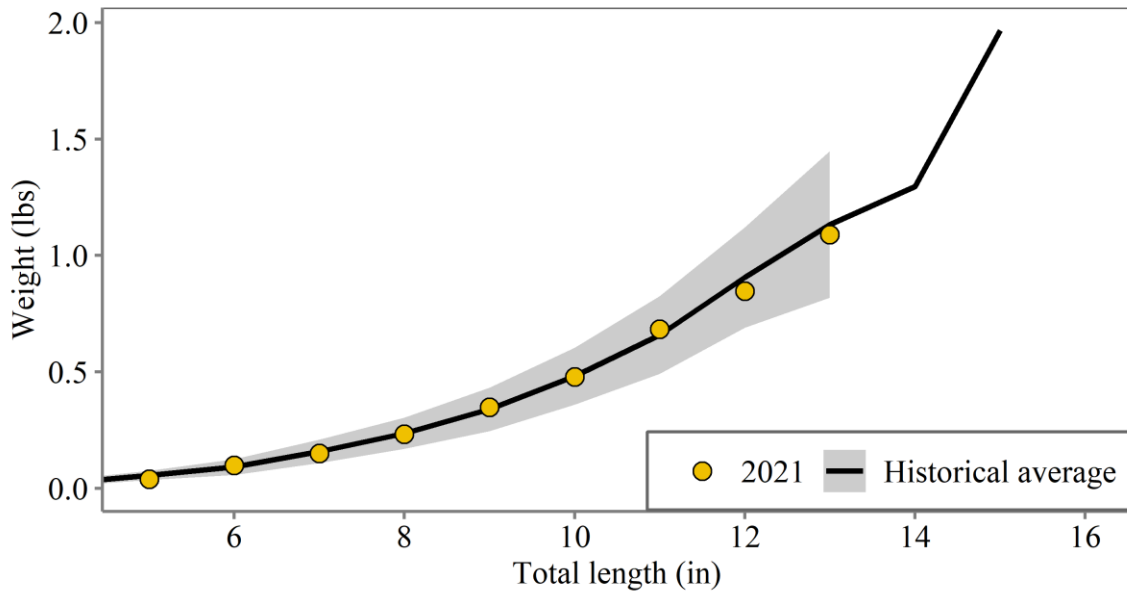


Figure 3.12. Yellow perch weight at length from trawl surveys for the Central Zone (Huron to Fairport Harbor). This chart can be used to estimate the weight of a yellow perch with a known length. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year's average.

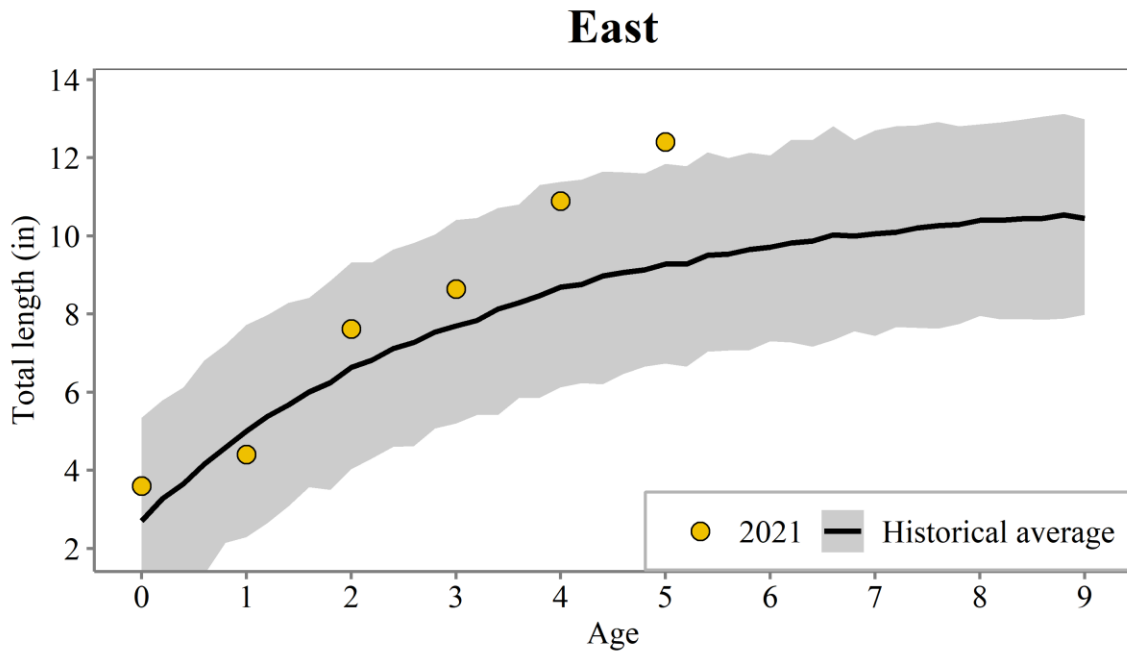


Figure 3.13. Yellow perch length at age from trawl surveys for the East Zone (east of Fairport Harbor). This chart can be used to estimate the age of a yellow perch with a known length. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year’s average.

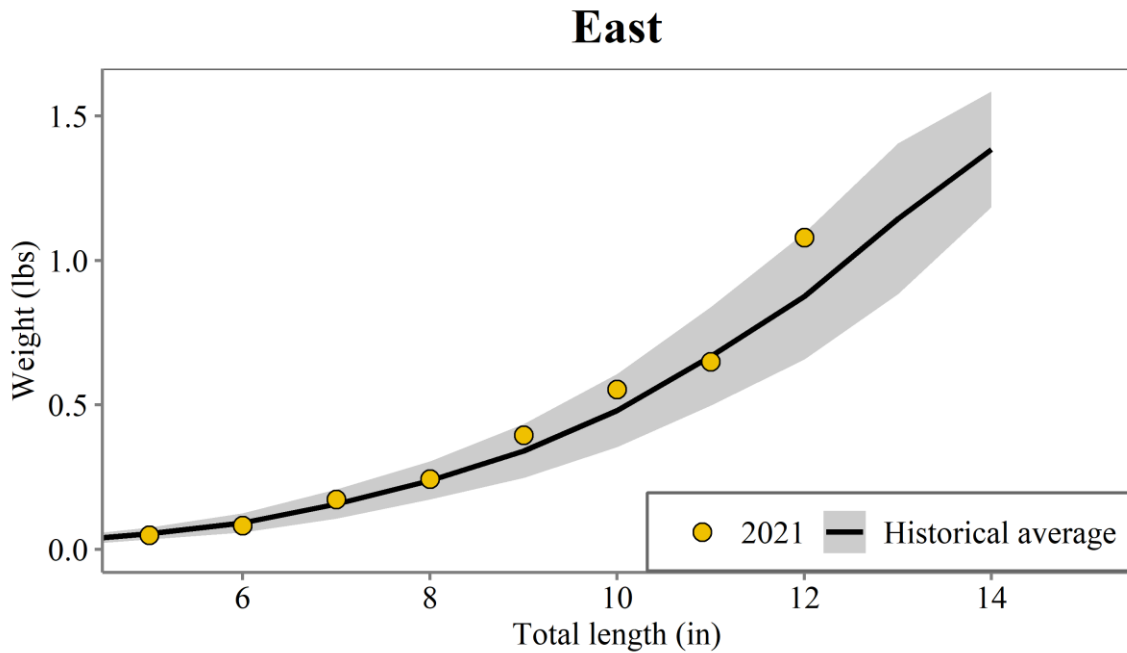


Figure 3.14. Yellow perch weight at length from trawl surveys for the East Zone (east of Fairport Harbor). This chart can be used to estimate the weight of a yellow perch with a known length. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year’s average.

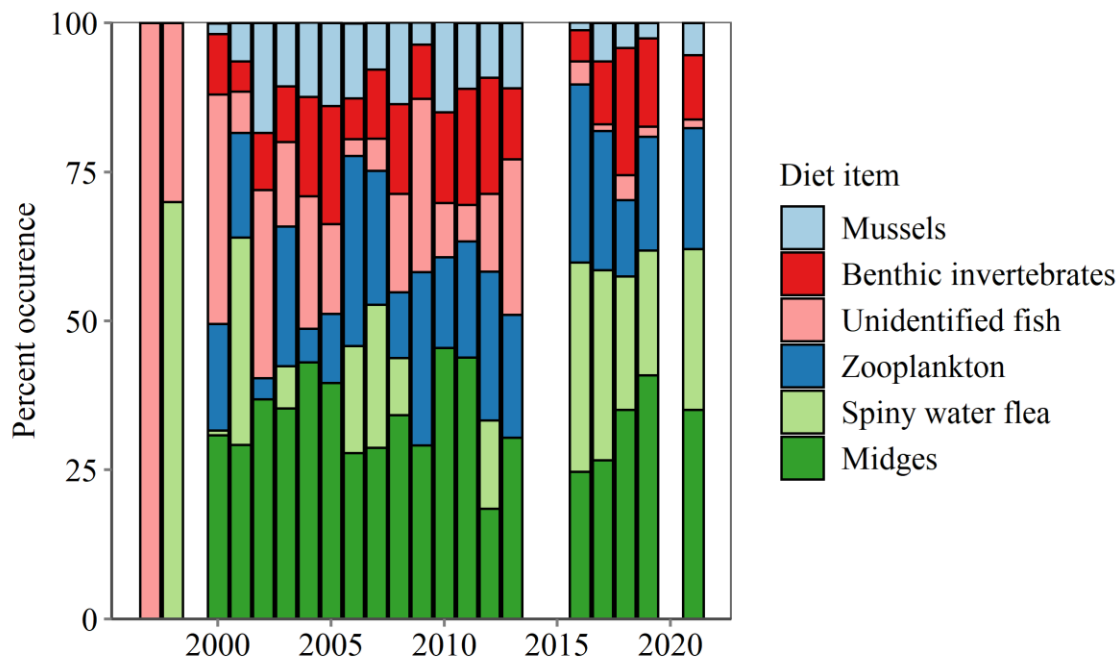


Figure 3.15. Percent occurrence of prey species in yellow perch diets in June (excluding empty stomachs and unidentified gut contents). These data come from Central and East Zone trawl surveys; midge larvae comprise the largest prey percent occurrence in June.

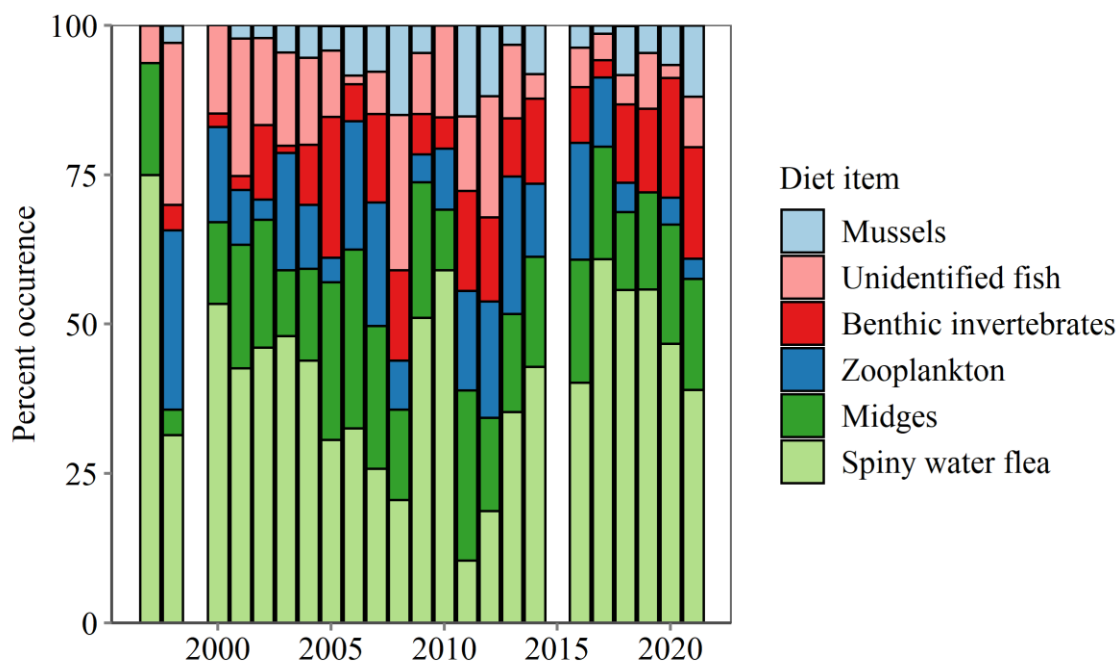


Figure 3.16. Percent occurrence of prey species in yellow perch diets in July and August (excluding empty stomachs and unidentified gut contents). These data come from Central and East Zone trawl surveys; Spiny water flea (*Bythotrephes*) comprise the largest prey percent occurrence in the summer.

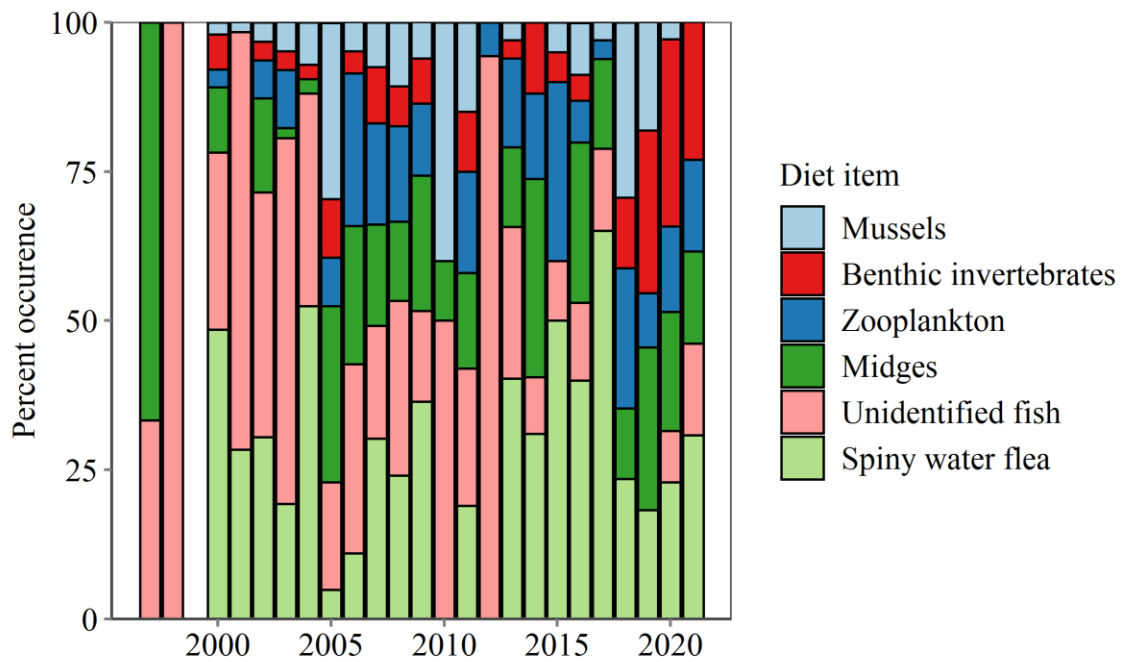


Figure 3.17. Percent occurrence of prey species in yellow perch diets in October (excluding empty stomachs and unidentified gut contents). These data come from trawl surveys; perch diets are more varied in the fall.

Smallmouth and Largemouth Bass

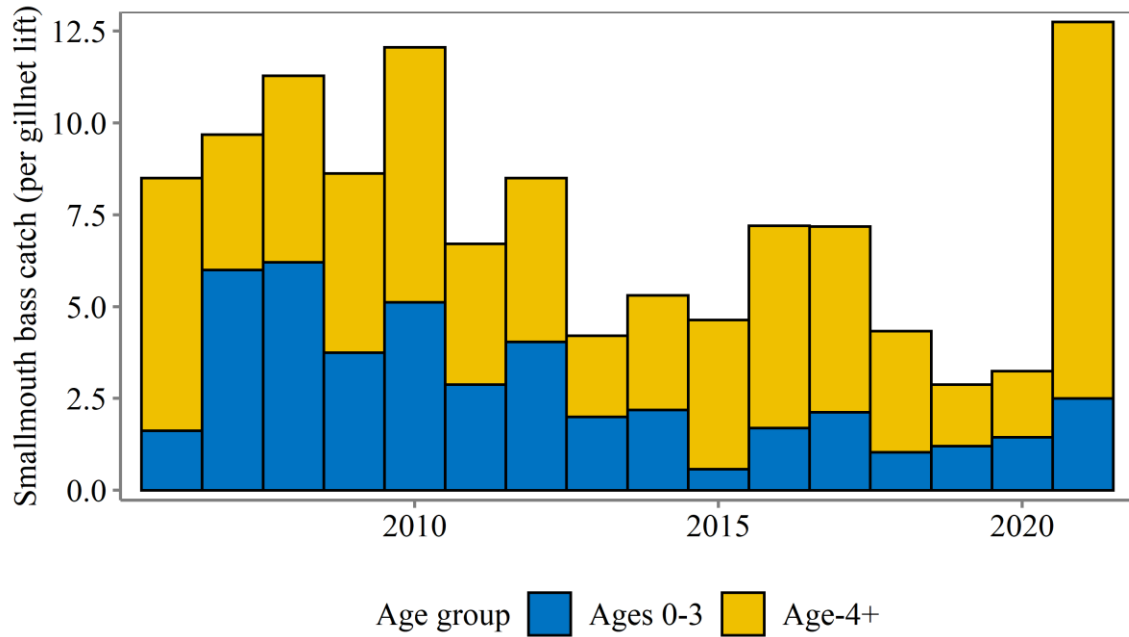


Figure 4.1. Average smallmouth bass catch from the September gillnet survey across all Ohio waters split into young (ages-0-3) and adult (age-4+).

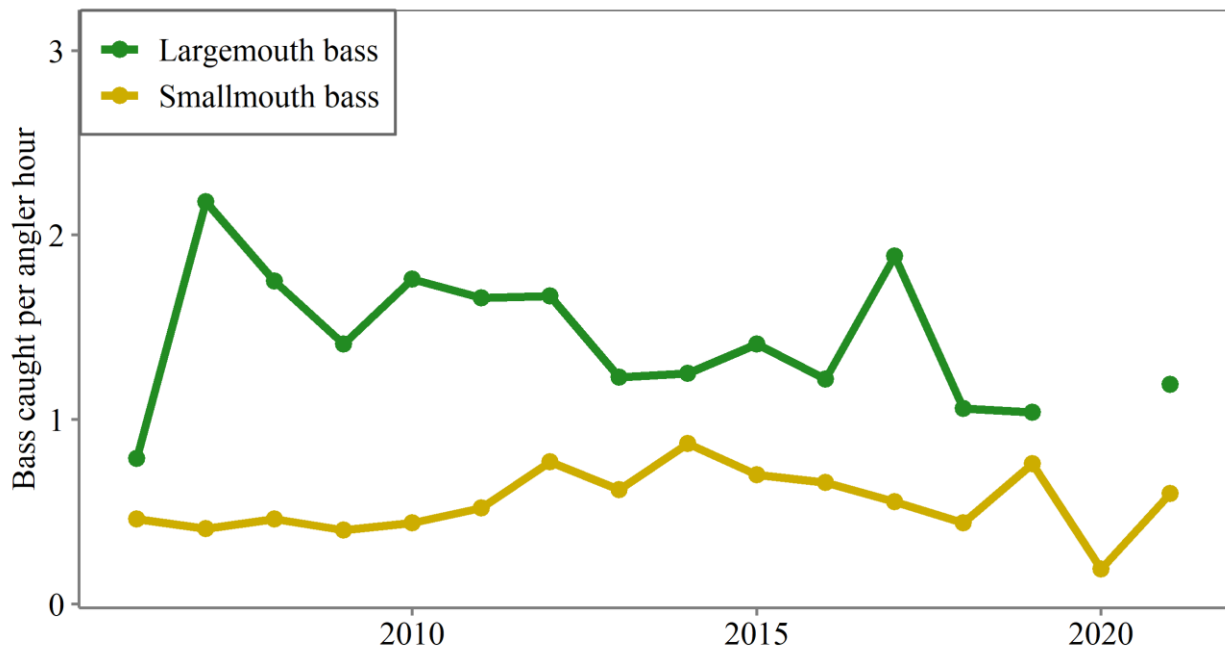


Figure 4.2. Angler catch rates (fish caught per hour per angler) for largemouth and smallmouth bass in the Ohio waters of Lake Erie. Data come from annual creel surveys (angler interviews). Largemouth bass catch rate recording began in 2006 and was unavailable for 2020.

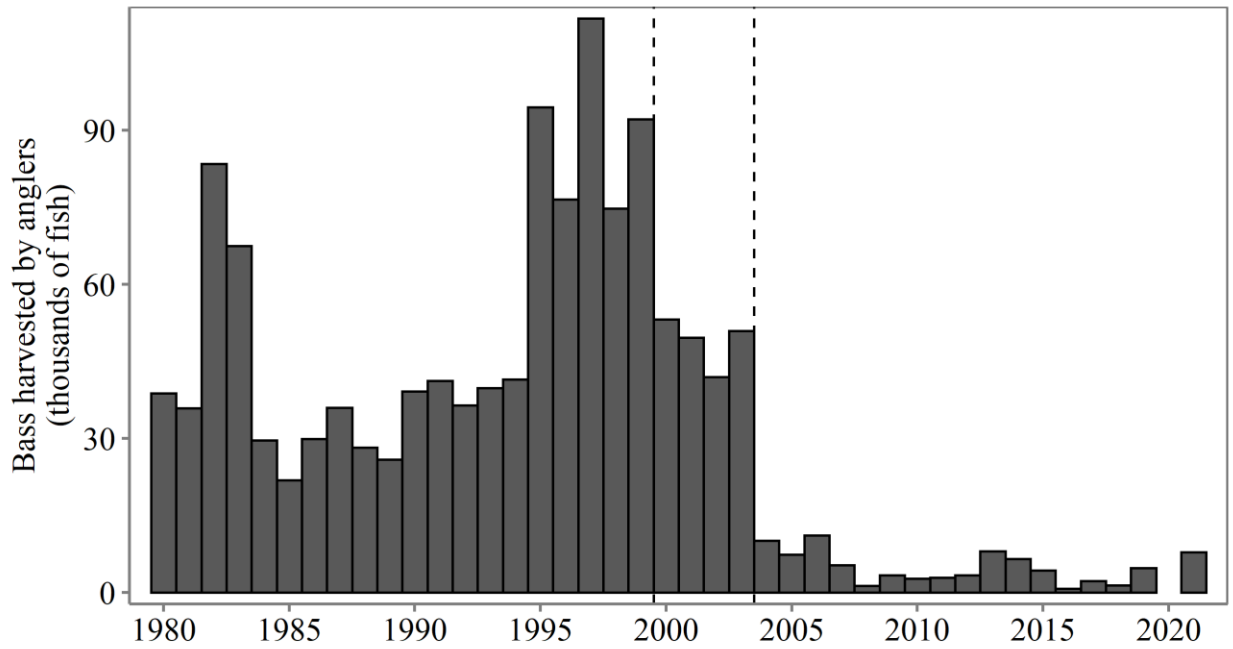


Figure 4.3. Harvest of smallmouth bass from Ohio waters of Lake Erie since 1990. Harvest declined substantially with stricter regulations implemented in 2000 and 2004 (dashed lines). Data come from annual creel surveys (angler interviews) and were unavailable for 2020.

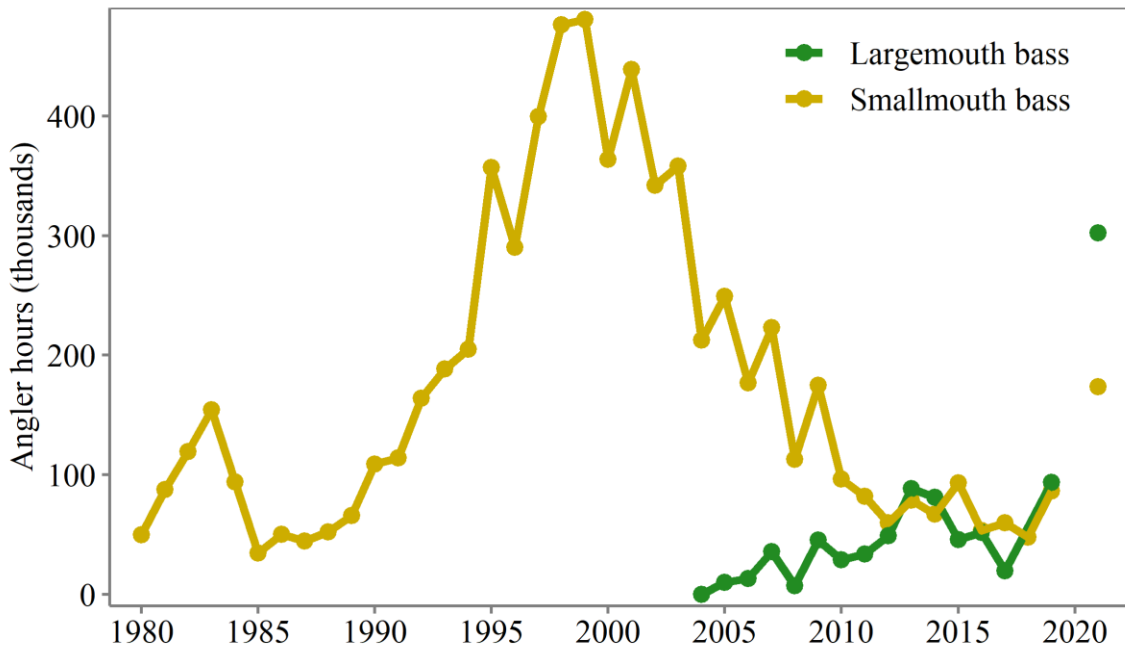


Figure 4.4. Black bass total angler effort (number of hours anglers fished for largemouth and smallmouth bass) for all Ohio's Lake Erie waters. Data come from annual creel surveys (angler interviews) and were unavailable for 2020.

Smallmouth Bass

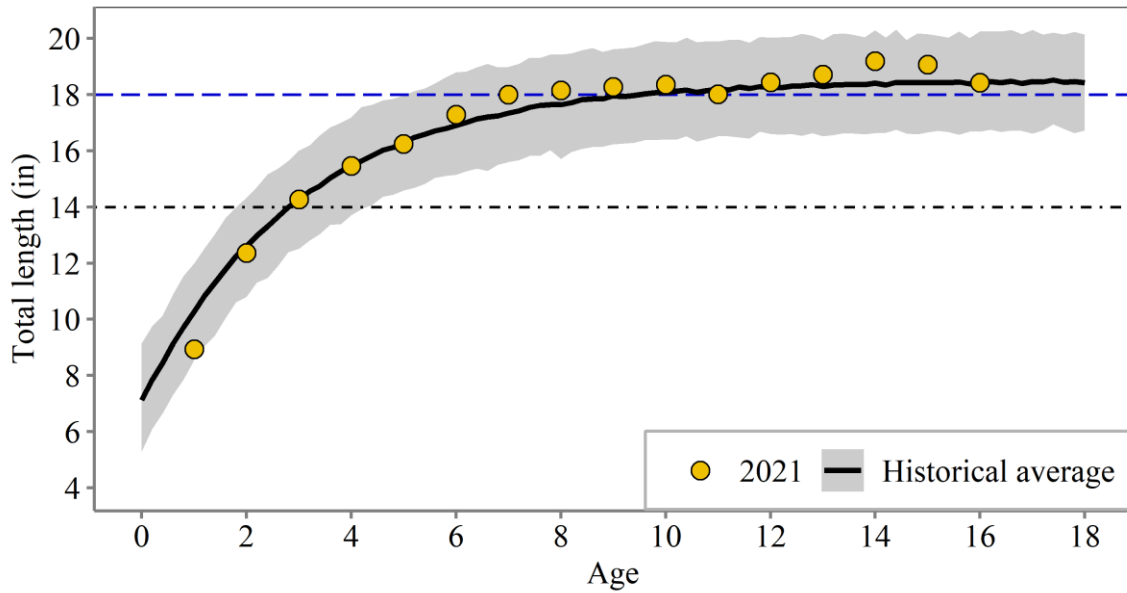


Figure 4.5. Smallmouth bass length at age from the gillnet survey across all Ohio waters of Lake Erie. This chart can be used to estimate the age of a smallmouth bass with a known length. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year’s average. The black dotted line indicates the legal minimum length for most of the year (14 in), while the blue dashed line indicates the spring minimum (18 in).

Smallmouth Bass

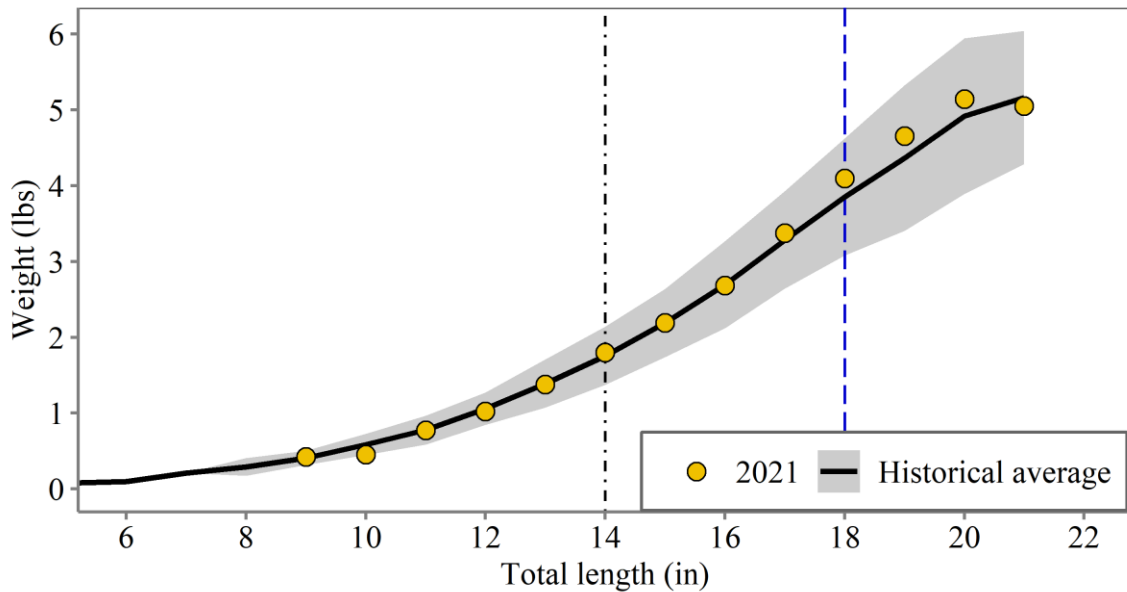


Figure 4.6. Smallmouth bass weight at length from the gillnet survey across all Ohio waters of Lake Erie. This chart can be used to estimate the weight of a smallmouth bass with a known length. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year’s average. The black dotted line indicates the legal minimum length for most of the year (14 in), while the blue dashed line indicates the spring minimum (18 in).

Largemouth bass

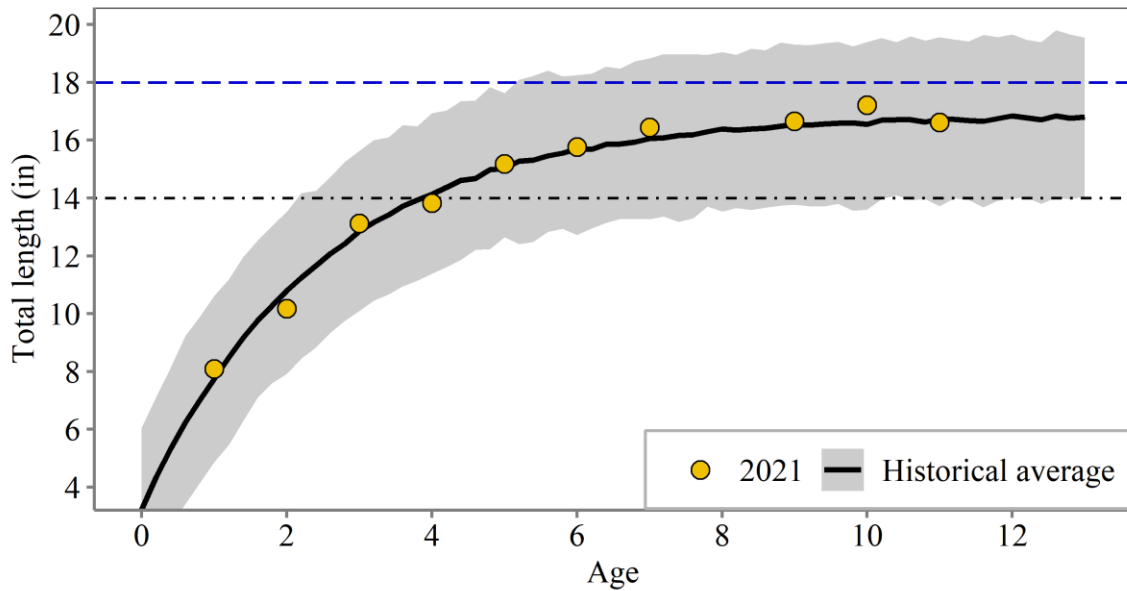


Figure 4.7. Largemouth bass length at age from the electrofishing survey in the West Zone. This chart can be used to estimate the age of a largemouth bass with a known length. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year's average. The black dotted line indicates the legal minimum length for most of the year (14 in), while the blue dashed line indicates the spring minimum (18 in).

Largemouth bass

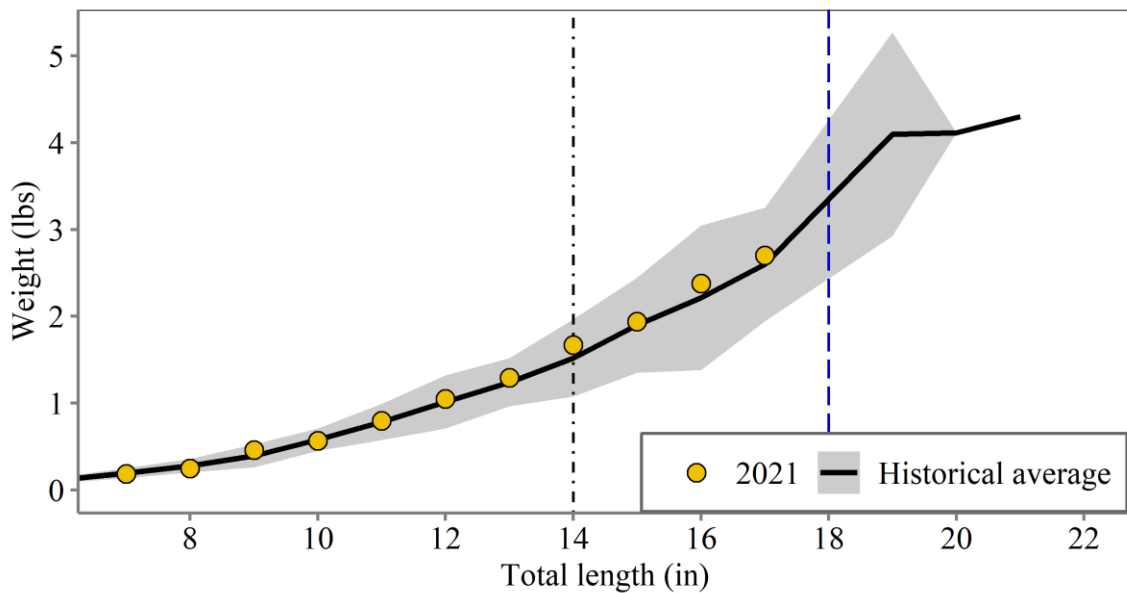


Figure 4.8. Largemouth bass weight at length from the electrofishing survey in the West Zone. This chart can be used to estimate the weight of a largemouth bass with a known length. The black line indicates the average fish, grey area represents 95% of fish, and yellow points indicate this year's average. The black dotted line indicates the legal minimum length for most of the year (14 in), while the blue dashed line indicates the spring minimum (18 in).

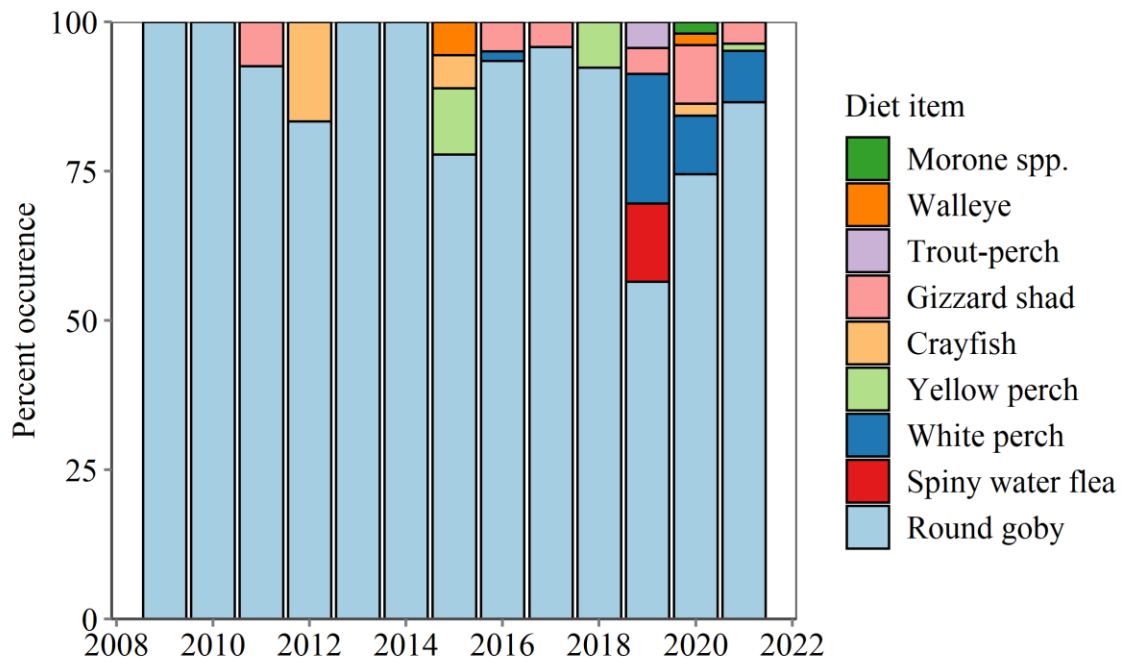


Figure 4.9. Percent occurrence of prey species in smallmouth bass diets in Ohio waters of Lake Erie (excluding empty stomachs and unidentified gut contents). These data come from early-fall gillnet surveys. Round goby make up the majority of smallmouth bass diets in Lake Erie.

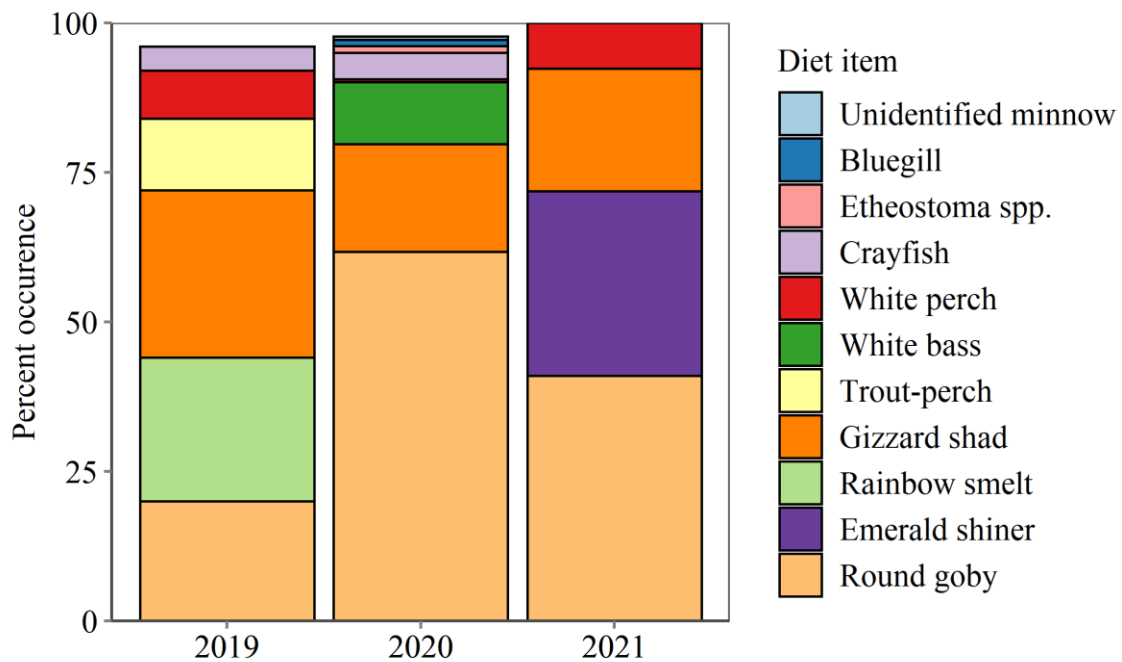


Figure 4.10. Percent occurrence of prey species in largemouth bass diets (excluding empty stomachs and unidentified gut contents). These data come from summertime electrofishing surveys. Largemouth bass diets in Lake Erie are highly variable.

Forage Fishes

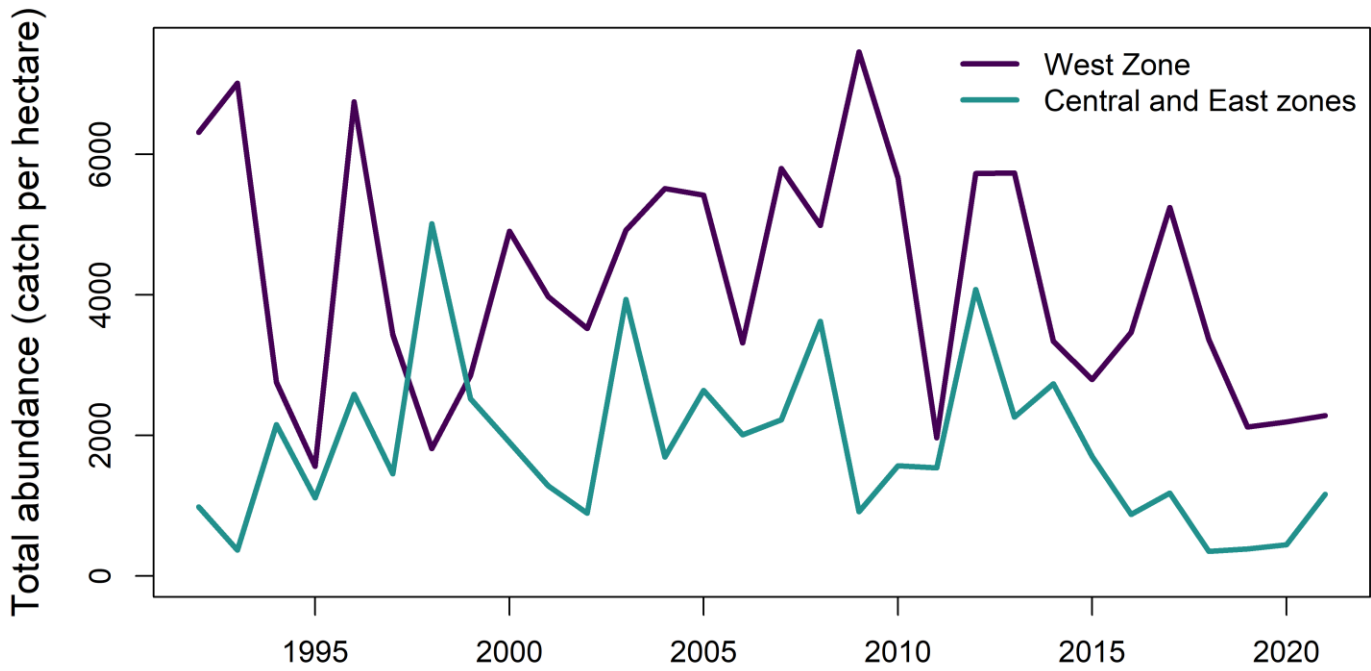


Figure 5.1. Total catch (fish per hectare) of forage fishes over time from the West, Central, and East Zone bottom trawl surveys (Central and East Zones combined). Forage fishes include any fish that would fit into an adult walleye mouth (roughly between 2–7 inches) and include emerald shiners, gizzard shad, white perch, rainbow smelt, and other species (listed in Figure 5.2).

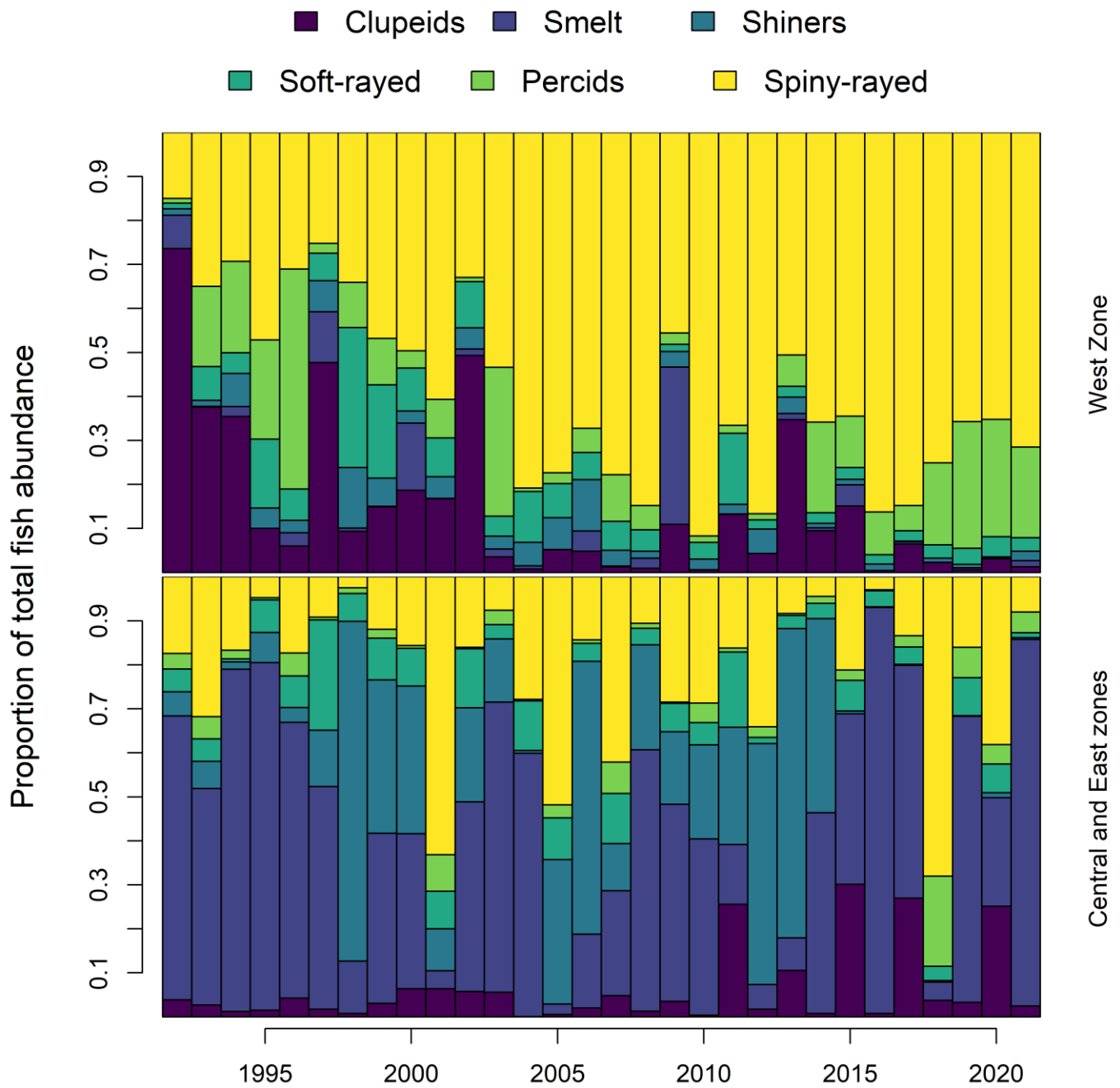


Figure 5.2. Proportion of total forage (percent) for various fish groups over time from the western (top) and central basin (bottom; Central and East Zones) trawl surveys. White Perch make up the majority of the West Zone forage populations (yellow), while rainbow smelt make up a greater proportion of central basin forage populations (blue).

Environmental

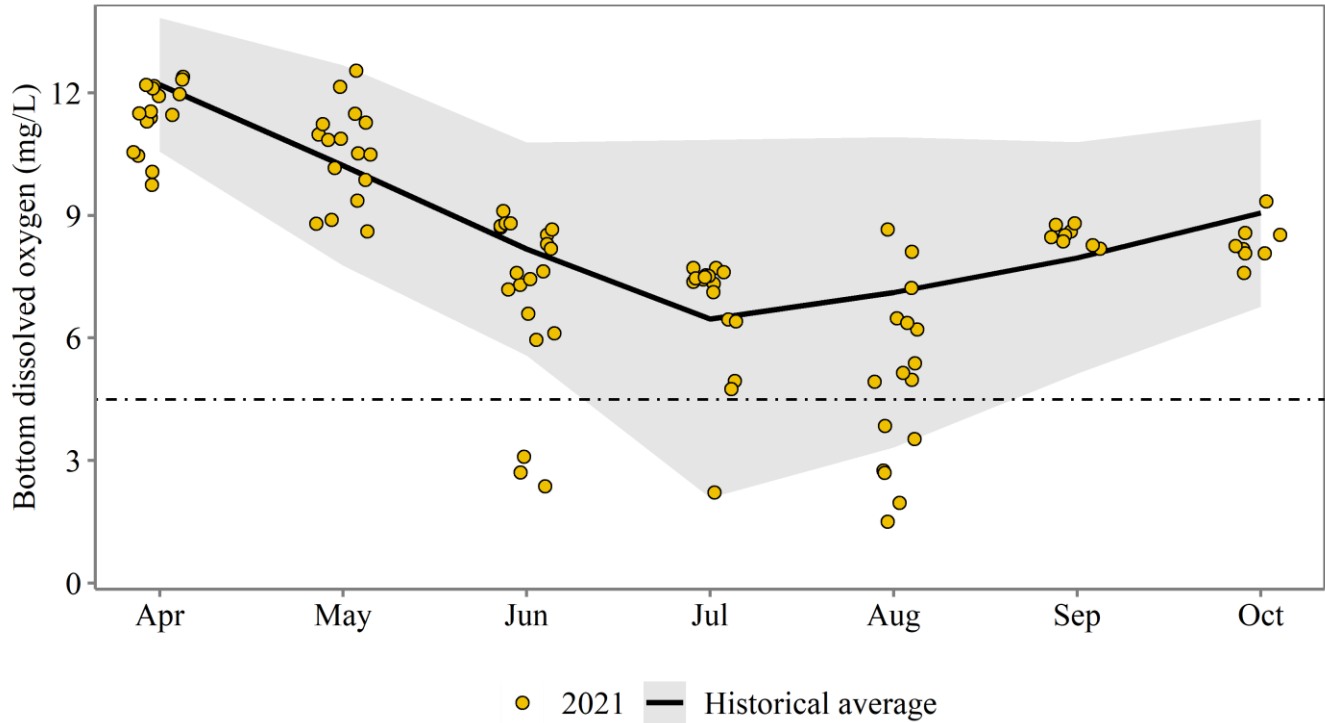


Figure 6.1. West Zone lake bottom dissolved oxygen measurements by month in 2021 (orange points) compared to the ten-year average (black line) and 95% range (grey area). Fish behavior, including feeding, tends to be impacted when dissolved oxygen is below ~ 4.5 mg/L (dashed line), which is typically prevalent in August.

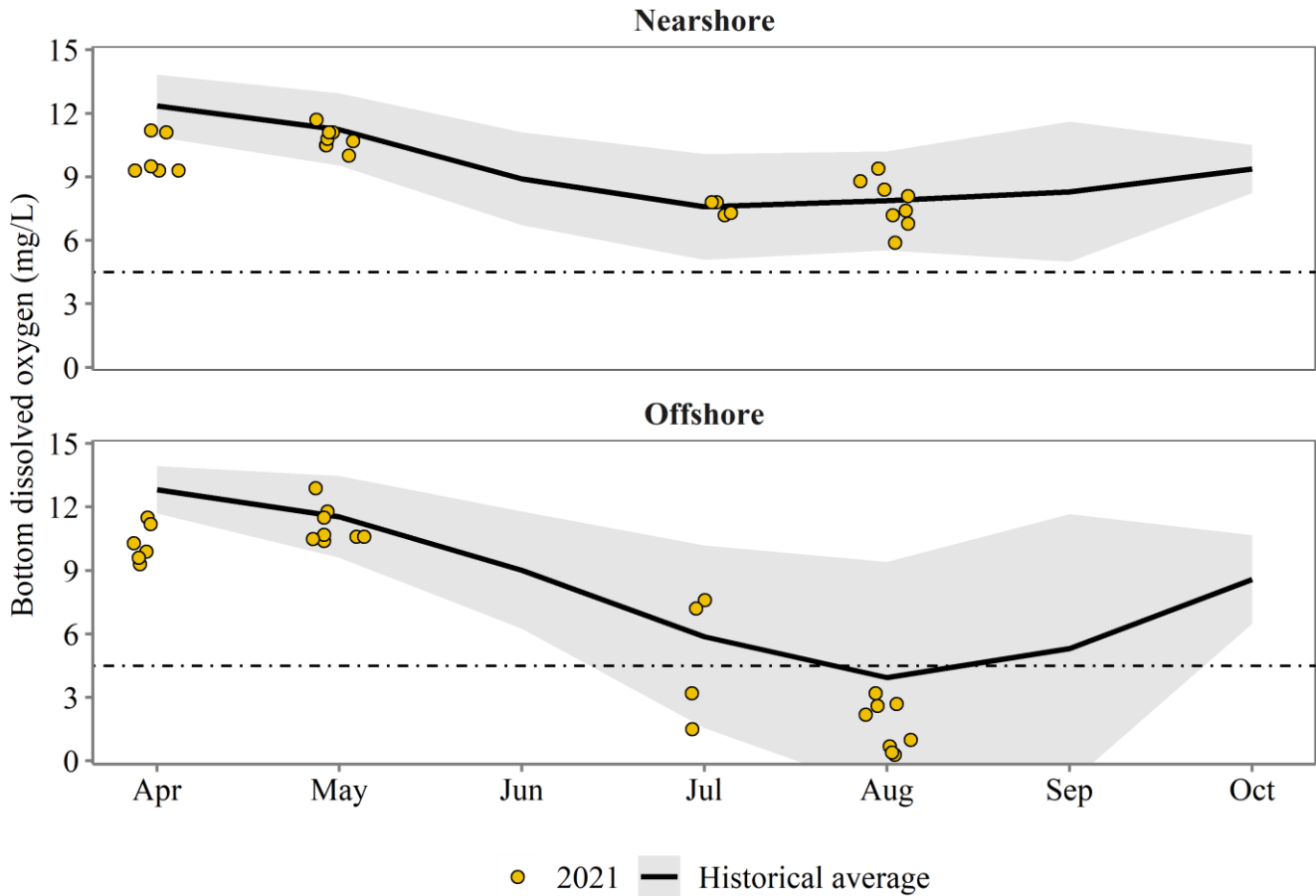


Figure 6.2. Central and East Zone lake bottom dissolved oxygen measurements by month in 2021 (orange points) compared to the ten-year average (black line) and 95% range (grey area). Offshore areas (bottom) tend to be more affected by low oxygen than do nearshore areas (top). Fish behavior, including feeding, tends to be impacted when dissolved oxygen is below ~ 4.5 mg/L (dashed line), which was is typically prevalent in August.

More Information

This document represents a small summary of the data that Ohio Division of Wildlife biologists collect every year. Greater detail can be found in the Division's annual Status Reports (before 2020) and Data Reports (2020–present). Background information on the multitude of annual surveys can be found in the Data Report Appendix. If you have questions, concerns, or would like to use these data, please contact one of the Division of Wildlife's Lake Erie offices:

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