

Merritt Reservoir

2023 Fall Survey Summary

Zac Brashears Fisheries Biologist



Merritt Reservoir is located in the Nebraska Sandhills approximately 26 miles southwest of Valentine, NE. The area is comprised of 2,905 acres of water with 6,000 acres of land adjacent to the reservoir. The reservoir was built in 1964 by the Bureau of Reclamation for irrigation purposes. When built, the Snake River was dammed near its confluence with Boardman Creek, flooding both valleys along with the Powder Horn arm of the reservoir. Flows from both the Boardman Creek and Snake River contribute to filling the reservoir to full pool each year. The water and land adjacent to the reservoir is managed by the Nebraska Game and Parks Commission for fishing, hunting, and recreational activities. Fishing is available year round and several different fish species are present in Merritt Reservoir which include: Alewife, Walleye, White Bass, Muskellunge, Northern Pike, Yellow Perch, Bluegill, Pumpkinseed, Black Crappie, Largemouth Bass, Smallmouth Bass, Freshwater Drum, Black Bullhead, White Sucker, and Common Carp.

Facilities at Merritt Reservoir include nine campgrounds (four with electrical hookups and one with ADA accessible shower), one dump station, vault toilets, picnic shelters, two fish cleaning stations, five boat ramps with lighted parking lots, and an area concessionaire which provides permits, groceries, fee camping with RV hookups, boat rentals, fuel, cabins and guide services.



The following text and graphs are the results of netting surveys completed at Merritt Reservoir in 2023 as well as historical data. Biologists use gill nets to sample species that are primarily found in open water such as Walleye, White Bass, and Channel Catfish and trap nets to sample shore oriented species such as Bluegill, Black Crappie, Yellow Perch and Northern Pike. Electrofishing surveys are used to sample Largemouth and Smallmouth bass at Merritt Reservoir. Trap net and electrofishing stations are sampled each year or on a 3-year rotational basis at approximately the same locations and dates as previous years to allow for trend comparisons. Gill nets for open water species are sampled annually.

Channel Catfish

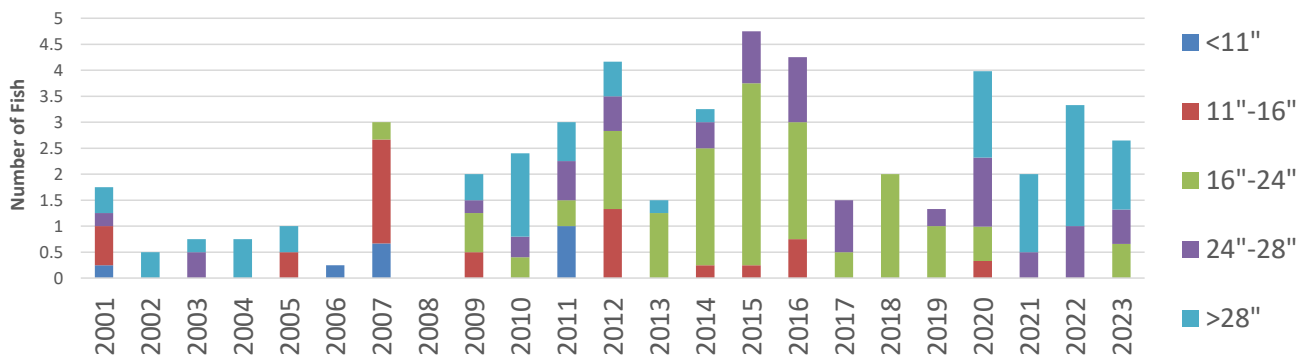
Historically Merritt Reservoir has always shown lower abundance of Channel Catfish compared to other irrigation reservoirs across the state. Gill net surveys completed in 2023 indicated a catch rate of 2.6 Channel Catfish per net which is lower than 2022 but higher than the average of 2.1 fish per net recorded since 2001. The surveys performed last year also showed 50% of the population was over 28 inches in length. Bigger Channel Catfish have been surveyed in 2020 and continue throughout 2023. These larger fish draw recreational and tournament anglers to Merritt each year where many trophy-sized fish are caught. Angler reports also suggest great numbers of Channel Catfish which is not shown in our standardized surveys. These fish may be in deeper water during the timing of our surveys where nets do not sample effectively.

Stocking requests are for 10,000 ten-inch Channel Catfish to be stocked on alternate years at Merritt (even numbered years). Efforts are being made to provide anglers with opportunities at catching trophy Channel Catfish.

Merritt Reservoir holds the state record Channel Catfish which was caught in 1985 and weighed 41.5 pounds. Anglers usually do well at Merritt drifting cut bait or dough balls and working the edges of drop-offs in late summer or early fall. Channel Catfish can also be targeted during the early spring at ice out or in the weed beds and timber when they venture in to spawn.



Channel Catfish per Gill Net



Regulation:

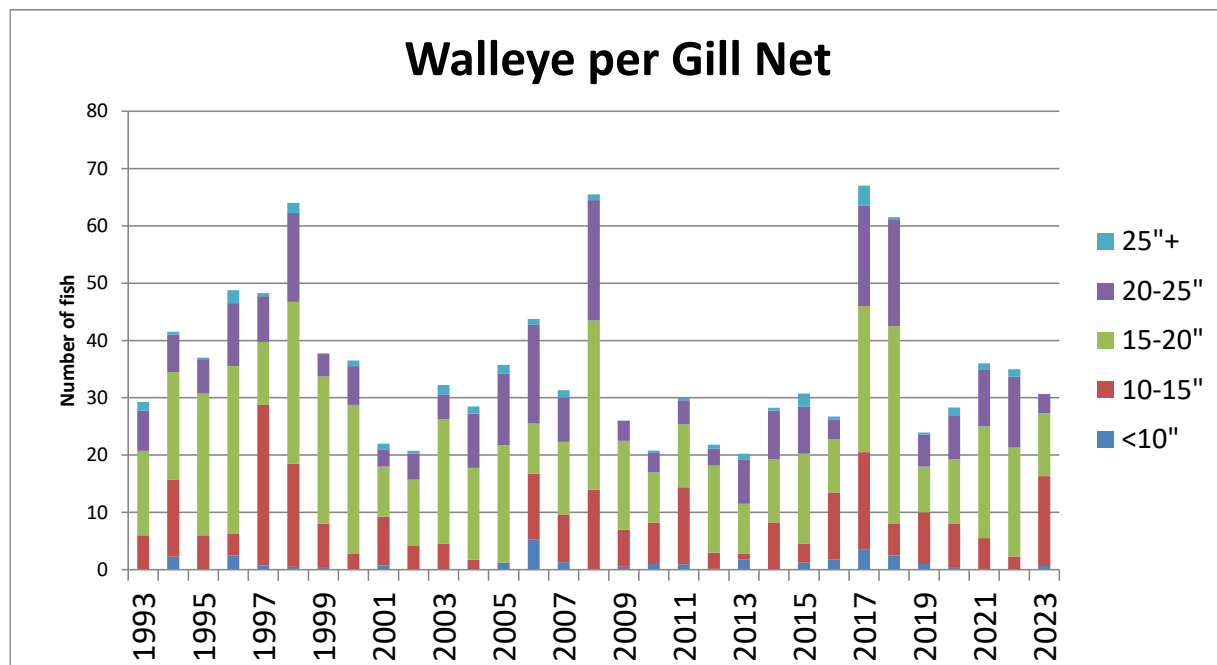
Daily bag limit of 5 fish with a possession limit of 20 fish. The Channel Catfish daily bag limit statewide shall include no more than one fish 30 inches or longer. This change is expected to protect larger fish at Merritt which have experienced a reduction in overall size of Channel Catfish.

Walleye

Merritt Reservoir has been a top destination in the midwest for Walleye anglers over the last several years and has consistently ranked in the top 5 for overall abundance in Nebraska's Fishing forecast. This can be found at <https://outdoornebraska.gov/wp-content/uploads/2023/03/2023-Fishing-Forecast-web-version-1.pdf>.

Fall surveys at Merritt in 2023 averaged 30.6 Walleye per gill net. This catch rate was good but a little lower than the average since 1993 of 35 Walleye per net. These fish still showed a good size structure with 47% of the population over the statewide minimum of 15 inches. Numbers of fish under 15 inches also looked really good and should contribute to year classes for many years to come. Young-of-the-year Walleye (<8 inches) are usually not big enough to recruit to our standardized gill nets but electrofishing surveys indicated a pretty good year class for 2023.

Walleye stockings at Merritt Reservoir occur during June with approximately 214,875 fingerling (2 inches) stocked to maintain the population. This stocking rate began in 2014 and is an increased stocking rate from 50 fish per acre to 75 fish per acre. Efforts are ongoing to determine if smaller fingerlings stocked in early June or larger fingerling stocked in later June are contributing more to the overall fishery at Merritt.



Regulation:

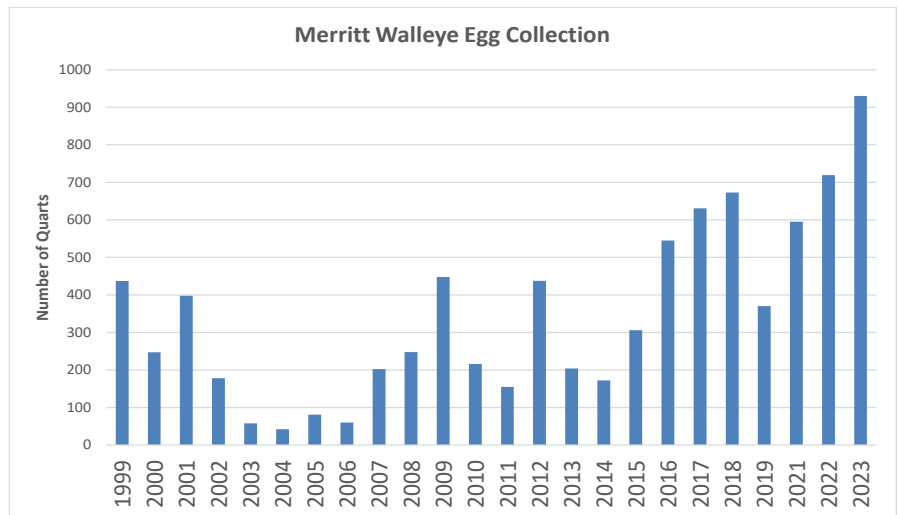
Anglers at Merritt are allowed a daily bag limit of 4 Walleye which may include one from 15 to 18 inches (it is allowable to have all fish over 18 inches) but only one fish over 22 inches is allowed in the daily bag. The possession limit for Walleye is 8 fish.



Walleye Spawn

Fisheries Division will conduct Walleye spawn operations at Merritt reservoir again in 2024. These operations usually occur during the first part of April and last until hatchery production needs are met for statewide requests. Gill nets are set parallel to the dam or shoreline in order to collect females as they venture into spawn. These nets are set short term and ran every 1-2 hours. The mesh nets target female Walleye and are usually big enough that male Walleye pass back and forth through the net avoiding capture. These nets are marked with a buoy on each end and anglers are reminded not to cast between the buoys or lures will be lost.

During the 2023 Walleye spawn, 1,308 females were captured in gill nets. Out of these fish 595 were “ripe” or had eggs flowing and hatchery personnel were able to collect 910 quarts of walleye eggs for statewide production needs.



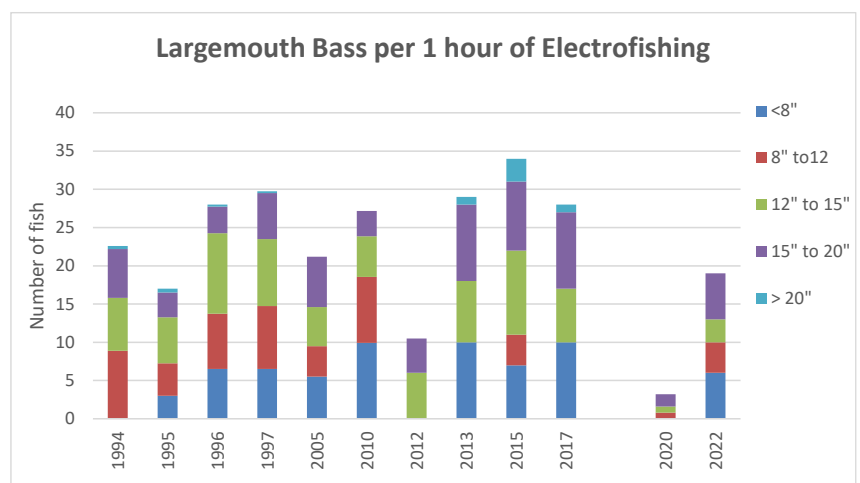
Largemouth Bass and Smallmouth Bass

Largemouth Bass were not surveyed at Merritt in 2023 due to time constraints and checking for winterkill conditions on other lakes across the district. Surveys for Largemouth Bass populations at Merritt will again be conducted in 2024.

Largemouth Bass numbers were slightly higher in 2022 than the previous survey indicating fish were missed during the 2020 survey. However, a catch rate of 19 Largemouth Bass per hour is still lower than historical catches have indicated. Even though numbers were lower the population showed an excellent size structure with similar catch rates of all size categories except fish over 20 inches. Out of the Largemouth Bass sampled 31% of these fish were greater than the statewide minimum of 15 inches. The biggest Largemouth Bass sampled measured 19.6 inches and weighed 5.8 pounds.

Smallmouth Bass also exist in Merritt at low abundance which makes sampling these fish difficult. In 2022, 5 Smallmouth Bass all less than 8 inches were caught indicating some natural recruitment of this population is occurring.

Black Bass Regulations: Minimum length limit of 15 inches with only one fish longer than 21 inches in the daily bag. Daily bag limit of 5 fish with a possession limit of 10 fish.

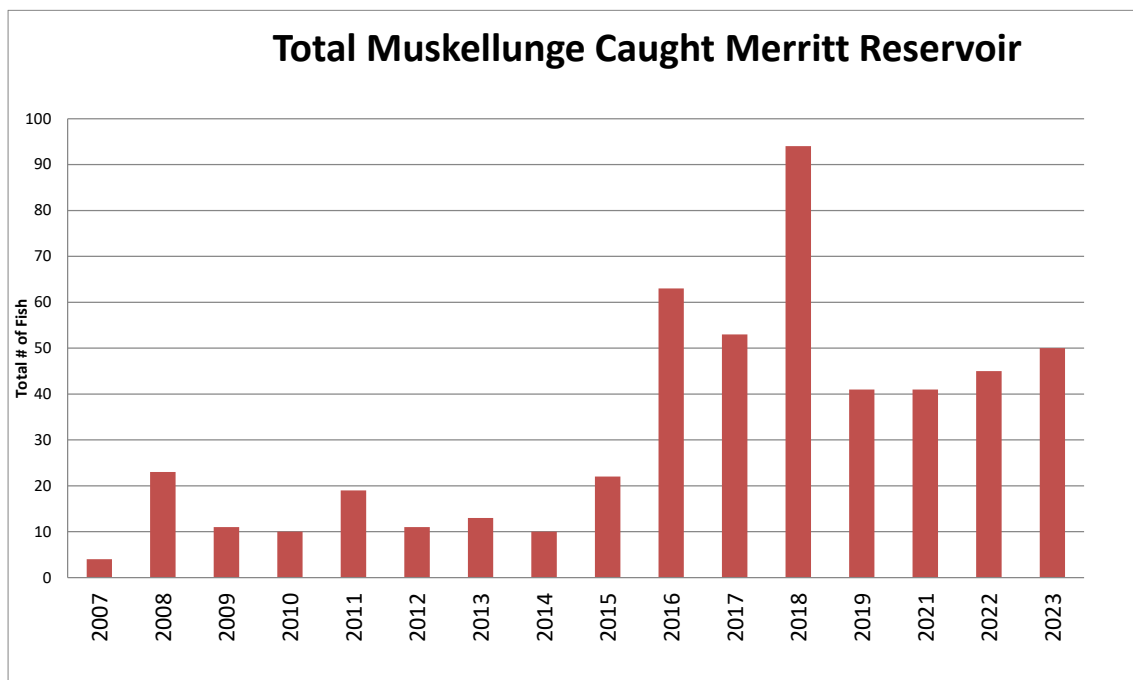


Muskellunge and Northern Pike

Merritt is gaining popularity with anglers targeting trophy muskellunge in recent years. The state record Muskellunge came from Merritt in 1992 and weighed 41.5 pounds. Angler reports of fish around or exceeding the 50 inch mark are received each year. These fish are difficult to sample during our standard surveys but are often collected during the spring Walleye spawn operations. Muskellunge typically spawn a little bit later than Walleye depending on weather conditions. In 2020, a research project was started at Merritt and Cottonwood Steverson Lakes, to determine how old Muskellunge can get, how fast they can grow, what lengths they can attain, and whether they can reproduce in these environments. Similar to other species we are finding that the females attain larger sizes than the males. Some of the females collected have been 46-48 inches in length and the males are topping out at about 40 inches.

As can be seen from the graph, Muskellunge populations really increased in 2015-2018. This can be attributed to a large year class of 28-34 inch fish. Since 2019 the Muskellunge catch has increased slightly from 40 total fish to 50 fish in 2023. Northern Pike are also present in Merritt providing additional fishing opportunities especially during the spring months and ice fishing season. Angler reports of pike over 40 inches are received each year.

Hatchery personnel raise esocids on a 3-year rotational basis usually (Northern pike, Muskellunge, Tiger Muskellunge). Merritt Reservoir is usually stocked every 3rd year with 500 advanced Muskellunge (12-15 inches).



Regulation:

There is a 50-inch minimum length limit for Muskellunge and Tiger Muskellunge at Merritt Reservoir. This change is expected to protect large Muskies and establish a destination location and trophy fishery at Merritt. Bag limit of 1 fish with a possession limit of 2 fish.

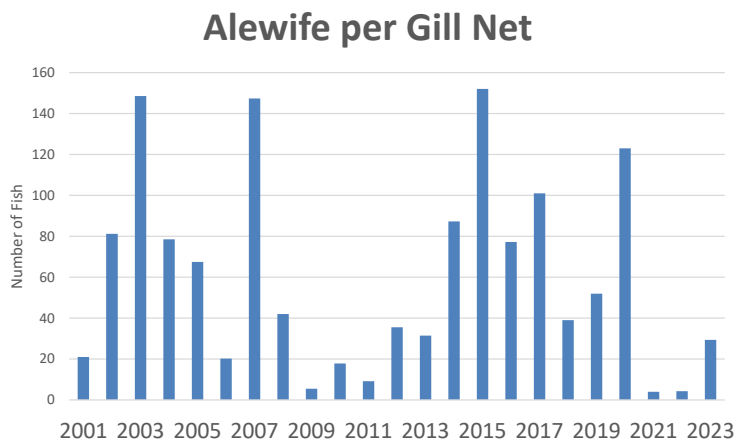
Alewife

Alewife are the dominant prey species in Merritt for Walleye, Northern Pike, Muskellunge, Largemouth Bass, and Channel Catfish. Angler reports and personal observation during the spring of 2023 created concerns that Alewife numbers were very low.

Electrofishing surveys were completed post alewife spawn and showed definite spawning success throughout the reservoir. Gill net surveys showed catch rates decreased drastically in 2021 and 2022 but bounced back slightly in 2023 as shown by the graph.

These lower numbers are also due to smaller young of the year Alewife which do not recruit to the gill nets until they reach a bigger size.

Fishing can sometimes be tough at Merritt and this usually falls in line with a high alewife prey base. Lower Alewife numbers over the past several years is why anglers have enjoyed some fairly high catch rates for Walleye and other species over the past several years. Alewife do grow and maintain great walleye populations but Alewife can be hard on eggs and or fry of all species which can lead to issues of recruitment making stocking of some species necessary.



Other Species

Many other species exist in Merritt Reservoir and some of these species are not surveyed each year such as Bluegill, Black Crappie, Yellow Perch, Rock Bass, and Pumpkinseed. White Bass populations are not abundant at Merritt Reservoir but opportunities do exist for large fish such as this 16 inch fish pictured right.



Invasive Species

Over the past several years invasive species have become a rising concern in Nebraska. In 2015, a regulation was established to help prevent the spread of invasive species via boats and trailers. The regulation states: It is illegal to either arrive or leave any water body in Nebraska with water other than from a domestic source (water supply system, well or bottled) except for firefighting purposes.



Zebra Mussels (pictured right) were first documented in Nebraska in 2006 at Offutt Airforce Base Lake and are now also located in Lewis and Clark Lake, Lake Yankton and the Missouri River. **Anglers should be made aware zebra mussels were just recently documented in Lake Oahe, South Dakota.** Zebra mussels and quagga mussels are small fingernail-sized mussels and adults are usually $\frac{1}{4}$ to $\frac{1}{2}$ inches long with alternating yellow and brownish colored stripes on their shell. These mussels can spread in their immature form known as veligers by being transported in bilge, ballast, or live-well water or as adults attached to boat hulls, engines, aquatic vegetation, or other surfaces. Sampling for these veligers occurs statewide from May through September. No evidence of these mussels has been discovered in any other lakes sampled. However, it is important to note that Zebra Mussels are spreading quickly in nearby South Dakota with expansion up the Missouri River Reservoirs, eastern South Dakota Glacial Lakes, and Pactola Reservoir in the Black Hills. Anglers and boaters fishing those waterbodies as well as Merritt should be extra cautious and always follow CLEAN, DRAIN, DRY protocols.

Aquatic vegetation such as curly-leaf pondweed and Eurasian water milfoil are also invasive species present in Nebraska. **Curly leaf pondweed is present in Merritt Reservoir.** Both of these plants form dense mats of vegetation near the water's surface which make recreational fishing, boating, and swimming difficult. Spread of these plants can happen through stem fragmentation where a single segment of plant material can be transferred to another water body and form a new colony. Both or one of these species have been documented throughout NW Nebraska at Merritt, Box Butte, Walgren Lake, Smith Lake WMA, Cottonwood SRA and on Fort Robinson State Park. Therefore, removing any visible plant material from boats and trailers is a must and remember to **CLEAN, DRAIN, and DRY!**

CLEAN- Remove plants, animals, and mud by thoroughly washing equipment that came into contact with the water.

DRAIN- Drain all water before leaving, including wells, bilge, ballast, and any parts or equipment that can hold water.

DRY- Allow all equipment to dry completely before launching into another body of water.



For more information on invasive species in Nebraska visit neinvasives.com.

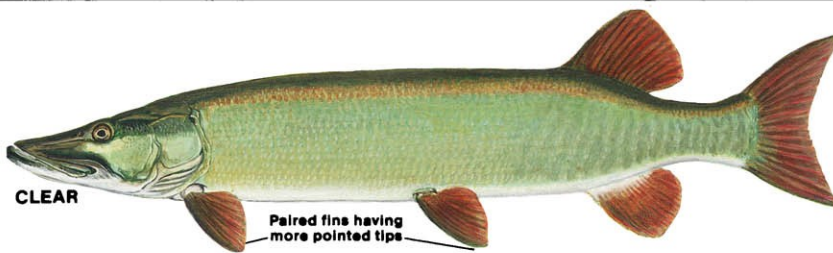
For more information on fisheries management or activities at Merritt Reservoir

Zac Brashears (NGPC Biologist), (402) 376-8080 zac.brashears@nebraska.gov

Al Hanson (NGPC Manager) or Joe Rydell (NGPC Biologist), (308) 763-2940 al.hanson@nebraska.gov, joe.rydell@nebraska.gov

MUSKELLUNGE - NORTHERN PIKE

Know How To Tell The Difference!



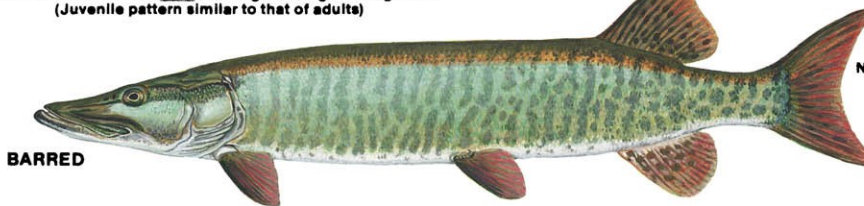
NOTE: Faint indication of marking pattern is sometimes present on posterior 1/3 of body in "clear" variation of muskellunge.

MUSKELLUNGE (*Esox masquinongy*)

3 COMMON PATTERN VARIATIONS

SPOTTED

Coloration with vertical dark markings on a light background (Juvenile pattern similar to that of adults)

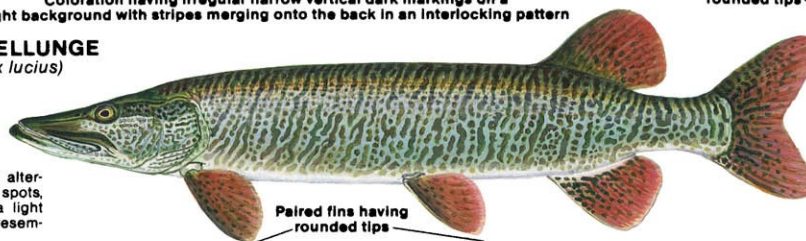


NOTE: Background colors of fish can vary slightly depending on environmental characteristics of the water body and its geographic location. One marking pattern may dominate in an area, but all 3 can be present.

Coloration having irregular narrow vertical dark markings on a light background with stripes merging onto the back in an interlocking pattern

HYBRID "TIGER" MUSKELLUNGE (*Esox masquinongy* X *Esox lucius*)

NOTE: Sides sometimes exhibit an alternating pattern of stripes and spots, or narrow paired-bars on a light background. Pattern never resembles that of northern pike.

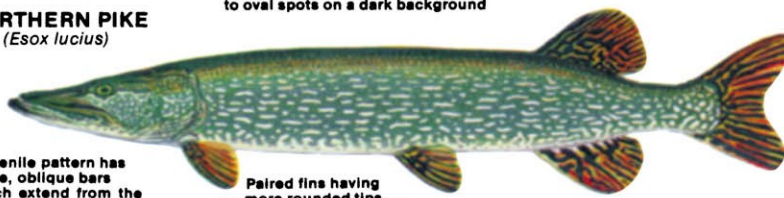


Caudal fin with rounded tips

Coloration with pattern of horizontal rows of light round to oval spots on a dark background

NORTHERN PIKE (*Esox lucius*)

(Juvenile pattern has white, oblique bars which extend from the white belly)



Caudal fin with more rounded tips

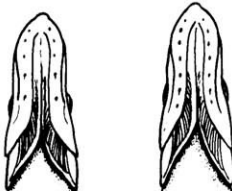
NOTE: Some areas may contain "Silver Pike" which is a mutant color variation of northern pike that lack the characteristic spots and have dark to light greyish/blue sides. Fin coloration normal for northern pike is exhibited in the "silver" variety.

Color illustrations by:

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IN MOST AREAS THESE FISH HAVE MINIMUM SIZE RESTRICTIONS, MAXIMUM POSSESSION LIMITS, AND SPECIAL OPEN SEASONS... CONSULT LOCAL FISHING REGULATIONS FOR SPECIFIC DETAILS.

Location of submandibular pores on under side of lower jaw...



NORTHERN PIKE
5 or fewer pores

MUSKELLUNGE
6 to 9 pores

NOTE: Hybrids have 5 to 8 pores on each side of lower jaw.

For further information please contact the Nebraska Game and Parks Commission or...

Muskies Inc.
www.muskiesinc.org



NEBRASKA GAME AND PARKS COMMISSION

Line diagrams courtesy of Dr. James C. Underhill, University of Minnesota



Upper half of cheek and operculum with scales



Entire cheek and upper half of operculum with scales

NOTE: Hybrids have 1/2 or more of cheek and upper half of operculum with scales.

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