

INSTITUTE FOR FISHERIES RESEARCH
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

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ANN ARBOR, MICHIGAN

July 19, 1938

REPORT NO. 485

THE PIKES OF MICHIGAN

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Probably no fish in Michigan has a more variable reputation than the pike. He is condemned by one group of anglers because of his habit of eating young bass, perch, bluegills and other game fish. Another group, and this includes many of the anglers from Ohio and Indiana, praise the fish and would rather catch one pike than a boat load of bass and bluegills. This may be explained by the fact that certain members of the pike family commonly reach a larger size than any other game fish found in Michigan; also the pike takes such a fine picture!

As late as 1931 spearing of pike was allowed while the fish were spawning. This was justified on the grounds that the pike is a predator and that the fewer the pike in a lake, the better the fishing for bass, bluegills and perch. While it is true that pike are fish eaters to a great extent, it is now being realized that in many lakes too great a survival of young fish may result in stunting. In other words, members of the pike family may perform a valuable service in "maintaining the balance" as well as giving the angler a thrill and a good picture to show to the folks back home.

In reading some of the more popular as well as scientific journals, we find that a considerable number of "stories" about the pike were actually believed. Izaak Walton, for instance, believed the pike to be the offspring of the common pickerel weed.* Then there is the story of the pike which reached the age of 260 years, and the one that reached the length of 19 feet and the weight of 350 pounds. Something was obviously wrong either with the figures or the pike, because a fish of that length should weigh several tons.

There are few questions that carry more possibilities of argument, difference of opinion and general misunderstanding among fishermen than the proper names of pike, pickerel, and muskellunge. The trouble would be serious enough if we were dealing with the members of the true pike family consisting of 6 species in North America, but unfortunately several unrelated fish are also called pike. One of these is the walleye, a member of the perch family, which is recognized by 80 legitimate names. To add to this confusion, one name has been applied to seven different fish. In every locality sportsmen have their own separate names for these fish.

There are well over 50 names used to designate the muskellunge and at least 40 legitimate spellings of the word.** These are divided into two groups, one derivation is from the Indian word spelled "Mas-kinonge"; and those which derive it from the French words "masque-al-longé." Other names for the muskellunge are: blue pike, great pike, longe, lunge, musky, and pike. There are over 40 names being used for the great northern pike, some are as follows:

* The Book of the Pike by O. W. Smith, page 25, Stewart Kidd & Co., Publishers, Cincinnati, Ohio. 1922.

** Weed, Alfred C. Pike, Pickerel and Muskalonge. Zoo. Leaflet No. 9, Field Museum of Natural History, Chicago, Ill. 1927.

Wasserwolf - (German)
Snake - (Upper Michigan)
Shovelnose pike
Pickerel, pike
Northern pike
Jack
Grass pike
Grass pickerel
Duck-billed pike
Canada pike

It has always been claimed by fishermen that the failure of pike to bite during the summer was due to sore gums. This was thought to be caused by the pike shedding their teeth at this time of year. This was disproven in 1935 by Dr. C. L. Hubbs and Milton Trautman of the University of Michigan. They found that the teeth of the pike are broken off or shed throughout the year and that the teeth are constantly being replaced. They also discovered, on the basis of stomach examination, that pike do not "go off their feed" in the summertime. Failure to catch many northern pike and muskellunge during hot weather may either be due to an abundance of the young of other fish at this time, or to retirement to deeper waters, or to general sluggishness due to high water temperatures.

The pike family (Esocidae) consists of six species of the genus Esox. All of them except the northern pike are found only in the fresh waters of North America. The body is elongate, and compressed. The head is also long, with a snout like the bill of a duck. The mouth is large and contains many teeth, some of which are long and pointed, others being shorter and hinged to allow food to enter more easily. The dorsal fin is set well back toward the tail. The coloration varies somewhat with the habitat, but each species does have a more or less characteristic spotting which will be discussed later. They are all voracious fish. David Starr Jordan* describes them as "mere machines for the assimilation of other

* Jordan, David Starr. Manual of the Vertebrate Animals, 1929. p. 97.

organisms solemn, stately, ruminant fish, lurking under the shadow of a lily pad at noon, with still, circumspect, voracious eye, motionless as a jewel set in water, or moving slowly to take up its position; darting from time to time at such unlucky fish or frog or insect as comes within its range and swallowing it at a gulp."

There are three pikes commonly found in Michigan. (A fourth, the chain pickerel, may be taken in the extreme southern part of the state, but we have no record of this to date.) The easiest method of telling them apart is by the scales upon the cheek and gill cover (operculum). The diagrams illustrate these differences.

Insert Figs. 1, 2 and 3 here.

Great Northern Pike (Esox lucius)

The color of the northern pike varies with different localities and different waters, tending to more or less resemble the color of the water, the weeds and the bottom. For example, the northern pike in Lake Michigan has a decided reddish color. Generally the back is a bluish or greenish gray with a more or less purple luster. The sides are yellow with irregular rows of small spots of yellow or gold (Fig. 5), which sometimes, especially in young specimens, merge to give the appearance of vertical bars. The belly is white. The dorsal fin is situated above the anal fin, near the tail. The cheeks are fully scaled and the gill cover has scales on the upper half only (Fig. 2).

The northern pike is the only member of the family found outside of the United States. It inhabits fresh waters of the northern parts of Europe, Asia, and North America, north to Alaska and Siberia. In eastern United States this species is found as far south as New York and the Ohio River. In Europe the northern pike goes as far south as Italy and Greece.

The northern pike breeds in the early spring, as soon as the ice leaves, or shortly after, depending upon the water temperature. As the water approaches 46°F., which in Michigan may be any time from March to May, the pike leave the lakes to spawn in the shallow water of marshes, or meadows that have been flooded. In streams or ditches spawning may occur in the sluggish or swampy sections or any overflow area. The breeding season is of several weeks' duration, depending upon the age of the fish. Young fish are said to spawn first, followed by increasingly larger ones.

The eggs of the northern pike are approximately one-eighth of an inch in diameter. A single female may deposit as many as 100,000 eggs. The period of hatching varies from 14 to 30 days depending upon the water temperature. The female pike is said to be larger than the male, and the fish may reach maturity at the minimum age of three years. Pike fry grow slowly at first, but after attaining a length of several inches, the size increases at a tremendous rate. It is not uncommon for pike to reach a length of one foot or even more by the end of the first year, depending among other things upon the average water temperatures and the amount of available food. Fish tend to grow faster in warmer waters if other biological conditions are favorable.

For average Michigan waters the rate of growth of the northern pike is about as follows:

1st year	-	8-12"
2nd "	-	14-18"
3rd "	-	22-26"
6th "	-	39"
12th "	-	53"

The most rapid growth is during the first four years. The maximum weight attained by pike in this state is approximately 35 pounds and the greatest length is around 54 inches. The average lengths of all northern pike taken and recorded for the 1935 and 1936 Michigan general creel census were 21.4 inches and 19.7 inches respectively. The greatest age attained by a pike has been given as 14 years.

The habitat of the northern pike varies with the seasons and water temperatures. In the summer pike prefer to stay in the shallower plant beds near shore, in water averaging approximately 4 feet in depth.* In autumn they migrate to the deeper waters, preferring precipitous, stony shores. In the winter most of them may return to their summer habitats, but the larger ones seem to go to the deeper waters, as they are seldom caught in winter in the shallow waters. Clear water seems to be preferred. Their favorite haunts in rivers are the pools at the foot of rapids or falls, or the weedy bayous of rivers.

The food of the small northern pike, up to several inches in length, consists mainly of small crustacea and insects. The larger pike feed almost entirely upon fish. The pike is probably the most voracious of our fresh water fish. Explaining the feeding habits of the northern pike, Kendall (1917)** said: "From the dense bed of grass or rushes, where it usually

* The Ecology and Economics of Oneida Lake Fish by Hankinson, T. H. and Adams, C. C. Roosevelt Wildlife Annals, Vol. 1, Nos. 3 & 4 of the Roosevelt Wildlife Forest Experiment Station, Syracuse, New York. Pp. 396-405.

** The Ecology and Economics of Oneida Lake Fish by Hankinson, T. H. and Adams, C. C. Roosevelt Wildlife Annals, Vol. 1, Nos. 3 & 4 of the Roosevelt Wildlife Forest Experiment Station, Syracuse, New York, p. 400.

passes the day in stationary watch, it pounces with the speed of an arrow on its unwary victims. It almost always seizes its prey crosswise and retains its hold until the latter is so dead or exhausted as to desist from all struggles. Then the pike turns the prize in its jaws till the head points toward the interior of its mouth and commences its meal."

Examination of the stomachs of pike have shown that they eat almost anything in the form of animal life. The following is a partial list of food found in pike stomachs and serves to illustrate the diversity mentioned above: Northern pike, walleyes, perch, bluegills, black bass, sunfish, suckers, various minnows, mice, the young of ducks and other waterfowl, reptiles, frogs, crayfish and other smaller crustacea, insects, snails, leeches and carrion.

The principal enemy of the northern pike is man. Certain water birds, fish and turtles may also take their toll of northern pike. During the summer of 1937 a large snapping turtle, weighing between 20 and 25 pounds, was captured and upon examination of its stomach it was found to contain a 15 inch northern pike. But as a whole, predation upon the northern pike is small as compared with that of most other fishes. The common parasites of fishes may be found in the pike, including the common yellow grub, but usually the pike is relatively free from such pests.

The relative importance of pike as a food and game fish is a subject on which fishermen disagree. It is true that an enormous poundage of food, mostly of other fishes, is required to bring a pike up to catchable size. Longevity and the relative slow annual growth of the larger pike is another factor to be considered. In waters where there is an abundance of minnows, suckers and other "coarse" fish and where bass or trout do not find suitable conditions, the pike might be a desirable fish. Waters containing pike have a great attraction for anglers because the pike is one of our largest fresh water fishes. But in trout waters or other

waters in which desirable game fish thrive, the pike may be detrimental.

In some instances pike could be introduced into a lake to check the overabundance of other fish such as bluegills, perch, etc. It may also be advisable to introduce pike into lakes that are overpopulated with stunted fish. This should create the proper balance between these stunted populations. But extreme caution must be exercised here because it would be relatively easy to introduce pike into any lake, but difficult or impossible to eradicate them. Creel census records on Houghton Lake show that as the catch of pike decreases, panfish and bass fishing improve and vice versa.

The flesh of the pike is firm and palatable. Because of its large size, many anglers save the head or the skin for trophies. Its photographic qualities are not forgotten by the angler.

Artificial propagation has been attempted in a few states. Experiments in pike culture were begun in Michigan in 1937. A relatively high percentage of the eggs hatch in an ordinary hatching jar. The main difficulty in pike culture is due to the voracity of the fish. Even when an abundance of live food is provided, it is still difficult to get a good production because of cannibalism.

When hooked, a pike is a persistent and spectacular fighter. Trolling usually yields good results. Large spoon hooks and other artificial lures, live bait, especially suckers and silversides, and frogs are commonly used in trolling in the shallow marginal waters. A large, lively minnow is probably the best bait for still fishing, although frogs sometimes produce good results. Bait casting with spinner, plug, or frog at the surface, or just below, is sometimes effective. Sometimes pike will not bite, and the most attractive lures fail to yield results. Other times they will strike savagely at anything offered them. In spearing through holes cut in the

ice, a light-tight shanty is necessary and silver tackle spoons, large, live minnows, and wooden decoy minnows prove to be excellent lures. In fishing with artificial lures, the hook should be set as soon as the fish strikes. With natural bait, it is usually best to slacken the line and allow the fish to retain the bait until it has been swallowed or is well in the mouth, because the pike sometimes take the fish crosswise in its mouth and as action ceases it works it around and swallows it, thereby not getting the hook until the bait is swallowed.

In April 1932, 84 mature northern pike were tagged in the Pine River in Gratiot County by C. W. Creaser of Wayne University. Twenty-three of these were recovered later that year by fishermen. Two of these fish had travelled 25 miles upstream, 38 days after being tagged. This shows that pike move rapidly and widely when on the spawning migration. On October 14, 1937, 100 northern pike which had been reared at the Drayton Plains hatchery were measured, tagged and released in Walled Lake in Oakland County. The returns from these tagged fish will give us some idea of the rate of growth in this lake.

Muskellunge (*Esox masquinongy*)

There are three subspecies of muskellunge, one found in the Ohio River and its tributaries; another in the headwaters of the Mississippi and the third in the Great Lakes region and its tributaries, ^{and} the Upper Mississippi. Only the latter species inhabits Michigan waters. The main distinguishing characteristic of the musky is the lack of scales on the lower half of the cheek and opercle (Fig. 3). The color varies somewhat in various localities, but is usually a dark gray. The sides are covered with round or square black spots of various sizes, on a ground color of silver-gray (Fig. 6). These spots sometimes run together to form bands. The belly is usually white, and the fins are black spotted.

The breeding habits of the muskellunge are not very well known, but the few observations that have been made indicate that they are similar to those of the northern pike.

The maximum recorded age of muskellunge is 20 years, the top weight from 60 to 75 pounds. The largest fish recorded in the World Almanac was 75 pounds; the greatest recorded length for 1936 was 60.5 inches. The average rate of growth of the musky as reported by Edward Schneberger in Wisconsin is as follows:

<u>Year</u>	<u>Length</u>	<u>Weight</u>
1	8"	$\frac{1}{2}$ lb.
2	16"	1 "
3	23"	3 "
4	28"	6 "
5	30"	8 "
6	32"	9 "
7	35"	12 "
8	38"	14 "
9	40"	16 "
10	43"	19 "
11	45"	23 "
12	46"	25 "
19	60.5"	42 "
20	59"	33 "

From the above table it appears that the growth of the muskellunge is similar to that of the great northern pike, being most rapid during the first few years of life. It has been estimated that between 10 and 15 pounds of food are required to add one pound of flesh to any members of the pike family. From these figures it can be appreciated what a tremendous drain a single musky must be upon the available food supply.

Little Pickerel or Mud Pickerel (Esox vermiculatus)

The mud pike is one of the smallest members of the family, rarely reaching a length of 14 inches, and averaging about 8 inches. Consequently it is of no importance as a game species. The color is typically grassy

to grayish-green, with darker streaks and bars resembling a network, with the lighter inner spaces worm-track-like. As with most species, the color varies with the habitat, and is sometimes highly colored and sometimes brassy blue or green (Fig. 4). There is a prominent dark streak below the eye. The main distinguishing feature of the mud pike is that the cheek and gill cover are fully scaled, (Fig. 1). This fish is found in the Mississippi Valley, the tributaries of Lake Erie and Lake Michigan south to the Mississippi and Arkansas. It is not known east of the Alleghanies nor Texas. It is abundant in creeks, ponds and the smaller rivers of the southern part of the Lower Peninsula of Michigan. It has a preference for quiet, muddy waters.

The mud pickerel is a greatly reduced model of the northern pike. Its food is chiefly animal matter, such as frogs, fishes, large insects and crustacea. It spawns early; ripe specimens have been taken in March. Breeding habits are probably similar to those of the northern pike.

The mud pickerel is not a game fish of any importance. Because of its small size it is not sought by anglers. Fishermen often think of this fish as being the young of the northern pike or muskellunge.

Hybrids among the pikes are uncommon. In the East hybrids have been occasionally found between the chain pickerel and the little pickerel (closely resembling our mud pickerel). Because of this, we ~~could~~^{might} expect hybrids between either the northern pike, muskellunge and the mud pickerel. This is possible due to the overlapping of their spawning periods and similar spawning habitats.

Captions for Figures

- Fig. 1. Head of mud pickerel. The cheek and gill cover are fully scaled. Copied from "The Pike, Pickerel and Muskalonge" by Alfred C. Weed. Zoology Leaflet No. 9, Field Museum of Natural History. Chicago, Ill. 1927.
- Fig. 2. Head of northern pike. Cheek fully scaled, gill cover with only upper half scaled. Copied from "The Pike, Pickerel and Muskalonge" by Alfred C. Weed. Zoology Leaflet No. 9, Field Museum of Natural History. Chicago, Ill. 1927.
- Fig. 3. Head of muskellunge. Only the upper half of the cheek and the gill cover are scaled. Copied from "The Pike, Pickerel and Muskalonge" by Alfred C. Weed. Zoology Leaflet No. 9, Field Museum of Natural History. Chicago, Ill. 1927.
- Fig. 4. Mud pickerel taken from Clinton River at Drayton Plains, Oct. 15, 1937. 10 inches long.
- Fig. 5. Northern Pike, $12\frac{1}{2}$ inches long, taken at Drayton Plains Hatchery Oct. 14, 1937.
- Fig. 6. Muskellunge. Lake St. Claire. Caught by Percy Haver. 49 lb. 11 oz. $58\frac{3}{4}$ in. long. Winner of Detroit Free Press Contest, 1937. (Photo by Jack Van Coevering)