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OCCURRENCE OF PINK SALMON IN MICHIGAN, 1963 - 1973

Wilbert C. Wagner, Fisheries Biologist

Thomas M. Stauffer, Fisheries Research Biologist

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by

Wilbert C. Wagner and Thomas M. Stauffer

The pink salmon (Oncorhynchus gorbuscha) was introduced into a tributary of the northwestern part of Lake Superior in 1956 by fisheries personnel of Ontario. The species has reproduced and there is now a self-sustaining population in the Great Lakes. On a 2-year life cycle, the pink salmon here spawns only in odd-numbered years. (Schumacher and Eddy 1960; Schumacher and Hale 1962; Parsons 1973.)

The species does not deviate from the 2-year cycle sufficiently to produce spawning runs during even-numbered years; the latter would require another introduction. The pink salmon in the Great Lakes is unique in that this is the only known self-perpetuating population of the species in fresh water. Should this salmon become abundant and widely distributed, it could have important effects on other fish and on the fisheries in the Great Lakes. Herein, we report on its dispersal and relative abundance in Michigan waters.

The pink salmon on the Pacific Coast has a 2-year life cycle. It spawns in streams during August and September. The fry emerge in the spring and immediately migrate to the sea. There they feed first on copepods and tunicates; at larger sizes they feed on euphausiids and amphipods. After two growing seasons in the sea, they return to the natal stream to spawn.

Spawners along the Pacific Coast average 22 inches in length and 4 pounds in weight (Bailey 1969).

Identification of pink salmon is not difficult. Along with other species of Pacific salmon, it has an elongate anal fin (13-19 rays) in contrast to the short anal fin (9-12 rays) of trout and the Atlantic salmon. The small size of scales of pink salmon (scale count of 170-232 in the lateral line) separates it from other Pacific salmon (scale counts of less than 160). Other useful characteristics of pink salmon for identification include: absence of parr marks on young, large dark oval spots on the back and tail of adults, small size at maturity (usually less than 20 inches, in the Great Lakes), and the prominent hump just behind the head on spawning males.

Methods

Literature and various unpublished records were reviewed to determine the distribution and abundance of pink salmon in Michigan waters prior to 1973. In 1973, surveillance of populations of this species was undertaken by Fisheries Research personnel of the Fisheries Division. Collections were made with electrofishing gear on Elm River, Huron River, and Harlow Creek (for locations, see Fig. 1). These streams will serve as index stations in future years. An incidental collection was made from the Dead River with a gill net. Visual observations were made on six other Lake Superior tributaries. All salmon collected were measured (total length) and weighed. Fork length was also recorded from some fish, so that size could be compared directly with Pacific Ocean pink salmon. Anglers were interviewed regarding the sporting quality of fishing for pink salmon and the flavor of the fish. We obtained information from field personnel of the Michigan Department of Natural Resources, on spawning runs, and on distribution and abundance.

Results

The distribution and abundance of pink salmon in Michigan during the years 1963-1973 are summarized in Figure 1 and Table 1. The first one reported from Michigan waters was caught by an angler in Keweenaw Bay at the mouth of the Falls River in May 1963; it was a 12.9-inch male. In September 1967, two salmon were collected from the Huron River in Baraga County. Although these fish were originally identified as coho "jacks," it has since been determined that they were pink salmon (personal communication, Barry R. Miller). In September 1967, a spawning pair was caught by an angler in Iron River, Marquette County. In 1969, pink salmon were found in three western Michigan tributaries of Lake Superior and in the Carp River, tributary to Lake Huron. Most of these salmon were caught by anglers. In 1971, pink salmon were observed in ten widely distributed tributaries of Lake Superior. As many as 20 salmon were seen at a time, and total runs of up to 300 were estimated for some streams.

By 1973, pink salmon had extended their range into Lake Michigan and had generally increased in numbers. They were observed in 17 tributaries of Lake Superior, 2 of Lake Huron and 4 of Lake Michigan. None was reported from Lower Peninsula tributaries of lakes Huron and Michigan.

In nearly all instances, spawning salmon were observed only in the first gravel area upstream from the stream mouth. Spawning began during the second week of September and was completed by the first week in October.

Pink salmon in the Great Lakes have not reached a large size. In Lake Superior tributaries, average length of mature salmon in 1973 was 16.2 inches and average weight was 1.3 pounds. Following are several

measurements, for the sexes separately; numbers of fish examined are in parentheses and 95% confidence limits are given for means:

Parameter	Males	Females
Mean total length (in.)	16.5 ± 0.3 (32)	15.6 ± 0.4 (21)
Range in length	15.2 - 18.9	14.2 - 18.1
Conversion--total to fork length	x 0.912 (25)	x 0.926 (18)
Mean weight (lb.)	1.4 ± 0.1 (32)	1.2 ± 0.1 (21)
Range in weight	1.0 - 2.1	0.8 - 2.2

Data on size of pink salmon during 1973 from lakes Huron and Michigan were few, but suggest that salmon from these waters were somewhat larger than those from Lake Superior. Ten mature salmon from Lake Huron tributaries averaged 17.0 inches long. The single specimen measured from a Lake Michigan tributary in 1973 was 19 inches long and 2.4 pounds in weight, which proved to be the largest pink salmon caught by an angler.

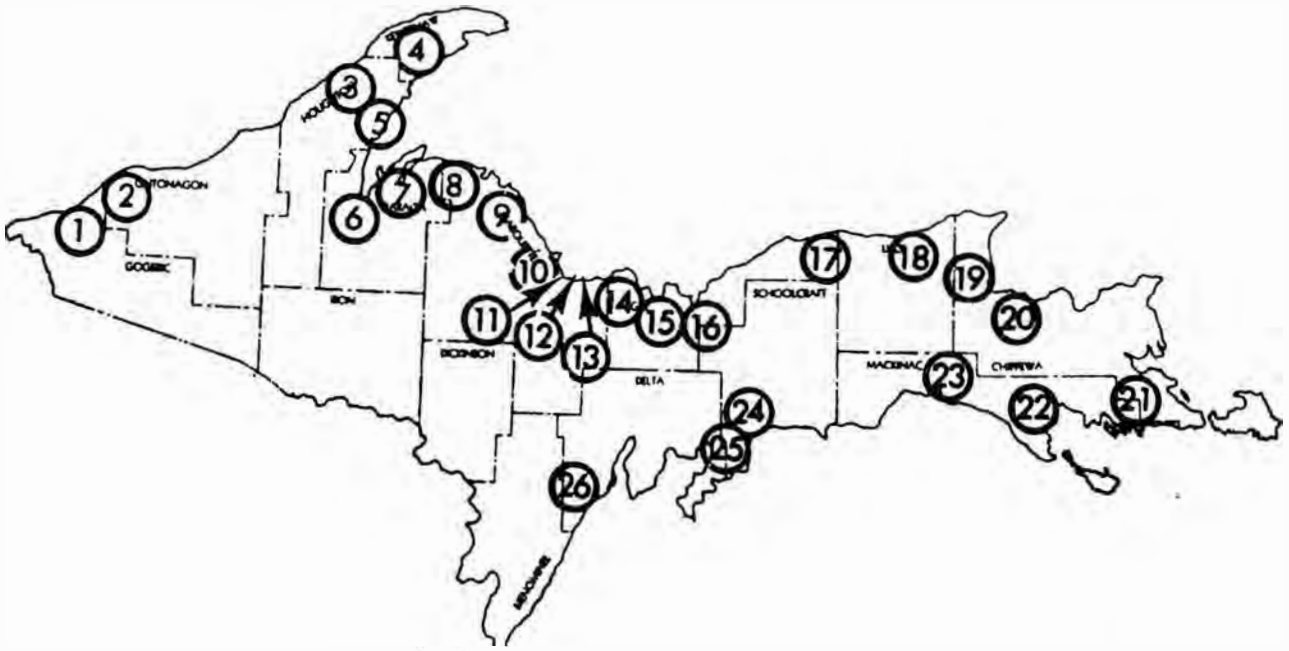
Discussion

The available data suggest that pink salmon are steadily increasing their numbers and extending their geographical distribution. Should they become extremely abundant, their feeding habits may have an undesirable effect on native fishes. In the ocean, during the first year of life, they feed on small planktonic organisms; and in the second year, macrocrustaceans of pelagic habit make up much of the diet (Manzer 1968, 1969). If Great Lakes pink salmon have similar habits, they may be expected to prey upon *Mysis*, amphipods, and copepods, which are the mainstay of the diet of many resident fish, at least in Lake Superior (Anderson and Smith 1971).

The potential of the pink salmon as a sport fish is low. None is known to have been caught in the open waters of the Great Lakes. A few may have been caught and misidentified, but it seems certain that a fishery for the species in the Great Lakes has not developed to date. If abundance

increases, perhaps some will be caught incidentally while trolling for coho and chinook salmon, as occurs in Alaska (Bailey 1969).

A very small fishery for spawning pink salmon, that is limited to about 2 weeks in September of odd years, has developed in several streams. Spawning salmon can easily be snagged because they spawn in shallow open areas and are not wary. However, they also can be easily caught by angling with spinners, spoons, flies, worms, or spawn bags. Anglers who were queried on the subject differed in their opinion of the sporting qualities of this fish. Some felt that "pinks" provide good sport when caught on light tackle, whereas others described them as "lethargic." The flavor of these fish generally is reported to be poor.



Legend: Key to Rivers

1. Black River
2. Presque Isle River
3. Elm River
4. Traverse River
5. Sturgeon River
6. Falls River
7. Silver River
8. Huron River
9. Iron River
10. Harlow Creek
11. Dead River
12. Carp River
13. Chocolay River
14. Laughing Whitefish River
15. Rock River
16. Anna River
17. Blind Sucker River
18. Two Hearted River
19. Tahquamenon River
20. Pendills Creek
21. Albany Creek
22. Carp River
23. Black River
24. Manistique River
25. Thompson Creek
26. Ford River

Figure 1. Michigan (Upper Peninsula) tributaries of the Great Lakes in which pink salmon were observed, 1963-73.

Table 1.--Distribution and abundance[1] of pink salmon in Michigan tributaries of the Great Lakes, 1963-1973

Lake	County	Tributary	Year observed				
			1963	1967	1969	1971	1973
Superior	Gogebic	Black River	-	-	-	-	P
		Presque Isle River	-	-	P	A	A
	Houghton	Elm River	-	-	-	-	A
		Traverse River	-	-	-	-	P
	Baraga	Sturgeon River	-	-	-	-	C
		Falls River	P	-	P	P	C
		Silver River	-	-	C	A	A
		Huron River	-	P	-	A	A
	Marquette	Iron River	-	P	-	-	-
		Harlow Creek	-	-	-	-	C
		Dead River	-	-	-	-	C
		Carp River	-	-	-	P	C
		Chocolay River	-	-	-	A	P
	Alger	Laughing Whitefish River	-	-	-	-	A
		Rock River	-	-	-	C	-
		Anna River	-	-	-	P	P
	Luce	Blind Sucker River	-	-	-	-	P
		Two Hearted River	-	-	-	-	P
		Tahquamenon River	-	-	-	P	-
	Chippewa	Pendills Creek	-	-	-	P	P
Huron	Chippewa	Albany Creek	-	-	-	-	A
	Mackinac	Carp River	-	-	P	-	C
Michigan	Mackinac	Black River	-	-	-	-	C
	Schoolcraft	Manistique River	-	-	-	-	P
		Thompson Creek	-	-	-	-	P
	Delta	Ford River	-	-	-	-	P

[1] The letter symbols represent rough estimates, most likely minimal, of the abundance and number of fish in spawning runs. P = present (less than 25), C = common (25 to 100), A = abundant (more than 100, probably less than 500).

References

Anderson, Emory D., and Lloyd L. Smith, Jr. 1971. A synoptic study of food habits of 30 fish species from western Lake Superior. Univ. of Minn. Agr. Exp. Sta. Tech. Bull. 279, 199 pp.

Bailey, Jack E. 1969. Alaska's fishery resources - The pink salmon. U. S. Fish Wildl. Serv., Bur. Sport Fish. Wildl., Fish. Leafl. 619: 8 pp.

Manzer, J. I. 1968. Food of Pacific salmon and steelhead trout in the northeast Pacific Ocean. J. Fish. Res. Bd. Canada, 25(5): 1085-1089.

Manzer, J. I. 1969. Stomach contents of juvenile pacific salmon in Chatham Sound and adjacent waters. J. Fish. Res. Bd. Canada 26: 2219-2223.

Parsons, John W. 1973. History of salmon in the Great Lakes, 1850-1970. U. S. Fish Wildl. Serv., Bur. Sport Fish. Wildl., Tech. Paper 68: 80 pp.

Schumacher, Robert E., and Samuel Eddy. 1960. The appearance of pink salmon, Oncorhynchus gorbuscha (Walbaum), in Lake Superior. Trans. Amer. Fish. Soc. 89(4): 371-373.

Schumacher, Robert E., and John G. Hale. 1962. Third generation pink salmon, Oncorhynchus gorbuscha (Walbaum), in Lake Superior. Trans. Amer. Fish. Soc. 91(4): 421-422.