

LAKE SUPERIOR'S "INFERIOR" FISHES
by Konrad Schmidt, St. Paul, Minnesota

Since my first visit to Lake Superior, I have marveled at its vastness. Minnesota may have more than 10,000 lakes, but only one freshwater sea, 350 miles long and 160 miles wide, making it the largest lake in the world, my sources say. Another remarkable feature, seemingly out of place, is Minnesota's rugged North Shore, where ancient volcanic activity and continuing erosion has sculptured incredible scenery of basalt cliffs, gorges, and waterfalls interspersed with cobble beaches yielding Lake Superior agates.

Most "normal" people come to the North Shore to enjoy the scenery, comb the beaches for agates, or fish for smelt and several species of trout and salmon; however, I have long realized that much more challenging, though nearly unattainable, quarry lurks in the deep, cold waters of Lake Superior. The objects of my fixation are three small, rarely seen fishes:

1. Pygmy Whitefish (Prosopium coulteri)
2. Spoonhead Sculpin (Cottus ricei)
3. Deepwater Sculpin (Myoxocephalus thompsoni)

I have yet to collect any of these species, due to the great depths they prefer. I have so far had to settle for immersing myself in the literature available. Unfortunately, it is not very extensive, but does shed just a little light--not only on these fascinating fishes, but also on the glacial history of the region.

Pygmy Whitefish

The Pygmy Whitefish escaped detection in Lake Superior until 1952, when deep-water trawls conducted by the U.S. Fish and Wildlife Service discovered this disjunct population over 1,000 miles east of the species' known range, which extends from the headwaters of the Columbia River in Montana and Washington northward into Alaska. Because of the great distance between these ranges, the Lake Superior population is believed to be a glacial relict.

The Pygmy has a brown back, silver sides, and a white belly. Juveniles have 8-11 round parr marks along the lateral line. In Lake Superior, the Pygmy's maximum recorded length is 5.4 inches. Females have deeper and broader bodies and males have longer-rayed fins. Spawning is believed to occur in November or December. The Pygmy Whitefish has been found at depths of 59 to 297 feet, but is most abundant at 152 to 234 feet. Their diets consist mostly of crustaceans called Pontoporeia. The Pygmy's most common associates are the Ninespine Stickleback and the Deepwater, Slimy, and Spoonhead Sculpins.

Spoonhead Sculpin

The Spoonhead Sculpin is found in all the Great Lakes and most of Canada including the brackish waters of James Bay. Within the Great Lakes Basin, it has only been found in a few inland lakes on Isle Royale and in Lake Charlevoix, Michigan. The Spoonhead is believed to have survived the Ice Age in the upper Mississippi basin and migrated northward as the glaciers retreated. The remaining southerly population eventually died out as the climate warmed.

It is described as one the most distinctive species of Cottus in North America, probably closely related to Old World sculpins. The head is flat and spadelike, with the eyes perched on top like a flounder's. The color is mottled brown on the top and sides, and the skin is usually very prickly to the touch. It is a small sculpin averaging 2.4 inches, with a maximum recorded length of 5.3. Adult males have a triangular fleshy projection behind the anus and spawning is believed to occur in summer or early fall. Their diet consists mostly of crustaceans called amphipods. In Lake Superior, Spoonheads prefer waters slightly deeper than do Pygmy Whitefish, and are most abundant at 122 to 363 feet.

Deepwater Sculpin

The Deepwater Sculpin's historic range includes the Great Lakes and deep lakes of Canada. The species has also been reported from Torch Lake in Antrim County, Michigan and a few North Shore streams in Minnesota. The Deepwater is believed to have arrived at its current distribution in the Great Lakes after advancing glaciers pushed it and its principal food supply of Mysis relicta and Pontoporeia affinis southward. When the ice eventually melted, all three species were left behind, stranded in proglacial lakes which includes what is now the present day Great Lakes.

The Deepwater has a tan back and sides with dark bands and averages 5.4 inches. The maximum recorded length is 7.8 inches. In males, both the second dorsal and pelvic fins are noticeably longer than the female. Spawning occurs in winter and the eggs hatch in spring. As the name implies, the Deepwater prefers the greatest depths of the three species, and in Lake Superior, it has been found at 241 to 1208 feet.

An interesting point not so far understood is that at these depths all social interactions and courtship would have to take place in total darkness.

There are two accounts of attempts to keep Deepwaters in aquariums. Unfortunately, the fish never accepted even live foods, remained timid and reclusive, and died within two weeks.

The status and continued existence of this species in the Great Lakes is uncertain. At one time, commercial fisherman on Lake Ontario considered the Deepwater a nuisance because it was so abundant that it would foul gillnets set for Lake Trout. Today, the Deepwater is believed extirpated in Lake Ontario, possibly due to DDT pollution. The secrets so far learned about the Deepwater have not come easily, and have actually cost the life of one researcher, William Van Vliet, who died studying this species while scuba diving in Lake Heney, Quebec in 1968.

Literature Sources

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- Phillips, G. L., W. D. Schmid, and J. C. Underhill. 1982. Fishes of the Minnesota Region. University of Minnesota Press, Minneapolis. 248 pp.
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Epilogue

Because the most recent literature source I could find was published in 1983, I decided to contact fisheries managers along the North Shore for current information on these species. The replies were not very encouraging for the Pygmy Whitefish and Spoonhead Sculpin, but I received a lead on the Deepwater Sculpin.

Dr. David Etnier of the University of Tennessee-Knoxville discovered Deepwaters in Lake Saganaga on the Minnesota-Ontario border. This little revelation was very interesting because no Deepwaters had previously been found in Minnesota waters of the Hudson Bay Drainage. Pursuing the lead to its source for additional information and expressing an interest to photograph live specimens for my slide collection, I received a cordial and unexpected invitation to go collecting in July (1989). Dave had discovered a new species of whitefish in Lake Saganaga that he believed was Coregonus nipigon. He wanted to collect additional specimens and was confident we would also find some Deepwater Sculpins.

For three days, we lifted gillnets set across the international boundary on the bottom at a depth of 60-75 feet. On the first lift, I was shown my first Nipigon Cisco. Externally, these fish have very distinctive, black-pigmented fins, but the clincher was a high gill-raker count which Dave tallied religiously on every specimen. We also collected Rainbow Smelt (Osmerus mordax), an introduced species, which had appeared just recently in the lake.

Back to the Deepwater. The trip did pay off with a total catch of three. One died shortly after removing it from the net, but two lived long enough to be photographed. To document the species occurrence in "Sag," all three were deposited in the collection at the James Ford Bell Museum of Natural History in Minneapolis. Overall, a whirlwind collecting trip, but for me, one of the most memorable.

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