

Sculpin, Shorthorn (*Myoxocephalus scorpius*) and Longhorn (*Myoxocephalus octodecimspinosus*)

Common Names: Shorthorn - daddy sculpin, greenland sculpin. Longhorn - long-spined sculpin, hacklehead, toadfish, bullhead, common sculpin, and gray sculpin.

Description, Distribution and Biology

Sculpin is a small demersal (bottom-dwelling) fish from the family Cottidae. There are approximately 16 species of sculpin found in the waters off the Atlantic coast of Canada. The two most popular species found in Newfoundland waters are the longhorn and shorthorn sculpin. Both species have slender, elongated bodies, tapering posteriorly to a small caudal peduncle. They have a large flat cranium with small teeth on the jaw and large eyes located high on the head. Both species have poorly developed gill rakers and plate-like scales above and below the lateral line. The longhorn can be differentiated from the shorthorn sculpin by its long opercula spine extending back behind the operculum. The longhorn sculpin's upper portion is typically dark olive to a pale green-yellow or grey above, to white on the abdomen with an irregular crossbar pattern (Fig.1). In comparison, the shorthorn sculpin's upper portion is green-brown with dark spots across its back shading to a yellow abdomen (Fig. 2). Males generally have grey blotches on the back and top of the head with green, brown or yellow fins. Maximum length for a shorthorn sculpin is 50.6 cm for females and 42.2 cm for males, while the maximum growth attained for longhorn sculpin is approximately 45.7 cm. Both male and female can live 9 to 15 years.

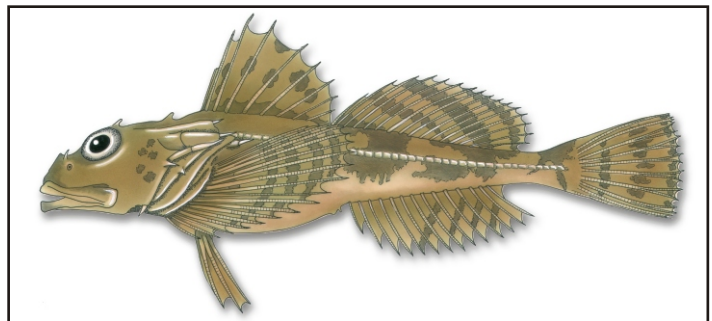


Figure 1. Longhorn Sculpin. Source: Roz Davis, provided courtesy of The Maine Department of Marine Resources Recreational Fisheries Program and The Maine Outdoor Heritage Fund.

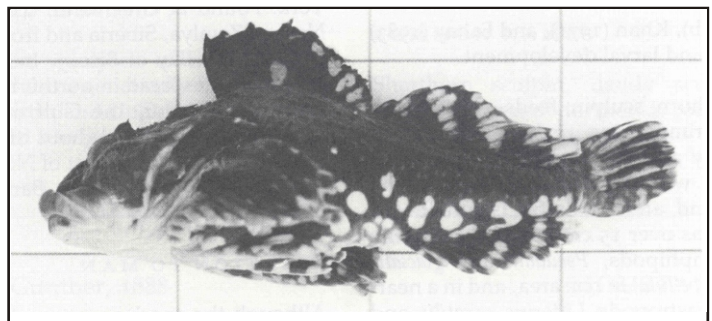


Figure 2. Shorthorn Sculpin. Source: W.B. Scott and M.G Scott, Atlantic Fishes of Canada, Canadian Bulletin of Fisheries and Aquatic Sciences No. 219.

The longhorn sculpin is distributed in the western Atlantic Ocean from the Strait of Bell Isle southward towards Virginia on the east coast of the United States. Off the east coast of Canada the

longhorn sculpin is frequently found around the Magdalen Islands, the Miramichi estuary, the coast of Nova Scotia (including Banquereau and Sable Island Banks), and in shallower waters in the Bay of Fundy and St. Mary's Bay. Sculpin has been found occupying a shallow area of the southeast Grand Bank including the southeast shoal off the coast of Newfoundland (Fig.3). The longhorn sculpin is a year-round resident of coastal areas. In the Bay of Fundy, the longhorn has been observed moving offshore during the winter and returning to shallower water during the spring, while in its southern most range it moves offshore during the summer months and returns near shore during the winter. This species prefers sandy or gravel substrates, water temperatures between 0.5 to 19 °C, and depths ranging from 50 to 90 meters but has been found in depths greater than 127m in areas around Nova Scotia.

The shorthorn sculpin is found on both sides of the North Atlantic Ocean and in the Arctic. In the eastern Atlantic it is distributed from Greenland, across to northern Europe and southward to the Bay of Biscay. This species is widely distributed throughout the northwest Atlantic and is common around the coast of Labrador, through the Gulf of St. Lawrence, in the Bay of Fundy and the Gulf of Maine (Fig.4). The shorthorn sculpin is a sluggish benthic (bottom dwelling) organism typically found in cool, shoal waters with smooth and weedy bottoms. This species prefers depths up to 37m but has been found at 145m near the Strait of Belle Isle.

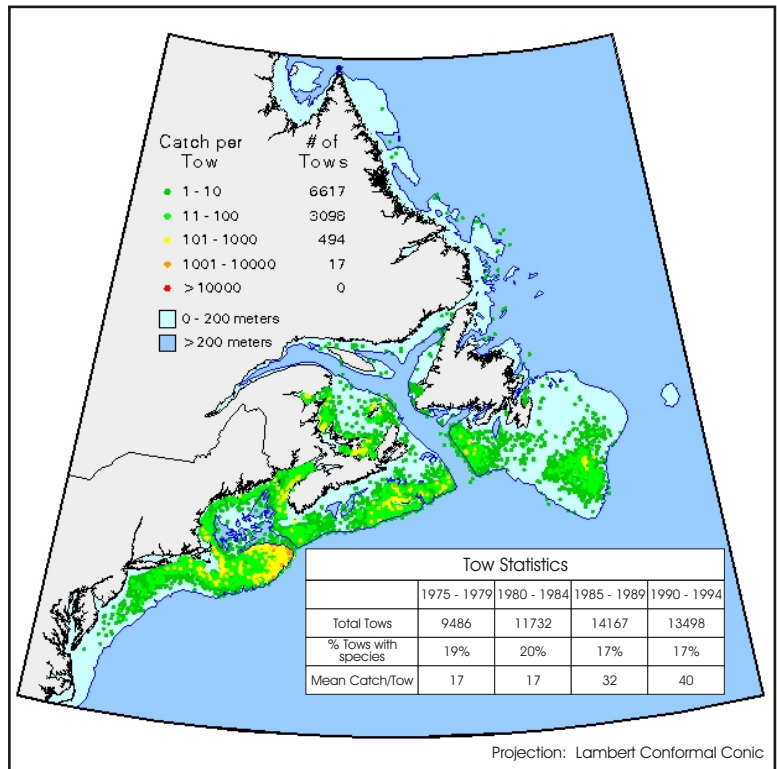


Figure 3. East Coast of North America Strategic Assessment Project. Distribution of Longhorn sculpin. Source: Science Sector, Department of Fisheries and Oceans, Canada. Office of Ocean Resources Conservation and Assessment, National Oceanic and Atmospheric Administration, USA

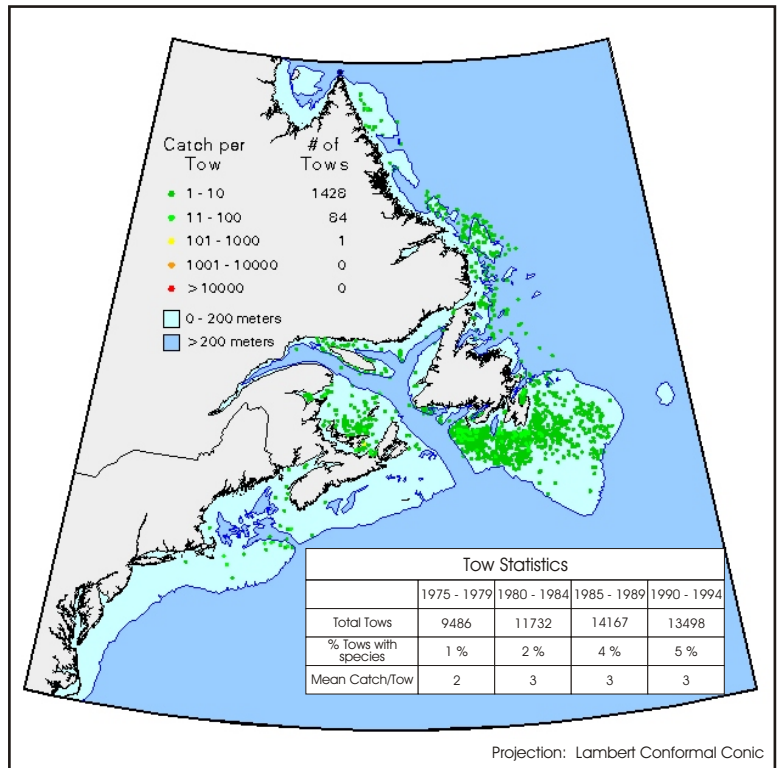


Figure 4. East Coast of North America Strategic Assessment Project. Distribution of Shorthorn sculpin. Source: Science Sector, Department of Fisheries and Oceans, Canada. Office of Ocean Resources Conservation and Assessment, National Oceanic and Atmospheric Administration, USA

Longhorn sculpin found in waters off New England, reach sexual maturity at 3 years. The approximate length at this time is 21 cm. In Atlantic Canada, sculpin typically reach sexual maturity at larger sizes than those off the east coast of the United States. Females will reach maturity between 23 and 25 cm in length, while males mature between 23 and 29 cm in length. The spawning season usually takes place in shallow inshore waters between December and January. Female longhorn sculpin can lay upwards of 8,000 eggs during the spawning season. The eggs are spherical, demersal, adhesive and between 1.9 and 2.3 mm in diameter. Eggs vary in colour from green, to red-brown or orange and are found in clusters attached to sponges and in cavities on clear, hard substrates. Hatching occurs between 36 and 65 days after fertilization. The newly hatched larvae are usually between 6.2 and 7.8 mm in length and grow rapidly during the first three years.

The shorthorn sculpin typically spawns between late November and early December off the coast of Newfoundland, in water temperatures between 3 to 5 °C. Male shorthorn sculpin mature between 3 to 5 years of age and 30 cm in length while the females typically reach sexual maturity between 6 and 8 years of age and 34 to 35 cm in length. Mature females can produce anywhere from 4,205 to 60,976 eggs during spawning. After fertilization, the eggs will adhere to each other and to the surrounding substrate. Shortly after spawning, the female sculpin will move offshore to deeper water leaving the male to protect the egg masses. The eggs, which range from a pale pink to bright red, usually hatch between March and April and the new larvae are 7.4 to 8.6 mm in length.

Both the shorthorn and longhorn sculpin are described as being voracious carnivores, feeding primarily on crab, shrimp, mollusc, squid, sea urchin, herring, sand lance, mackerel, and smelt. Newly hatched larvae typically feed on small planktonic organisms. Predation is minor for both species. The shorthorn sculpin avoid predation of its egg masses through the constant guarding by males and the lower temperature associated with spawning areas. The longhorn sculpin avoids predation because of its spiny characteristics and its ability to erect its opercula spines as avoidance behaviour.

The Fishery

There is no traditional fishery for either longhorn or shorthorn sculpin on the east coast of Canada. In New England, the longhorn sculpin has been captured with “trash fish” and processed into fishmeal and oil and in the production of dog and cat food. The shorthorn sculpin has been used for both lobster bait and biological research, particularly in the study of cell structure and pollution impacts. In Newfoundland and Labrador, both species have been captured around wharves by hook and line or by “jigging” and were considered a nuisance species, often interfering in commercial harvesting for more valuable fish species. Future development of this fishery will require investment and research into harvesting technology and processing techniques. Baited pots could eliminate by-catch issues and allow sculpin to be captured alive. Sculpin fished for human consumption should be placed on ice immediately after capture to maintain flesh quality and then filleted for commercial distribution. Although no market for sculpin exists in the northwest Atlantic, markets in larger North American cities and in Asia have been identified but further investigation into these and other markets is required.

ADDITIONAL READINGS:

DFO. (1993). *Offshore/Inshore Fisheries Development, Sculpin*. Communications Directorate, Department of Fisheries and Oceans, Ottawa, Canada. Retrieved from the Word Wide Web {August 27/02}: <http://www.mi.mun.ca/mi-net/fishdeve/sculpin.htm>.

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Scott, W.B, and M.G Scott. (1988). Atlantic Fishes of Canada. *Can. Bull. Fish. Aquat. Sci.*, 219: 731 p.

For Further Information Contact:

Centre for Sustainable Aquatic Resources, Marine Institute of Memorial University of Newfoundland, P.O. Box 4920, St. John's, NL A1C 5R3
Toll Free: 1-709-778-0521 Website: <http://www.mi.mun.ca/csar/> OR
Department of Fisheries and Aquaculture, Government of Newfoundland and Labrador, P.O. Box 8700, St. John's, NL, A1B 4J6
Telephone: 1-709-729-3766

Partners/Contributors:

Centre for Sustainable Aquatic Resources (CSAR)
Fisheries and Marine Institute of Memorial University of Newfoundland