

Lumpfish (*Cyclopterus lumpus*)

Common Names: Lumpsucker, lump, henfish, seasnail, poule de mer, and paddle-cock.

Description, Distribution and Biology

Lumpfish is primarily a demersal (bottom-dwelling) fish from the family Cyclopteridae, which includes all lumpfish and snailfish. Lumpfish is characterized by a short, stout body with a cartilaginous and gelatinous hump on its back, formerly the dorsal fin (Fig.1). It lacks scales and has three rows of large flattened bony tubercles of various sizes down both sides of its body. The pelvic (ventral) fins located on the underside of the body are modified into six pairs of fleshy knobs surrounded by a circular flap of skin to form an adhesive disc used for attaching to bottom substrates or seaweed beds. Although the lumpfish is capable of quick bursts of speed, it is a relative poor swimmer and requires the adhesive adaptation to avoid being carried off by currents. Its colour varies to match its surroundings, particularly during early development. Adults can vary in colour from a mottled blue-green, olive-brown, to a grey-white. Males are usually more vivid in colour than females and turn an intense red during the breeding season.

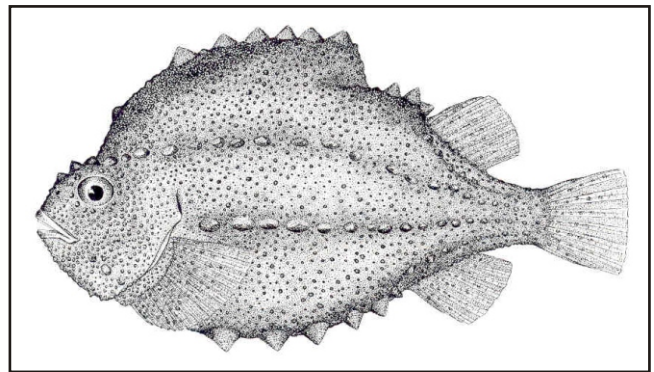


Figure 1. Lumpfish. Source: W.B. Scott and M.G. Scott, Atlantic Fishes of Canada, Canadian Bulletin of Fisheries and Aquatic Sciences No. 219.

Lumpfish (*C. lumpus*) is distributed on both sides of the Atlantic Ocean. In the eastern Atlantic they range from Greenland, south to the British Isles, to Gascoyne Bay, France. In the western Atlantic, lumpfish can be found from Hudson's Bay and the Labrador coast southward to New Jersey. Major concentrations have been found in the Bay of Fundy and on the St. Pierre Bank off the south coast of Newfoundland (Fig.2).

Lumpfish migrate toward shallow coastal water during late spring and early summer (April to May) to spawn and usually migrate back to deeper water during late summer and early autumn. Preferred spawning grounds are rocky substrates and sheltered areas with abundant seaweed resources. It will often attach to fishing gear or other solid objects, such as wharfs pilings. When not spawning, lumpfish prefer deeper cooler water and can be found at depths greater than 300 m.

This species has a homing mechanism allowing it to return to areas where it has previously spawned. Spawning occurs during the early spring and can continue over a lengthy period. In Newfoundland, spawning takes place in water temperatures approximately 4 °C. The eggs are laid in a large spongy mass of 140,000 eggs or more and females can lay more than one egg mass during each spawning season. Each lumpfish egg contains an oil droplet, usually pale green to yellow in colour, becoming darker during development, and are approximately 2 mm in diameter. Studies have shown that eggs vary in colour and can be black, brown, red, orange, green or purple. After fertilization, the female will migrate back to deeper water while the male remains to guard and nurture the eggs.

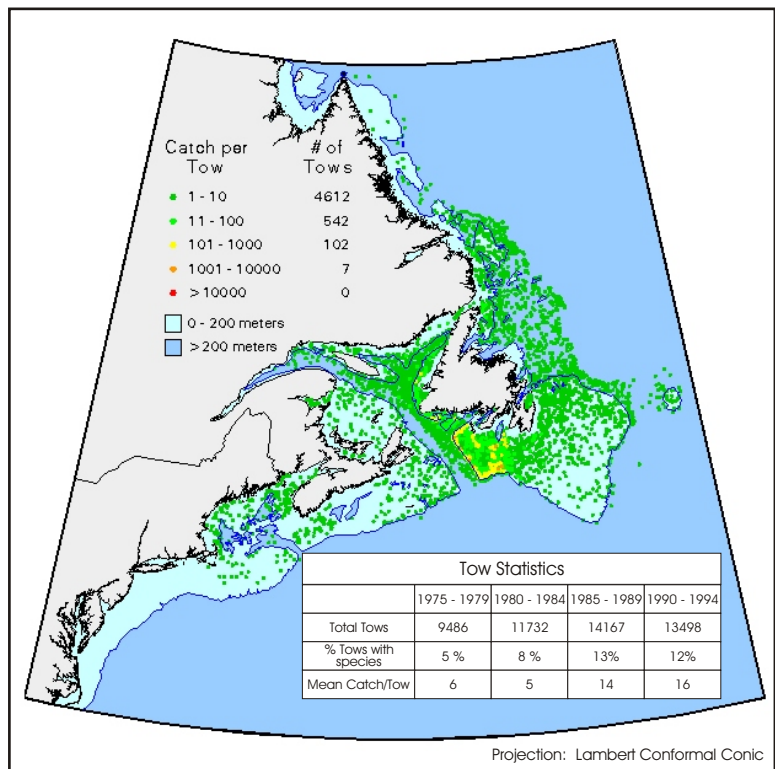


Figure 2. East Coast of North America Strategic Assessment Project. Distribution of Lumpfish. Source: Science Sector, Department of Fisheries and Oceans, Canada Office of Ocean Resources Conservation and Assessment, National Oceanic and Atmospheric Administration, USA

After 6 to 8 weeks, depending on water temperature, the eggs will hatch and the male will migrate offshore. The newly hatched juvenile are 4 to 5 mm in length and grow rapidly during the first year. At one year, the juvenile lumpfish can range between 5 and 7.5 cm in length. During this first year they will remain at the surface (1 m of water), often hiding under seaweed or other suitable protection. After the first year, the lumpfish will migrate to deeper water near or at the bottom of the ocean. Females usually grow faster and larger than the male. Females have been known to grow upwards of 61 cm in length and weigh up to 9.1 kg. Males are typically 35.6 to 38.1 cm in length and weigh 1.4 to 2.7 kg. Lumpfish mature between 3 and 5 years. Mature lumpfish feed primarily on small shrimp and crustacean, jellyfish, worms and other small fish. Feeding activity occurs near seaweed beds in the upper water column where food resources are more abundant. Lumpfish is prey to seals and has been discovered in the stomach of sperm whale and Greenland shark.

The Fishery

Prior to the 1970s, exploratory work was conducted on lumpfish in Atlantic Canada to assess the viability of a lumpfish roe fishery and its use as bait in longline operations. In 1976, an inshore fishery was developed off the coast of Newfoundland. Between 1977 and 1984 landings were approximately 500 metric tonnes (mt). In 1987, landings reached a high of 3,000 mt decreasing the following year and averaging 1,500 to 2,000 mt from 1988 to 2001 (Fig.3). Landed value of lumpfish varies according to market demand. Between 1990 and 2001, the highest landed value was in 1993 at \$13,072,000 while the lowest value obtained was during 1990 at \$1,477,000 (Fig.4).

Harvesting begins in May on the St. Pierre Bank and extends to mid-July in northern Newfoundland and along the Labrador coast. Traditionally, lumpfish has been captured using 25.4 to 28 cm gillnets deployed near shore to capture the females as they move toward shallow water to spawn. Females are distinguished from males by both colour and size. The female is larger than the male and the male displays bright red abdomens during spawning season.

In recent years, there has been a number of small scale experiments conducted on lumpfish aquaculture in Newfoundland and Labrador. These studies have been carried out at the Ocean Science Centre (Memorial University of Newfoundland) and at the Wesleyville Hatchery, using land-based tanks. Future development and management of this fishery will require additional research into lumpfish culture, especially as harvesting of this species is conducted during the spawning season and targets female eggs.

The roe of the female is removed immediately after capture, placed in appropriated containers, and kept at cooler temperatures in a protected environment. The roe is extracted from the female sacs either by manually rubbing it through a series of screens or by a mechanical process using a perforated drum. The eggs account for 20% to 30% of the total body weight during the harvesting period. The average female (45 cm) can produce upwards of 140,000 eggs during the spawning season equaling approximately 1 kg of its body weight. Markets prefer mature eggs that are purple or red. After removing, washing and sieving the eggs, they are salted and cured for commercial distribution to caviar markets. The flesh of the lumpfish is consumed on a small scale in both North America and Europe. Some smoked products have been marketed for Europe and for many years the flesh was converted into pet food in North America.

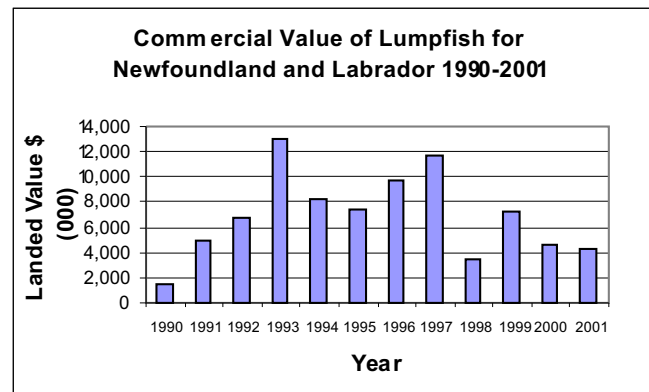


Figure 3. Commercial Value of Lumpfish for Newfoundland and Labrador 1990 - 2001. Source: DFO Statistics, Canada

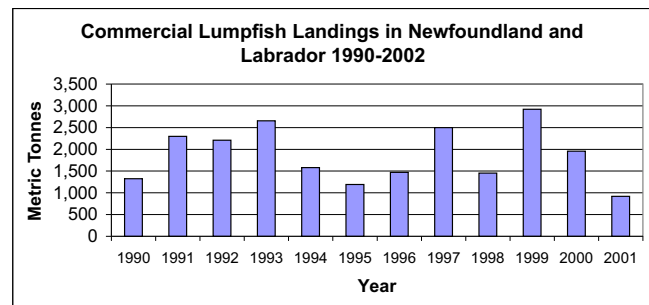


Figure 4. Commercial Lumpfish Landings for Newfoundland and Labrador 1990 - 2002. Source: DFO Statistics, Canada

ADDITIONAL READINGS:

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