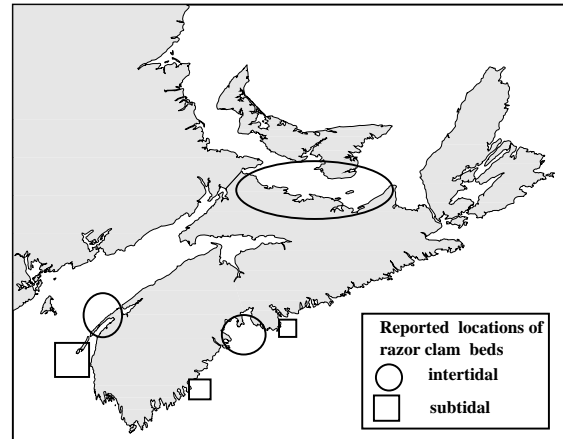




Scotian Shelf Atlantic Jack Knife



Background

The Atlantic Jack knife, *Ensis directus*, is found along the western Atlantic Ocean from Labrador to South Carolina. It is also known as the "razor clam". Colonies may be found in the intertidal area, often associated with other bivalves such as softshell and surf clams. Several subtidal beds, 5-8 meters deep, have been located in Eastern Canada. Preferred habitat appears to be gently sloping beaches with shifting sand but *Ensis* is found in mud and gravel as well.

Ensis has a thin, elongated, slightly curved shell and grows to lengths exceeding 20 cm. A large muscular foot, used in combination with jets of water, enables the animal to quickly burrow into the substrate. The foot is also used to propel the animal across the substrate by first extending it in a 'U' shape alongside the shell, then by rapidly straightening the foot, the clam moves forward, siphon end first. Clams may be seen with siphons exposed above the sand and when disturbed will burrow to depths of 25 cm. in a few seconds.

Sexes are separate and spawning occurs around early June, eggs and sperm are released through excurrent siphons. Fertilization occurs externally. Development is typical of bivalves and larval stages are similar to other species.

There was a short-lived fishery in St. Mary's Bay, N.S. from 1951 to 1954 to supply a cannery. Québec has a mechanized fishery for razor clams which landed approximately 25 tonnes in 1995.

The Fishery

There is presently no commercial fishery for razor clams. There have been several recent inquiries from commercial interests and one research permit for the species has been issued for 1996. Recreational harvesting of razor clams does not require a license and there is no minimum size. Quotas differ between areas where a possession limit of 300 clams (all species) applies in the Atlantic Shore of Nova Scotia and a limit of 100 (all species) is imposed in the Gulf of St. Lawrence.

Resource Status

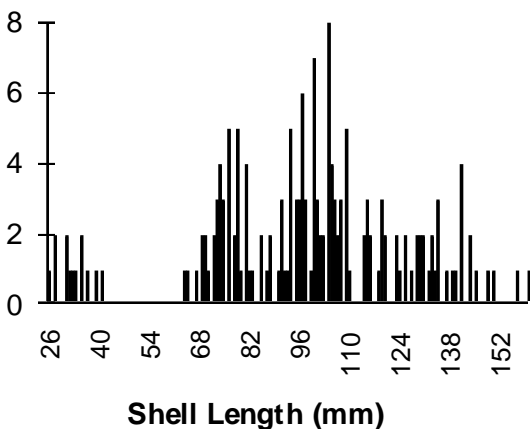
Interest in this fishery has been limited and there are no data on the status of the resource. *Ensis* samples were collected during 1995 for an aquaculture transplant experiment and to learn more about the species. One large intertidal colony on Northumberland Strait had densities approaching 20 per square meter. Observations were made on a subtidal colony near Prospect N.S. which appeared to have only large animals, >150mm shell length, with densities reaching more than 50 per square meter.

In the absence of any significant fishery, **catch statistics** are not kept for razor clams. Animals for the transplant experiment were dug with shovels from an intertidal bed at Amherst Shore. The quota for personal use in the area along the Nova Scotia

coast of Northumberland Strait was 100 and could easily be harvested on a low tide. Intertidal harvesting would be limited to some extent by tidal cycles as the more extreme range of low tides is required to expose the beds. Commercial or mechanical harvesting of intertidal colonies would have implications for other species typically occupying the same habitat.

Little if anything is known about **recruitment**. Specimens as small as 10 mm length were collected in October and were assumed to have been spawned earlier in the year.

Preliminary observations on razor clam colonies from both intertidal and subtidal locations show maximum densities reaching 20 and 50 per square meter respectively. In both instances, the distribution was patchy. Shell length of clams collected from the intertidal bed ranged from 10 mm to 160 mm while those from the subtidal area (several dozen hand dug by scuba divers) were all >150 mm. Length frequencies from the intertidal bed show distinct modes for the first three years and correspond with size data reported from Québec where clams reach 40 mm in their first year and 80 mm after 2 years. Chance spawning of a sample collected on May 15 for length frequency measurement yielded eggs 70 microns in diameter. Fertilized eggs reached the pediveliger stage in 15-16 days and measured 245 by 206 microns. These were set on sand and had reached 7-9 mm in length by Aug. 7. Abundance estimates are not available for the rest of the Maritimes although it is generally considered that numerous beds exist. A 1986 survey of molluscs in the Shippagan area of New Brunswick estimated populations of *Ensis* ranging from 21,000 to 2,700,000 individuals per bed from the four beds studied.



Razor clams are filter feeders. Moon snails and crabs prey on *Ensis* on intertidal beds. Weak or damaged animals are also eaten by seabirds which scavenge sandbars at low tide. Both crabs and lobsters prey on subtidal colonies as evidenced by piles of broken shells at entrances to crustacean burrows.

Outlook

Several enterprises have expressed interest in commercially harvesting razor clams using hydraulic dredges. Research on the potential impacts of the harvesting gear would be required. One recipient of a research permit has begun to investigate harvesting techniques and marketing.

The wide spread occurrence of this species creates problems for formulating management policies. Caution must be exercised in areas where potential for toxins exists. The occurrence of coexisting species and the burrowing ability of the animal presents problems for efficient harvesting. Harvesting of subtidal populations would require mechanized equipment and one proposal to conduct gear testing has been met with strong opposition from local area residents.

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