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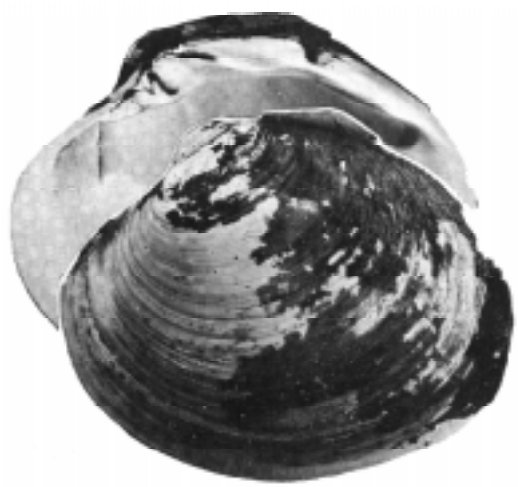

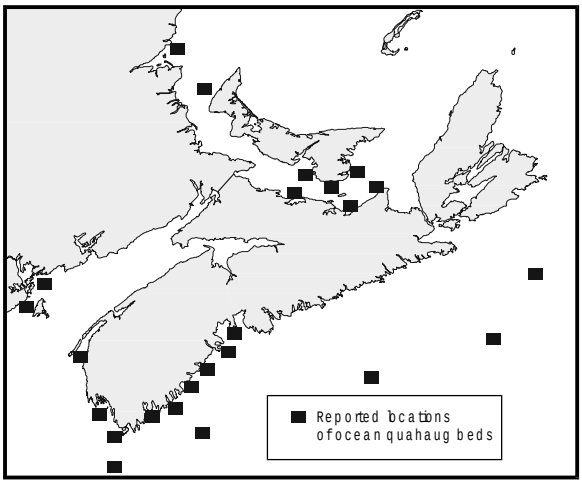

Scotian Shelf Ocean Quahaug

Background

The ocean quahaug (Arctica islandica) is a large (10-13 cm) subtidal bivalve with a heavy, roughly oval shell. The colour ranges from a yellow-tan through to black, apparently darkening with age. It is similar to the bay quahaug, from which it can be distinguished by the hinge structure and details on the interior of the shell.

The ocean quahaug occurs in eastern North America from the Arctic to Cape Hatteras, N.C. and in Europe from the Arctic to the Bay of Cadiz, Spain. It also occurs in Iceland, the British Isles and the Faroes Islands.

It is most abundant in muddy to sandy bottom, burrowed within 12 mm of the surface. It is less abundant in clays and gravels. It is found in ocean depths from 4 to 256 m (deeper in the southern part of its range), but has been dredged live from as deep as 482 m.

A fishery for ocean quahaugs is pursued by three licenses in southwestern Nova Scotia. This species is fished with hydraulic clam dredges. Animals 45-60 mm are sold whole to the U.S. market as an alternative to the northern or bay quahaug.

Ocean quahaugs are long lived and slow growing bivalves. The oldest specimen aged to date was 221 years old. Sexual maturity is reached at an average age of thirteen years but can occur as early as five. Average size at sexual maturity is 48 mm. Spawning in Nova Scotia appears to occur year round peaking between July and September.

In the Scotia-Fundy sector of Nova Scotia it is most abundant in the inshore harbors and bays of southwestern Nova Scotia and the mouth of the Bay of Fundy, and on the offshore banks, especially Sable and Western banks. It does occur in lower numbers in sandy areas throughout the region.

Summary

- The fishery, prosecuted by inshore N.S. hardclam license holders, reported 142t of ocean quahaug in 1996.
- During 1980-83, DFO surveys of 12 major Scotian Shelf banks estimated a minimum fishable stock of 676,000t. Surveys on inshore bays from St. Mary's to St. Margaret's identified 56,833t of ocean quahaug at commercial densities.
- In 1997, an industry-funded survey of the previously unsurveyed bed in St. Mary's Bay provided a fishable biomass of 45,233t.
- There is a large biomass of older/larger ocean quahaugs available for harvest.
- Infrequent recruitment pulses support the fishery over intervening years of low recruitment.
- The very slow growth rate of ocean quahaug means that low exploitation rates (3%) would have to be set for sustainable management.
- A new plan for the local fishery should consider; 1) bed by bed management; 2) exemption of a portion of each bed from harvesting; 3) systematic strip harvesting; and 4) a minimum size limit.

The Fishery

Landings (Tonnes)

1991	1992	1993	1994	1995	1996
17.9	29.1	11.2	29.6	78.8	142.0

The **fishery** for ocean quahaugs on the Scotian Shelf is pursued by the inshore hardclam license holders along the south-west coast N.S. The inshore fishery fishes a mixture of ocean quahaugs, Arctic surfclams and northern propellerclams, directing for whichever species is marketable at the time. This fishery has been targeting ocean quahaugs in recent years. In addition, the offshore clam fishery is allowed a by-catch of ocean quahaugs, however these are not currently landed.

The existing hardshell clam fishery is **managed** as a limited entry fishery for which three licenses have been issued. The inshore fishery occurs within the twelve mile limit but is restricted to waters outside headlands in depths greater than ten fathoms. There is no minimum size or a total allowable catch requirement. Landings are continuously monitored for presence of toxins.

The offshore fishery, which operates outside the 12 mile line, has a total allowable catch (TAC) of 30,000 t for Arctic surfclams, and is allowed a 10% by-catch of ocean quahaugs. Both sectors are required to use hydraulic clam dredges.

The inshore fishery is currently marketing small ocean quahaugs (45-60mm) as an alternative to the preferred bay or northern quahaug (*Mercenaria mercenaria*) in the live seafood trade. These clams are locally referred to as “mahoganies”. The larger clams are not being harvested. The management plan for this fishery is currently under review. The St. Mary’s Bay bed is being regarded as a new fishery and a separate management plan will be formulated for this area.

Resource Status

Between 1980 and 1983, twelve major banks on the Scotian Shelf and inshore bays from St. Mary’s Bay to St. Margaret’s Bay were surveyed with a hydraulic dredge by the Department of Fisheries and Oceans to determine the size of the stock biomass for ocean quahaugs, Arctic surfclams, and other shellfish resources off Nova Scotia.

It was estimated that there was a minimum standing stock of 956,000 t (676,000 t commercial densities) of ocean quahaug on the surveyed offshore banks. The presence of ocean quahaugs has also been reported from George’s Bank.

Surveys of the inshore areas identified a total of 56,833 t of ocean quahaugs at commercial densities. Difficulty operating the equipment in some areas prevented accurate estimates. In 1997, an industry-funded survey using commercial harvesting equipment was completed on a previously located but unsurveyed bed in St. Mary’s Bay. High densities limited tows to extremely short durations of three minutes or less. Determination of actual tow distances for each set was difficult due to limited precision of the differential global positioning system used for the survey. Total biomass was estimated to be 59,504 t (95% bounds; 49,356; 70,898) when corrected for the variations in positioning equipment and a tidal effect. Fishable biomass for this bed, assuming a minimum size of 62 mm, was estimated to be 45,233 t (95% bounds; 37,017; 53,174). A spatial model was also fitted to the data but the spatial pattern was

not very strong and resulting estimates differed little from those above. New surveys using more efficient commercial gear should be conducted on previously located areas to provide more accurate biomass estimates for the existing fishery.

Catch rates for the inshore fishery can exceed 3 t per day, but are usually determined by the amount of quahaugs the fishers feel they can market. The vessels do some exploratory fishing but most landings are from areas off Lockeport and Liverpool on the south shore of Nova Scotia.

Data from US stocks indicate that **recruitment** is variable with infrequent strong year-classes. The current management plan advises a very low exploitation rate (3%), theoretically allowing the strong year-classes to carry the fishery through periods of low recruitment. Estimates for adult natural mortality range from 0.01 to 0.04. Mortality on newly settled and juvenile quahaugs is thought to be high, with crabs and groundfish being the main predators.

Outlook

There is a large biomass of older/larger animals of this species available for harvest. Because the market for larger animals is for chowder and other processed products, it would not be economical to harvest them unless there were processing facilities in the area. Industry has recently expressed interest in setting up a local processing plant.

The very slow growth rate of this species means that low exploitation rates would have to be set for **sustainable management**. The infrequent recruitment pulses seen in the U.S. fishery means that these pulses have to support the fishery over the intervening years of low recruitment. A new plan for the local fishery should consider bed by bed management and exemption of a portion of each bed from harvesting to preserve a spawning biomass. In addition, systematic strip harvesting of fishing areas may promote recruitment. A minimum size limit should be implemented to prevent the harvesting of animals before they have had a chance to spawn. New beds located by exploratory fishing should be evaluated as soon as practical.

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This report is available from the:

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