

Scotian Shelf Sea Cucumber

Background

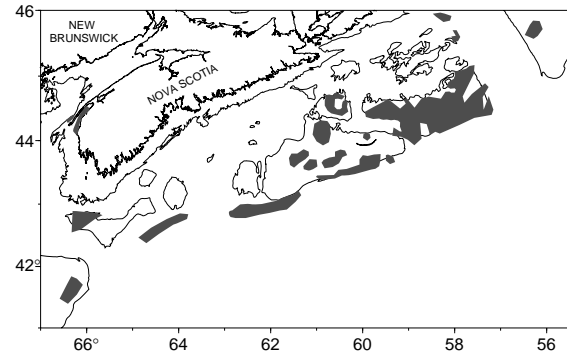
The Sea Cucumber, (*Cucumaria frondosa*), commonly referred to as “pumpkins”, and the “great northern cucumber” or “orange footed cucumber” occurs in small dense beds throughout the Maritimes Region on rock or gravel substrate. It is a benthic echinoderm, cylindrical in shape with 5 rows of tube feet. The mouth is surrounded by 8 large tentacles and 2 smaller ones which are used for planktonic filter feeding unlike the most exploited worldwide sediment-feeding sea cucumbers.

Sexes are separate and generally reach sexual maturity at 2.5 - 3 years of age. Spawning occurs between June and August and is dependent on environmental factors. Fertilization occurs externally followed by a pelagic stage of approximately 48 days after which preferential settlement on rock and gravel occurs. Growth is thought to be slow.

Little is known of the general biology, spatial distribution, and densities of *C. frondosa* in N. S. waters. Being a benthic, slow-moving animal in generally small beds, depletion of fishing grounds due to overfishing can occur rapidly.

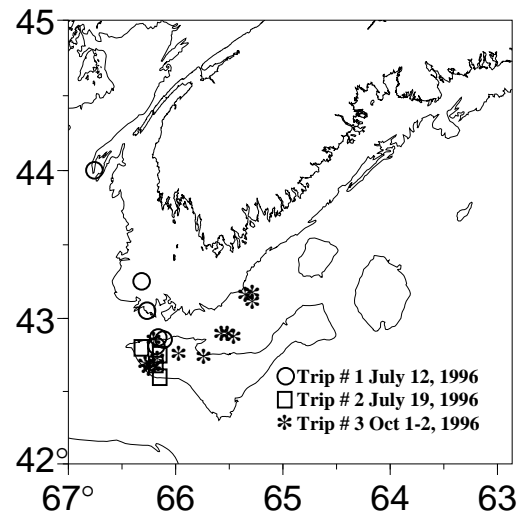
Sea cucumber fisheries have been expanding worldwide with a growing Chinese market, however *C. frondosa* is a smaller, thinner walled animal than the commonly exploited species which results in a lower end commercial product. Trepang (gutted and dried body wall) is the more viable product, however the muscle strips have been marketed as well.

Although *Cucumaria* have been fished in Maine and Japan, there have been futile attempts since 1980 to develop a cucumber fishery in Nova Scotia; the main caveat being the production of a viable product.



The Fishery

At present there is no commercial fishery on the Scotian Shelf. The map refers to by-catch of cucumbers noted by observers in groundfish fisheries. One experimental license was issued in July 1996 to conduct a one year exploratory fishing project on Georges Bank and the Scotian Shelf to determine whether the development of a fishery is commercially viable. Three trips have been made by the license holder to determine whether a suitable product can be caught in this area using five-gang Digby scallop gear.



The volume of cucumbers and scallops were measured in wired bushel baskets.

Trip	# Tows	Depth (m)	Catch (bushels)	Bycatch (bushels)
1	6	50-150	0.	0-.5
2	6	56-70	0-1.5	0-.5
3	14	45-130	0-.5	0-1

Preliminary samples have yielded small, poor quality animals with thin body walls and muscle strips. It has been suggested that this may be due to the transfer of energy towards reproduction from somatic growth in the summer. Sampled areas have been very localized and may not reflect the general quality of a possible resource.

Resource Status

By-catch information from the scallop, clam and groundfish fisheries is the only data available on the spatial distribution of *C. frondosa* on the Scotian Shelf. Due to the types of gear (trawl versus dredge) this is only an indication of where possible beds occur and not a quantitative estimate of densities. The density appears extensive enough to justify further exploration. A scientific program has been initiated in conjunction with the license holder to collect various types of data (gross distribution, seasonal variability, CPUE, population size structure, and the effects of harvesting). Until further data are collected from the experimental license holder the status of this possible resource will remain unknown. It is unknown what role the cucumber plays in the ecosystem on the Scotian Shelf. The flesh is poisonous to fish and predation by the sea star *Solaster endeca* and the sea urchin *Strongylocentrotus droebachiensis* appears to be minimal and size dependent. The sea cucumber is a filter feeder and competes with other filter feeders such as scallops which may be of greater economic value.

Outlook

The feasibility of a viable cucumber fishery on the Scotian Shelf is unknown and is dependent on the availability of a marketable product. Biological information is limited for this species and it is not known if these are applicable to the Scotian Shelf. *C. frondosa* is a slow growing species that can be overexploited fairly easily. If a fishery develops strict controls will be needed with a concerted effort to collect scientific information.

For more information

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