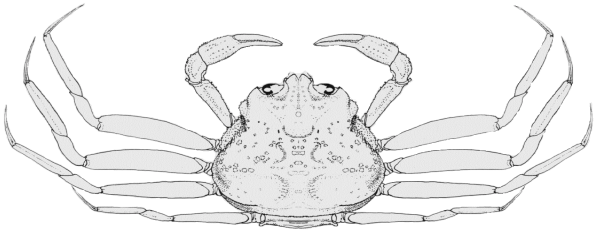
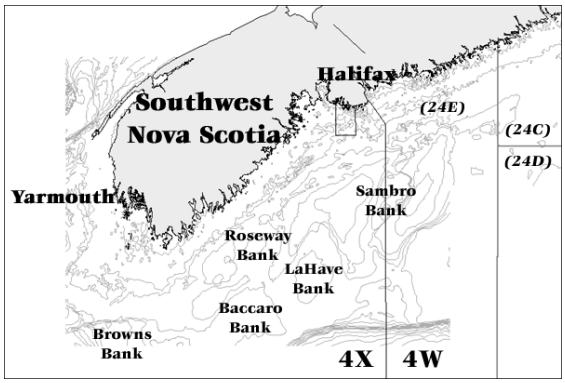


Southwestern Nova Scotia Snow Crab



Background

Snow crab (Chionoecetes opilio) is a crustacean like lobster and shrimp, with a flat almost circular body and five pairs of spider-like legs. The hard outer shell is periodically shed in a process called molting. After molting, crab have a soft shell for a period of time and are therefore called soft-shelled crab. Unlike lobster, male and female snow crab do not continue to molt throughout their lives. Females stop growing after the molt in which they acquire a wider abdomen for carrying eggs. This occurs at shell widths less than 95 mm. Male snow crab stop growing after the molt in which they acquire relatively large claws on the first pair of legs. This can occur at shell widths as small as 40 mm. Female crab produce eggs that are carried beneath the abdomen for approximately 2 years. The eggs hatch in late spring or early summer and the tiny newly hatched crab larvae spend 12-15 weeks free floating in the water. At the end of this period, they settle on the bottom. It then takes at least 8-9 years for snow crab males to reach legal size.

The range of distribution of this species in the western Atlantic is from Greenland to the Gulf of Maine, and at depth from 20 to 310 m but mostly from 70 – 280 m. Typical fishing depths off southwestern Nova Scotia are 90 m to 180 m. The records of distribution clearly indicate that Exploratory Area 4X is situated at the most southerly limit for the distribution for this species. Different sources indicate that no snow crab have been captured on Georges Bank (NAFO Area 5ZE, situated immediately west to Area 4X).

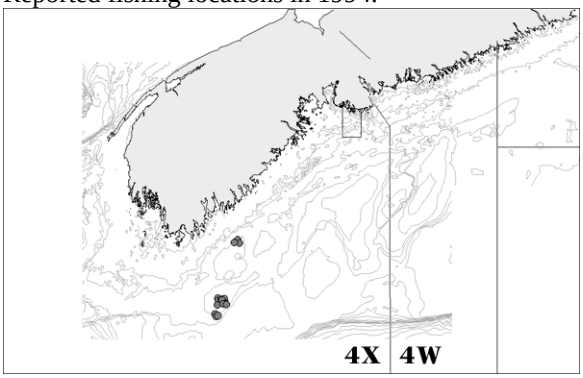
Summary

- In 1999, the catch was 110 t. Catch rates increased in 1998 and 1999 in the Halifax-Lunenburg area.
- A trap survey indicated that adult crab were present in concentrations in two areas, both with cold water bottom temperature.
- Because southwestern Nova Scotia is at the southern limit of snow crab distribution, it is expected that this fishery will be sporadic.

The Fishery

Harvesting of snow crab, *Chionoecetes opilio*, off the southwestern coast of Nova Scotia (NAFO Division 4X) began in 1994 with 4 licenses and a 30 trap limit. A by-catch of Jonah crab (*Cancer borealis)* was allowed and logbooks were obligatory. There was minimal fishing activity that year, and reported **landings** were 130 kg.

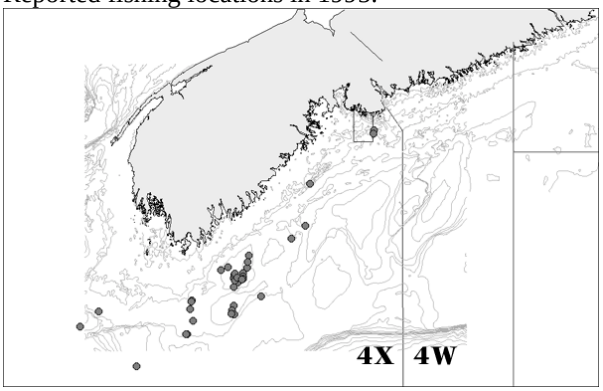
Reported fishing locations in 1994.



In 1995, license holders were allowed 100 traps of which 30 could be 6 feet in diameter instead of the standard 4 feet in diameter. By-catch of northern stone crab (*Lithodes maja*) was allowed.

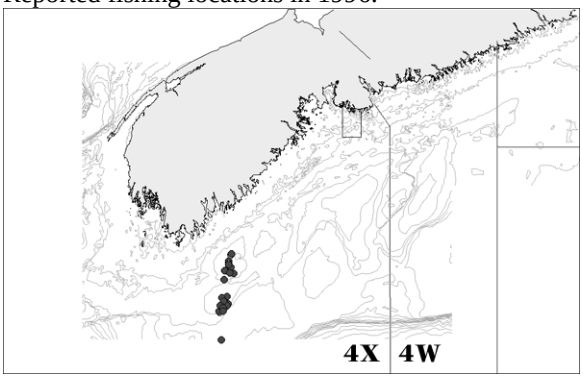
Fishing effort peaked at 12,500 trap hauls, but catches were often equal to zero and landings were 18 t.

Reported fishing locations in 1995.



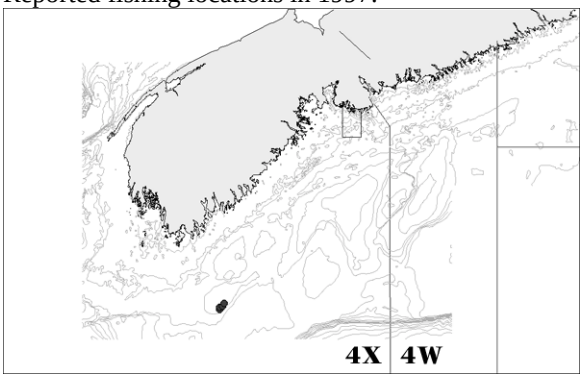
In 1996, the trap limit was increased to 250 of which 30 could be the larger-size traps. By-catches of Jonah crab and northern stone crab were again allowed. Traps required a biodegradable panel, and 10% dockside monitoring (DMP) was required. Fishers were required to fish at least 18 sea days per year, which was based on 10% of the available fishing days in the previous year's season. The effort was 10,700 trap hauls and landings were 11 t.

Reported fishing locations in 1996.



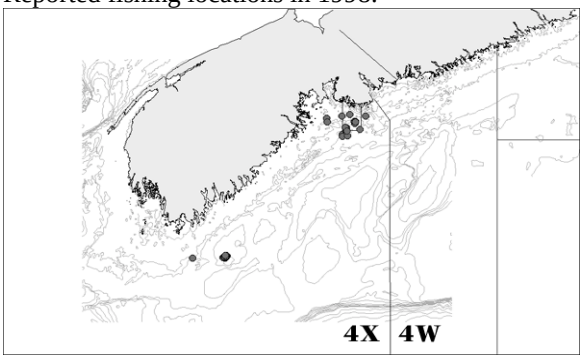
In 1997, the dockside monitoring program coverage was increased to 20%. Only two license holders fished. The effort was 700 trap hauls and landings were 2 t.

Reported fishing locations in 1997.



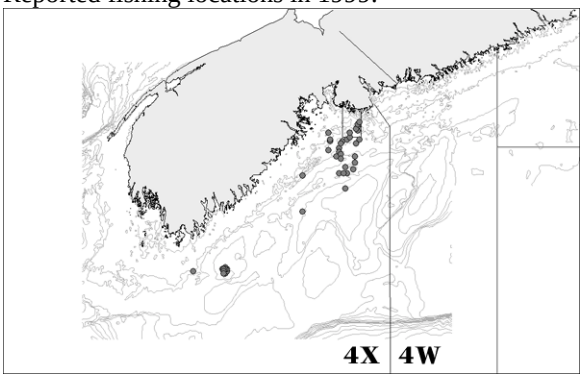
In 1998, Jonah crab was dropped as an allowed by-catch. A concentration of snow crab was found along the NAFO fishing boundary of 4W/4X. Three fishers relocated to this area. The trap limit was reduced to 175, of which 30 could be large-sized traps. The effort was 7,900 trap hauls and landings were 42 t.

Reported fishing locations in 1998.

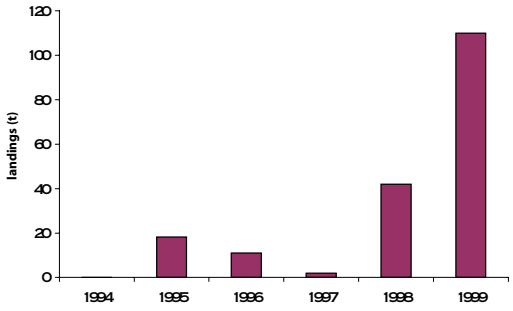


In 1999, the distribution of effort was similar to 1998 with one fisher fishing the Roseway Basin, while the other three fished the Lunenburg – Halifax area. Total landings of 110t were almost 160% higher than those of 1998.

Reported fishing locations in 1999.



Landings (t).

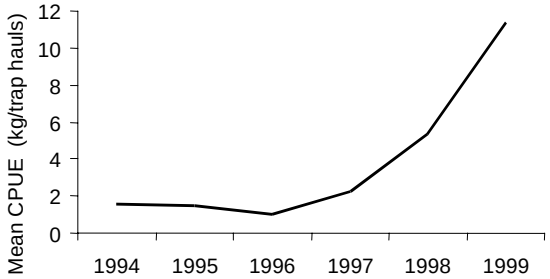


Resource Status

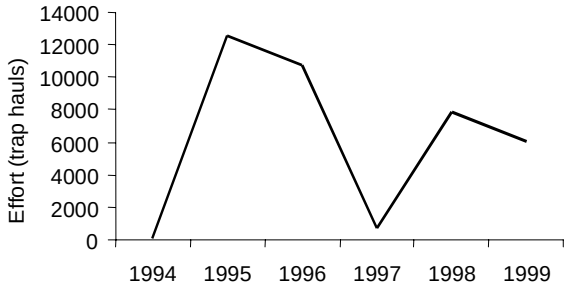
The evaluation of stock status for 1999 is based primarily on fishery information and an exploratory trap survey. **Catch rate** (CPUE: kg/trap haul) and effort (total number of trap haul) were derived from fishing logs. Catch rates were not adjusted for soak time.

Catch rates have increased progressively from the initial low rates of 2 kg/trap haul to 11.4 kg/trap haul in 1999. In contrast, the total seasonal effort has steadily decreased from 12,500 trap hauls in 1995 to 6,000 in 1999. In the 1998 and 1999 fishery, the highest catch rates were in the January-April period.

CPUE for Area 4X.

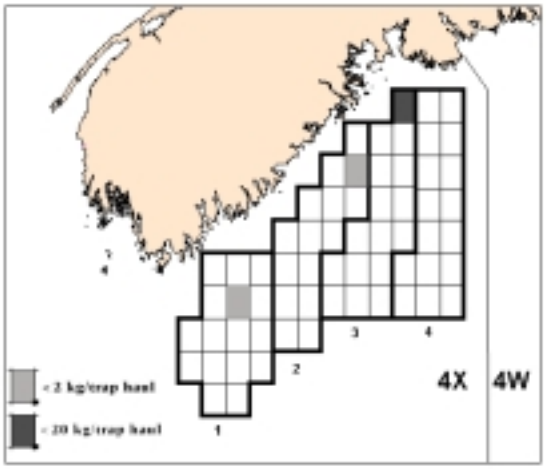


Fishing effort for Area 4X.



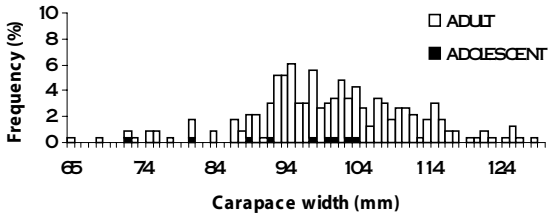
An exploratory **trap survey** was conducted in 1999 which covered 63 grids of 10' latitude by 10' longitude. The survey showed that the distribution of adult crabs was limited to only two areas and that there was a full range of carapace conditions. However, 85% were older than carapace condition 3. Only 3 females were found, all were multiparous females carrying new eggs.

Trap survey (grids) and related CPUE in 1999.



An historical review of the groundfish survey on the Scotian Shelf revealed that of a total of 5,801 trawl sets between 1980 and 1994, 96 (1.7%) yielded snow crab, and only three of them were west of 62° longitude.

Male histogram from the trap survey in 1999.



Sources of uncertainty

There are uncertainties in the current assessment of the resource status. The available snow crab biomass for this area is unknown, and there is no scientific basis to determine a TAC. In addition, the trap survey may not provide a complete view of population structure.

Ecosystem Considerations

Snow crab on the Scotian Shelf are found mainly where summer bottom temperatures are less than 3°C, and these conditions are limited to the eastern Scotian Shelf and cold pockets off of southwestern Nova Scotia.

In most grids surveyed, especially in blocks 3 and 4, temperatures were above 7°C, and no snow crab was present. However, in 4X, all snow crab that were caught were in water between 3-7°C.

Outlook

This area is at the southern limit of snow crab distribution and the population is considered to have sporadic abundance. Because of warm water conditions and the absence of young crab, it is unlikely that a large fishery is sustainable. The current level of fishing effort is appropriate.

Management Considerations

The fishery monitoring requirement now in use in eastern Nova Scotia fisheries should be applied (e.g, 100% dockside monitoring, a minimum observer program coverage, a defined season).

Based on the current available information, this fishery should be considered as sporadic. Commercial-sized males likely migrate from the northern Scotian Shelf when the biomass is at high level. This movement has not been assessed and may vary considerably from year to year, depending on fluctuations in water temperature.

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Reference

Biron, M., R. Campbell and M. Moriyasu. 2000. Historical review (1994-1998) and assessment of the 1999 exploratory snow crab (*Chionoecetes opilio*) fishery off southwestern Nova Scotia (NAFO Division 4X). DFO Can. Stock Assess. Sec. Res. Doc. 2000/18.

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ISSN: 1480-4913

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Correct citation for this publication

DFO, 2000. Southwestern Nova Scotia Snow Crab. DFO Science Stock Status Report C3-65 (2000).