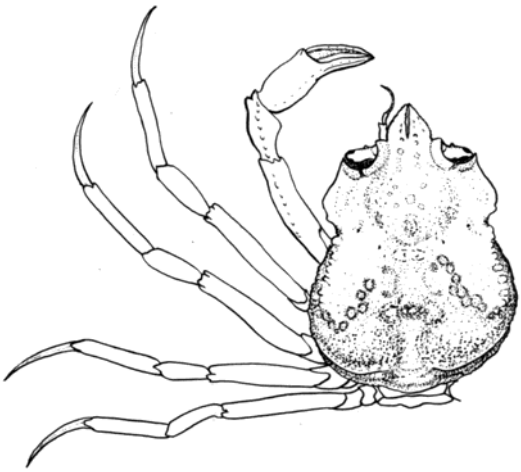

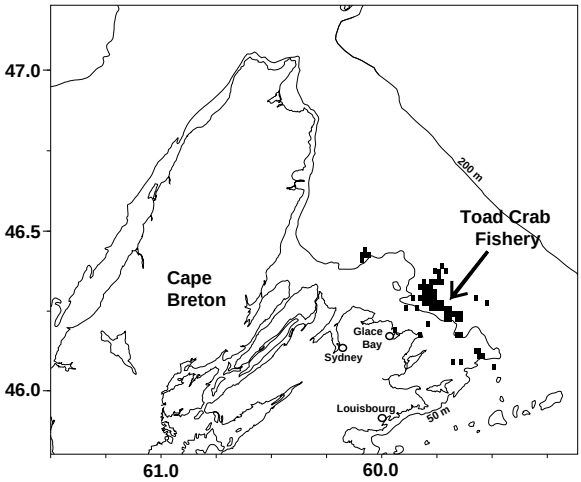

EASTERN CAPE BRETON TOAD CRAB

Background

The two species of toad crab in Atlantic waters have long round walking legs and a triangular (Hyas araneus) to lyre shaped (Hyas coarctatus) body covered by tubercles. They concentrate at depths of 50-100 m between lobster and snow crab grounds. There is limited information for Nova Scotian waters but in Newfoundland, molting occurs May-September and earliest female maturity is around 20-25 mm carapace width. There are three larval stages and development occurs over several months between spring and summer. Males are larger than females reaching a maximum carapace width of about 95 mm and 65 mm respectively.

Toad crab occur as a by-catch in the lobster and snow crab fisheries. Initially, exploration in 1995 occurred during the winter and early spring before the lobster season in the Louisbourg and Glace Bay areas and then permits were issued for eastern Nova Scotia and the heaviest effort occurred from August to October in the Glace Bay area. Fishers were experimenting with various trap types, usually modified wire or wood lobster traps and some small conical crab traps.

There were 31 exploratory licenses issued for eastern Nova Scotia of which 7 were allocated to native bands. One other fisher using a general crab license also landed toad crab. A small amount was landed as a by-catch in the snow crab fishery. Dockside monitoring coverage was near 30% by weight and the fishers self monitored the remaining landings. Biological information was collected from port and sea samples as well as fisher submitted logbooks.

The Fishery

Regulations included a preemptive minimum carapace width of 62 mm, no retention of females or any other commercial species and a 150 trap limit. To minimize by-catch of other commercial crustaceans, fishers were restricted to at least three miles from shore and a depth no less than 10 fathoms (20 m). In an attempt to maximize the explored area, permits were restricted to existing crab areas (CFA 20-24).

Fishers did not distinguish between the two species and a total of 63 t were **landed** in 1995 as Hyas sp. The majority (94%) was landed at Glace Bay. Point Aconi had one active fisher and landed 6% of the total while minor landings were reported in L'Archeveque and Canso.

The known fishing locations, averaged for one minute squares, show that the fishing effort was concentrated in an area approximately 10 miles from the home port of Glace Bay. Fishers from other ports concentrated their effort to the west and east of the main area.

Data were collected from fishers logbooks and by sea and port sampling of the commercial catch.

Crab were caught at depths between 35 and 80 meters with concentrations in the 65-75 m **depth**

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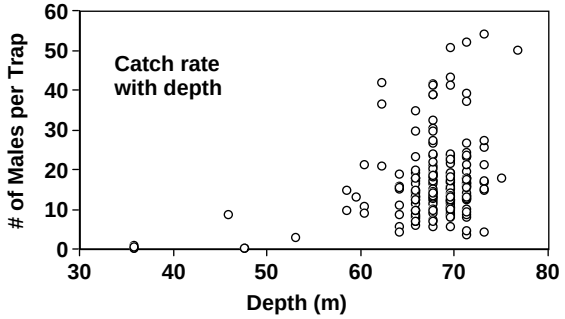
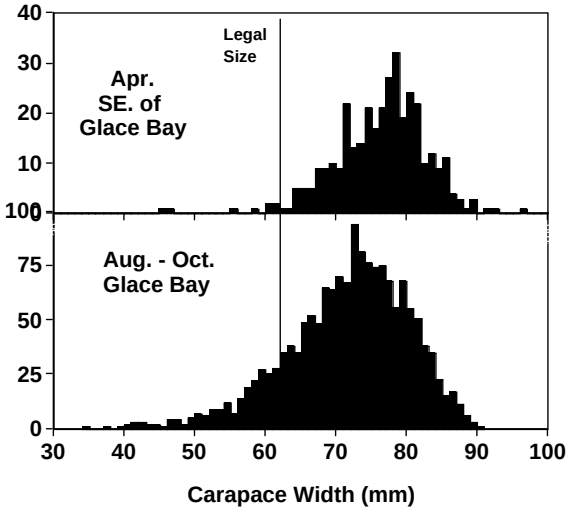
range off Glace Bay during the August to October season. In February to April, the prime catches were in 40-50 m. Whether this is an indication of seasonal migration or geographic differences is unknown since depth exploration by the fishery was limited once acceptable quantities of crab were located.



A geographical difference in size is suggested by the three sea samples collected in April 1995 southeast of Glace Bay. They show a larger mode for carapace width (76-82 mm) than was seen in the Glace Bay area in Aug.-Oct. (72-74 mm). However, H. araneus are normally larger than H. coarctatus. Preliminary information suggests that the February sample may have had a greater percentage of H. araneus. Also there may be some temporal or trap variability causing this size difference.

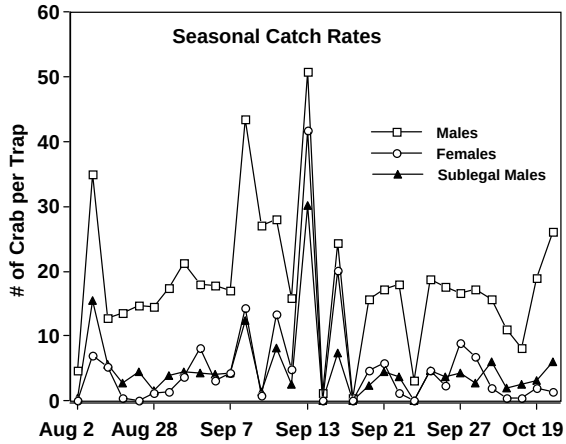


Data on **discards** from sea samples and logbooks show no lobster by-catch and few snow crab. The ratio of the total toad crab to snow crab from sea samples was 22:1. Males made up 75% of the snow crab discards.

Catch Summary from Glace Bay Sea Samples

	Toad Crab			Snow Crab	
	Total	<62 mm	<75 mm	Total	Mean Size
Males	1587	96	458	56	73 mm
Females	52	51	52	19	56 mm

Total season data collected by the Glace Bay fishers show females and sublegal males each represented approximately 15% (by number) of the catch. Less than 1% of the catch was considered soft by the fishers. The average catch of females and sublegal males was consistently less than the average catch of legal males except for a period in mid-September. Landings at that time were dominated by one fisher using some conical traps. It is unknown if the observed increase in females is due to trap selectivity or fishing location.



Resource Status

All assessment data were based on fishery information since there is no independent index of abundance. To reduce costs for the developing fishery, dockside monitoring covered approximately 30% (by weight) of the landings. Data on the remaining 70% were obtained by fishers completing and submitting the forms. Catch rate and effort are also derived from logbooks and include inherent problems of completeness and accuracy.

Eight fishers returned logbooks with subsample data. This represented a total of 108 fishing days and 915 traps sampled. The variation in catch rates (0.4 - 51 crabs/trap) may be due to the fishers learning where and how to fish optimally. Since **catch rates** were high throughout the season, it suggests that the area

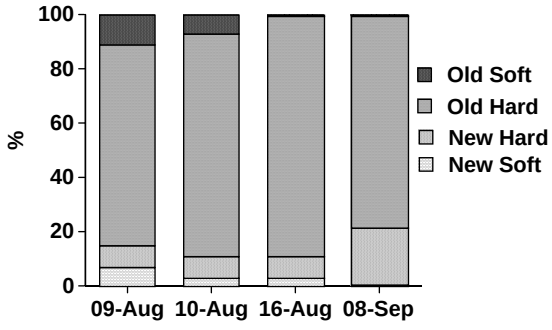
was not being fished out and it is unlikely that exploitation influenced the variation in catch rates.

There are no **surveys** completed specifically for toad crab, however, data are available from groundfish surveys where toad crab were caught as incidental bycatch. While toad crab were identified infrequently, these data are currently being analyzed.

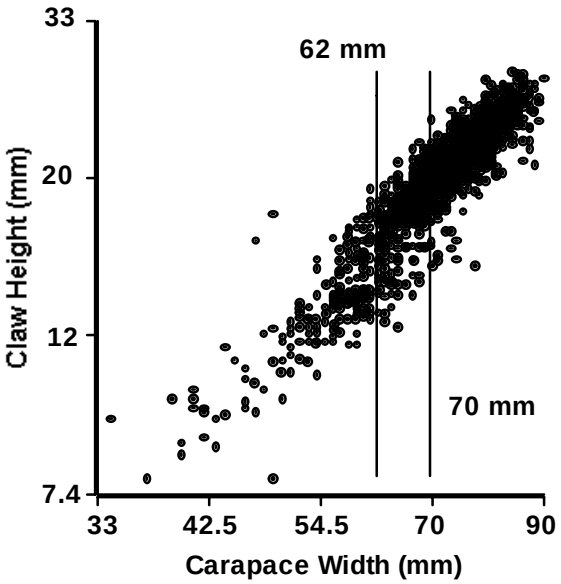
The average daily catch of legal males stayed high throughout the fishing period from Aug to Oct. (18 crab/trap) with only five days dropping below 10 crab/trap. This suggests that the removal of 63 t had little effect on the **abundance** of the stock. Available biomass for all Eastern Cape Breton may be much larger given the small area fished in 1995.

Classification of shell condition, in toad crabs, is based on relative age and hardness. Recently molted crab have a new soft shell, which is bright, iridescent, has no epibionts and the claw can be compressed with moderate pressure. The new hard shell may have some epibionts, is duller in color and the claw is difficult to compress. An old hard shell is brown, non-iridescent, has epibionts and the claw is fully rehardened. An old soft shell is common in older crab where the shell has blackened and has softened areas due to the loss of shell chitin.

Sea samples in Aug.-Sep. show that the majority of crab sampled were hard shelled and that the percentage soft decreased throughout the period. Around 20% of the sample were considered new molts providing an approximate level of **recruitment**. Without better estimates of the abundance and molting rates of sublegal males, future recruitment cannot be predicted.



Other males of related species show a pronounced change in claw size after the terminal molt at onset of maturity. Preliminary analyses of claw height samples from the Feb.-Apr. and Aug.-Sept. time periods suggest a terminal molt for these species, as well.



There is limited information concerning growth rates, variation in annual recruitment or female maturity and egg production. Until exploratory fishing or scientific surveys are conducted in other areas, there is also **uncertainty** about the full distribution and abundance of the stocks.

Toad crab occupy habitat which borders both lobster and snow crab habitat. An interaction with other commercial species is seen with the by-catch of snow crab and anecdotal information from lobster fishers that toad crab can be found on lobster grounds early in season. Cod and skate feed on toad crab.

Outlook

In 1995, only 50% of the fishers were active. They stated they did not maximize effort due to a low price (.30-.40 $/lb). With this potential for increased effort, caution should be used in considering expansion of the fishery in the areas already exploited around Glace Bay.

The fishers are using various types of traps (conical traps and lobster traps with different modifications). Further data needs to be collected on trap selectivity.

There was some interest by buyers to increase the minimum carapace width from 62 mm to 75 mm. As stated above, the relationship between claw height and carapace width suggests a terminal molt. For the Glace Bay area, this relationship suggests that there is little terminal molt before 60 mm and few non-

terminal males above 70 mm. Therefore, an increase to a minimum size of 70 mm would allow growth of non-terminal males giving the potential for increasing yield per recruit.

In addition, a minimum size in this range would be near or above the maximum size observed for females and a larger sized male would be released which may be of importance if larger females cannot mate with smaller males. If there is an increase in the minimum size, a larger escape vent could be considered.

Fishers are presently discarding soft crab. It may be useful to limit fishing during periods of high incidence of soft shell.

Most of the effort at this time is concentrated in the Glace Bay area. Any additional effort should be directed to other areas to assist in the exploratory nature of this fishery.

References

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