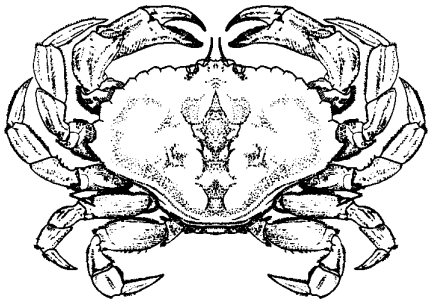


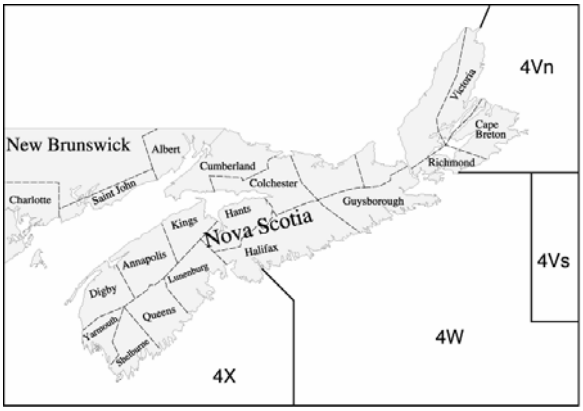
Scotian Shelf Rock Crab

Background

Rock crab (Cancer irroratus) have a broad, oval carapace with nine smooth "teeth" along the margin of each side. They concentrate in shallow water less than 20 m deep and prefer sandy bottom, although they can be found on all types of substrate. Molting occurs primarily in April and May and earliest maturity is around 25 mm and 40 mm carapace width for females and males respectively. Average maturity occurs between 50 mm and 57 mm for females while average male maturity is between 65 mm and 75 mm. Egg extrusion appears to occur in late October with development of six larval stages occurring the following summer. Males are larger than females with a maximum carapace width of 150 mm and 110 mm respectively. Commercial size is reached in approximately 6 years.

Rock crab generally occur as a by-catch in the lobster fishery, and are sold or used or as bait. Although limited commercial fishing has occurred in the Gulf of St. Lawrence since 1974, there has been no directed fishery along the Scotian Shelf until 1993. Initial exploration was in Cape Breton and has progressed southward. It is mainly a summer fishery using modified lobster traps.

A total of 44 licenses were available in 1996 between Shelburne and Victoria counties in Nova Scotia, with six allocated to First Nations. Regulations included a minimum carapace width (102 mm), a hard shell, male only fishery and a limit of 100 traps. Dockside monitoring coverage was near 20% with fishers self monitoring the remaining landings. Biological information was collected in 1996 from sea samples and logbooks.



The Fishery

Regulations in 1996 to increase catch quality included a minimum carapace width of 102 mm, and no retention of females or soft shelled crab. Conservation concerns were addressed by setting a trap limit of 100 conical crab or modified lobster traps and requiring traps to have 2 round escape gaps, with a diameter of 63.5 mm, placed 76 mm from the floor of the trap and a biodegradable panel to prevent ghost fishing. The retention of other commercial species was prohibited, and to reduce the by-catch of lobsters a rectangular entrance of no more than 1 7/8" was required when using modified lobster traps. The season was restricted to between one week after the lobster season closed and one week prior to its reopening. Licenses were restricted to normal LFA boundaries (although fishing areas were within roughly twelve miles from shore) and vessels <65' in length. All trips required hailing in to report catch although only 20% were dock-side monitored.

The directed fishery started with one experimental license in 1993 and then expanded to 10 licenses in 1994. In 1996, an additional 36 licenses were distributed bringing the total number of licenses on the Scotian Shelf to 44. By county, the distribution was three each in Shelburne, Queens, and Richmond; four each in Lunenburg and Victoria; six each in Halifax and Guysborough and nine in Cape Breton; along with 6 First Nation licenses.

Rock crab were caught as a by-catch in the lobster fishery, between 1982-1992, and although **landings** along the Scotian Shelf were usually less than 20t

Available from: Maritimes Regional Advisory Process, Department of Fisheries and Oceans, P.O. Box 1006, Stn B105, Dartmouth, Nova Scotia, Canada B2Y 4A2. Telephone: 902-426-8487. E-mail: d_geddes@bionet.bio.dfo.ca

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they did reach a high of 48 t in 1988. Rock crab are also used as bait in the lobster fishery so total removals are underestimated. With the introduction of licenses in 1993, reported landings increased from 56 t in 1994 to 173 t in 1995. Reported 1996 landings are available only by NAFO division for the Scotian Shelf zones (part of 4X, 4W, 4Vn) and are incomplete since the fishery is still underway.

Scotian Shelf Landings by NAFO Division (t)

Year	4X	4W	4Vn	Other	Total
1996*	10	1	45	2	58
1995	10	48	115		173
1994	0	4	52		56
1993		1			1
1992	1	2			3

*preliminary

There was no directed fishery for rock crab in Division 4X (that area south of Halifax) prior to 1996. Since 1994, the majority of 4Vn landings come from the directed fishery in Cape Breton County and the most heavily fished area is from Louisbourg to St. Anns Bay where at least 85 t were landed in 1995 (78% of 4Vn landings).

Exploratory license and total landings by county

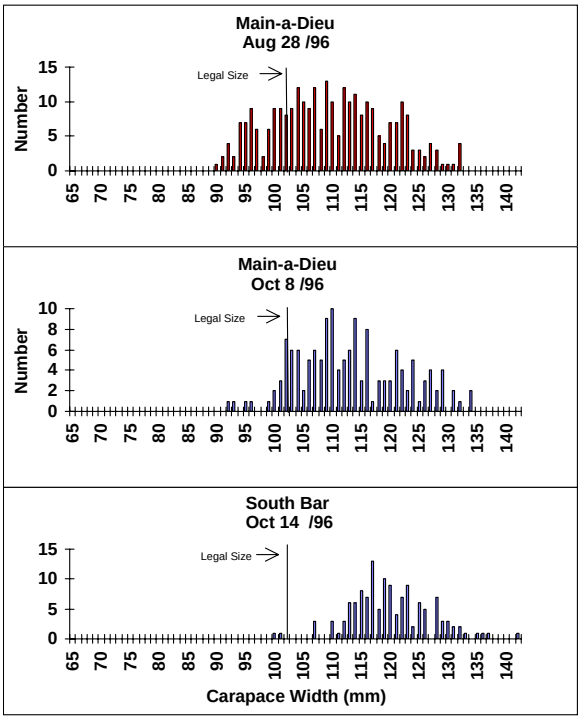
	1995 Landings (t)		NAFO
County	Total	Exp. Licenses	Division
Victoria	1	no licenses	4Vn
Cape Breton	109	85	4Vn
Richmond	18	no licenses	4W
Guysborough	27	5	4W
Halifax	2	0	4W
Halifax	0	no licenses	4X
Lunenburg	0	no licenses	4X
Queens	5	no licenses	4X
Shelburne	5	no licenses	4X

The only **biological** data available prior to 1996 are from DFO and partial fisher logbook coverage. Catch rate and effort derived from logbooks include inherent problems of completeness and accuracy and represent only one fisher per area. In 1996, the number of licenses in the fishery increased and this expanded the possible area fished. However, with poor prices and bad weather in 1996, this effort was not maximized. Available data in 1996 were collected from three sea samples (Aug. 28 - Oct. 14) using commercial traps.

The logbooks returned from the fall of 1994 suggest that there was a geographical difference in **catch rates**. Average rates varied from a low of 1.3 kg/trap to 10.7 kg/trap haul. There was a slight increase in catch rates (3.0 - 4.4 kg/trap haul) of one fisher between 1993 and 1995 which suggested fishing pressure had little affect on the catch rate over the three years.

Markets for rock crab were limited in 1996 and with poor weather conditions, little directed fishing was conducted in Sept. and Oct. The average size of legal males was similar in both the Aug. 96 and Oct. 96 Main-a-Dieu sea samples (113.5 mm and 114.3 mm respectively).

A geographical difference in size is suggested with larger males found east of Main-a-Dieu. Legal males from the October sample in South Bar were slightly larger (120.4 mm).



Variations in catch rates (number/trap haul) from sea samples suggest temporal and geographical differences. Catch rates of females and all sizes of males were considerably lower in the Oct. samples from Main-a-Dieu compared to Aug., although the same traps were used in similar areas.

Using modified lobster traps, Oct. sea samples from Main-a-Dieu and Sydney show the male catch is made up of differing percentages of large sized males and have considerably lower catch rates.

Acerage catch rates by size and sex from the 1996 sea samples

	Main-a-Dieu		Sydney
	Aug. 28	Oct. 8	Oct. 14
Total Male (#/trap haul)	56.2	24.5	10.9
Total Female (#/trap haul)	8.6	3.7	0.4
Legal Males (#/trap haul)	43.4	22.8	10.8
% Males at legal size	77%	93%	98%
% Males at 115 mm	32%	39%	82%

Data on **discards** from sea samples and logbooks show little lobster by-catch. No lobsters were reported during sea samples or by fishers using conical traps. The most complete logbook for a fisher using modified lobster traps indicates one lobster for approximately every 150 trap hauls**.** It was reported that those lobsters usually had not reached the parlor end where the escape vents were located. Verbal information suggests that, particularly early in the season, lobster by-catch can be higher in some areas.

Resource Status

Seven of ten licensed fishers were active in 1994 and all returned logs. The number of fishers returning logbooks decreased in 1995. The returned logbooks represented a total of 11,000 and 15,694 traps hauls in 1994 and 1995 respectively. Since weekly catch rates were relatively stable throughout the season, it suggests that the areas are not being fished out and it is unlikely that exploitation influenced the variation in catch rates. With depressed prices ($0.18- $0.28 per pound) and bad weather it is unlikely that effort will increase dramatically in 1996.

The mean size of harvestable males from the sea samples (113 - 120 mm) is considerably larger than the estimated size at 50 % maturity (75 mm), therefore exploitation should not affect mating and potential egg production at this time.

Of 353 males sampled for shell hardness using the durometer, only one was considered soft (having a reading of <67). Another 200 males, not measured with the durometer, were visibly rated as having hard, old shells. The shell condition suggests that in this fishery the crab have sufficiently recovered from molt so that the limited handling of undersized crab should not increase mortality.

The catch rates for females from the sea samples ranged from 0.4 - 8.6/trap haul. These lower values would suggest that the escape vents are reducing handling of females or that the fishery is not being conducted on suitable bottom to find females. All females were larger than the estimated size at maturity of around 57 mm (63-98 mm). However, no ovigerous females were found. This may be related to catchability of berried females or may indicate a lack of specific knowledge on the biology of animals in this area.

Until more exploratory fishing or scientific surveys are conducted there is limited information concerning growth rates, variation in annual recruitment or female maturity and egg production.

Outlook

This species is not heavily fished so the potential of this resource is known. The increased number of licenses in 1996 should have allowed a better evaluation of catch rates and expanded fishing areas. However, effort is related to price and it appears that effort will not be maximized in 1996 because of limited markets and poor price. Further increases in the number of licenses is not recommended until the present level of effort is maximized and the effect on the fishery is determined.

A major concern to most fishers is the by-catch of rock crab in the lobster fishery. The amount landed can be documented but some rock crab by-catch is used as bait. Anecdotal information suggests that in some areas the amount of rock crab used for bait can be as high as hundreds of pounds per day. With increased cost of bait other than rock crab, the practice of using rock crab could expand. This may be a biological concern in the lobster fishery as well since smaller crab are part of a lobster's diet. Rock crab landings, as a lobster fishery by-catch, should be under the same restrictions as the rock crab fishery. To determine the quantity of rock crab used as bait, a section should be included on the mandatory logbooks now being returned by lobster fishers.

For More Information

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