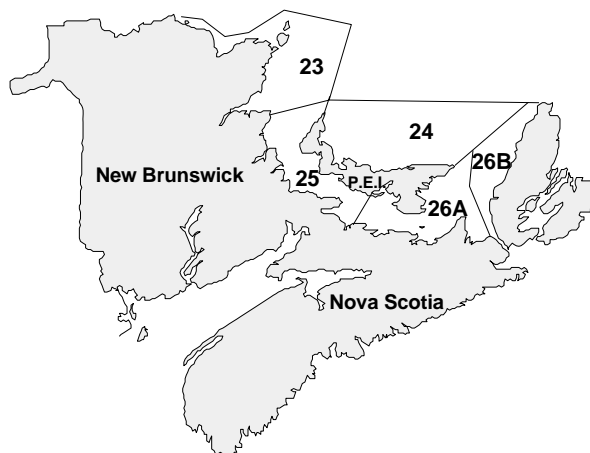


American Lobster
(Homarus americanus)
Southern Gulf of St. Lawrence

**Background**

The habitat of the American lobster extends along the Atlantic coast from North Carolina to Labrador. In Canadian waters, lobster may be fished in deep waters (i.e.: Georges Bank) but the most important concentrations are generally observed within 20 km from the shore. In the southern Gulf of St. Lawrence, lobster is found in depths ranging from 1 to 40 meters.

The life history of the lobster can be divided into a benthic and planktonic phase. The planktonic phase follows the hatching of the eggs during the months of July and August. The free-swimming period of larvae lasts from 3 to 10 weeks, depending on environmental conditions, and ends when the larvae settle on the substrate. After 5 to 6 years of growth, female lobsters in the southern Gulf of St. Lawrence become sexually mature. Males become sexually mature at smaller sizes and ages than females. Mating occurs between the months of July and September. Generally, female lobsters extrude their eggs one year after mating and carry them under the abdomen, for nearly another year.

The lobster fishery in the southern Gulf of St. Lawrence is managed in five Lobster Fishing Areas (LFA) with a variety of regulations and management controls based on limited entry, fixed fishing seasons, maximum number of traps per fisher and minimum size at capture. The trap is the only fishing gear permitted and it is illegal to keep egg-bearing females.

There are approximately 3,300 fishing license holders fishing more than 1 million lobster traps in the southern Gulf of St. Lawrence.

The Fishery

Management: The present fishery management regime is based on five Lobster Fishing Areas (LFA), two major fishing seasons, four minimum carapace sizes at capture and three maximum number of traps permitted per fisher.

Lobster Fishing Area	Minimum carapace size	Fishing season	Number of license holders	Maximum number of traps/fisher
LFA 23	66.7 mm	May - June	764	375
LFA 24	63.5 mm	May - June	638	300
LFA 25	66.7 mm	mid-Aug. to mid-Oct.	887	250
LFA 26A	65.1 mm	May - June	774	300
LFA 26B	70.0 mm	May - June	255	300

Landings: Commercial lobster landings in the southern Gulf of St. Lawrence have increased since 1974 to high levels in the 1990. Increases in landings have been observed in all LFA's with some variation in the year of peak landing. The 1995 landings are comparable to 1994 levels.

Year	71-80 Avg.	81-91 Avg.	1992	1993	1994	1995
LFA 23	1,193	2,855	4,257	4,486	4,073	3,979
LFA 24	2,093	3,441	4,605	4,732	4,755	5,082
LFA 25	2,356	4,975	4,578	4,100	4,430	4,345
LFA 26A	2,024	4,883	4,594	4,686	3,469	3,536
LFA 26B	558	1,081	1,411	1,455	1,110	1,152
Total	8,225	17,235	19,444	19,459	17,837	18,094

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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Resource Status

Annual review of the fishery is based on fishery's statistics and data collected from the sea sampling and the index-fisher programs. Catch and effort data from the index fisher program, indicate stable catch levels in all LFA's for 1994 and 1995.

Based on simple basic hypotheses, two techniques were used to estimate exploitation rates. One method used a modal analysis of the annual depletion of molt classes recruited into the fishery (catch curve method). Each molt class was followed for five (5) consecutive molt increments or years.

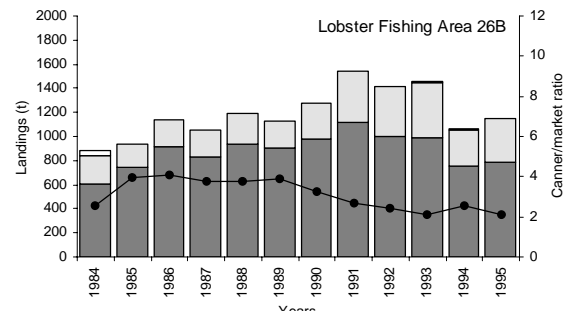
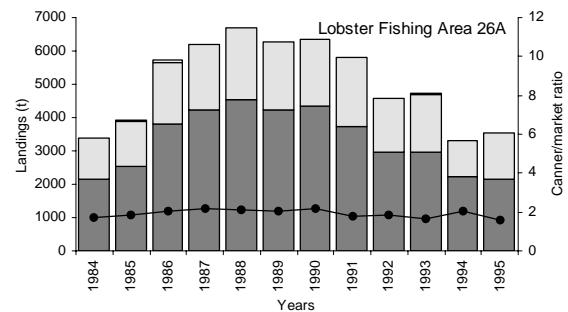
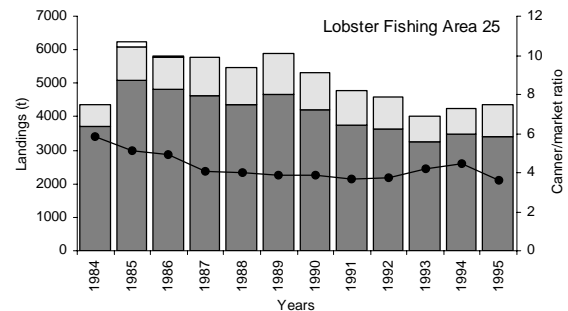
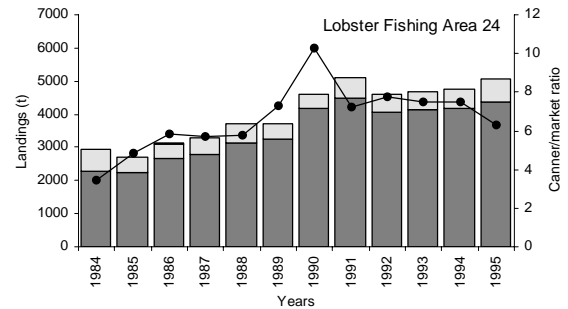
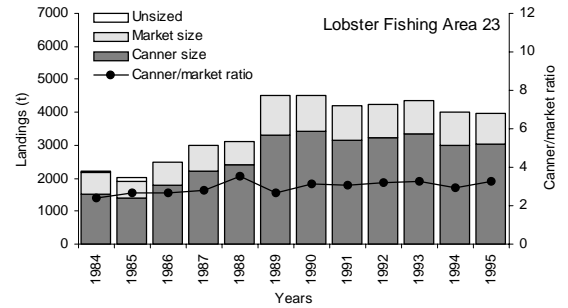
From 1987 to 1995	LFA 23	LFA 24	LFA 25	LFA 26A	LFA 26B
Average Exploitation levels (%)	74.0	81.3	76.5	78.0	85.0

Mean exploitation rates for male lobsters only were estimated for each LFA with sea sampling and catch data from 1987 to 1995. The landed weight for each molt class was used as weighting factor.

The second method used was the Leslie analyses. Calculations for canner and market size categories were done separately (males and females combined).

Lobster Fishing Area	1993		1994		1995	
	exploitation level in %	canner market	exploitation level in %	canner market	exploitation level in %	canner market
LFA 23	73.9	36.2	75.2	51.8	70.3	32.5
<i>all sizes</i>	<i>65.5</i>		<i>68.7</i>		<i>61.6</i>	
LFA 24	76.2	86.1	82.2	62.7	86.6	71.9
<i>all sizes</i>	<i>78.0</i>		<i>79.8</i>		<i>84.6</i>	
LFA 25	---	---	---	---	---	---
<i>all sizes</i>	<i>---</i>		<i>---</i>		<i>---</i>	
LFA 26A	75.4	52.5	72.4	23.8	65.3	52.0
<i>all sizes</i>	<i>69.1</i>		<i>57.0</i>		<i>59.5</i>	
LFA 26B	71.9	88.3	82.4	65.2	82.6	47.9
<i>all sizes</i>	<i>76.9</i>		<i>78.1</i>		<i>72.5</i>	

The results of the catch curve method provide average exploitation rates over multiple years when the Leslie method providing annual values. Nevertheless, both methods gave similar values, indicating that estimated exploitation rates were high in all lobster fishing areas.



The results of both methods corroborate in presenting the highest exploitation levels in LFA's 24 and 26B.

Sources of uncertainty: The index-fisher program was initiated in 1993 and involved few volunteer fishers in the first year. Therefore, caution is required in the interpretation of the results for that particular year. In addition, the CPUE's were calculated without considering the different trap designs and dimensions.

Furthermore, both methods used to calculate exploitation rates are based on numerous basic assumptions from which any departure will result in bias. Changes in lobster catchability can induce important variability and bias in the Leslie analyses. This situation of changing catchability was suspected in 1994. In many locations of the southern Gulf, fishers indicated that the somewhat low CPUE's during the first two to three weeks of the spring seasons were due to colder water temperature and unfavorable weather. The low catchability at the beginning of the fishing season may have resulted in an overall reduction in exploitation rate.

Changes in yearly recruitment will also induce bias in the exploitation level estimations. Lobster recruitment is known to be highly variable between LFA's and within LFA's. This variability was not considered in any of the calculation method.

The fact that the fishery in LFA 25 is conducted during and after a period of important physiological events (molting, mating and hatching) that are known to affect catchability. Although the exploitation level calculations for that LFA were conducted using the catch curve method, these physiological events may have induced unknown bias in the estimates. Despite these uncertainties, exploitation rates are considered to be high.

Ecological interactions: With the increasing interest and development of the rock crab (*Cancer irroratus*) fishery, fishers have raised numerous questions and concerns on the ecological interactions between the lobster and the rock crab. Further research will be required to better understand the relationship between these two species in the context of a commercial exploitation.

Water temperature: In all LFA's with a spring fishing season, numerous fishers have indicated abnormally low catches at the beginning of the 1995 season. These observations corroborated with bottom water temperature information, suggested the presence of colder than usual water masses in numerous locations in the southern Gulf. Although the CPUE's were low at the beginning of the fishing season, the overall catch for the season did not seem to be affected. Since 1995, the bottom and surface

temperatures on lobster fishing grounds have been monitored through a series of coastal temperature recorders.

Outlook

Landings from the past two to three years suggest relatively stable annual catches in Lobster Fishing Areas 23, 24 and 26B. The situation is different in LFA 25 and 26A where the landings have been declining since the mid to late 1980's. The worst landings are observed in the central region of the Northumberland Strait. Given the lack of information on recruitment, there is no clear outlook for the 1997 fishery.

The exploitation levels estimated with the two methods are in agreement with the values presented in the Fisheries Resource Conservation Council (FRCC) report (Anonymous, 1995). The estimated values are considered high for all LFA's.

For 1996, the use of a rectangular escape mechanism (38.1mm x 127mm) was required on all traps in the southern Gulf. This new regulation will reduce the number of sub-legal size lobsters in the commercial catches therefore reducing indirect fishing mortality. This change will probably require adjustments in the sampling procedures and analyses of the fisheries data collected through the different sampling programs.

For More Information

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References

- Anonymous, 1995. A Conservation Framework for Atlantic Lobster. Fisheries Resource Conservation Council, Report to the Minister of Fisheries and Oceans, FRCC95.R.1, Nov. 1995.
- Lanteigne, M. and P. Mallet. 1995. Southern Gulf of St. Lawrence Lobster Fishery - 1994 Summary Sheets. Can. Ind. Rep. Fish. Aquat. Sci. 232: 14p.
- Maynard, D., F. Savoie, W. Landsburg, G. Roach and E. Wade, 1992. The Cape Breton experiment on legal minimum lobster size increase: An

intermediate report. Can. Atl. Fish. Sci. Adv.
Comm., Res. Doc. 92/64: 47p.

Ricker, W.E. 1975. Computation and interpretation of
biological statistics of fish populations. Bull. Fish.
Res. Board Can. 191: 382p.