Atlantic King Crab *(Lithodes maja)*

Common Names: Northern Stone Crab

Description, Distribution and Biology

The Atlantic King crab or stone crab is a bottom dwelling crustacean from the family Lithodidae. It is one of two species of king crab found in the northwest Atlantic, the other being the red atlantic king crab (*Neolithodes grimaldii*). Like other members of the family, it has a pear shaped carapace and appendages covered with short sharp spines (Fig.1). This species can grow to a similar size as snow crab, generally not exceeding 2.0 kg in weight and a carapace length of 12 cm. It also possesses unique characteristics associated with deep-sea crab, including a bright orange or red colouring and highly developed bronchial chambers. Males reach maturity at a carapace width of approximately 9.8 cm while females mature at a carapace width of 6.5 cm. There is little information regarding the life history and biology of this species, however it is not considered exceptionally fertile, in comparison to other crab species such as the snow crab (*Chionoecetes opilio*). Like all other crab species, the atlantic king crab will moult or shed its shell to grow. After discarding the old shell the crab will take in water and swell to a larger size. The new shell hardens after several months. Moulting decreases as the crab matures and its growth increment diminishes. The atlantic king crab typically targets small mussels, snail, scallop, worms and crustaceans as a food source.

Figure 1. Atlantic King crab. Source: Department of Fisheries and Aquaculture, St. John's, NL.

Atlantic king crab (*L. maja*) occurs in many regions of the North Atlantic. On the eastern coastline, it is distributed from Greenland to the British Isles and the Netherlands. In the west Atlantic, the atlantic king crab is distributed from western Greenland to New Jersey. In Newfoundland and Labrador, densely populated areas are located on both the south and west coast. This species is a deep-water organism that prefers soft substrates and depths ranging from 100 to 800 m.

Harvesting, Technology and Resource Management

An atlantic king crab commercial fishery has not been explored in Newfoundland and Labrador. Large quantities of this species have been taken as by-catch in gillnet operations, particularly on the south coast of the Island. In the early 1990s, exploratory research on atlantic king crab was conducted off the south and west coasts of the province and off the southeast coast of Greenland. The harvesting gear used in these experiments was customized from a traditional snow crab pot. The pots were conical in shape, approximately 67 cm in height with a 65 cm top and a 120 cm bottom, and covered with 5 ½" mesh webbing. Several bait types known to attract king crab to harvesting pots include herring, mackerel, squid, and redfish.

There are no regulations or management guidelines governing harvesting or handling procedures of atlantic king crab in Newfoundland and Labrador. In Nova Scotia, an integrated management plan for multi-species crab fishery has been developed and implemented. Management measures for this fishery include trap/pot limits (30 to 150 maximum), exclusion of female crab landings (population stability), by-catch provisions, defined fishing areas, and dockside monitoring programs (DMP).

Processing and Markets

As with any crab industry, harvested crab should be processed live to ensure product quality. Newly harvested crab must be placed immediately into storage tanks filled with circulating seawater or iced boxes. The species can remain alive in these conditions for a number of days prior to processing. Exploratory fisheries carried out in 1993-94 and 1996-97, illustrated types of products that could be produced and potential markets for these products. Samples of this species were sent to brokers, restaurants, seafood traders and end users in various forms including sections, whole, or as extracted meats. Response to these initial samples was positive in both Asia and the United States. The texture, colour and taste of the meat make it an attractive product for seafood markets. The atlantic king crab is a true king crab species that can obtain a position in high end markets and even compete with the Alaskan King crab and Chilean King crab products.

Constraints and Future Development

The atlantic king crab fishery in Newfoundland and Labrador has been limited to exploratory or experimental work. The research conducted on this resource over the last number of years has proven large concentrations in particular areas exist and could support a commercial fishery. However, none of the previous research projects obtained catch rates that approached commercial potential, which may be the result of fishing season, bait, soak times or harvesting equipment. Any further work in this fishery should consider longer soak times (48-hours) with a good quality bait in sufficient quantities. Pots should be set in 165 to 238 m of water and fishing season and regions need to be altered to determine resource abundance.

Processing of atlantic king crab during these projects also encountered a number of problems. The equipment used for processing snow crab was inadequate for king crab species. First, the leg rolling equipment crushed the shell rather than extracting the meat. Second, the sharp spines on the carapace and legs stuck into the equipment and the gloves and hands of the workers. Lastly, the brushes were unable to remove the gills of the crab. Future work will be required to address these issues.

ADDITIONAL READINGS:

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Dooley, T., and B. Johnson. (1993). Exploratory Fishing Spiny Crab South Coast 1992. Harvesting Operations Division, Department of Fisheries, Government of Newfoundland and Labrador.

Seafood Development Unit. (1992). A Report on the Procurement and Production of 100 lbs of Spiny Crab from Ramea. Marine Institute, Memorial University of Newfoundland, p. 452: Unit # 8745.

Woll, A. (1996). Exploratory Fishery for the Northern Stone Crab (Lithodes maja) Off the Southeast Coast of Greenland. International Council for the Exploration of the Sea (ICES), CM 1996/K: 19.

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The $10 million Fisheries Diversification Program is part of the $81.5 million Canada-Newfoundland Agreement respecting the Economic Development Component of the Canadian Fisheries Adjustment and Restructuring Initiative, announced in August, 1999. The main thrust of the Fisheries Diversification Program is industry-wide research and development initiatives that reflect the economic development priorities of the Newfoundland and Labrador fishing industry.