The Distribution and Relative Abundance of Jonah and Rock Crabs in the Bay of Fundy, Based on By-catch Records from the Lobster Fishery

by

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Abstract

Jonah crabs (Cancer borealis) and rock crabs (C. irroratus) have been counted (sometimes sexed and measured) during sampling of catches at ports along both sides of the Bay of Fundy during 1979-82. Only inshore areas were sampled and mostly in November, December, April, May and June. Jonah crabs were generally absent east of Digby and Saint John and scarce to moderate to the west. Conversely, rock crabs were absent or scarce to the west and scarce to moderate to the east. Jonah and rock crab by-catch data must be interpreted with caution since traps were set to maximize lobster catches and, therefore, were never directed toward locating areas of crab abundance.

Résumé

Dans l'exécution de programmes d'échantillonnage des prises dans des ports situés sur les deux côtes de la baie de Fundy entre 1979 et 1982, on a fait des comptages de crabes-tourteaux boréaux (Cancer borealis) et de crabes-tourteaux communs (C. irroratus) (on en a parfois mesuré et noté le sexe). Seules les zones côtières ont été échantillonnées, surtout en novembre, decembre, avril, mai et juin. Les crabes-tourteaux boréaux sont généralement absents à l'est de Digby et de Saint-Jean, et leur abondance varie de faible à modérée vers l'ouest. Inversement, les crabes-tourteaux communs sont absents ou rares à l'ouest et varient de rares à modérés vers l'est. On doit être prudent dans l'interprétation des prises accidentelles de crabes-tourteaux boréaux et communs, car les casiers sont placés de façon à porter au maximum les prises de homards et ne visent pas à localiser les zones d'abondance des crabes.

Introduction

Jonah crab (Cancer borealis) and rock crab (C. irroratus) constitute a minor fishery on the Atlantic coast of Canada and the U.S.A. coast down to at least the Chesapeake Bay area. In Canadian waters, rock crabs are relatively abundant in the Gulf of St. Lawrence (Scarratt and Lowe 1972; Wilder 1973), while jonah crabs are absent in the Gulf of St. Lawrence and in the upper portion of the Bay of Fundy. Jonah crabs are found at the mouth of the Bay of Fundy, though still not in high abundance, as by-catch to the lobster fishery.

Little is known of the biology and detailed distribution of the jonah crab (Rathbun 1929; Haefner 1977; Krouse 1980). In the course of sampling lobster catches at sea, the by-catch of jonah crabs and rock crabs was frequently recorded. On occasion carapace width measurements were taken. Our paper presents field data on trap-caught jonah and rock crabs collected for the Biological Station, St. Andrews, N.B., from spring 1979 to fall 1982, from the Bay of Fundy and SW Nova Scotia to Port Maitland (Fig. 1).

Methods

Most data were obtained during routine field sampling of commercial lobster traps on inshore grounds (usually less than 30 m deep) in lobster fishing district 1,2, 3 and 4 from 1979 to 1982. Additionally, data sources include pre-season lobster tagging surveys from Port Maitland and summer lobster tagging surveys at 5 locations in New Brunswick and Nova Scotia.

Results

All carapace width measurements (Fig. 2) result from crab by-catch in commercial lobster traps. Figure 3 shows the mean catch/trap haul for jonah and rock crabs taken inside and outside the Bay of Fundy. The dividing line for inside and outside of the Bay runs between Digby and Saint John, with the inside being to the east and outside to the west. The relative abundance (mean number of crabs per trap haul) (Fig. 1) was arbitrarily categorized as absent, scarce (0.01 to 0.49/trap haul), moderate (0.50 to 1.99), and abundant (2 or more), combining the by-catch of crabs from lobster tagging surveys during closed seasons with the open season at-sea samples. No distinct seasonal trend in relative abundance of jonah crabs or rock crabs were apparent for Fig. 3.

Discussion

In the Bay of Fundy, jonah crabs and rock crabs appear more abundant in the Digby area with rock crabs occurring close to shore in coves or bays while jonah crabs are more frequently caught in open, deeper waters. To maximize their lobster catch, fishermen will often move their traps when the by-catch of crabs increases; thus, the best crab grounds are deliberately avoided by lobster fishermen. Hence, the relative abundance of Cancer crabs, as observed from by-catches of the commercial lobster fishery, is probably an underestimate of the relative abundance that could be achieved by a directed fishery for Cancer crabs.

Acknowledgments

We wish to thank the many field personnel who were involved in sampling at sea. Figures were prepared by F. B. Cunnigham.

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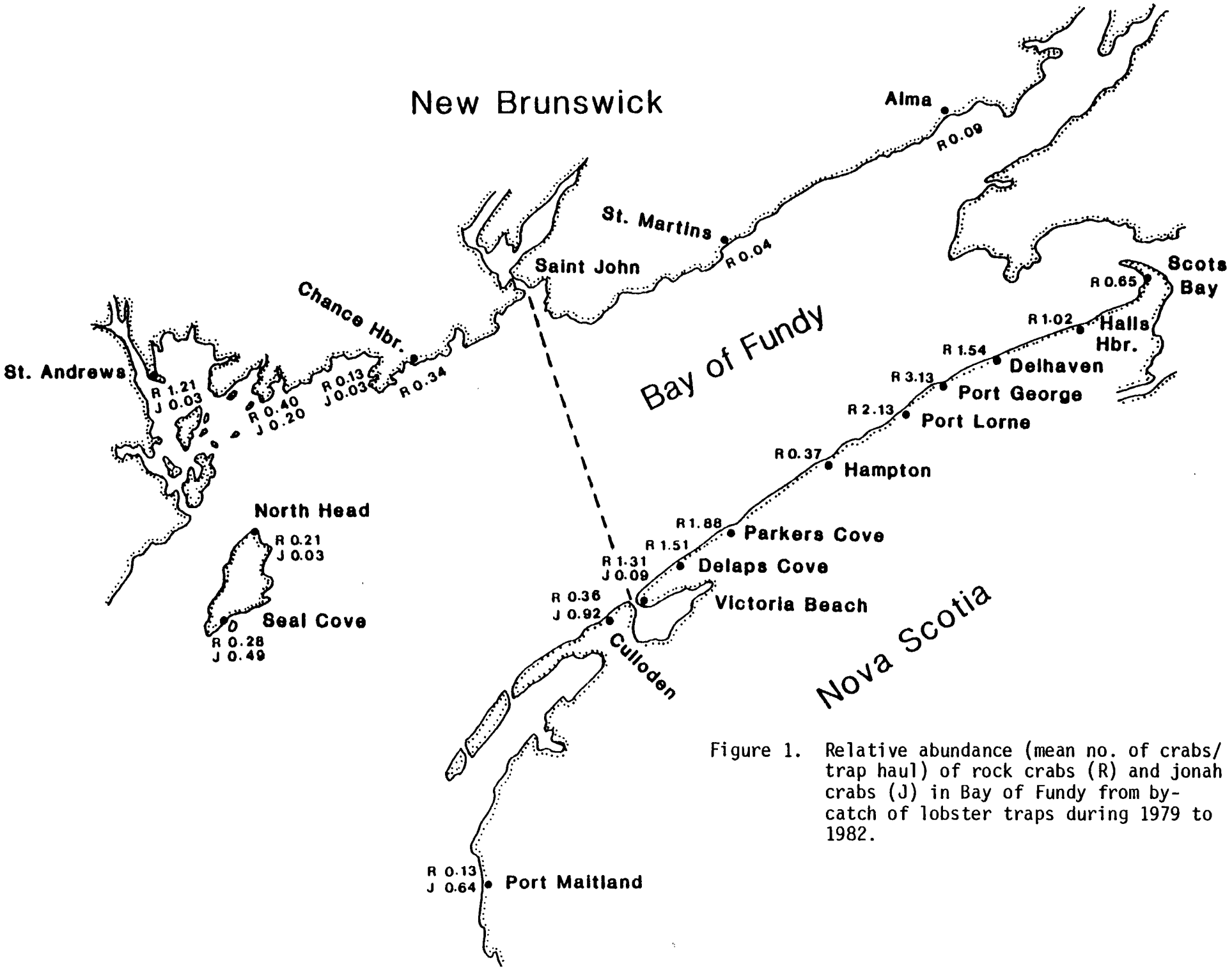

Figure 1. Relative abundance (mean no. of crabs/ trap haul) of rock crabs (R) and jonah crabs (J) in Bay of Fundy from by-catch of lobster traps during 1979 to 1982.

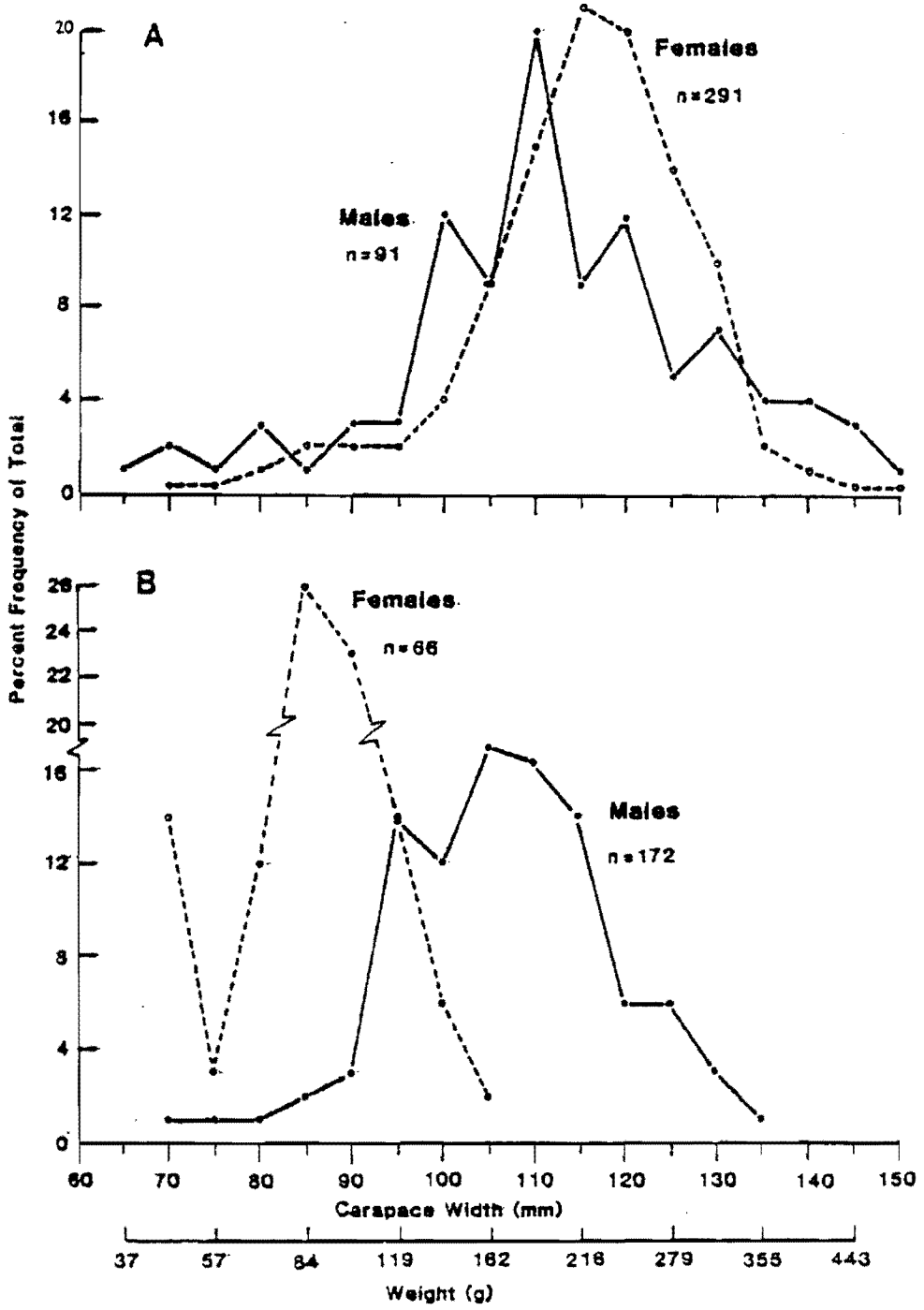

Figure 2. Frequency distribution by carapace widths (mm) and weight (g) of (A) jonah crabs *(Cancer borealis)* and (B) rock crabs *(C. irroratus)* caught inshore, Bay of Fundy.

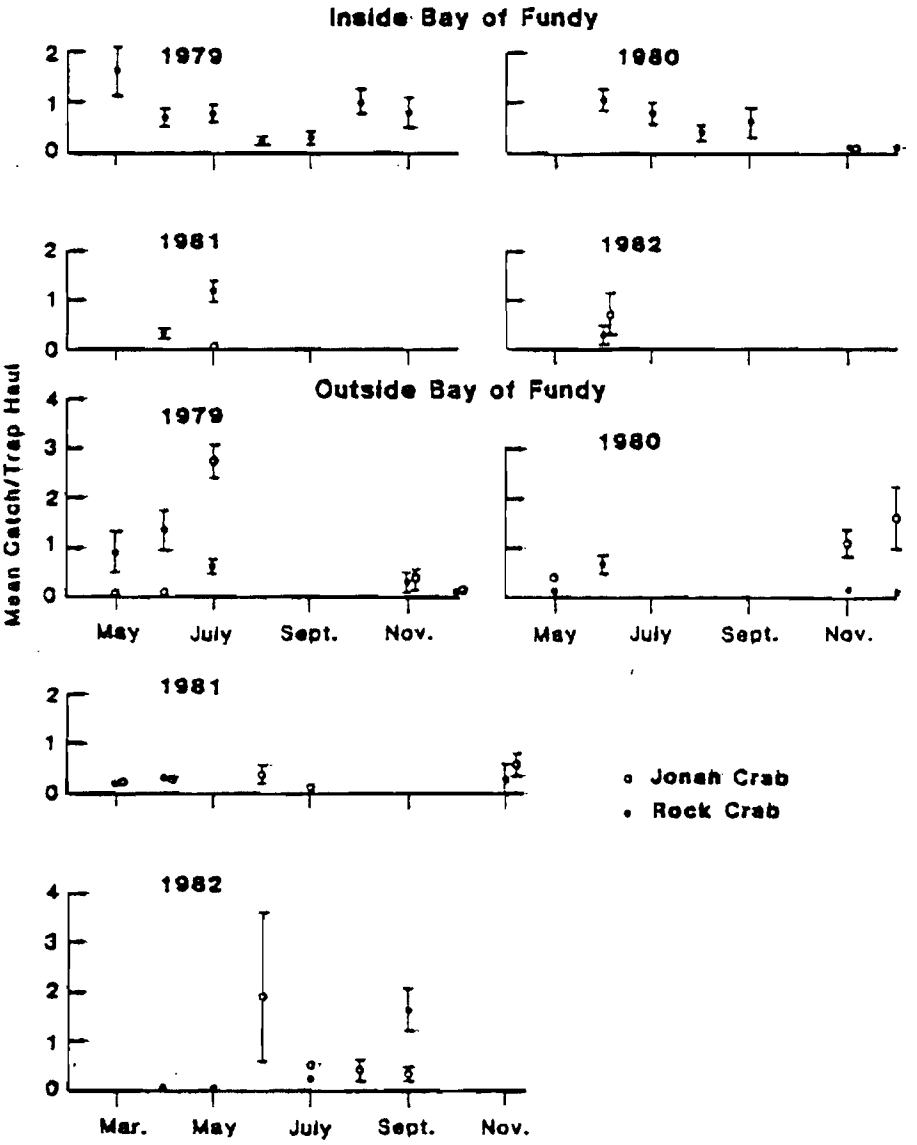

Figure 3. Seasonal abundance (mean catch/trap haul) of jonah and rock crabs taken from lobster trap by-catch inside (a) and outside (b) Bay of Fundy during 1979 to 1982.