Northwest Atlantic Fisheries Organization

Serial No. N1137 NAFO SCR Doc. 86/23

SCIENTIFIC COUNCIL MEETING - JUNE 1986

Relationship Between Inshore Cod Catch and Abundance in the 2J3KL Cod Stock

by

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INTRODUCTION

The annual fluctuations in the level of inshore cod catches from 2J3KL are traditionally large (Baird and Bishop, 1985) and may be attributed to a number of factors (Pinhorn, 1984), among which is the abundance of cod. Also, the inshore fishery is traditionally dominated by young fish and this is especially so with the codtrap catches. During the 1974-84 period the age 4 and 5 year-old cod represented 50-70% by number of the total inshore catch by all gears and the percentage in cod trap catches was much larger, since fish of age 7 and older are caught in only very small number by codtraps.

Therefore, the inshore catch in the period 1962-84 was plotted against the abundance of age 4+5 year-old cod in the 2J3KL cod stock (Fig. 1). The catch generally declined as abundance of age 4+5 year-olds fluctuated between 1000 and 1500 million fish during 1962-1972, declined as stock abundance declined during 1973-75 and increased as stock abundance increased during 1976-84. However, the catch in the latter period was higher at a given level of abundance of age 4+5 year-olds than in the 1972-75 period. No good explanation of this is available but some possibilities are:

1) Increased effort in the 1976-84 period.
No reliable measures of effort are available for the inshore fishery.

2) Underestimates of abundance of age 4+5 year-olds in the 1976-84 period.

3) Overestimates of abundance of age 4+5 year-olds in the 1962-73 period.

Disregarding the earlier period, the total inshore cod catch by all gears was regressed against the abundance of age 4+5 year-old fish in the stock for the 1974-84 period (Fig. 2A). The R^2 (0.71) is highly significant.

Similarly, the cod trap catch was regressed against the abundance of age 4+5 year-old fish for the same period (Fig. 2B). The R^2 (0.90) is very highly significant. In fitting the regression the 1979 point was omitted as an outlier. This was the year when the inshore squid catch in Subarea 3 (89,000 MT) was more than twice as high as any other year and effort that would normally have been expended in the codtrap fishery was probably directed to fishing for squid.

The regressions imply a very high dependence of the inshore cod catch on the abundance of ages 4 and 5 year-old fish in the stock.

REFERENCES

Baird, J.M. and C.A. Bishop. 1985. Assessment of the cod stock in NAFO Div. 2J+3KL. NAFO SCR Doc. 85/37. Ser. No. N987. 38 p.

Pinhorn, A.T. 1984. Inshore exploitation of Atlantic cod, Gadus morhua, in Labrador and Eastern Newfoundland waters. J. Northw. Atl. Fish. Sci. Vol. 5: 79-84.

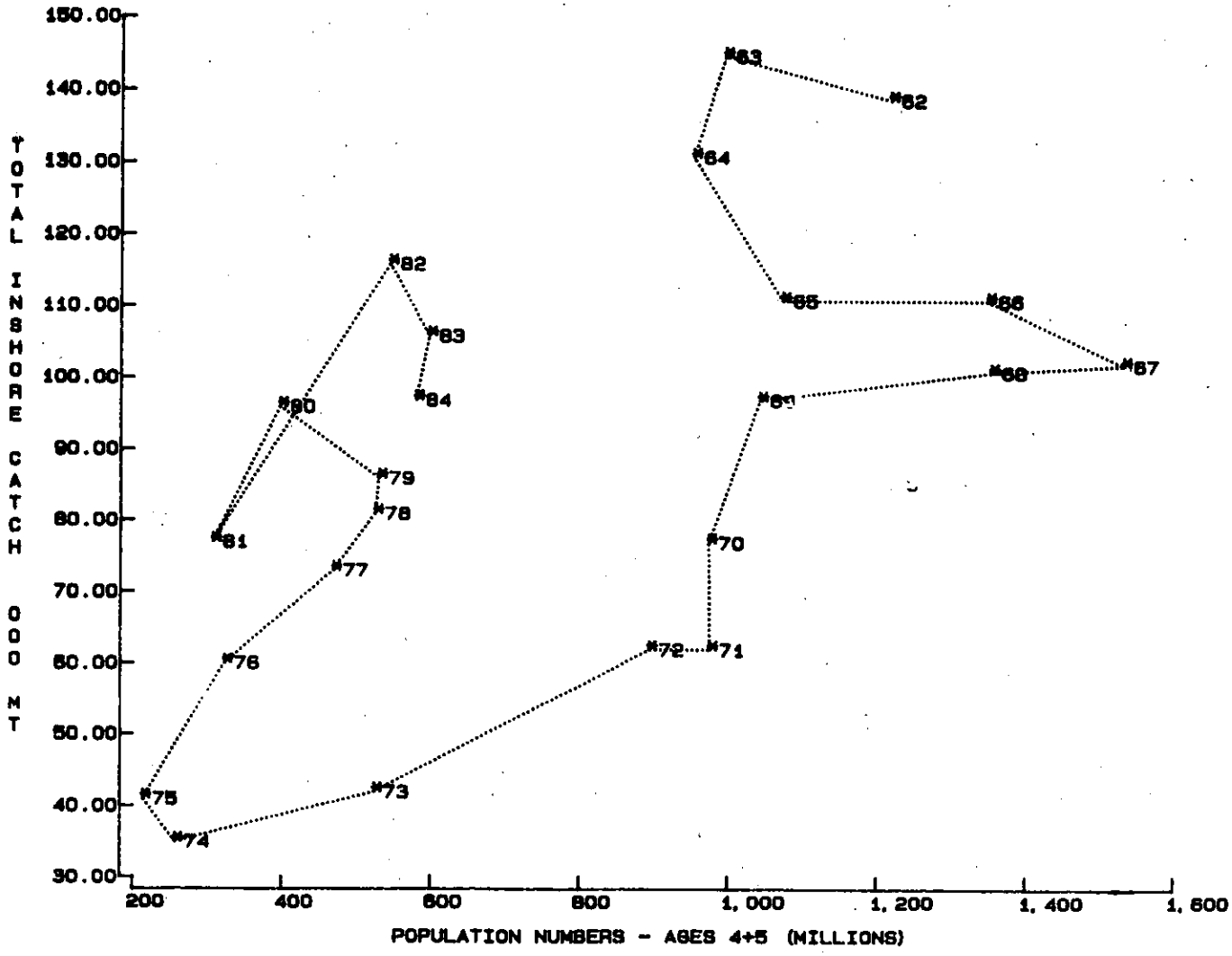

FIG.1 PLOT OF TOTAL INSHORE CATCH VERSUS ABUNDANCE OF AGE 4+5 YEAR-OLDS IN DIVS. 2J3KL 1962-1984.

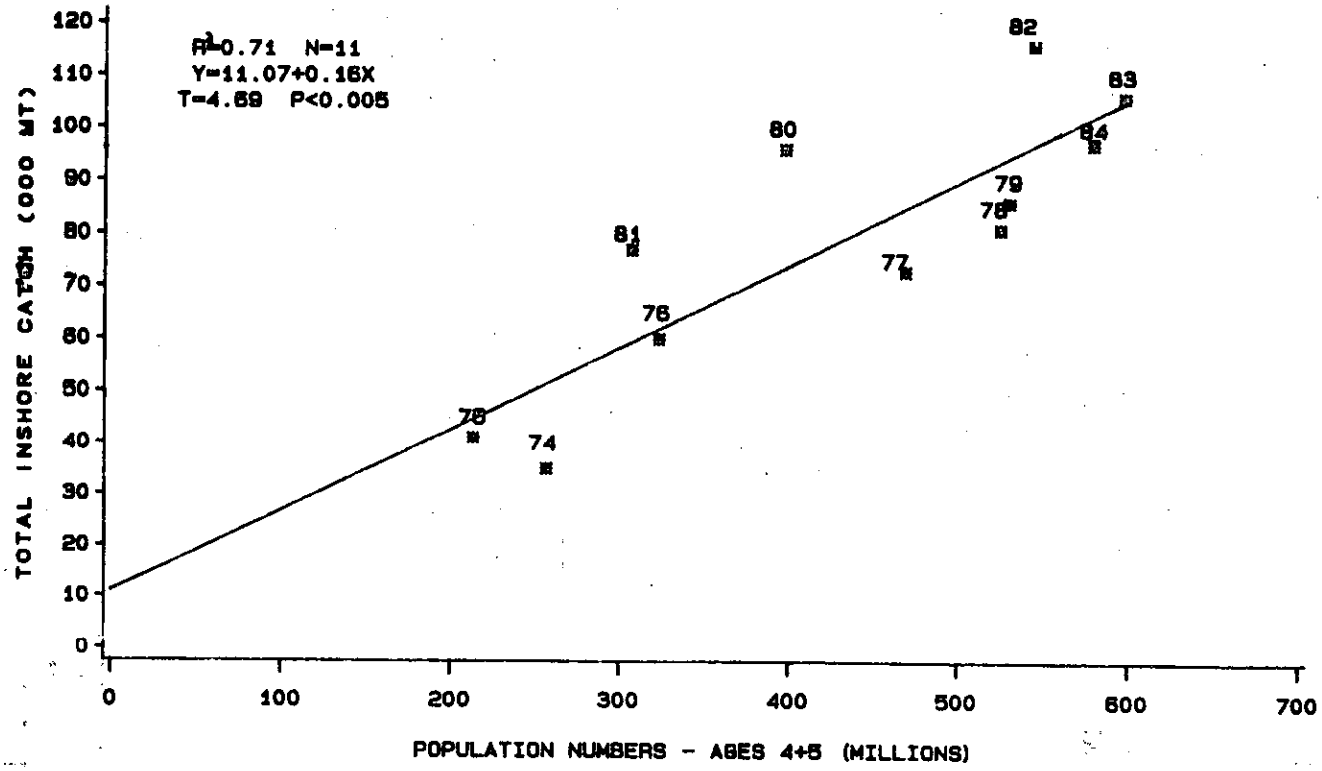

FIG 2A. REGRESSION OF TOTAL INSHORE CATCH VERSUS ABUNDANCE OF AGE 4+5 YEAR-OLD COD IN DIV. 2J3KL, 1974-84.

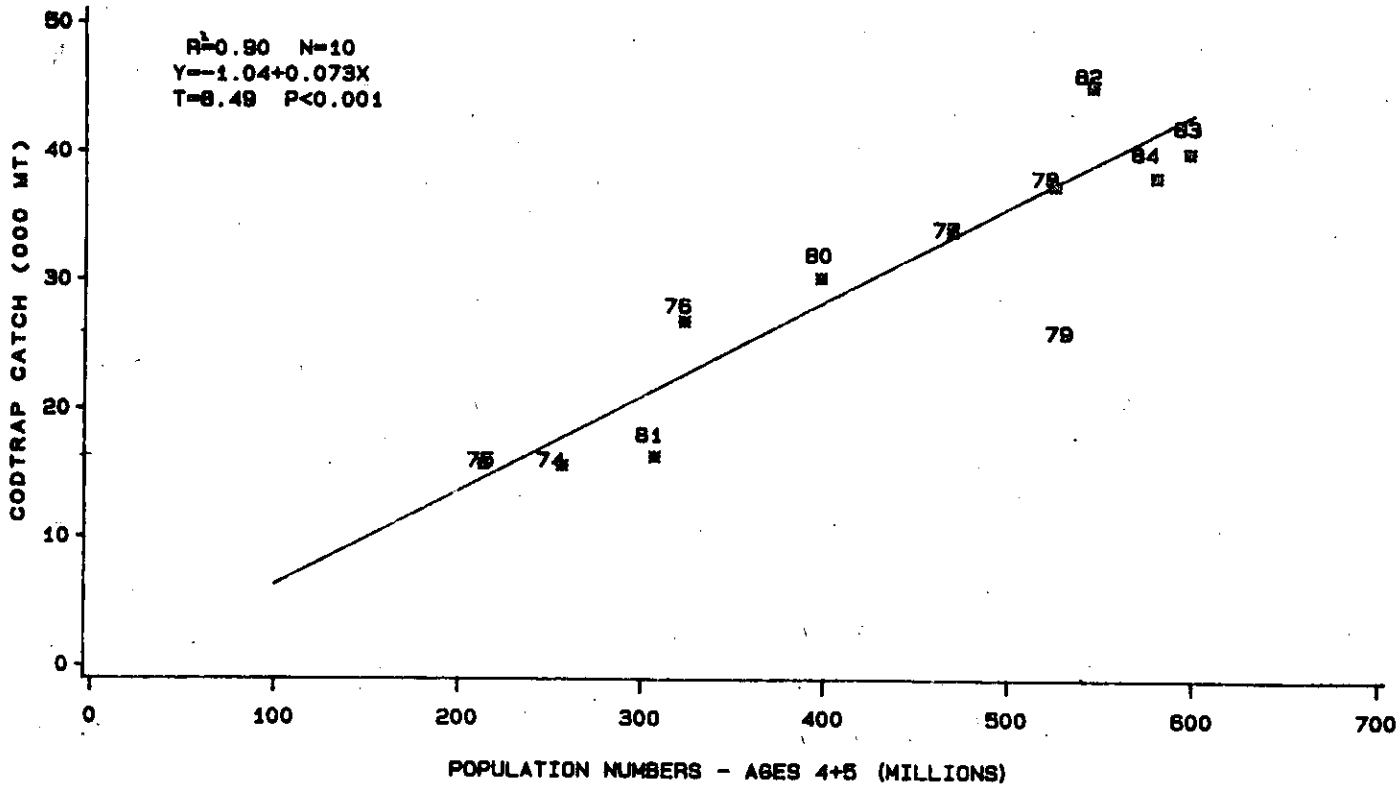

FIG 2B. REGRESSION OF CODTRAP CATCH VERSUS ABUNDANCE OF AGE 4+5 YEAR-OLD COD IN DIV. 2J3KL, 1974-84.