



1950

International Commission
for the
Northwest Atlantic Fisheries



1970

RESTRICTED

Serial No.2420
(B.g.7)

ICNAF Res.Doc.70/27

ANNUAL MEETING - JUNE 1970

Trends in the American plaice fishery in ICNAF Subarea 3

by

T. K. Pitt

Fisheries Research Board of Canada
Biological Station, St. John's, Nfld.

Introduction

The main fishery for American plaice (*Hippoglossoides platessoides*) in ICNAF Subarea 3 occurs in Divisions 3L and 3N. The fishery started in the late 1940's with the introduction of the otter trawler to the Canadian fleet. Generally speaking the fishery has remained primarily Canadian in this subarea, although since 1965 European trawlers principally those of the USSR and Poland have gradually increased their share of the landings so that by 1968 they were taking about 70% of the total from 3N (Fig. 1). Most of the Canadian landings were by Newfoundland trawlers and plaice has become the major species sought by the Newfoundland otter-trawler fleet offshore.

Since 1954 sampling of commercial plaice has been carried out by the St. John's Biological Station. Most of the otoliths have been read and the age distributions, etc. are at present being processed. This document is a preliminary report of a more detailed assessment of the effects of increased exploitation on this species.

Materials and methods

The total landings especially for 3N (Fig. 1 and 4) are calculated values based on Newfoundland landings since the European fleet report the flounder in Subarea 3 merely as "unspecified flounder" in the ICNAF Statistical Bulletins. The amount of American plaice represented in this "unspecified flounder" total was calculated from the proportion that this species was of the total Newfoundland catch of plaice, yellowtail flounder (*Limanda ferruginea*) and witch (*Glyptocephalus cynoglossus*) from Divisions 3L and 3N.

The standard unit of effort selected was the Newfoundland side trawler (151-500 tons) since up to 1964 practically all the landings were by this gear. To convert the effort of Newfoundland stern trawlers, which have gradually dominated the fishery since then, to standard side trawler units, a conversion factor of 1.2 was used. This was obtained by plotting the landings per hour of Newfoundland stern trawler against those of the side trawler by month and for the same statistical unit areas (as used by the St. John's Biological Station) (Fig. 2).

Since very little data on landings and effort of flatfish by European trawlers were available to make direct comparisons with Newfoundland trawlers, it was necessary to make certain assumptions. Soviet trawlers, 151-500 tons, were considered to be equal to Newfoundland side trawlers with respect to catch per unit effort. Similarly, European 501-900 tonnage class trawlers were treated the same as Newfoundland stern trawlers of the same tonnage. The landings per hour by these latter trawlers were also used to calculate the effort of European factory ships (>1800 tons) and the resulting effort is thus probably underestimated. These factory ships apparently caught about 50% of the total "flounder" landed by European vessels. However, since a fair amount of redfish was included in their landings they probably fished at least part time beyond the usual plaice depth range (approximately 70-230 m). Some of the reported flounder may therefore have included fair quantities of witch, a species that normally inhabits deeper water than plaice.

Results

The landings of American plaice remained relatively static at about 12,000 tons from 3L and less than 5,000 tons from 3N until the early 1960's. (Fig. 1) However, with the decline in the haddock fishery the Newfoundland fleet diverted its main effort to American plaice.

Division 3L. The fishery here is almost exclusively Canadian (Fig. 1A) with the Newfoundland fleet taking a large percentage of the total landings. The landings per hour by Newfoundland trawlers have fluctuated somewhat (Fig. 3) with the overall trend being downwards. A plot of total landings against total effort seems to indicate that up to 1967 the landings were nearly proportional to the total effort (Fig. 4A). However, the levelling off from 1967 possibly indicates that the fishery has reached a point of maximum efficiency. The 1969 data are from Newfoundland only, but these probably represents 90% of the effort and landings for this area.

Division 3N. Up to 1965 practically all the landings of plaice were by Canadian trawlers and here again the Newfoundland-based vessels landed the greatest proportion (Fig. 1B). From 1966, however, Canadian landings have declined and European countries are taking most of the landings from this division. The landings per hour by Newfoundland trawlers have fluctuated, but from 1956 to 1961 there was a general downward trend (Fig. 3). However for the next 3 years (up to 1964) landings per hour increased. This possibly reflects an increase in abundance of this species on the southern half of the Grand Bank coupled with a decline in haddock abundance. An increase in the abundance of a closely related species, the yellowtail flounder (*Limanda ferruginea*), in this locality (3N) has been fairly well documented (unpublished data, Fisheries Research Board of Canada, Biological Station, St. John's) and a similar condition could have occurred with American plaice. With the big increase in effort which occurred from 1964 onwards (Fig. 4B) the landings per hour have declined sharply especially since 1966 (Fig. 3B and 4B). As in 3L it appears that the point of peak efficiency for this fishery has been reached and from rough calculations of yield curves it is perhaps just beyond the maximum sustainable yield.

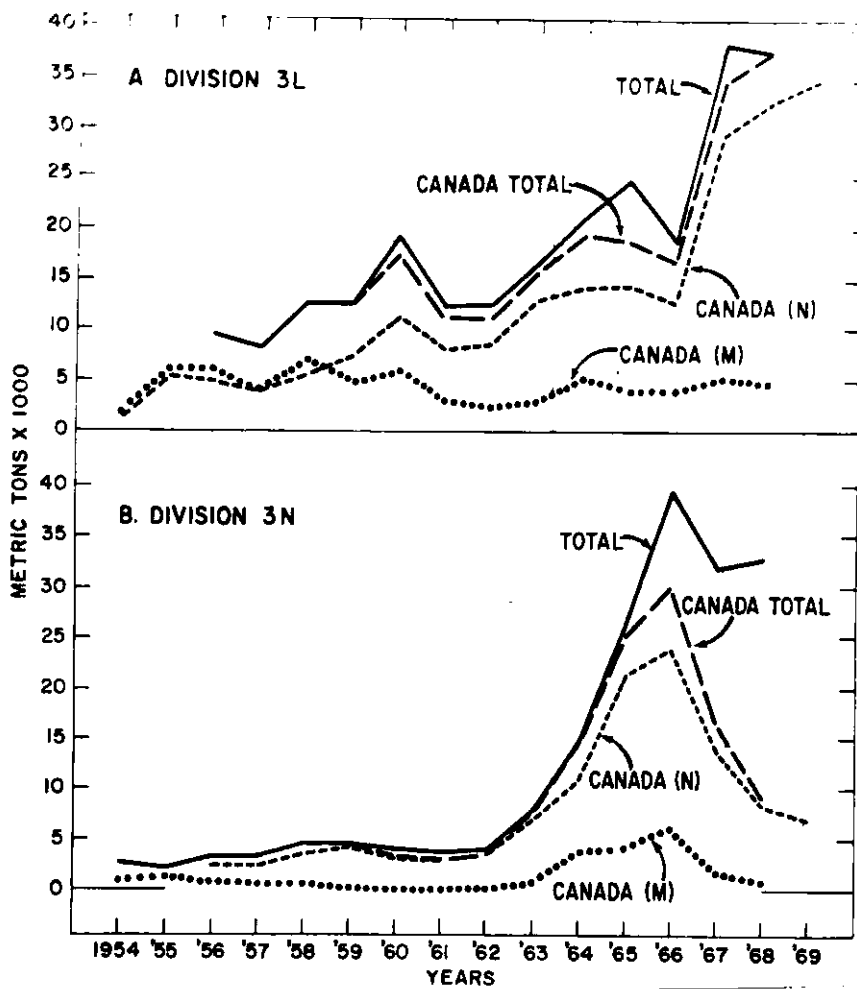


Fig. 1. A. Landings of American plaice from ICNAF Division 3L. B. Landings of American plaice from ICNAF Division 3N.

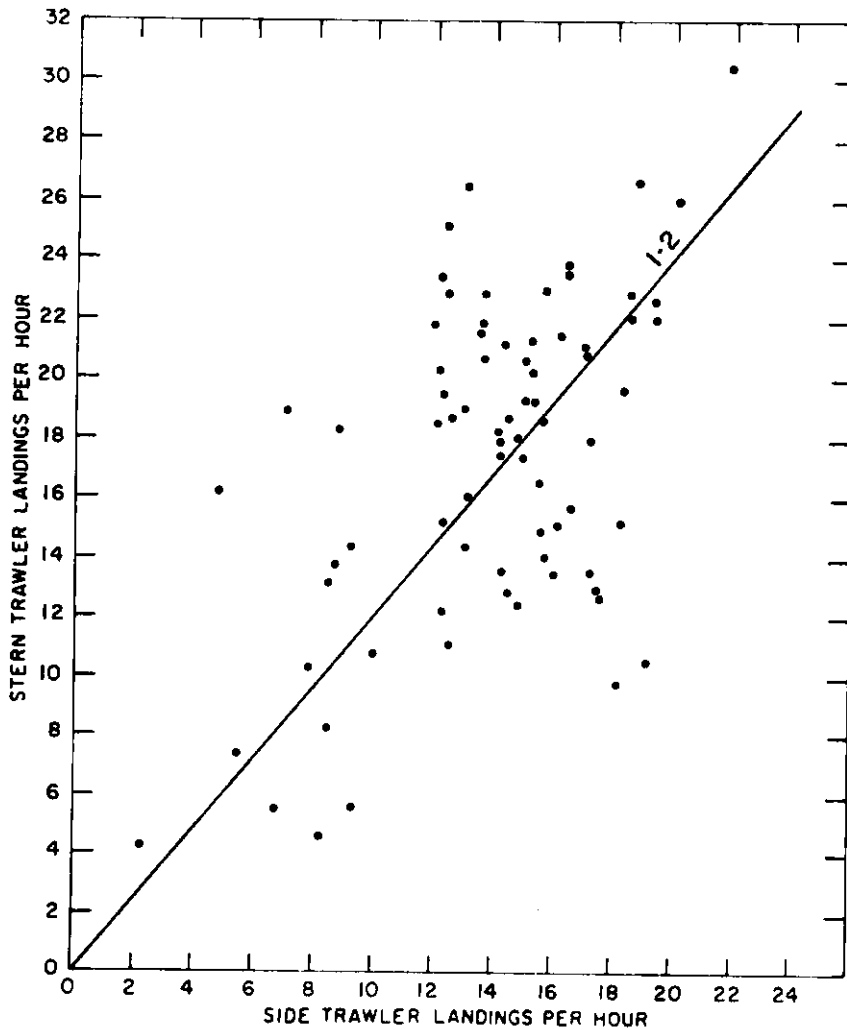


Fig. 2. Plaice landings per hour (averaged on a monthly basis for arbitrary statistical unit areas) for Newfoundland stern trawlers plotted against Newfoundland side trawlers.

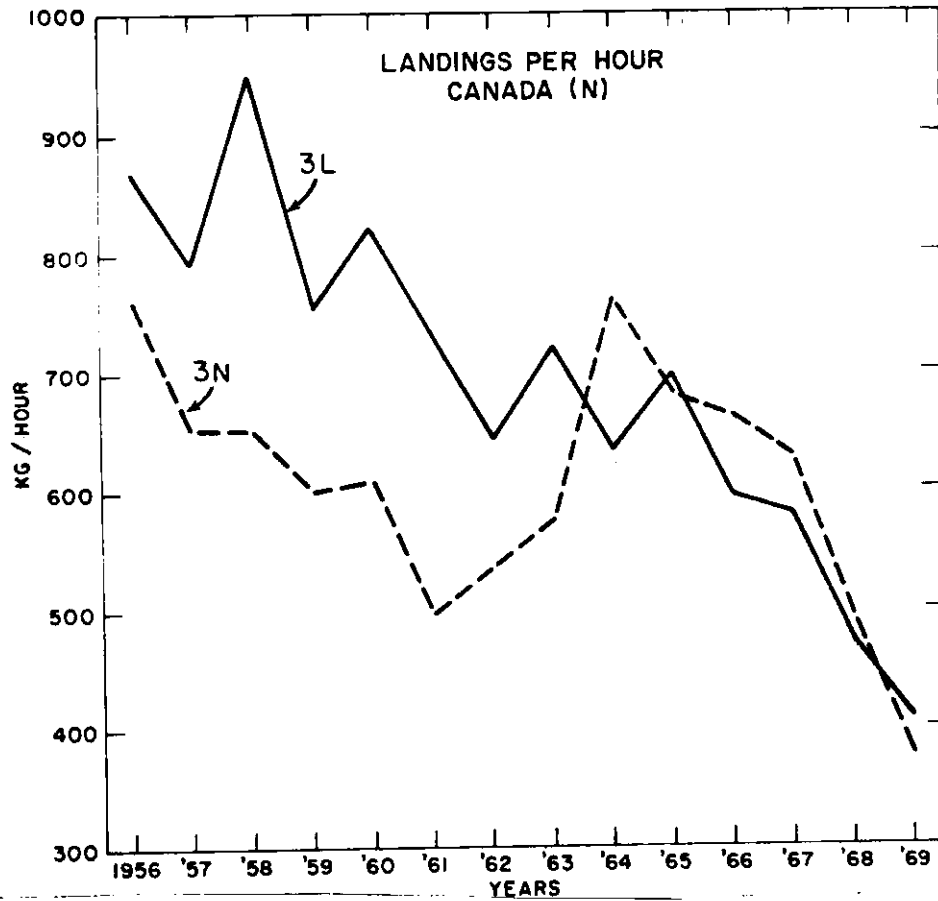


Fig. 3. Plaiice landings per hour's trawling ~~of Newfoundland trawlers~~ of Newfoundland trawlers in standard Newfoundland side trawler units.

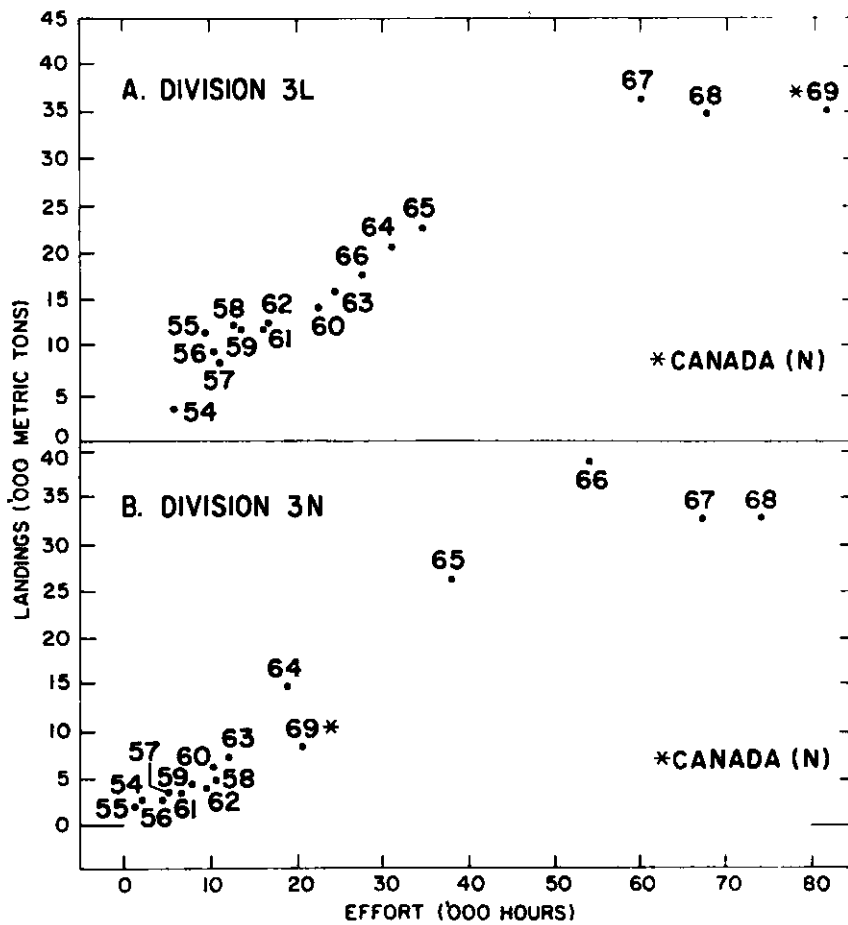


Fig. 4. Total landings of American plaice plotted against total effort for (A) Division 3L and (B) Division 3N.