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Fishing Grounds of Groundfish Longliners from the Cape Sable Island Area
(Southwestern Nova Scotia) in 1982-84

by

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Abstract

A survey of longline fishermen based in the Cape Sable Island area of Southwestern Nova Scotia was conducted to determine their fishing grounds in the Gulf of Maine Area in 1982-84. Of 30 responses (a sampling rate greater than 20% for vessels 40'-65'), 24 gave specific fishing positions. Based on these, composite seasonal maps are given of fishing locations, and indicators of relative fishing effort in different areas are derived.

Introduction

Precise maps of the locations of commercial fishing are of value for a variety of fisheries management related studies. Most recently such maps were required to evaluate the possible disruption of Canadian fishing patterns in the Gulf of Maine Area resulting from the 1984 International Court of Justice (ICJ) decision on the maritime boundary between Canada and the USA. Questions concerning potential gear conflicts also arose immediately after the ICJ decision, particularly in relation to third party fishing.

Comprehensive data on fishing locations in the Canadian Department of Fisheries and Oceans statistical system have Unit Area as the finest geographical scale, which is too coarse for many purposes. The log books which provide input for the Departmental system do contain, in some cases, much more specific data on fishing location than is captured. This is particularly so for large groundfish trawlers greater than 150 registered tons (grt) and several studies have mapped the detailed distribution of fishing by these vessels based on log book data (Halliday *et al.*, in press; Hare, 1977; Kohler, 1969; McCracken, 1968). A much smaller proportion of small vessels provide detailed records of their fishing locations, and log record analysis for these vessels has not been given much emphasis because of concerns regarding record quality and representativeness of fleet activity. Most recently observer programmes have provided a new source of data on fishing locations and this has been utilized by Waldron *et al.* (1985) for small trawlers (less than 150 grt) based between Cape Sable Island and Digby, and by Sinclair (1985) for large trawlers.

Longline fleet fishing distribution in the Gulf of Maine Area based on log records was mapped for the periods 1960-72 and 1973-77 by Halliday *et al.* (in press) but only conclusions on general area of fishing were made and the data were characterized as scanty. This is an important fleet component comprising about a thousand active vessels most of which are smaller than 45' (50 grt), and which land about 30,000 t of groundfish annually from the Gulf of Maine Area (Table 1). More detailed information on fishing grounds of this fleet component were required to adequately answer questions concerning potential gear conflicts and the impact of the ICJ decision on traditional fishing patterns.

To determine the distribution of groundfish longline fishing in the boundary area immediately prior to the ICJ decision a survey was conducted in early 1985 among longline fishermen from the general area of Cape Sable Island, roughly Statistical District 32 (Fig. 1), concerning their fishing patterns in 1982-84. Of the groundfish caught by longline in Div. 4X more is landed in this District than any other, and longline catches in Div. 5Z are almost exclusively landed in District 32 (Table 1). Longline fishermen in more easterly areas than that surveyed, of which the immediately adjacent Shelburne- Lockeport area (in District 31) is the most important, apparently fish in more easterly waters (D. Lyon, Dept. of Fisheries and Oceans, Lockeport, N.S. and C. Roach, fisherman, Lockeport, N.S.; pers. comm.). To the west of District 32, longline fishing is widespread but conducted on a relatively small scale.

Methods

The survey was organized by the Canadian Department of Fisheries and Oceans but conducted by the Longliner Branch of the Nova Scotia Fishermen's Association. Fishermen surveyed were provided with an information sheet and four maps, about 35 x 45 cm in size, of the Gulf of Maine Area on which to draw their seasonal locations of fishing. The maps distributed covered the same geographic area as is illustrated in Fig. 1 but showed details of soundings and bathymetric contours. Seasons were defined as follows:

Winter - December - February
Spring - March to May
Summer - June to August
Autumn - September to November

The number of trips to each fishing location in 1982-84 was requested, as was the vessel length overall (LOA) and tonnage. No identification of the vessel was requested and confidentiality was emphasized in the hope of obtaining the most accurate information possible and encouraging a widespread response. The Association representative solicited responses on an opportunistic basis.

Of the 30 returns received, 6 gave only general fishing locations. Positions indicated on the remaining 24 were superimposed on a single map for each season. Three levels of fishing intensity were used to contour fishing locations. Areas fished by 1-2 fishermen were labelled low intensity, those fished by 3-4 fishermen as medium intensity, and by 5 or more as high intensity. The number of trips indicated as fished in each area by each fisherman was not taken into account in this contouring process. However, the Gulf of Maine Area was divided into 5 parts (two bank, two slope and the Fundian Channel areas) and numbers of trips totalled within these as another indicator of relative fishing effort in each area. The 100 fm contour was used to separate banks from slopes and the Channel (Fig. 1). When a fishing area overlapped this contour, trips were assigned to the side on which most of the area lay.

Results

The approximately 260 vessels in District 32 which were licensed to fish for groundfish in 1983 ranged in length up to 65', and half were in the 40'-65' range. The smallest vessel surveyed was 37' and 13 grt and the largest was 65' and 83 grt, but most were in the 40'-45' range. Thus, surveyed vessels comprised about 20% of the total vessels in the district over 40'. Their size composition within the range 40'-65' was comparable to that of total licensed vessels. As not all vessels holding groundfish licences are necessarily active in the fishery, this is a minimum estimate of sampling rate.

The activity of surveyed vessels was least in winter (Table 2) and restricted to the Div. 4X banks, particularly northern Browns Bank, close to home port (Fig. 2a). Cod and haddock were the primary species fished. (Each fishing location is labelled by primary species fished in order of frequency.)

In spring activity increased and focused on the Northern Edge of Georges Bank and to a much lesser extent on the northeastern edge of the bank and the eastern extremity of the Fundian Channel (Fig. 2b, Table 2). About one-third of the trips made were to Div. 4X banks, mainly to coastal

grounds. During this quarter, Browns Bank is subject to closure under the haddock spawning area regulations which no doubt explains the absence of effort reported from that area. Although the Georges Bank haddock closure is also in effect during this quarter, longline vessels using large hooks (greater than 3 cm gape) are exempt to allow for a directed cod fishery. Cod is, in fact, the primary species recorded from Subarea 5 locations, followed by cusk particularly in deeper waters at the western end of the Northern Edge and at the mouth of the Fundian Channel.

Fishing activity was highest in summer, with twice as many trips being made as in winter. The Northern Edge of Georges Bank was still the most important fishing area but the eastern end of the Fundian Channel supported almost as intensive a fishery and the eastern slope of Georges Bank in the Corsair Canyon area was also important (Fig. 2c). The Northern Edge fishery was primarily for cod with some haddock whereas the eastern Channel fishery was for halibut and cusk as well as cod and, in addition, hake was important in the Corsair Canyon area. A specific fishery for cusk is again identifiable in the western end of Georges Basin. Fishing on the Div. 4X banks and slope was lowest in the summer.

Fishing activity declined and became more widespread by autumn (Table 2). The Northern Edge and Northeast Peak of Georges Bank remained the most important locations fished. A similar amount of effort was expended on the Div. 4X banks, but this was spread out from German Bank in the west to LaHave Bank in the east (Fig. 2d). The eastern Fundian Channel remained heavily fished. The primary species fished in Div. 4X banks and slope areas were haddock and halibut as was the case in summer, but hake and cod were the species fished off German Bank. Fishing on Georges Bank was mainly for cod and haddock. The Fundian Channel and Georges slope fisheries were primarily for cod and cusk but halibut was important in the Channel area and hake further south towards Corsair Canyon.

Discussion

The results of this survey no doubt suffer from incorporation of some degree of subjectivity by the fishermen respondents and by the data analysts in contouring and in assigning effort to areas. This is an unavoidable limitation of the method. Furthermore, the sample is small and can, at best, be representative of only one sector of the western Scotia-Fundy Region longline fishermen. It is, nonetheless, an important sector and does appear to be the primary sector fishing the Georges Bank-Fundian Channel-Browns Bank area. While a few boats as far east as Shelburne (District 31) fish this area, both Departmental and fishing industry sources agree that longliners from District 31 and east focus their attention on the eastern banks of Div. 4X (Roseway, Baccaro and LaHave) in winter and fish yet more easterly waters in summer months. Thus, for the Browns Bank-Georges Bank area, the proper fleet sector has been sampled.

For the above reasons, it would not be wise to interpret the results of this survey in any more detail than is done above. It may also be unwise to extrapolate outside the period 1982-84. Interference of dogfish with longlining appears to have been increasing during this time and may have influenced locations fished. The survey results do, however, give the first maps illustrating the detailed locations of the longline fishery in the Browns-Georges banks area and can reasonably serve in this general way until more reliable data are forthcoming from other analyses.

Acknowledgments

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References

- Halliday, R.G., J. McGlade, R. Mohn, R.N. O'Boyle and M. Sinclair. In press. Resource and fishery distributions in the Gulf of Maine Area in relation to the Subarea 4/5 boundary. NAFO Sci. Coun. Studies.

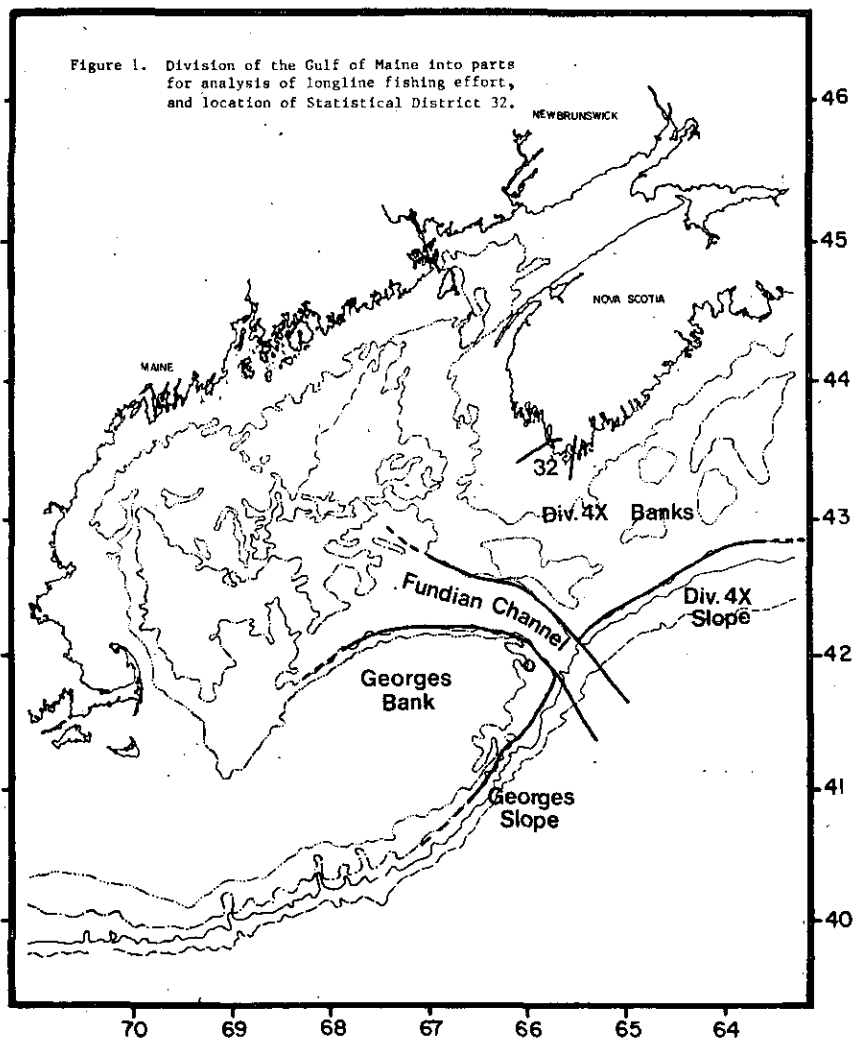
- Hare, G.M. 1977. Atlas of the major Atlantic coast fish and invertebrate resources adjacent to the Canada-United States boundary areas. Fish. Mar. Serv. Res. Dev. Tech. Rep. 681, 97 p.
- Kohler, A.C. 1969. Cod and haddock catches from Georges Bank, the Bay of Fundy, Scotian Shelf, and the Gulf of St. Lawrence by Maritime otter trawlers in 1967. Fish. Res. Bd. Can. Tech. Rep. 157, 4p. + 1 table + 25 fig.
- McCracken, F.D. 1968. Cod and haddock catches by Maritime trawlers on the Scotian Shelf and Georges Bank, 1965. Fish. Res. Bd. Can. Tech. Rep. 86, 3 p + 25 fig.
- Waldron, D.E., T.D. Iles and G.V. Hurley. 1985. Estimating the effects of introducing a minimum 130 mm mesh regulation on the 4X groundfish fishery. Can. Tech. Rep. Fish. Aquat. Sci. No. 1400, 47p.
- Sinclair, A.F. 1985. Fishery distribution on the Scotian Shelf. p. 183-193. In: R. Mahon [ed.] Towards the inclusion of fishery interactions in management advice. Can. Tech. Rep. Fish. Aquat. Sci. No. 1347.

Table 1. Average annual longline landings (t) of principal species in 1982-84, from Div. 4X and Div. 5Z by Statistical District of landing. (Districts listed only if landings from Div. 4X or 5Z reported. Principal species are cod, haddock, cusk, white hake and halibut.)

NAFO Div.	Statistical District	Average annual landings from		
		4X	5Z	4X + 5Z
4V	1	5	-	5
	6	7	-	7
	7	5	-	5
4W	15	1	-	1
4X	22	2516	-	2516
	23	9	1	9
	25	25	-	25
	26	2	-	2
	27	776	15	791
	28	1581	1	1583
	30	1345	25	1369
	31	6036	723	6759
	32	8406	5121	13527
	33	216	111	326
	34	434	57	491
	35	9	-	9
	37	646	-	646
	38	3	-	3
	39	296	-	296
	40	14	-	14
	42	+	-	+
44	2	-	2	
48	13	-	13	
49	278	-	278	
50	16	12	28	
51	318	-	318	
52	4	-	4	
53	46	-	46	
TOTAL		23010	6065	29075

Table 2. Number of trips reported from 5 parts of the Gulf of Maine Area in 1982-84, by season, by 24 longline fishermen surveyed.

Part	Winter	Spring	Summer	Autumn	Total
Georges slope	-	5	84	35	124
Georges Bank	-	274	347	197	818
Fundian Channel	-	36	269	110	415
Div. 4X banks	404	150	83	174	811
Div. 4X slope	1	34	31	24	90
Total	405	499	814	540	2258



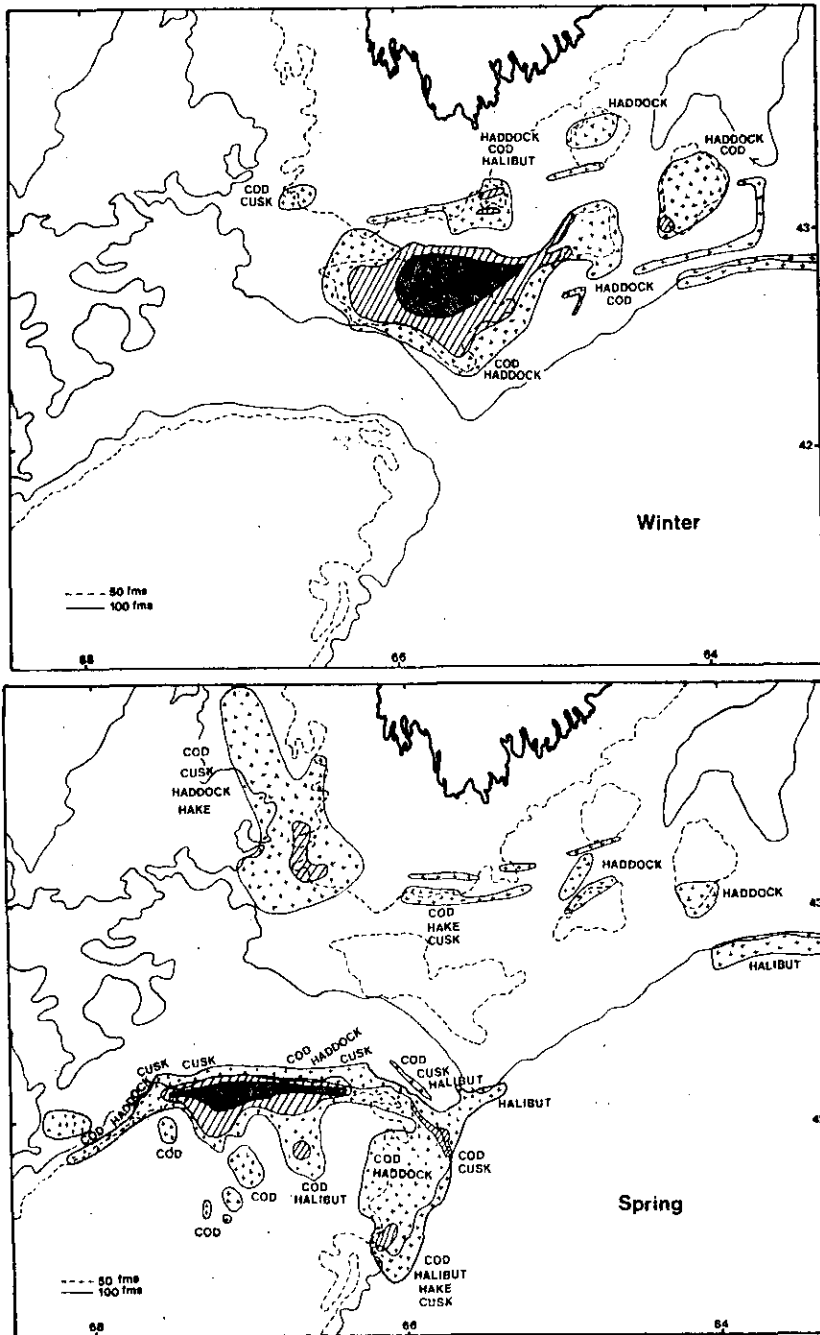


Fig. 2a+b. Distribution and intensity (crosses = 1-2 boats, diagonals = 3-4 boats, solid = 5+ boats) of longline fishing in 1982-84 by a sample of District 32 boats, a-winter, b-spring.

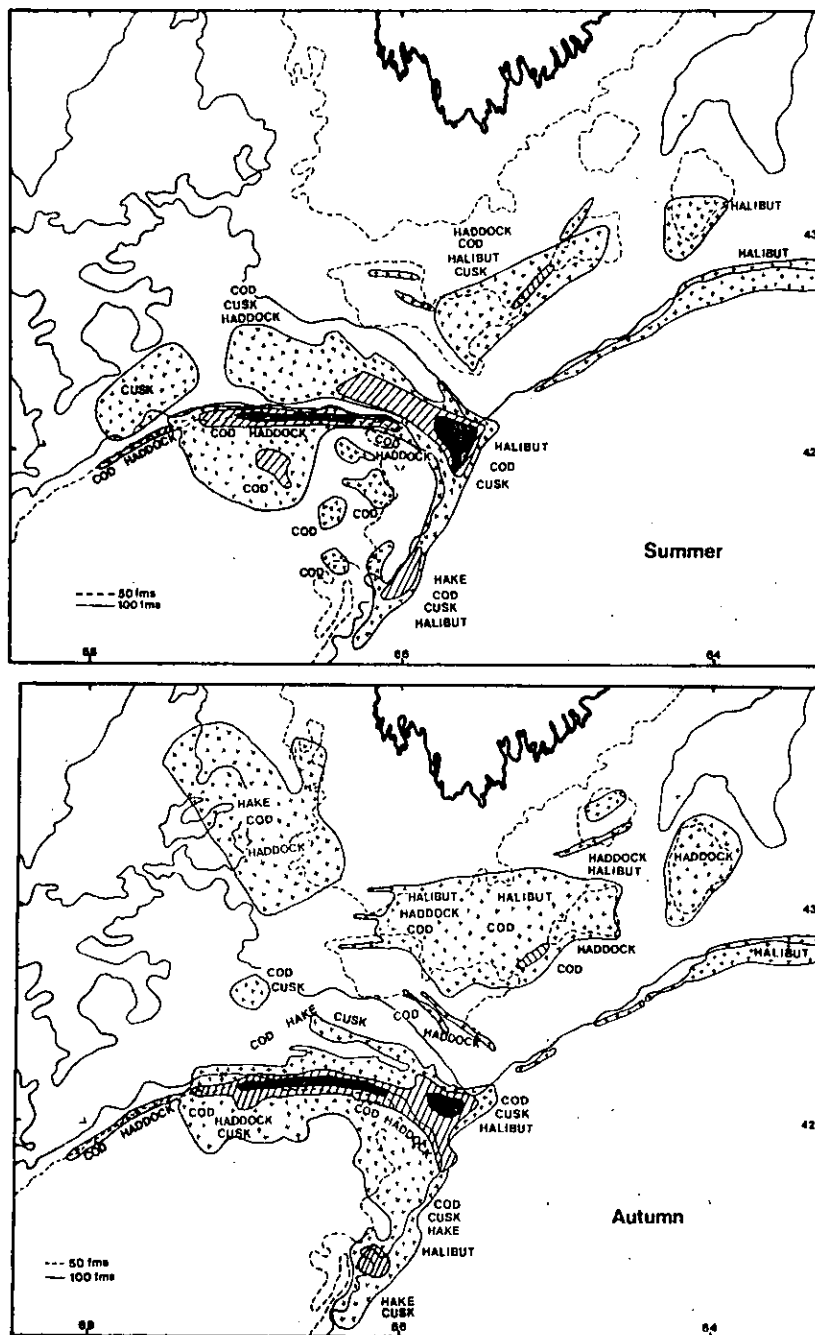


Fig. 2c+d. Distribution and intensity (crosses = 1-2 boats, diagonals = 3-4 boats, solid = 5+ boats) of longline fishing in 1982 -84 by a sample of District 32 boats, c=summer, d-autumn.

