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Results of cod tagging off Labrador (Subarea 2) and Newfoundland (Subarea 3)

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In 1966, ichthyologists of the Polar Research Institute (PINRO) carried on mass tagging of fish (cod mostly) in the ICNAF Area. A total of 4,291 cod were tagged in Subarea 1, 3,974 in Subarea 2 and 2,128 specimens in Subarea 3.

As in previous years, the greatest numbers of tagged cod were released in Div.2J (South Labrador) in January-June (1,334 specimens) and in November-December (1,686 specimens). During this period, cod of the Labrador stock concentrate near the continental slope and are of great importance for trawl fishery. Soviet ichthyologists used a hydrostatic tag that is attached by means of a flexible thread in front of the dorsal fin of fish.

Most tagged cod were recaptured by Canadian fishermen operating off Labrador and Newfoundland in summer-autumn (July-September). In Table 1, data are set out on the returns of tagged cod released in Subareas 2 and 3 for the last six years. This table includes data on tagged specimens which were recovered to 1 March 1967. Further information on new recoveries would enable us to make this table more detailed.

Movements of some tagged cod recovered in 1965 and 1966 reflect fairly well the general picture of migration of cod from the Labrador stock (Table 2).

In winter, mature cod usually move in a northerly direction toward the main spawning grounds off North Labrador (cod specimen No.1 in Table 2), whereas immature cod of a smaller size migrate in other directions as well (specimen No.2).

After spawning cod migrate to the south moving along the continental slope (specimens No.3 and 4). In June-July, with the warming of inshore shallows, cod migrate toward the shores (specimens No.5, 6, 7, 8, 9). In this case, cod fairly often move from Labrador (Subarea 2) to the northern Newfoundland Bank (Div.3K) and to the northern slope of the Grand Bank (Div.3L) (specimens No.8 and 9). Cod specimens No.10, 11, 12 released in 1965 and recaptured in 1966 moved from Subarea 2 to Subarea 3. This migration is considered possible but not at all necessary since great quantities of cod remain in Subarea 2 (specimens No.13 and 14). Figure 1 shows schematically the movements of tagged cod released during the same twenty-four hour period. It is quite evident that cod migrate from Div.2J to Div.3K and 3L.

The above facts, which are most typical, and the other data obtained during mass tagging lead to the conclusion that cod from Labrador, the northern Newfoundland Bank and the northern part of the Grand Bank all belong to the same stock and that a partial mixing of cod occurs over the whole area extending between 46° and 60°N. Postolaky (1962) came to the same conclusion from a comparison of mean numbers of vertebrae from Labrador and Newfoundland cod.

In summer, cod also migrate from the open sea toward the shore within the limits of the Grand Bank (specimens No.15 and 16). It is interesting to note that the average speed of migration of cod specimen No.16 is extremely high. For a 10-day period it covered about 200 miles. Postolaky (1966) believes that the highest speed of migration of cod moving from north to south Labrador is 22 miles per day, considering that cod move with the current. Cod specimen No.16, however, moved across constant currents and in spite of this travelled 20 miles a day.

After spawning off Labrador, cod migrate southward at a very high speed. Konstantinov and Noskov (1966) have reported on a cod which moved from Div.2H to Div.2J and covered 300 miles in 50 days. Data on this migration of cod are given in Table 2 (specimen No.17). Also, information was obtained by the Polar Research

Table 1. Number of cod tagged in Subareas 2 and 3 from 1960-1966 and recaptured to 1 March 1967.

Year of Tagging	No. of cod Tagged	No. of cod recaptured to 1 March 1967													
		USSR	Canada	Eng-land	Spain	DDR	Bundes-repub-lik	Portu-gal	Nor-way	Poland	France	Den-mark	Ire-land	USA	Other Countries
1960	511	2	10	-	2	-	-	6	-	-	-	-	-	-	20
1961	1,878	4	50	1	5	1	4	7	-	-	2	-	-	-	74
1962	2,110	7	48	4	4	1	-	5	-	1	1	-	-	2	72
1963	6,152	29	169	12	21	9	3	30	-	5	-	1	-	-	279
1964	11,892	52	198	21	12	19	22	9	2	3	-	3	-	-	343
1965	6,648	17	109	14	2	5	7	1	3	1	1	2	1	1	163
1966	6,102	2	14	1	-	2	-	-	-	-	-	-	-	-	20
1960-1966	35,293	113	598	53	46	37	36	58	2	5	12	6	3	971	

Note: Tagging was carried out by scientists of PINRO and the Fisheries Reconnaissance of the "Sevryba" Administrative Board.

Table 2. Data on some cod specimens tagged in Subareas 2 and 3 in 1965 and 1966.

No.	Released				Tag No.	Recaptured		
	Date	Latitude (N)	Longitude (W)	Cod length (cm)		Date	Latitude (N)	Longitude (W)
1	26 Dec 1965	51°40'	54°12'	68	110121	54°17'	53°17'	DDR
2	13 Dec 1965	56°35'8	58°19'5	50	110755	55°00'	54°30'	Poland
3	1 Jan 1966	54°45'3	54°02'	57	117146	51°25'	54°15'	USSR
4	22 Jan 1966	54°30'	54°11'	52	117478	53°45'	53°00'	DDR
5	13 Dec 1965	56°35'	58°20'	60	110934	53°08'	56°00'	Canada
6	1 Jan 1966	54°45'3	54°02'	55	117091	52°20'	55°40'	Canada
7	4 Apr 1965	58°32'	59°40'	61	95224	56°33'	61°40'	Canada
8	1 Feb 1966	55°01'	54°48'	55	117888	46°40'	53°40'	Canada
9	20 May 1965	53°38'	53°45'	57	96220	49°32'	54°15'	Canada
10	29 Nov 1965	52°48'	54°08'	61	1100728	51°42'	54°08'	Poland
11	2 Mar 1965	52°50'	52°45'	60	88024	48°30'	52°30'	Canada
12	4 Apr 1965	58°40'3	59°46'7	60	89353	55°50'	60°55'	Canada
13	31 May 1965	54°46'5	54°38'5	56	77698	57°00'	59°00'	Canada
14	13 Dec 1965	56°35'5	58°20'1	50	110939	55°30'	56°15'	DDR
15	9 July 1965	48°45'	50°23'	62	82518	47°25'	53°25'	USSR
16	27 June 1966	46°05'	47°52'	43	143594	46°35'	53°35'	Canada
17	5 Apr 1965	58°31'1	59°39'9	47	95151	54°13'	54°25'	Canada
18	5 Apr 1965	58°31'1	59°39'9	60	95157	54°10'	54°25'	USSR
19	5 June 1965	51°31'	54°19'	51	96817	51°38'	55°26'	Spain
20	5 June 1965	51°31'	54°19'	61	96822	51°38'	55°26'	Canada

Institute on another tagged cod (No.18) that performed a similar migration. Table 2 clearly shows that tagged specimens No.17 and 18 were caught with the same trawl, were tagged and released simultaneously, then they migrated in the same direction and at the same speed.

Konstantinov (1961, 1966) has stated that in the Barents Sea each cod shoal represents a stable aggregation of cod keeping together for a rather long period. Cod belonging to one shoal stay and migrate together for a number of years (possibly for the whole life period). The same ecological feature (stability in the composition of a shoal) is likely to be typical of cod from Northwest Atlantic. Cod that join a shoal after being released on tagging perform further migrations with that shoal. It is evident from Table 2 that cod specimens No.19 and 20 moved together as did specimens No.17 and 18. These specimens were caught, tagged and released simultaneously and were recaptured in the same place and at the same time.

Based on the above, we recommend that tagged fish be released in groups and not one by one. This method has already been used in tagging and releasing herring (McKenzie and Skud, 1958; McKenzie and Tibbo, 1958; Jacobsson, 1961) and gadoid fish (Beverton, Gulland, Margetts, 1959).

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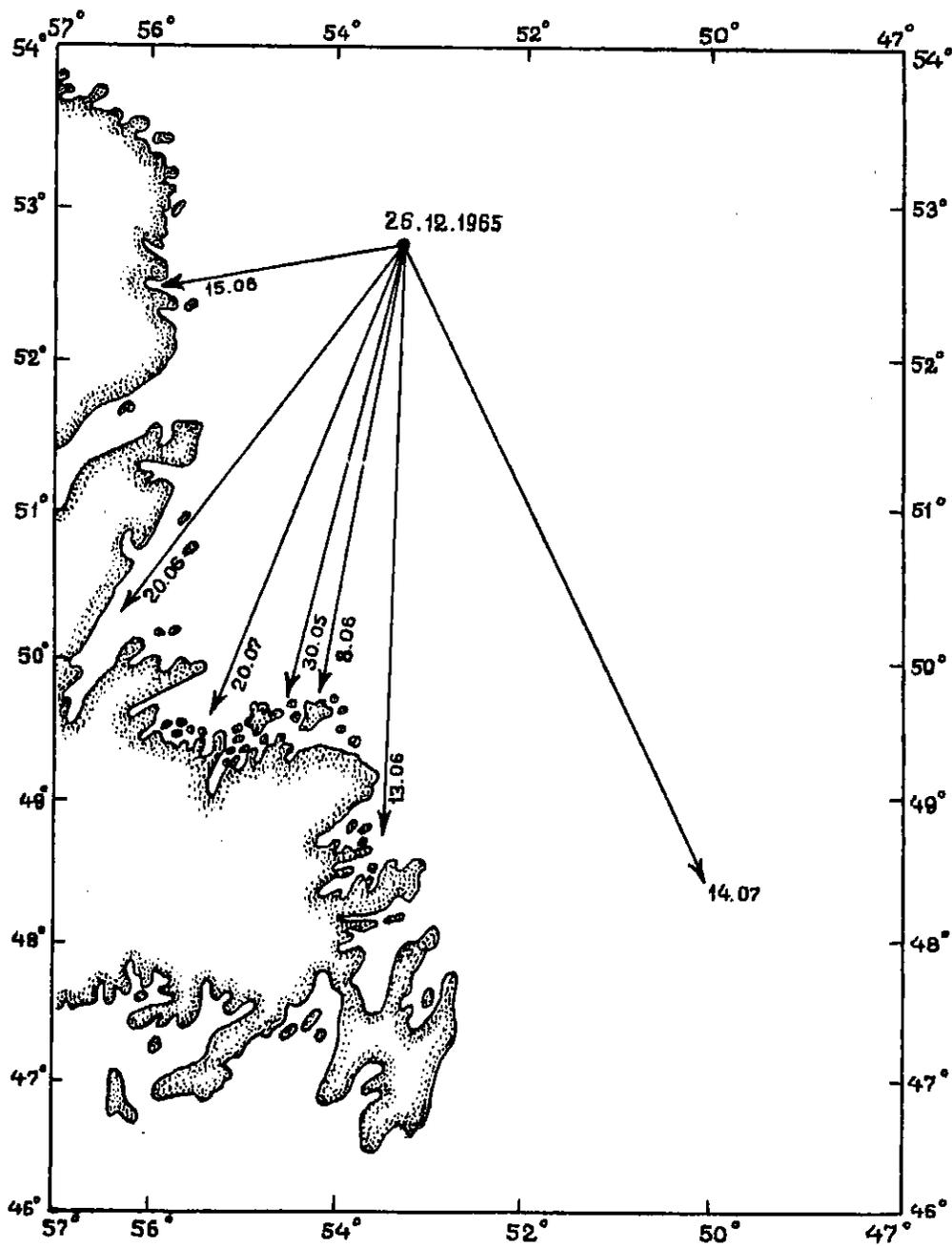


Fig. 1. Movements of some cod specimens tagged on 26 December 1965. Time of capture (date and month of 1966) is shown next to each arrow.