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On the USSR Fisheries of Greenland Halibut and Roundnose Grenadier in the Davis Strait Area

by

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ABSTRACT

History and the modern status of fisheries in Davis Strait are outlined. Statistical data on Greenland halibut and roundnose grenadier in the economic zones of Canada and Greenland are cited. The results of tagging Greenland halibut in Davis Strait are considered.

SUMMARY OF THE RESULTS OF THE INVESTIGATIONS

The USSR vessels began fishing roundnose grenadier and Greenland halibut in Davis Strait in 1968. That was preceded by numerous expeditions of scientific research and exploitation vessels of PINRO and the northern fishery exploration organization. The research work resulted in the determination of the character of concentrations and some biological features of Greenland halibut and roundnose grenadier (Chumakov, 1975; Konstantinov, Podrazhanskaya, et al., 1972; Pechnik, Troyanovsky, 1970; Savvatimsky, 1969; Zilanov, et al., 1976).

Assessments of abundance and biomass of Greenland halibut performed on the basis of statistical data of catches and biological materials indicates a good status of the commercial Greenland halibut stock and possibility of increasing the catches (Chumakov, et al., 1978).

After the 200-mile fisheries zones were introduced by coastal states, the USSR catches of Greenland halibut and roundnose grenadier in Davis Strait decreased. Thus, USSR research and fishing ceased in the West Greenland area in 1977 and in the Baffin Island area in 1978, the termination of fishing having been due to the indistinct boundary between the fisheries zones of Canada and Denmark (Greenland). However, from ICNAF Com. Doc. 79/VI/15, it becomes clear that the new boundary will not correspond to the boundary between Statistical Area 0 and Subarea 1.

In Davis Strait, Greenland halibut is distributed practically throughout the whole area investigated in a broad range of depths in waters having bottom temperatures of 0.5° to 4.5°C. In the summer-autumn period on the Continental Slope of Baffinland in depths of 160-900 m, mixed concentrations of roundnose grenadier and Greenland halibut are observed. Greenland halibut and roundnose grenadier at that period are feeding intensively. Depending on the depth of fishing, the ratio of the species changes considerably. Within the above-mentioned range of depths, Greenland halibut is distributed

irregularly. There are areas where its quantity is considerably and catches amount to 1-2 tons per 1 hour of trawling. Such areas are deep underwater valleys and terraces, which are distributed along the Continental Slope. Temperature measurements of bottom water layers indicated that Greenland halibut mainly concentrate in places with near-bottom temperatures close to 3°C. With the increase of the trawling depth, the proportion of roundnose grenadier in catches increases sharply. Also, correlation between catches of these species and temperature conditions were determined (Burmakin, Svetlov, Chumakov, 1977).

In years of anomalous low temperatures of Continental Shelf waters of Baffinland, concentrations of Greenland halibut in traditional depths of fishing sharply increase due to the massive migration from the inshore shallow water areas and from the north.

Due to insufficient knowledge of the bottom soil and contour in the area and of the biology of Greenland halibut and roundnose grenadier, the fishing vessels primarily conducted fishing in a limited area. In the process of exploration of the area, the zone of the fishing fleet activities broadened. Since 1973, the area and period of fishing were enlarged as a result of detecting, in October-November, pre-spawning concentrations in the north of the Greenland-Canadian threshold (ICNAF Div. 1B) and spawning (December-January) concentrations in the south of the threshold (ICNAF Div. 1CD). Favourable weather conditions in that period contributed to a considerable increase of abundance of Greenland halibut in that area.

In November-December 1977, the fleet was successfully fishing off migrating concentrations of Greenland halibut in the area of Baffinland.

The analysis of the fishing fleet dislocation indicates a considerable seasonal migration of Greenland halibut in Davis Strait. That becomes most apparent in the autumn-winter period when the fleet is operating on pre-spawning concentrations of Greenland halibut. In that period, Greenland halibut migrate from the huge area of Davis Strait to the spawning ground located in the southeastern part of the Greenland-Canadian threshold. The results of tagging Greenland halibut in Davis Strait provides evidence of considerable migrations of Greenland halibut (Table 3).

Large spawning areas of Greenland halibut discovered in the southeast off the Greenland-Canadian threshold are, in our opinion, the most important in the reproduction of that stock (Chumakov, Chekhova, 1977). In this connection, it is necessary to consider the commercial stock of Greenland halibut in the area as being a single whole. It is more advisable to fish on feeding and pre-spawning concentrations of Greenland halibut when the ratio of males and females is nearly 1:1. The total allowable catch in the area should not exceed 30,000 tons, and a small part of the total allowable catch can be taken in the southeast off the Greenland-Canadian threshold on the spawning grounds, where males are considerably predominant in the catches (Chumakov, Shafran, and Tretjak, 1978).

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Table 1. Greenland halibut catch (tons of whole weight) in the ICNAF Subareas 0+1 in 1968-1977 by months (border of Subareas along 58°W).

Year	Area	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
I968	0							I50	432	896				I478
	I	6			I									7
I969	0								77	39I	463			93I
	I								5					5
I970	0								60I	54				655
	I					4								4
I97I	0						57	260	III8	I33	8			I576
	I					3	55	206					3	267
I972	0							I87	3676	4406	II84			9453
	I						I23		32	5	9	20		I89
I973	0							20	I032	I36	633	328	2	2I5I
	I					I			5		II0	I086	778	I980
I974	0							I37	I68	62	44	7I	428	9I0
	I				2				6		I60	I593	6840	860I
I975	0	346					77	297	34	72	368	294	672	2I60
	I	497	6	85							847	603I	I0604	I8070
I976	0							4	I055	3594	2206	II3		6972
	I	I72			69						734	I299	I688	3962
I977	0								I96	I0I8	453	I254	443	3364
	I	297						59	400	I40				896

Table 2. Roundnose grenadier catch (tons of whole weight) in the ICNAF Subareas 0+1 in 1968-1977 by months (border of Subareas along 58°W).

Year	Area	January	February	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1968	0							570	1857	3580				6007
	1							16						16
1969	0								22	998	1680			2700
	1								10					10
1970	0								5220	1305				6525
	1													
1971	0						114	823	4798	486	25	19		6265
	1						40	1976					9	2025
1972	0							2667	3136	1140	423			7366
	1						12		301	43	3	8		367
1973	0							44	478	528	729	229	2	2010
	1					4			16		369	48	591	1028
1974	0							389	1234	182	422	487	94	2808
	1								72		104	1341	5184	6701
1975	0		7		2		5	116	323	661	112	61	134	1421
	1			151		40					314	94	2708	3307
1976	0								206	631	1680	1425		3942
	1	475	7		197						113	1706	1734	4232
1977	0								20	665	22	18	4	729
	1	347						57	862	350				1616

TABLE 3. Return of tagged greenland halibut.

	Released			Recovered		
W = %	Date	Latitude	Longitude	Date	Latitude	Longitude
1.	27.VII.74	60°25'N	61°15'W	13.XII.74	60°42'N	61°08'W
2.	3.XI.74	67°05'	56°25'	23.XI.76	64°47'	55°57'
3.	3.XI.74	67°05'	56°25'	25.XII.74	64°42'	55°55'
4.	3.XI.74	67°05'	56°25'	14.XII.74	64°59'	55°37'
5.	27.X.76	66°44'	56°37'	12.XII.76	64°40'	56°05'
6.	27.X.76	67°13'	58°30'	22.XI.76	66°15'	57°04'