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Soviet Investigations of Saithe (Pollachius virens) in the North Sea in 1966 - 1970

by

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Summary

Data on the size composition of saithe were collected by AtlantNIRO vessels in 1965 to 1970, the material on age composition was collected in 1966 to 1970.

The growth rate of males and females of saithe in the North Sea proved to be similar.

The growth rate of saithe from Shetland shallow waters was somewhat higher than from the southern part of the Norwegian Deep.

Catches in 1966 to 1968 were dominated by the strong 1962 year class and partly by the moderately strong year class of 1963. In the following two years (1969 - 1970) the 1966 and 1967 year classes predominated in the catches.

The bulk of the catches consisted of saithe 39 to 70 cm in length, at the age of 3 - 6 and even 7 years.

Soviet fishery for gadoids in the North Sea exists since 1966. Among the gadoids, saithe was the most important commercial fish for the Soviet fishery after haddock. Catches of saithe from the North Sea are shown in Table 1. As is seen from the Table, a considerable increase in the yield of saithe occurred in the North Sea in recent years. This was the cause for the more thorough studies of this species.

An attempt was made to determine growth rate and age and size composition of the saithe in the North Sea. The material included age samples and mass length measurements made in commercial trawl catches and catches from trawls with a fine-meshed cover (8-10 mm). Age was determined by means of otoliths. Age composition was obtained by extrapolation of the results

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of the mass measurements. The investigations of growth rate are based on direct observations.

The data on male and female growth rate are given in Table 2 for the period 1968 to 1970. The comparison of these data shows a similar growth of males and females. Therefore, later on the growth rate of saithe from various areas were compared without sex differentiations.

In the Shetland shallow waters the growth rate of saithe was somewhat higher than in the southern part of the Norwegian Deep (Table 3). This higher growth rate in the area of the Shetland shallow waters can be explained by mixing the different stocks. As was noted earlier (Saemundsson, 1929; Schmidt, 1955) saithe inhabiting Iceland waters is characterised by a higher growth rate than saithe from Norwegian waters. Bertelsen (1942) discovered that saithe from the Faroes waters are characterised by a growth rate which is intermediate between the growth rates of saithe of Icelandic and Norwegian origin. At the same time (Anon. 1965) it was found that saithe migrate from the Faroes and Shetland Island areas towards Iceland, into the North Sea and to the coast of Norway.

The age composition of saithe from the North Sea is presented in Table 4, while the size composition is given in Table 5.

Table 4 shows that in 1966 to 1968 catches were dominated by specimens of the strong 1962 year class and partly of the moderately strong year class of 1963. These data coincide with those of Draganik (1967), who noted that in 1967 the bulk of the catches off Norway consisted of the 1962 year class. (In the previous report (Polonsky and Golubjatnikova, 1970) it was erroneously stated: "Our data do not coincide with the material of Draganik"... The authors express their apology to Mr Draganik for this inaccuracy.)

In 1969-1970 the strong 1966 and 1967 year classes predominated in the catches. The bulk of the catches consisted of saithe of 39-70 cm long and 3 to 6 and even 7 years old (Tables 4 and 5).

No particular differences were observed in the size composition between the catches by commercial trawls and those by trawls with a fine-meshed cover except for 1967. Some variations in the size composition of the catches in 1967 are explained by the great abundance of yearlings of a strong year class. Our data coincide with the material of Reinsch (1969), who noted a high abundance of saithe yearlings in the North Sea in August-November 1967.

As stated earlier (Polonsky and Golubjatnikova, 1970) an increase in the mean size and mean age of saithe occurred in the North Sea up to 1968 inclusive. In 1968 - 1970, the introduction of the young 1966 and 1967 year classes into the fishery resulted in some decrease in the mean size and mean age.

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TABLE 1 Saithe catches in the North Sea

Year	All countries in 1 000 Russian cwt ^{x)}	Including USSR	
		1 000 Russian cwt	%
1962	382	-	-
1963	444	-	-
1964	544	-	-
1965	712	+	+
1966	903	224	24.8
1967	738	115	15.6
1968	976	114	11.7
1969	1 060	328	30.9
1970	no data	681	no data

^{x)} Russian cwt (hundredweights) = 100 kg.

Table 2.

Growth rate of males and females of saithe off South-Western Norwaay.

Age groups	Sex	1968									1969										
		I quarter		II quarter		III quarter		IV quarter		Year	I quarter		II quarter		III quarter		IV quarter		Year		
		mean No.of length specim.	mean No.of length specim.	mean No.of length spec.	mean No.of length spec.	mean No.of length specim.	mean No.of length specim.	mean No.of length specim.	mean No.of length specim.	mean No.of length specim.	mean No. of length spec.	mean No. of length spec.	mean No. of length spec.	mean No. of length spec.	mean No. of length spec.	mean No. of length sp.	mean No. of length sp.	mean No. of length sp.	mean No. of length sp.		
I	♂	-	-	-	-	-	-	29.0	2	29.0	2	-	-	-	-	-	-	-	-	-	
	♀	-	-	-	-	-	-	31.6	5	31.6	5	-	-	-	-	-	-	-	-	-	
II	♂	-	-	-	-	38.5	22	42.0	1	38.7	23	35.4	5	-	-	39.0	1	42.7	16	40.9	22
	♀	-	-	-	-	39.0	25	-	-	39.0	25	35.6	6	34.0	1	-	-	45.6	17	41.2	24
III	♂	-	-	-	-	46.4	60	51.5	8	47.0	68	45.6	20	45.0	2	45.5	19	58.5	2	46.1	43
	♀	-	-	-	-	46.1	65	50.6	9	46.6	74	44.9	28	43.1	7	45.0	10	49.8	5	45.2	50
IV	♂	61.0	3	65.0	5	54.7	51	58.4	10	56.3	69	52.1	32	59.0	4	59.9	8	-	-	54.1	44
	♀	61.0	5	59.8	5	55.9	58	55.6	15	56.4	83	50.4	35	59.3	4	56.2	5	42.0	1	51.6	45
V	♂	63.2	14	63.3	32	62.9	52	60.7	7	62.9	105	57.9	13	66.2	4	63.2	24	68.3	4	62.4	45
	♀	62.8	15	65.1	17	63.0	53	57.6	5	63.1	90	58.5	14	61.6	5	60.3	18	-	-	59.8	37
VI	♂	69.1	8	71.3	11	71.7	35	56.0	1	71.0	55	62.5	21	67.4	7	71.4	15	72.5	2	66.7	45
	♀	67.4	19	70.8	19	71.7	42	63.0	1	70.4	81	64.8	17	70.7	7	68.6	13	77.0	1	67.5	38
VII	♂	62.0	1	76.7	3	-	-	-	-	73.0	4	71.6	10	77.8	13	78.3	3	76.0	2	75.5	28
	♀	82.0	1	75.0	4	77.0	3	-	-	76.6	8	72.9	14	78.6	18	74.2	6	77.5	4	75.9	42
VIII	♂	-	-	-	-	82.0	1	-	-	82.0	1	80.3	3	79.5	2	-	-	-	-	79.9	5
	♀	-	-	99.0	3	-	-	-	-	99.0	3	75.0	1	83.0	1	-	-	84.0	2	81.5	4
IX	♂	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86.0	1	86.0	1
	♀	-	-	-	-	-	-	-	-	-	-	-	-	91.0	1	-	-	97.0	1	94.0	2
X	♂	-	-	-	-	-	-	-	-	-	-	-	-	96.0	1	-	-	-	-	96.0	1
	♀	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82.0	1	82.0	1
XI	♂	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	♀	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	111.0	1	111.0	1
XII	♂	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	♀	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XIII	♂	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	♀	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XIV	♂	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	♀	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	1	100.0	1

(continued...)

Table 2 (continued)

Age groups	Sex	1970										1969-1970									
		I quarter		II quarter		III quarter		IV quarter		Year		I quarter		II quarter		III quarter		IV quarter		Year	
		Mean length	No. of spec.	Mean length	No. of spec.	Mean length	No. of spec.	Mean length	No. of spec.	Mean length	No. of spec.	Mean length	No. of spec.	Mean length	No. of spec.	Mean length	No. of spec.	Mean length	No. of spec.	Mean length	No. of spec.
I	♂	-	-	-	-	29.8	13	-	-	29.8	13	-	-	-	-	29.8	13	29.0	2	29.7	15
	♀	-	-	-	-	30.1	12	-	-	30.1	12	-	-	-	-	30.1	12	31.6	5	30.6	17
II	♂	-	-	40.5	2	43.3	6	-	-	42.6	8	35.4	5	40.5	2	39.5	29	42.6	17	40.2	53
	♀	-	-	38.5	2	41.2	6	51.5	1	41.7	9	35.6	6	37.0	3	39.4	31	44.0	18	40.3	58
III	♂	45.5	6	43.0	25	-	-	53.5	4	44.6	35	45.6	26	43.1	27	46.1	79	53.1	14	46.1	146
	♀	46.5	7	43.5	42	-	-	57.5	1	44.2	50	45.2	35	43.4	49	46.0	75	50.8	15	45.5	174
IV	♂	52.0	32	50.5	22	-	-	61.7	6	52.4	60	52.4	67	53.9	31	55.4	59	59.6	16	54.4	173
	♀	53.7	20	51.0	19	-	-	56.7	6	52.9	45	52.4	60	53.8	28	55.9	63	55.3	22	54.3	173
V	♂	62.5	3	-	-	-	-	72.0	2	66.3	5	60.8	30	63.6	36	63.0	76	64.8	13	62.9	155
	♀	58.0	2	59.8	3	-	-	66.5	1	60.3	6	60.5	31	63.8	25	62.3	71	59.1	6	62.0	133
VI	♂	65.5	2	70.5	2	-	-	83.5	1	71.1	5	64.4	31	69.8	20	71.6	50	71.1	4	69.2	105
	♀	64.0	1	72.5	2	-	-	81.5	2	74.4	5	66.1	37	70.9	28	70.8	55	75.8	4	69.7	124
VII	♂	65.0	1	75.3	6	-	-	88.0	2	76.3	9	70.2	12	77.0	22	78.3	3	82.0	4	75.5	41
	♀	-	-	79.9	7	-	-	80.5	6	80.2	13	73.5	15	78.4	29	75.1	9	79.3	10	76.9	63
VIII	♂	86.0	1	80.2	7	-	-	84.5	9	82.8	17	81.7	4	80.0	9	82.0	1	84.5	9	82.1	23
	♀	86.5	2	81.8	9	-	-	83.5	2	82.8	13	82.7	3	85.9	13	-	-	83.8	4	85.0	20
IX	♂	-	-	89.0	2	-	-	85.5	1	87.8	3	-	-	89.0	2	-	-	85.8	2	87.4	4
	♀	-	-	100.0	1	-	-	89.5	1	94.7	2	-	-	95.5	2	-	-	93.2	2	94.4	4
X	♂	-	-	-	-	-	-	95.5	1	95.5	1	-	-	96.1	1	-	-	95.5	1	95.8	2
	♀	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82.0	1	82.0	1
XI	♂	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	♀	-	-	-	-	-	-	98.0	1	98.0	1	-	-	-	-	-	-	104.5	2	104.5	2
XII	♂	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	♀	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	111.0	1	111.0	1
XIII	♂	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	♀	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XIV	♂	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	♀	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	1	100.0	1

Table 3. Growth rate of saithe in various areas
of the North Sea

Age groups	Shetland shallow waters							
	1968		1969		1970		1968-1970	
	Mean length, cm	No. of specimens	Mean length, cm	No. of spec.	Mean length, cm	No. of spec.	mean length, cm	No. of specimens
I	33.0	1	-	-	-	-	33.0	1
II	43.1	12	41.9	63	44.1	9	42.3	84
III	52.1	51	45.3	325	47.6	142	45.6	518
IV	59.4	153	56.1	252	53.2	320	55.5	725
V	65.9	191	63.4	246	63.5	114	64.1	551
VI	70.9	110	70.4	220	68.8	154	70.0	484
VII	76.8	25	76.2	179	74.8	97	75.8	301
VIII	80.8	5	82.5	26	81.4	68	81.6	99
IX	-	-	85.9	17	91.6	6	87.4	23
X	94.0	2	91.3	6	92.6	7	92.3	15
XI	93.0	1	111.0	1	107.5	1	103.3	3
XII	-	-	112.0	1	91.5	1	101.8	2
XIII	-	-	-	-	117.5	1	117.5	1
XIV	-	-	110.0	1	-	-	110.0	1
XV	-	-	117.0	1	-	-	117.0	1

(continued)

Table 4. Age composition of saithe in the
North Sea in %

Age groups	1966		1967		1968		1969		1970	
	commercial trawls	com. trawls	trawls with fine meshed cover	trawls with fine meshed cover	comm. trawls	trawls with fine meshed cover	comm. trawls	trawls with fine meshed cover	comm. trawls	trawls with fine meshed cover
0	-	-	82.8	-	-	-	-	-	-	-
1	-	-	+	0.8	-	-	-	-	-	+
II	0.6	1.2	+	2.4	2.9	8.7	12.4	1.6	2.3	
III	10.6	22.3	2.3	17.6	18.6	30.0	40.3	18.5	29.7	
IV	78.1	44.7	6.0	26.8	32.7	16.5	18.3	47.7	54.7	
V	10.6	29.0	6.5	31.1	31.5	16.3	13.0	13.6	5.4	
VI	0.1	1.6	1.3	18.9	14.3	15.4	9.6	12.9	4.4	
VII	-	1.2	1.2	1.9	-	10.8	5.6	4.3	2.1	
VIII	-	-	0.7	0.5	-	1.4	0.6	1.4	1.2	
IX	-	-	0.1	-	-	0.7	0.2	+	0.2	
X	-	-	0.1	+	-	0.2	+	+	+	
XI	-	-	0.1	+	-	+	+	+	+	
XII	-	-	0.1	-	-	+	-	-	+	
XIII	-	-	-	-	-	+	+	-	-	
Mean age	4.0	4.1	0.8	4.5	4.4	4.4	3.9	4.4	3.9	
No. of specimens	7397	690	4221	8110	70	29371	5763	10822	18141	

Table 5. Size composition of saithe in the North Sea in %.

Length, cm	1965		1966		1967		1968		1969		1970	
	Commercial trawls	Commercial trawls	Commercial trawls	Trawls with finemeshed cover	Commercial trawls	Trawls with fine meshed cover	Commercial trawls	Trawls with fine meshed cover	Commercial trawls	Trawls with fine meshed cover	Commercial trawls	Trawls with fine meshed cover
9-11	-	-	-	1.2	-	-	-	-	-	-	-	-
12-14	-	-	-	55.2	-	-	-	-	-	-	-	-
15-17	-	-	-	25.1	-	-	-	-	-	-	-	-
18-20	-	-	-	1.4	-	-	-	-	-	-	-	-
21-23	-	-	-	+	0.4	-	-	-	-	-	-	-
24-26	-	-	-	-	0.3	-	-	-	-	-	-	+
27-29	-	-	-	-	+	-	-	-	-	-	-	0.1
30-32	-	-	-	-	+	-	-	+	0.1	0.1	-	0.1
33-35	-	-	-	-	0.2	-	-	0.1	0.9	-	-	+
36-38	0.7	0.5	-	-	0.4	-	-	3.5	4.9	0.1	-	+
39-41	3.5	4.6	0.1	-	1.0	1.4	10.5	13.8	1.7	1.0	-	-
42-44	32.4	6.1	1.0	0.1	3.4	4.3	12.1	17.2	5.4	6.2	-	-
45-47	30.0	8.5	6.5	0.4	6.1	5.7	8.0	11.0	10.5	19.6	-	-
48-50	11.5	13.6	13.0	1.1	8.9	5.7	6.1	7.2	11.8	28.8	-	-
51-53	11.1	27.1	16.3	1.8	7.2	11.4	4.6	6.2	13.0	21.1	-	-
54-56	10.1	20.0	14.2	2.2	9.0	18.6	5.0	6.0	12.3	7.3	-	-
57-59	0.7	10.7	14.5	1.9	9.9	10.0	5.9	5.4	9.3	3.1	-	-
60-62	-	6.0	10.9	1.6	9.3	11.4	7.4	6.3	10.6	2.4	-	-
63-65	-	2.1	10.0	1.7	10.5	8.6	7.6	5.8	9.0	2.5	-	-
66-68	-	0.6	7.7	1.7	12.1	5.7	7.5	4.5	6.4	2.3	-	-
69-71	-	0.2	3.5	1.6	8.9	10.0	6.4	3.5	4.7	1.6	-	-
72-74	-	+	2.0	1.3	5.5	2.9	5.6	2.6	2.4	1.3	-	-
75-77	-	+	0.1	0.9	3.6	1.4	3.8	2.4	1.3	0.9	-	-
78-80	-	+	0.1	0.5	2.1	-	2.8	1.4	0.8	0.6	-	-
81-83	-	-	0.1	0.1	1.0	2.9	1.4	0.3	0.4	0.4	-	-
84-86	-	-	-	+	0.2	-	0.8	0.2	0.2	0.3	-	-
87-89	-	-	-	+	+	-	0.4	0.1	0.1	0.2	-	-
90-92	-	-	-	-	+	-	0.3	0.2	+	0.1	-	-
93-95	-	-	-	+	+	-	0.1	-	+	+	-	-
96-98	-	-	-	0.1	+	-	0.1	+	+	0.1	-	-
99-101	-	-	-	-	+	-	+	+	-	+	-	-
102-104	-	-	-	+	-	-	+	-	-	+	-	-
105-107	-	-	-	0.1	-	-	+	-	-	+	-	-
108-110	-	-	-	+	-	-	+	-	-	+	-	-
111-113	-	-	-	+	-	-	+	+	-	+	-	-
114-116	-	-	-	+	-	-	-	-	-	-	-	-
117-119	-	-	-	-	-	-	+	-	-	-	-	-
Mean length	46.8	52.1	56.9	22.3	60.0	58.6	56.7	51.9	56.9	52.4	-	-
Number of specimens	287	7397	690	4221	8110	70	29371	5763	10822	18141	-	-

(cont)