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SAITHE TAGGING EXPERIMENTS IN NORTHERN NORWAY NORTH OF
68°N, 1970 - 74

by

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INTRODUCTION

From 1970 to 1974, 7913 saithe were tagged and released along the coast of northern Norway from north of 68°N and eastwards nearly to the border between Norway and the USSR.

Sund (1925) tagged 1119 saithe at about 68°30'N in summer 1921. Two recaptures of mature saithe were made at about 63°N and 59°N, but apart from that recaptures were made chiefly near the tagging area. Norwegian saithe tagging experiments have been carried out in northern Norway each year since 1954. Results from experiments from 1954 to 1964 are reported by Olsen (1959a, b, 1961) and Anon. (1965). These experiments gave evidence of a yearly spawning migration in winter of saithe from northern Norway to the spawning grounds further south (Halten Bank, Svinøy area, northern North Sea). They also demonstrated a considerable migration of saithe from northern Norway to Iceland. Reinsch (1969) in 1964 - 1968 tagged 92 saithe caught by trawl on the coastal banks between 68°N and 70°30'N. The seven recaptures were all made in northern Norway.

MATERIAL AND METHODS

In 1970, 1200 saithe were tagged in two experiments, in 1971, 792 saithe were tagged in one experiment, in 1972, 1500 saithe were tagged in three experiments, in 1973, 2421 saithe were tagged in six experiments, and in

1974, 2000 saithe were tagged in four experiments. Hydrostatical tags of Lea's type were used, fastened to the fish with a nylon gut in front of the anterior dorsal fin. Details about each experiment are given in Table 1.

Table 1. Saithe tagging experiments in northern Norway north of 68°N
1970 - 1974.

Date	Position	No. rel.	Size range (cm)	Recaptures							Tot.
				1970	1971	1972	1973	1974	1975	1976	
28.8.70	N 68°36' E 14°26'	600	37-55	4	4	1	1	-	1	-	11
20.8.70	N 71°09' E 26°45'	600	38-71	15	29	17	7	3	1	-	72
22.9.71	N 70°37' E 23°10'	792	37-52		94	36	13	12	5	1	161
3.8.72	N 68°52' E 16°46'	400	32-52			48	28	18	5	3	102
5.8.72	N 70°12' E 20°32'	300	39-49			14	8	4	4	2	32
14.8.72	N 70°15' E 30°35'	800	39-69			78	55	29	13	10	185
1.8.73	N 68°36' E 14°32'	397	33-55				2	3	1	-	6
3.8.73	N 69°04' E 16°48'	396	38-57				29	18	7	1	55
23.8.73	N 69°39' E 19°43'	429	36-62				110	38	9	4	161
6.8.73	N 70°28' E 22°10'	450	35-61				1	16	5	6	28
8.8.73	N 70°50' E 26°42'	390	40-65				12	18	10	12	52
13.8.73	N 70°15' E 30°35'	359	40-70				24	24	9	3	60
31.7.74	N 68°55' E 15°03'	500	37-60					8	7	1	16
2.8.74	N 70°38' E 21°58'	500	37-68					17	27	20	64
7.8.74	N 70°58' E 25°59'	500	36-64					13	31	25	69
17.8.74	N 70°15' E 30°35'	500	45-66					105	24	11	140

In all cases, the tagging was carried out in the period July - September, mostly in August. The tagging comprised chiefly the age groups 3 - 5 years. The tagged fish were usually larger in the eastern part where the 6 and 7 year old fish in some cases were significantly represented.

The saithe had been caught with purse seine and kept alive in a net for a period of from a few hours to a couple of weeks. The net had usually been towed from the fishing ground to a more sheltered area. Poor condition of

the fish caused by long towing and storage may explain the low recovery-rate of some of the experiments.

The data comprise all recaptures up to 1976. In all, 1204 recaptures have been reported. In 83 (6.9 per cent) of the cases, the position of the recapture was not, or inadequately, reported and the recaptures are not included in the charts.

RESULTS AND DISCUSSION

Figs. 1 - 16 show the recaptures up to 1976 from each experiment in 1970-1976. One peculiar thing is that all three experiments carried out in the area south of 68°N (Vesterålen) (Figs. 1, 7, 13) have given a very low recovery-rate, on the average only 2 per cent. The reason for this is not known.

In all the experiments, the majority of the recaptures were made near the tagging area. In most cases the saithe appear to have migrated about as frequently to the east as to the west. In three experiments there is a clear tendency to a westward migration (Figs. 5, 8, 10), whereas two experiments show an eastward migration (Figs. 6, 12). However, in these two experiments the tagged fish were relatively old and much of the recaptures may therefore have been saithe that have started on a spawning migration.

One experiment was carried out in a fiord (Fig. 9) and after a couple of months about 30 per cent of the saithe were recaptured in the fiord by a purse seiner. This was a clear demonstration of the efficiency of purse seine fishing for saithe in a restricted area.

According to Reinsch (1976) most of the saithe in Norwegian waters spawn for the first time when they are 5 or 6 years old. Most of the recaptures from these experiments are consequently immature saithe. However, most of the saithe that were recaptured south of 68°N were probably fish that were or had been on a spawning migration. This assumption is borne out by the fact that recaptures in the southern area so far are most frequently reported from the experiments before 1973.

On Fig. 17 the recaptures up to 1976 from all the experiments in northern Norway north of 68°N in 1970 - 1974 are charted. Of the recaptures south of 65°N which presumably are predominantly spawning saithe, 50.8 per cent were caught in the North Sea region, 9.2 per cent at Iceland, 7.7 per cent at Faroe, 3.1 per cent west of Scotland and 29.2 on or near the Svinøy and Halten Bank spawning grounds north of 62°N . In addition, a few were also recaptured during the spawning season in the Lofoten area where there are also spawning grounds for saithe.

Although recaptures of spawning saithe in the North Sea were frequently reported also in experiments from 1954 - 1964 (Olsen 1959b, 1961, Anon. 1965), the proportion of recaptures from North Sea compared with recaptures from the spawning grounds north of 62°N , is much higher in the new experiments. Increased fishing effort in the North Sea may provide some of the explanation, but the difference is so marked that there can be little doubt that spawning saithe from northern Norway migrate more frequently to the North Sea area now than around 1960. On the other hand, recaptures at Iceland are very few compared with the earlier experiments (Olsen 1959a, 1961, Anon. 1965). This seems to support the theory of Olsen (1959a) that the saithe followed Atlanto-Scandian herring across the Norwegian Sea to Iceland. The high recovery-rate in the North Sea at present may then possibly be the result of the decline of stock of Atlanto-Scandian herring stock which have forced the saithe to look for food elsewhere.

As shown on Fig. 17 few recaptures were reported north of $71^{\circ}30'$ and this confirms that the saithe in northern Norway is closely confined to the coastal banks.

SUMMARY

In 1970 - 1974, 7913 saithe were tagged in northern Norway. Recaptures of spawning saithe in the North Sea were more frequent, whereas recaptures at Iceland were much less frequent than in earlier experiments. This may be a result of the decline of the stock of Atlanto-Scandian herring which was important food for the spawning saithe.

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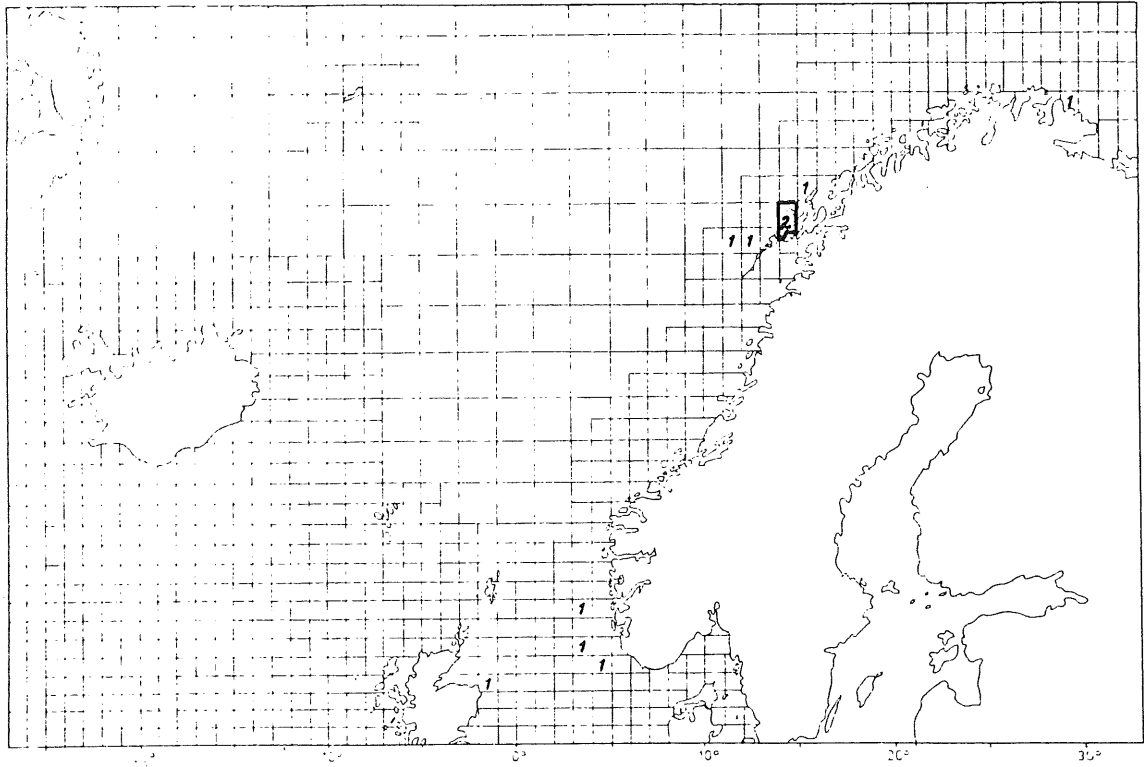


Fig. 1. Saithe tagging experiment 28 August 1970. 600 fish released inside the outlined area. Recaptures 1970 - 1976.

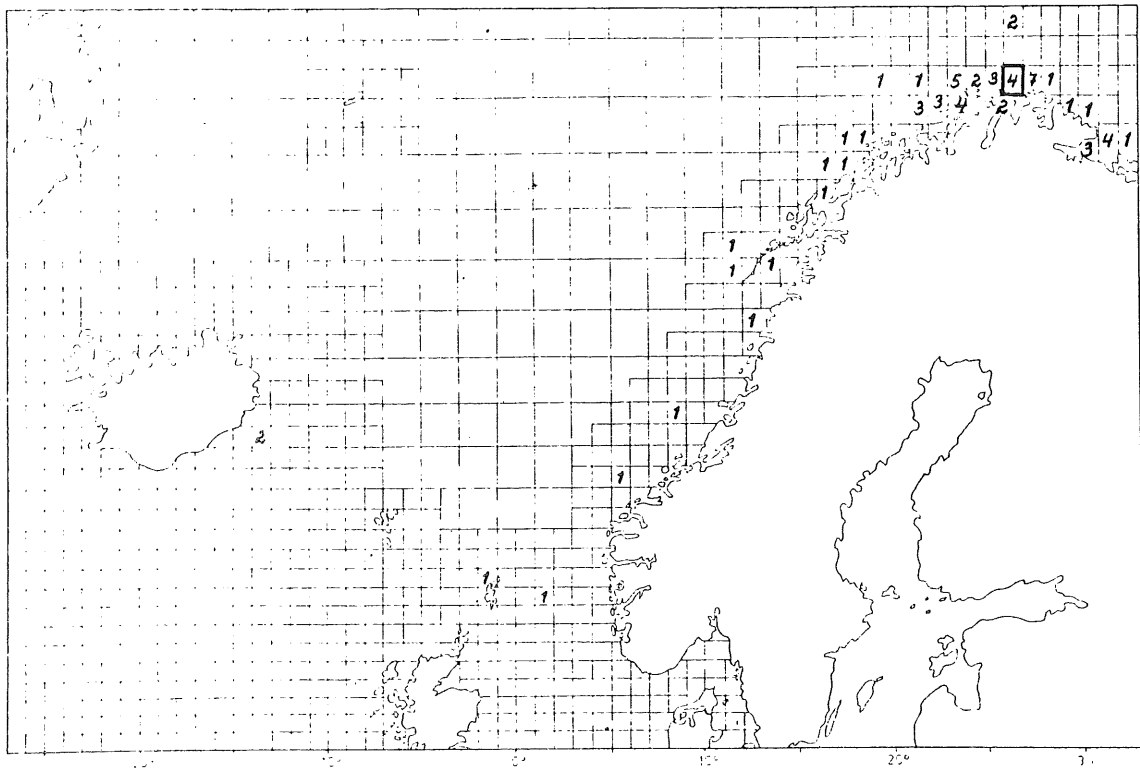


Fig. 2. Saithe tagging experiment 20 August 1970. 600 fish released inside the outlined area. Recaptures 1970 - 1976.

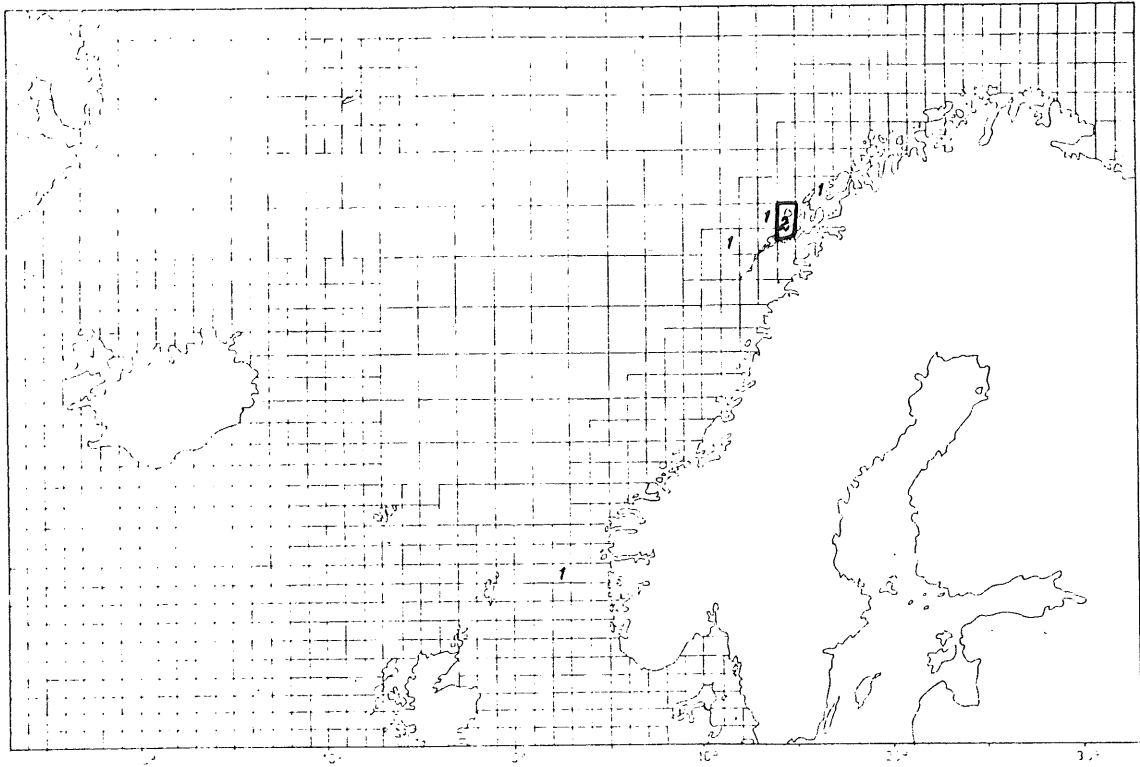


Fig. 7. Saithe tagging experiment 1 August 1973. 397 fish released inside the outlined area. Recaptures 1973 - 1976.

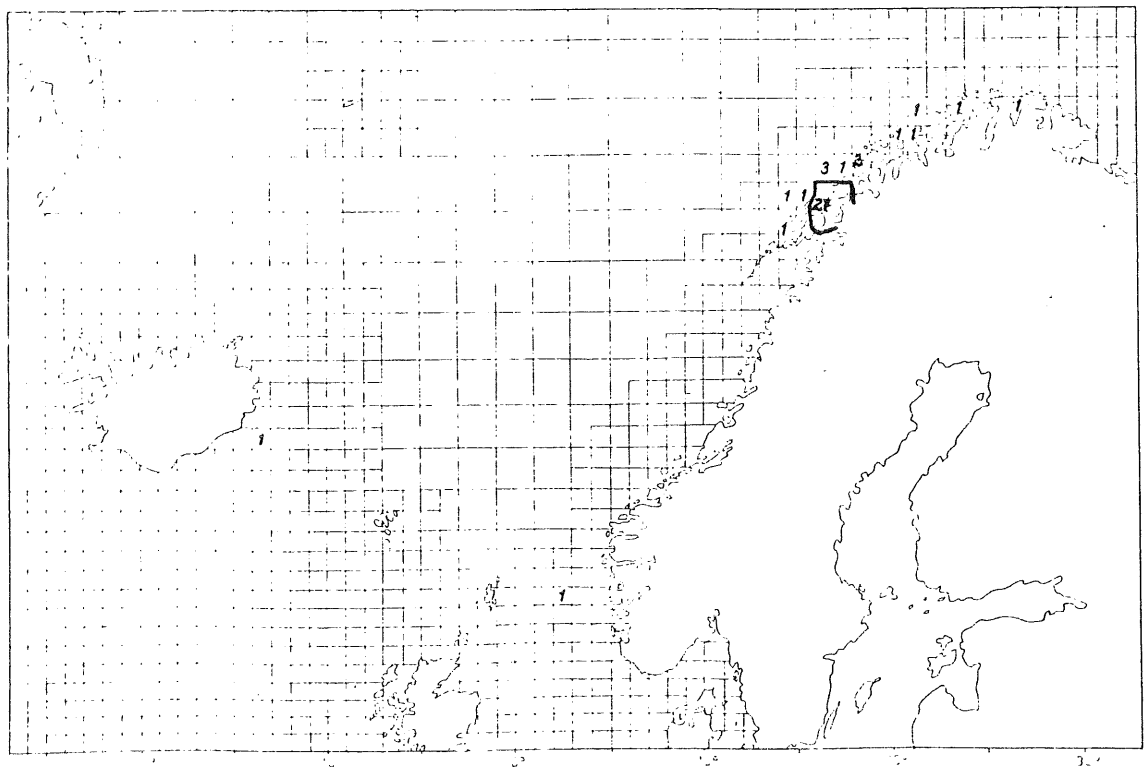


Fig. 8. Saithe tagging experiment 3 August 1973. 396 fish released inside the outlined area. Recaptures 1973 - 1976.

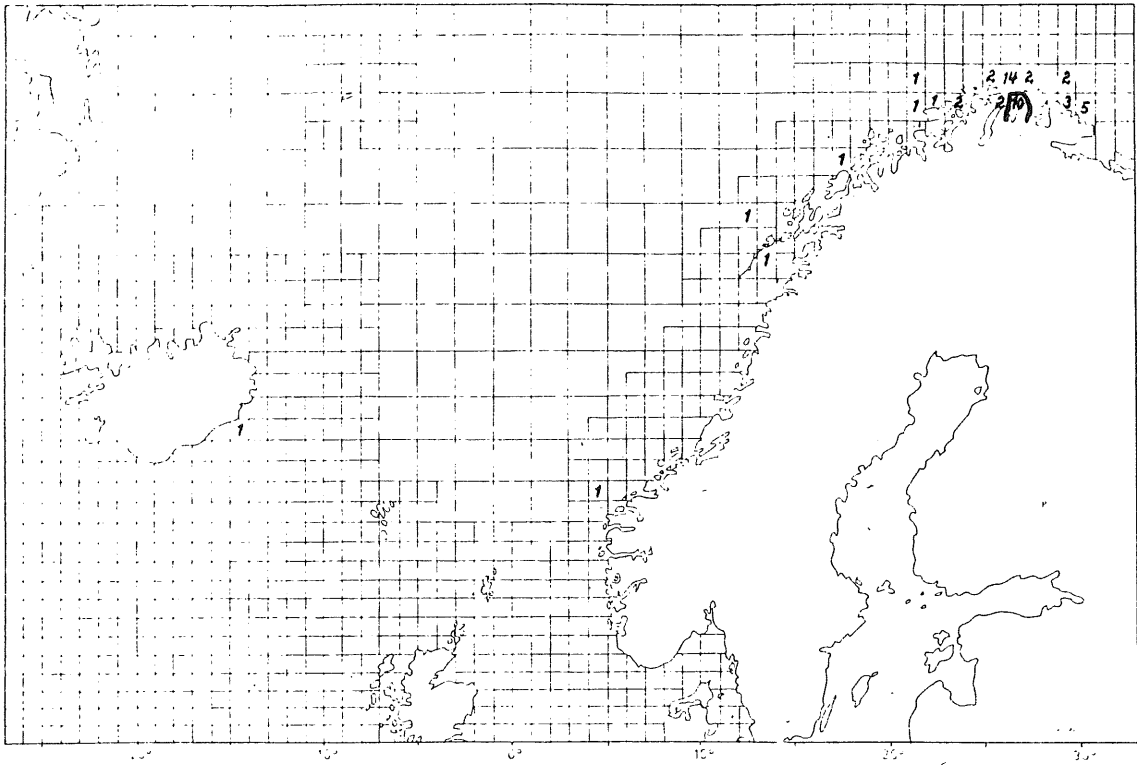


Fig. 11. Saithe tagging experiment 8 August 1973. 390 fish released inside the outlined area. Recaptures 1973 - 1976.

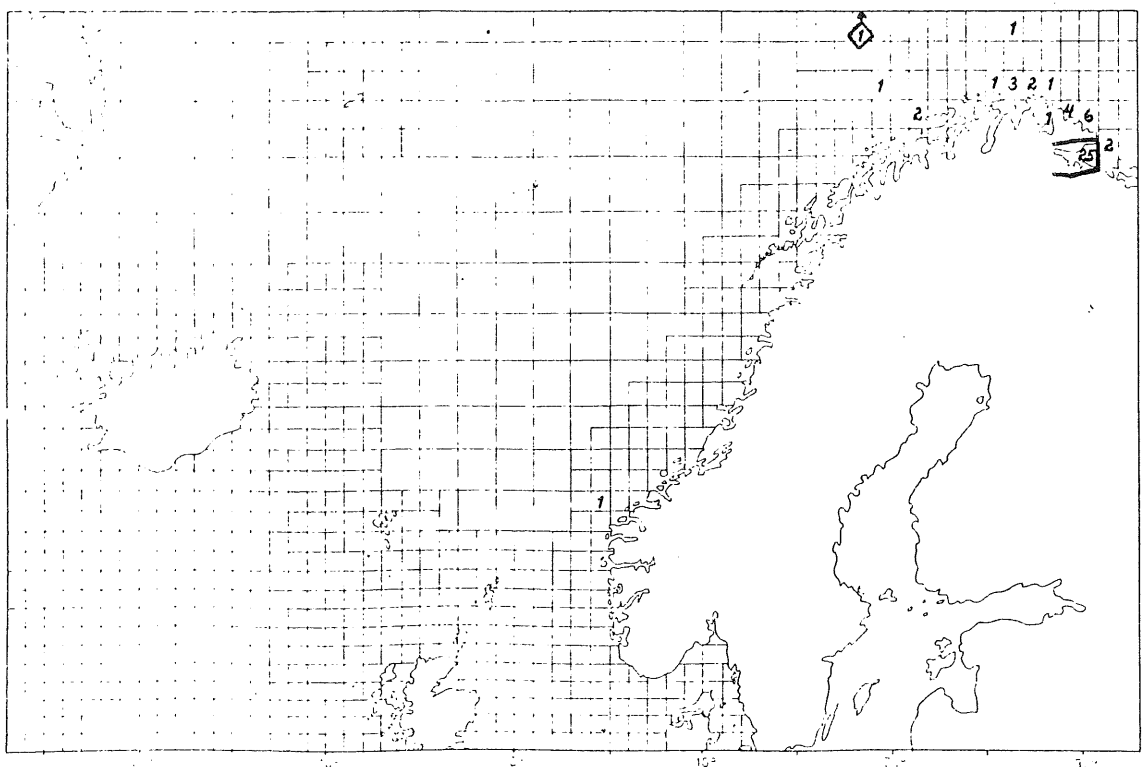


Fig. 12. Saithe tagging experiment 13 August 1973. 359 fish released inside the outlined area. Recaptures 1973 - 1976.

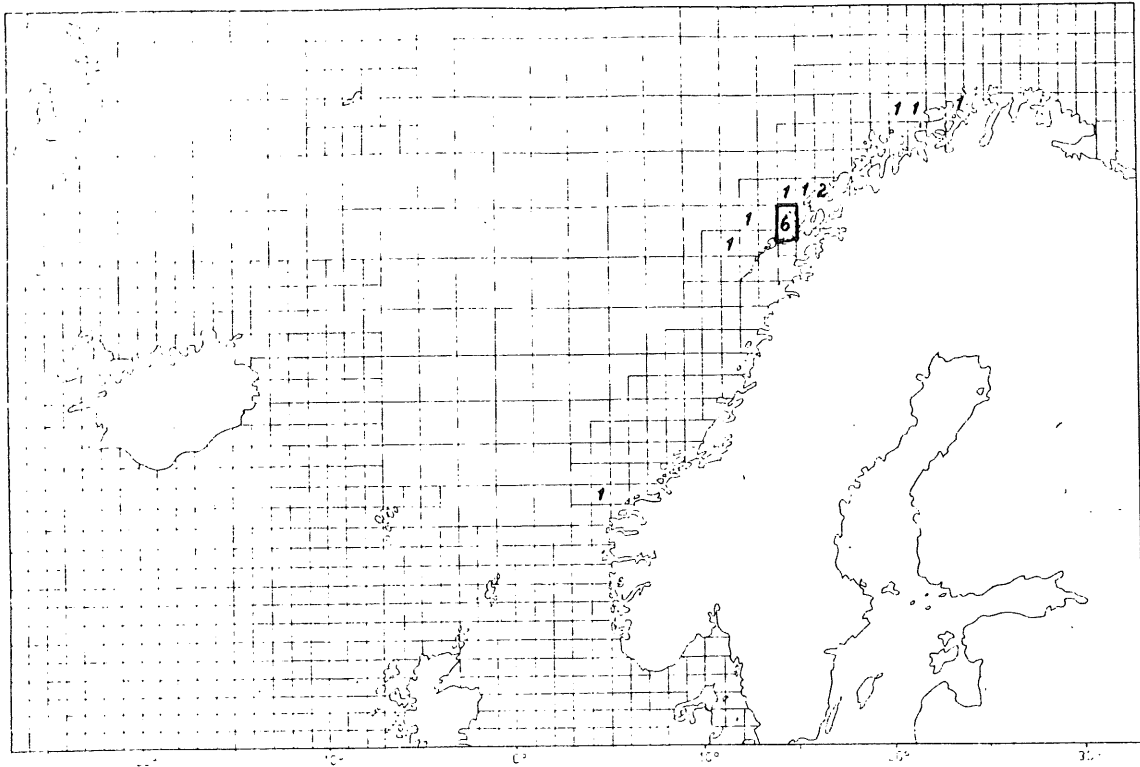


Fig. 13. Saithe tagging experiment 31 July 1974. 500 fish released inside the outlined area. Recaptures 1974 - 1976.

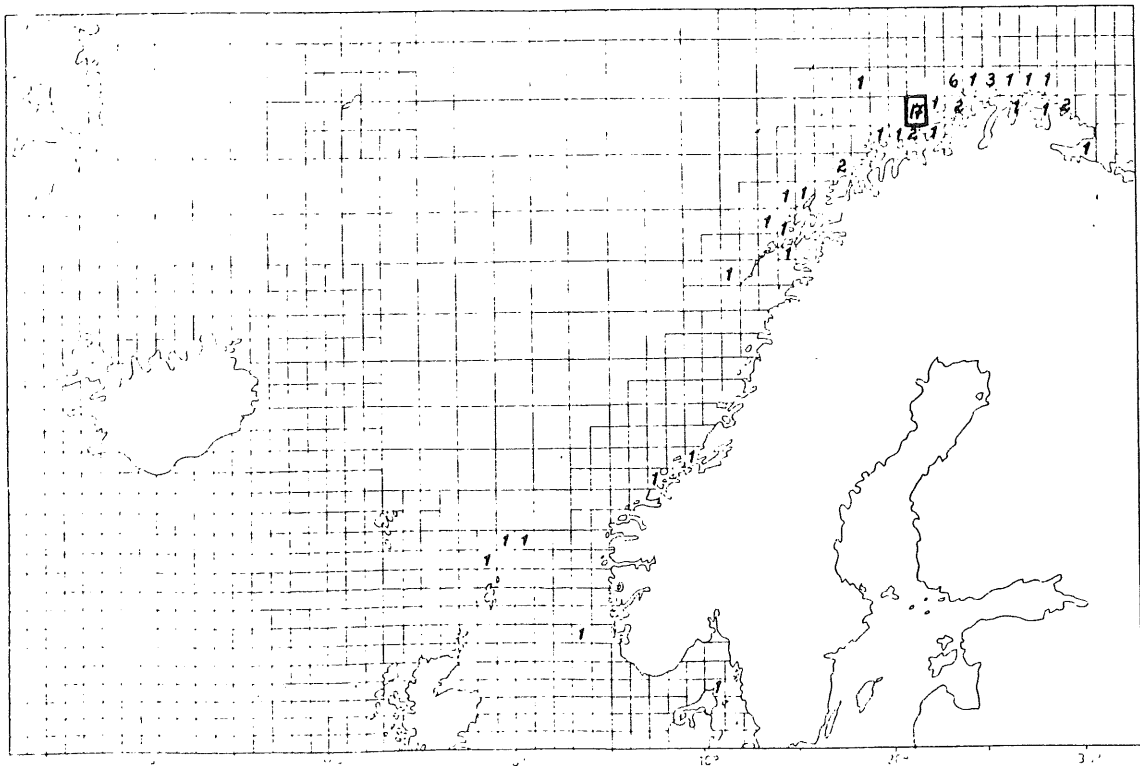


Fig. 14. Saithe tagging experiment 2 August 1974. 500 fish released inside the outlined area. Recaptures 1974 - 1976.

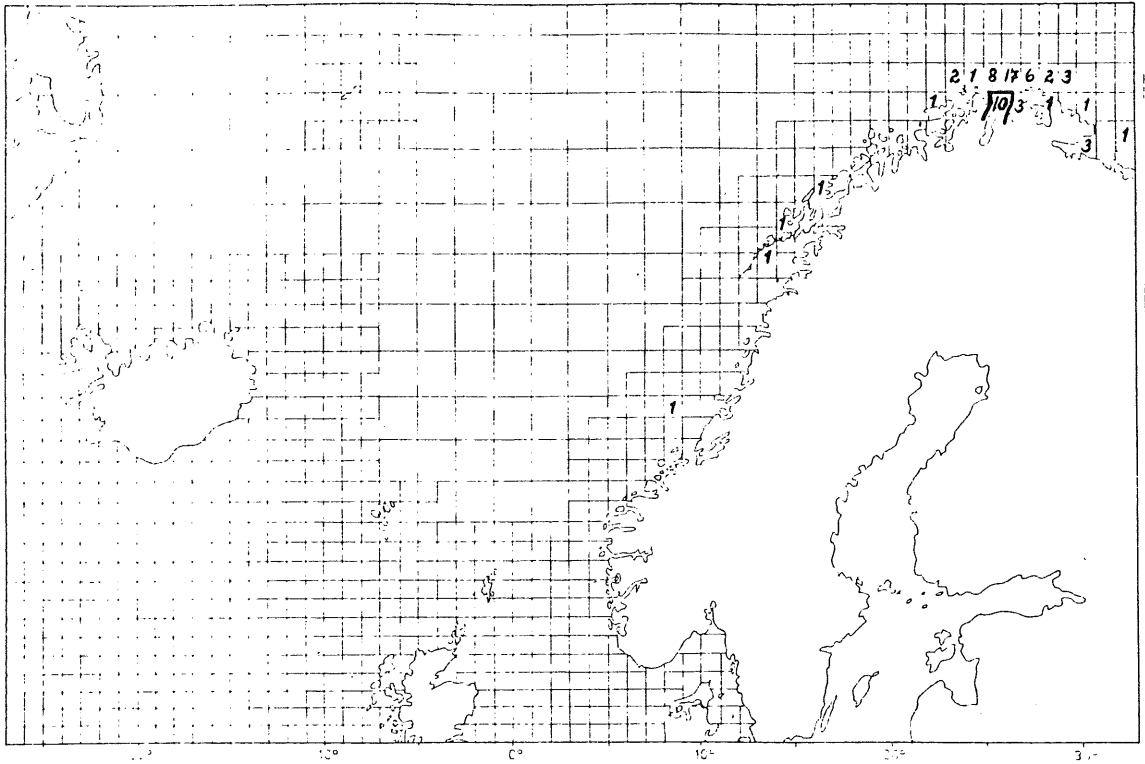


Fig. 15. Saithe tagging experiment 7 August 1974. 500 fish released inside the outlined area. Recaptures 1974 - 1976.

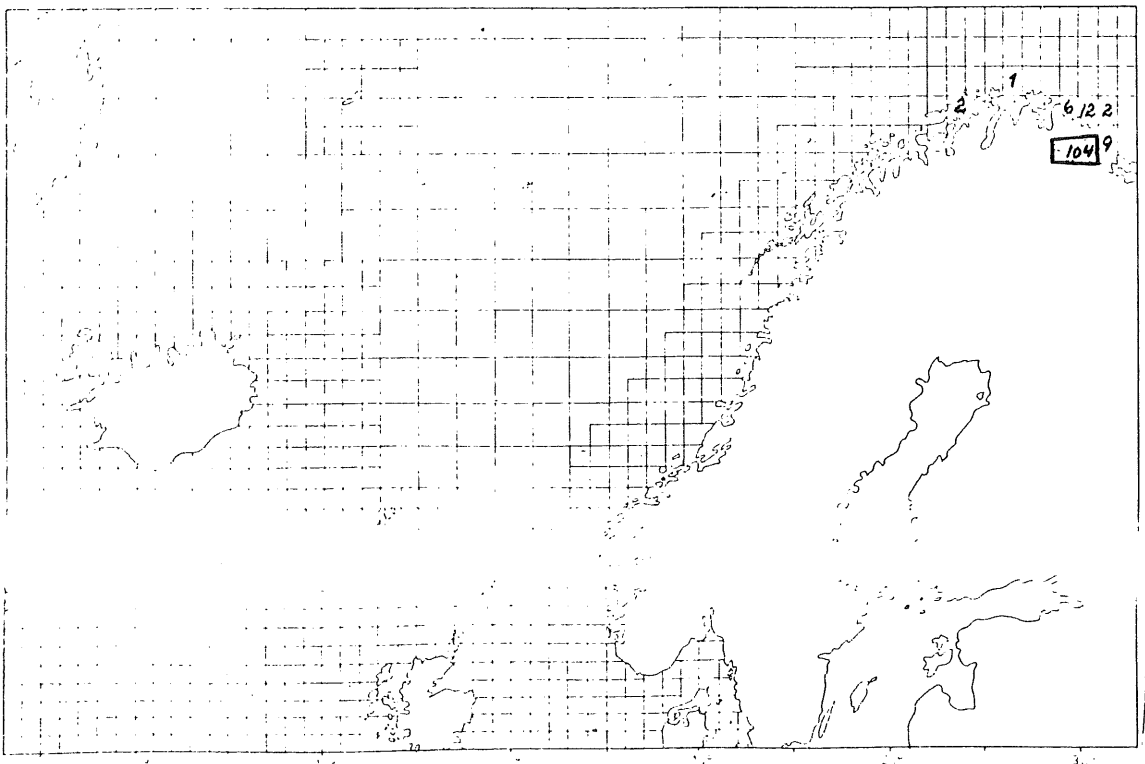


Fig. 16. Saithe tagging experiment 17 August 1974. 500 fish released inside the outlined area. Recaptures 1974 - 1976.

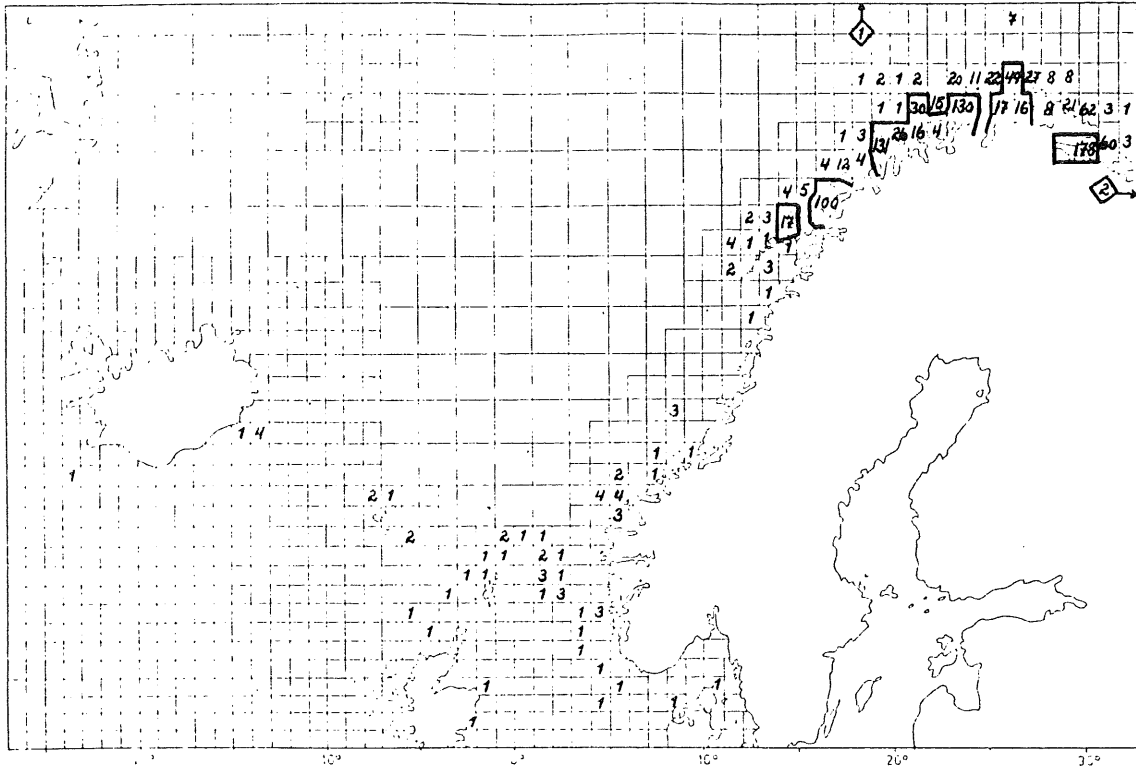


Fig. 17. Saithe tagging experiments in northern Norway north of 68°N 1970-1974. 7913 fish released inside the outlined areas. Recaptures 1970 - 1976.