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Results of sand eel investigations in the
Newfoundland Grand Bank area in 1974

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Abstract

The paper deals with distribution of sand eel in the Grand Bank area in 1974. Age and length compositions, data on spawning and fecundity are given. The significance of sand eel in feeding of many fishes is pointed out.

Investigations of sand eel were continued in May-July and November-December 1974.

Sand eel widely distributed at small depths of the Newfoundland Shallows and within isobath of 100 (Fig. 1) in the spring-summer period.

A more easterly distribution is characteristic of the fish in 1974, in contrast to previous years. In May-June of 1971-1973 hundreds and thousands of sand eel per trawling were caught on the St. Pierre and Green Banks. Sand eel 21- to 24 cm long were met with singly in these areas in 1974.

The greatest catches (up to 400 kg. per trawling) were taken on the south-eastern slope of Grand Bank (Division 30). Fish 19 to 23 cm long (Table 1) at the age of 3-4 years (Table 2) distributed in the area.

In July scattered concentrations were registered on the north-eastern and south-western slopes of Grand Bank (Divisions 3L and 3N). Specimens 19 to 23 cm long at the age of 3-4 years prevailed in the catches; the average length of fish in Division 3L was less than in other areas, making up 20.92 cm.

In November-December Divisions 3L and 3N were investigated. Sand eel were found in the bottom trawl only in the day time when water temperature varied from 0.9 to 3.8C in the near bottom layer. Prespawning specimens from 14 to 26cm long were met with in catches in Division 3L. Females had gonads at the 4th stage of maturity while those of males were at the 4th(79%) and IV-Vth(15%) stages of maturity. Maturity rate was 19.2% and that of females accounted for 18.3%. Young fishes 8 to 13cm long were registered in the area as well.

Larger specimens were met with further south. Fish 20 to 24cm long prevailed in catches in Division 3O; average length of fish accounted for 21.75cm. In the same area spawning of sand eel was registered at a depth of 48-55m at the temperature of 3.8C. Spawned out fish made up about 50% of the catches. Rate of maturity of prespawning females amounted to 40%.

Males predominated in the spring-summer period in all the areas (excepting Division 3L, where sex ratio was about 1 to 1), whereas females were two times greater in the spawning area.

Examining of gonads in 24 females from Division 3L showed, that individual fecundity of sand eel vary from 7.2 to 26.8 thousands, making up about 16.2 thousand of eggs.

Diameter of mature eggs(stage V) is 1.04mm; it is 0.79mm at the stage IV.

Sand eel, together with capelin, is one of the main food objects for many commercial fishes, especially for cod. Sand eel could make up about 65% of food ball in a cod stomach in Division 3N in May-June and up to 86-100% in July (Popova, 1962; Turuk, 1969). In the Newfoundland Bank areas in the summer period the largest cod 50cm long feed mainly on sand eel (Popova 1962).

In winter the significance of sand eel for cod feeding doesn't decrease, its high proportion in cod stomachs makes up 70-80% to 93%. (Turuk 1968, 1973)

Sand eel is an important food object for feeding of many fishes in other areas, too, for example on the Nova Scotia shelf (Scott, 1968).

Sand eel constitute the bulk of cod food off West Greenland in the second half of the year(Sidorenko,1962). This species is an important food object for redfish in the same area(Zakharov,1962).

Sand eel was eaten in great quantities by whale(Balaenoptera) (Bigelow ,Schroeder,1953).

Conclusions:

1. A more easterly distribution is characteristic of sand eel in 1974. Species 19 to 23 cm long at the age of 3-4 years made up the bulk of catches.

2. Prespawning and spawning species were registered in November-December in Division 3L. The spawning of sand eel occurred at depths of 48-55m when water temperature was 3.8°C off the bottom. Absolute individual fecundity of species varied from 7.2 to 26.8 thousand eggs, accounting on the average for 16.2 thousand eggs.

3. Sand eel plays an important role in feeding of commercial fishes and marine mammals in the North West Atlantic area.

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Table 1. Length composition of sand eel in 1974 (%).

Month, area Length, cm	May	June	July		November	December
	3 P	3 N	3 L	3 O	3 L	3 N
8					0,1	
9					1,5	
10					4,8	0,1
11					6,1	0,3
12			+		3,5	0,1
13			+		2,9	0,2
14			+		4,7	0,4
15		+	0,1	0,2	5,1	0,9
16		*	0,5	0,3	10,5	0,9
17		1,2	1,3	1,2	9,7	2,2
18		5,3	3,9	6,8	10,1	3,3
19		10,7	11,6	10,3	9,7	3,0
20		17,8	22,9	10,5	8,2	7,6
21	6,0	21,2	25,9	14,9	8,1	17,4
22	46,0	20,3	18,3	18,8	7,3	25,0
23	42,0	14,6	10,9	19,1	5,1	23,5
24	6,0	6,9	3,7	11,5	1,6	11,4
25		1,7	0,8	4,8	0,7	3,0
26		0,3	0,1	1,6	0,3	0,7
Number of spec.	50	2409	1886	1186	1065	1004
M	22,53	21,23	20,92	21,66	17,31	21,75

Table 2. Age composition of sand eel in 1974 (%).

Age Month Area	1	2	3	4	5	6	Number
June							
3 N		6,7	34,9	49,2	7,7	1,5	195
July							
3 O		15,0	36,0	42,0	4,0	3,0	100
November							
3 L	3,0	25,0	49,0	16,0	6,0	1,0	100
December							
3 N		7,0	38,0	40,0	13,0	2,0	100

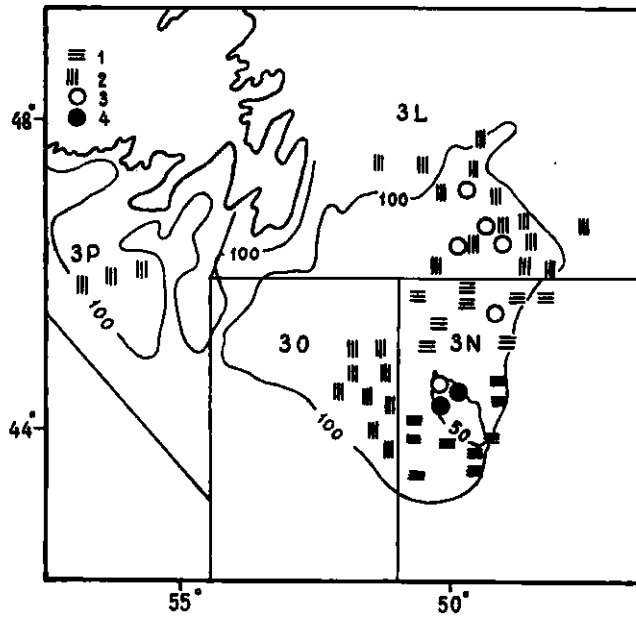


Fig. 1. Distribution of sand eel in 1974:

- 1 - June
- 2 - July
- 3 - November
- 4 - December