

ZE 78-04

BIOLOGICAL REPORT ON THE DUTCH
EXPLORATORY FISHING CRUISES FOR
BLUE WHITING IN 1978.

G. van de Kamp and C.J. Kuiten.

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Auteur:

G. van de Kamp and C.J. Kuiten.

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Inhoud:

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**DIT RAPPORT MAG NIET GECITEERD WORDEN ZONDER TOESTEMMING VAN DE
DIRECTEUR VAN HET R.I.V.O.**

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BIOLOGICAL REPORT ON THE DUTCH EXPLORATORY FISHING CRUISES
FOR BLUE WHITING IN 1978.

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I - Introduction

During the months January - March 1978 three exploratory fishing surveys of 20 days each were carried out by three Dutch commercial sterntrawlers in order to locate major blue whiting concentrations off the north and west coast of Great Britain and to try to catch these fish in commercially profitable quantities, preferable for human consumption. Dutch trawlers fished for blue whiting never before. During the first survey the trawlers had no fishing permit for Faroe waters.

Blue whiting was frozen (ungutted) in boxes of 25 kg. The maximum freezing capacity of the trawlers varied from 30 to 50 metric tons per day. When the catch reached this amount the fishery was terminated for the rest of the day.

Nine samples of blue whiting were collected for determination of length distributions, age, maturity stage and sex.

In this report no age distributions will be given because of difficulties in interpreting the ring structures in blue whiting otoliths in terms of age. These problems may be solved in future by an international otolith exchange program, which is presently carried out.

Since no echo integrators were available no track charts will be given but the approximate areas covered are indicated in figure 2. In view of the lack of experience with the echo sounding equipment at larger depth ranges concentrations may have been overlooked during the survey.

II - Participating vessels

	<u>Name</u>	<u>Horse power</u>	<u>Length (m)</u>
SCH 21	"De Hoeker"	2000	52.9
SCH 108	"Ondernemer II"	2700	52.9
SCH 302	"Willem van der Zwan"	2000	50.8
KW 122	"Arie Ouwehand"	2300	55.3
KW 172	"Dirk Diederik"	2300	55.3
YM 36	"Egmond"	2000	50.8

These stern trawlers were at sea during the following periods:

SCH 21, SCH 108 and KW 172 : 4 Jan - 24 Jan 1978.

SCH 302, KW 122 and IJM 36 : 15 Feb - 7 March 1978.

SCH 302, KW 122 and IJM 36 : 10 March - 30 March 1978.

III - Fishing gear

The fishing gear employed was a pelagic trawl. The number of meshes of 1.8 m in the front part of the net varied from 250-300 (2300-2800 meshes nets). The boards (7 m²) weighted about 800 kg each. On the lower edges of the net weights varying from 675 to 800 kg were attached. On the middle of the headline a transducer was mounted. The vertical netopening was about 15 fathoms (see figure 1).

IV - Results

a - Fishing days.

Only on 30% of the available days the fishing gear has been shot. In addition to searching time for fishable concentrations the reason for this low percentage were: long distance from Dutch ports to fishing grounds, bad weather conditions and no fishing on Sundays.

b - Radio contact with foreign vessels.

1st period: "Anton Dohrn" (Mr. Schöne)
 2nd period: "Leivur Össursson" (Mr. Jákupsstovu and skipper Simonsen).
 "Polarfisk (skipper Justinussen).
 "G.E. Ray" (Mr. Wittle).
 3rd period: "Polarfisk" (skipper Justinussen).

In Thorshavn, Mr. Joensen from the Fiskirannsóknarstovan (Faroe Islands) provided details about the distribution of blue whiting in Faroese waters.

These contacts proved very helpful in finding appropriate concentrations and the cooperation of the persons mentioned above has been highly appreciated.

c - Catch, catch per effort and length distributions.

Data per haul are given in table I. The data can be grouped in 9 time/area units (see figure 2).

Area (see fig 2)	Midpoint area	Date	Catch Blue Whiting in metric tons	Fishing hours	Catch per effort t/10 hours
1	60°20'N 4°00'W	12 Jan '78	0	3.45	0
2	48°25'N 8°50'W	17-18 Jan '78	0	0.55	0
3	45°50'N 3°30'W	21 Jan '78	15	6.30	23
4	62°01'N 4°21'W	20 Feb '78	0	6.45	0
5	60°30'N 6°00'W	21 Feb- 3 Mar '78	587	66.30	88
6	60°10'N 4°30'W	24-25 Feb '78	112	35.55	31
7	60°12'N 6°10'W	13-14 Mar '78	104	14.05	74
8	58°23'N 9°20'W	17-18 Mar '78	110	30.20	36
9	54°39'N 10°44'W	22 Mar '78	100	15.00	67
Total			1,028	179.45	57

For length distributions and number of collected otoliths see table II.

V - Summary

The absence of dense concentrations in the January-survey suggest that the main concentrations of adult blue whiting in this time of the year are still located N.E. of Faroe (62°30'N 4°15'W, as suggested by German observations in 1978 as well as in 1977). A lower concentration found in the Bay of Biscay (45°40'N 3°30'W) consisted of small blue whiting (mean length \pm 20 cm).

In February 2 concentrations were found. The most important one on the S.E. edge of Faroe-plateau ($62^{\circ}30'N$ $6^{\circ}00'W$) and a second one on the edge of the continental shelf west of the Shetlands ($60^{\circ}10'N$ $4^{\circ}30'W$).

In March 4 main concentrations were found; on the S.E. edge of Faroe-plateau, on the Wyville Thompson ridge ($60^{\circ}N$ $6^{\circ}25'W$), N.W. of St. Kilda ($58^{\circ}23'N$ $9^{\circ}20'W$) and N.W. of Black Rock ($54^{\circ}39'N$ $4^{\circ}30'W$).

The mean length of the caught blue whiting was generally in the range of 30-32 cm, the males being 30 and the females 32 cm (see table II).

In view of the problem concerning the age determination only preliminary results can be given here. The mean age of the Northerly caught blue whiting appeared to be in the order of 7-9 years. The approximate mean length of the 1-group seems to be 18-20 cm, of the 2-group 24-25 cm, and of the 3-group 26-27 cm. The 1-group and the majority of the 2-group were immature.

However, in the Bay of Biscay the mean length at age was considerable smaller: 1-group 14-15 cm, 2-group 17-18 cm and 3-group 20-21 cm. Up to \pm 19 cm the fish was immature and from 20 cm onwards ripe specimens were observed. Probably this concentration represents a separate population.

TABLE I - Data per haul of three cruises on Blue Whiting of each three Dutch trawlers.

Schip	Haul no.	Haul Date	Time shooting GMT	Time hauling GMT	Position shooting	Depth in m.	Towing direction	Catch in metric tons	Catch per fish. hour	Depth net in m.	Remarks
Sch 21	1	12-01-78	16.40	18.25	60°22'N 3°53'W	315	S.W.	0	0	300	0.5 ton silversmelt
Sch 108	1	12-01-78	16.45	18.00	60°20'N 4° W	325	W.S.W.	0	0	315	1 ton silversmelt
Kw 172	1	12-01-78	16.40	16.35	60°20'N 4° W	330	S.W.	0	0	325	0.5 ton silversmelt
Kw 172	2	18-01-78	00.50	01.00	50°55'N 10°50'W	170	S.E.	0	0	170	
Sch 108	2	18-01-78	00.45	01.15	50°45'N 10°50'W	215	S.E.	0	0	215	
Kw 172	3	18-01-78	15.25	15.40	48°25'N 8°50'W	215	S.E.	0	0	215	
Sch 21	2	21-01-78	09.45	10.15	45°46'N 3°35'W	185	E.S.E.	2	4	175	15 ton horsemackerel
Sch 108	3	21-01-78	09.30	11.45	45°47'N 3°37'W	170	E.S.E.	0	0	165	
Sch 21	3	21-01-78	14.30	15.00	45°38'N 3°30'W	220	W.N.W.	3	6	215	2 ton horsemackerel
Kw 172	4	21-01-78	12.00	13.00	45°50'N 3°30'W	146	E.S.E.	0	0	140	
Sch 108	4	21-01-78	12.45	13.00	45°50'N 3°30'W	145	E.S.E.	0	0	140	
Kw 172	5	21-01-78	15.00	15.45	45°40'N 3°30'W	185	W.N.W.	7	9	180	6 ton horsemackerel
Sch 108	5	21-01-78	15.00	16.15	45°38'N 3°31'W	200	W.N.W.	3	2	190	10 ton horsemackerel
Sch 302	1	20-02-78	16.15	17.15	62°03'N 4°18'W	350	S.W.	0	0	345	
Kw 122	1	20-02-78	16.00	17.15	62°00'N 4°28'W	320	S.W.	0	0	310	
IJm 36	1	20-02-78	15.00	16.00	61°50'N 4°30'W	310	E.N.E.	0	0	300	1 ton silversmelt
Kw 122	2	20-02-78	18.30	22.00	62°00'N 4°28'W	400	S.W.	0	0	380	
Sch 302	2	21-02-78	10.00	11.05	60°28'N 6°02'W	400	N.N.W.	0	0	380	
Sch 302	3	21-02-78	14.10	16.00	60°20'N 6°03'W	430	N.N.E.	1	0.5	420	
Sch 302	4	21-02-78	17.45	18.35	60°23'N 6°02'W	440	S.S.E.	7	4	420	
Kw 122	3	21-02-78	11.30	13.00	60°26'N 6° W	415	N.N.E.	14	9	390	
Kw 122	4	21-02-78	14.00	17.00	60°27'N 6° W	430	NE-SW	22	7	400	
Kw 122	5	21-02-78	18.00	20.30	60°26'N 6° W	420	S	10	4	400	
IJm 36	2	21-02-78	09.00	10.00	61° N 5°30'W	290	S.W.	0	0	275	1 ton silversmelt
IJm 36	3	21-02-78	15.00	17.00	60°30'N 6°10'W	450	E.W.	14	7	425	
Sch 302	5	22-02-78	12.30	13.15	60°24'N 5°56'W	475	W.S.W.	7	9	450	
Sch 302	6	22-02-78	14.20	17.05	60°24'N 6° W	465	N.N.E.	35	13	435	
Kw 122	6	22-02-78	12.30	18.00	60°28'N 5°58'W	440	S.S.W.-N.N.E.	25	5	420	
IJm 36	4	22-02-78	10.45	13.15	60°30'N 6° W	470	S.S.W.-N.N.E.	18	7	440	
IJm 36	5	22-02-78	15.15	17.15	60°30'N 6° W	435	S.W.	14	7	410	
Sch 302	7	24-02-78	12.45	14.05	59°56'N 5°07'W	435	E.N.E.	15	11	425	1 ton silversmelt
Sch 302	8	24-02-78	15.45	16.50	60°01'N 4°57'W	435	W.S.W.	13	12	425	
Kw 122	7	24-02-78	12.15	14.15	59°56'N 5°12'W	450	N.E.	25	13	440	
Kw 122	8	24-02-78	15.15	18.00	60°03'N 4°57'W	450	S.W.	12	4	440	
Kw 122	9	24-02-78	18.30	20.30	59°55'N 5°10'W	450	N.E.	0	0	440	
IJm 36	6	24-02-78	10.00	12.00	60°40'N 6° W	450	S.S.W.-N.N.E.	0	0	425	
IJm 36	7	24-02-78	15.00	17.30	60°30'N 6° W	450	S.S.W.-N.N.E.	12	8	425	
Sch 302	9	25-02-78	10.10	12.10	60°15'N 4°19'W	435	N.E.	2	1	425	7 ton silversmelt
Sch 302	10	25-02-78	14.30	16.25	60°15'N 4°27'W	450	S.W.	5	3	440	3 ton silversmelt
Kw 122	10	25-02-78	10.30	13.00	60°22'N 4°13'W	450	S.W.	1	0	440	5 ton silversmelt
Kw 122	11	25-02-78	14.00	17.00	60°12'N 4°25'W	490	S.W.	15	5	470	
IJm 36	8	25-02-78	10.30	12.30	60°10'N 4°30'W	460	N.E.	8	4	450	
IJm 36	9	25-02-78	13.30	15.30	60°15'N 4°25'W	460	N.E.-S.W.	4	2	450	
Sch 302	11	27-02-78	13.40	15.00	60°02'N 4°54'W	440	S.E.	0	0	435	1 ton silversmelt
Sch 302	12	27-02-78	19.30	21.30	60°21'N 6°07'W	410	N.E.	0	0	360	
Kw 122	12	27-02-78	11.30	14.30	60°12'N 4°25'W	450	S.W.	0	0	445	Net torn
Kw 122	13	27-02-78	19.00	21.00	60°19'N 6°17'W	500	E	2	1	450	
IJm 36	10	27-02-78	08.30	12.30	60°10'N 4°40'W	410	S.W.	0	0	400	
IJm 36	11	27-02-78	18.00	20.00	60°25'N 6° W	400	N.E.	0	0	350	

(continued)

TABLE I - Data per haul of three cruises on Blue Whiting of each three Dutch trawlers. (table continued)

Ship	Haul no.	Haul Date	Time shooting GMT	Time hauling GMT	Position shooting	Depth in m.	Towing direction	Catch in metric tons	Catch per fish. hour	Depth net in m.	Remarks
Sch 302	17	28-02-78	10.45	11.50	60°36'N 6°03'W	390	S.S.E.	11	10	340	
Sch 302	14	28-02-78	13.00	15.20	60°32'N 6°00'W	380	N.N.W.	35	15	370	
KW 122	14	28-02-78	10.30	12.00	60°35'N 6°03'W	455	S.S.E.	5	3	400	
KW 122	15	28-02-78	13.00	14.30	60°28'N 6°00'W	420	S.S.E.	10	7	410	
KW 122	16	28-02-78	15.45	18.00	60°25'N 5°55'W	420	N.N.W.	45	20	410	
Ijm 36	12	28-02-78	08.45	09.30	60°25'N 6°	410	S.S.W.	13	17	400	
Ijm 36	13	28-02-78	10.45	13.15	60°30'N 6°10'W	420	N.N.E.	26	10	410	
Ijm 36	14	28-02-78	14.15	16.15	60°40'N 6°	410	S.S.W.	14	7	400	
Sch 302	15	01-03-78	13.15	15.20	60°39'N 6°02'W	410	S.S.E.	23	11	370	
KW 122	17	01-03-78	15.00	18.00	60°28'N 6°	440	N.N.W.	25	8	340	
Ijm 36	15	01-03-78	09.00	12.00	60°35'N 6°	380	S.S.W.-N.N.E.	12	4	350	
Ijm 36	16	01-03-78	13.15	15.15	60°32'N 5°58'W	400	S.S.W.-N.N.E.	18	14	350	
Sch 302	16	03-03-78	11.05	12.20	60°24'N 5°57'W	390	N	24	19	380	Net torn.
Sch 302	17	03-03-78	17.15	18.00	60°26'N 5°59'W	390	N	20	27	350	
KW 122	18	03-03-78	09.45	11.45	60°25'N 5°48'W	400	N	55	28	380	
Ijm 36	17	03-03-78	09.00	10.00	60°37'N 6°	400	N.N.E.	12	12	380	
Ijm 36	18	03-03-78	11.00	13.15	60°40'N 6°	420	N.N.E.-S.S.W.	30	13	370	
Ijm 36	19	04-03-78	08.00	09.00	60°26'N 5°58'W	410	S	30	30	390	
Sch 302	18	13-03-78	11.00	12.30	60°25'N 6°	380	W.S.W.	12	8	360	
Sch 302	19	13-03-78	16.00	17.00	60°02'N 6°25'W	700	W.S.W.	3	3	400	
KW 122	19	13-03-78	16.00	18.30	60°05'N 6°20'W	600	W	4	2	400	
Ijm 36	19	13-03-78	11.00	13.00	60°25'N 6°15'W			20	10		
Ijm 36	20	13-03-78	14.00	18.00	60°25'N 6°15'W			20	7		
Sch 302	20	14-03-78	11.40	14.00	60°25'N 5°55'W	400	W.S.W.	30	13	350	
KW 122	20	14-03-78	11.00	12.45	60°23'N 5°50'W	400	W.S.W.	15	9	350	
Sch 302	21	17-03-78	14.20	15.20	58°30'N 8°20'W	315	W.S.W.	0	0	240	
Sch 302	22	17-03-78	17.10	21.45	58°33'N 8°54'W	460	W.S.W.	1	0	400	
KW 122	21	17-03-78	15.00	17.00	58°30'N 8°10'W	280	W.S.W.	0	0	240	
KW 122	22	17-03-78	18.00	24.00	58°34'N 8°45'W	550	W.S.W.	0	0	300	
Ijm 36	21	17-03-78	14.15	17.15	58°30'N 8°50'W	580	S.W.	1	0	440	
Sch 302	23	18-03-78	10.30	14.00	58°24'N 9°08'W	590	N.E.	30	9	400	
KW 122	23	18-03-78	10.45	13.00	58°19'N 9°25'W	600	N.E.	40	18	400	
KW 122	24	18-03-78	14.00	17.00	58°26'N 9°15'W	600	S.W.	3	1	400	
Ijm 36	22	18-03-78	11.00	13.00	58°20'N 9°20'W	580	N.E.	30	15	400	
Ijm 36	23	18-03-78	14.00	17.00	58°50'N 8°50'W	580	S.W.	5	2	400	
Sch 302	24	22-03-78	14.30	18.00	54°35'N 10°50'W	500	W.S.W.	25	7	400	
KW 122	25	22-03-78	14.00	18.00	54°42'N 10°37'W	575	W.S.W.	30	7	425	
KW 122	26	22-03-78	19.10	20.40	54°35'N 10°50'W	430	W.S.W.	10	7	380	
Ijm 36	24	22-03-78	14.00	18.00	54°40'N 10°40'W	520	W.S.W.	25	6	430	
Ijm 36	25	22-03-78	19.00	21.00	54°35'N 10°50'W	440	W.S.W.	10	5	370	

TABLE II - Blue Whiting Length distributions (cm below).

DATE	12-01-78	18-01-78	21-01-78	20-02-78	21/2-3/3-78	24/2-25/2-78	13-03-78	18-03-78	22-03-78
Position NB	60°20'	48°25'	45°50'	62°01'	60°30'	60°10'	60°12'	58°23'	54°39'
WL	04°00'	08°50'	03°30'	04°21'	06°00'	04°30'	06°10'	09°20'	10°44'
Number per kg	3.48	-	4.14		5.55	7.43	5.56	5.38	7.03
Total catch (m.ton)	0	0	15	0	589	100	104	110	100
Maturity stage	spent	juvenile	juv.+rip.	juv.+rip.	ripening	juv.+rip.	ripening	ripening	spent
♂(m) or ♀(f)	m+f	m+f	m+f	m+f	m+f	m+f	m	m	m
12			21						
13		5	48	1	1	2			1
14		18	18	6		7			
15		15	9	7		5			
16		6	6	5		7			
17		3	7	4		2			
18		1	11	1		7			2
19			16	1		7			1
20			6	1		4			
21			5	3		1			
22			2			8			
23			2			4			
24			3			1			
25			1			7			
26						4			
27						5			
28						8			
29						34			
30	1					54			
31	2					65			
32	1					81			
33	5					90			
34	4					86			
35	3					58			
36	4					51			
37	4					30			
38	1					12			
39	4					8			
40	3					6			
41	4					1			
42	4					1			
43	1					1			
TOTAL	31	48	153	52	754	532	152 120	78 63	25 130
NUMBER OF OTOLITHS TAKEN	25	11	34	-	50	63	69	36	38

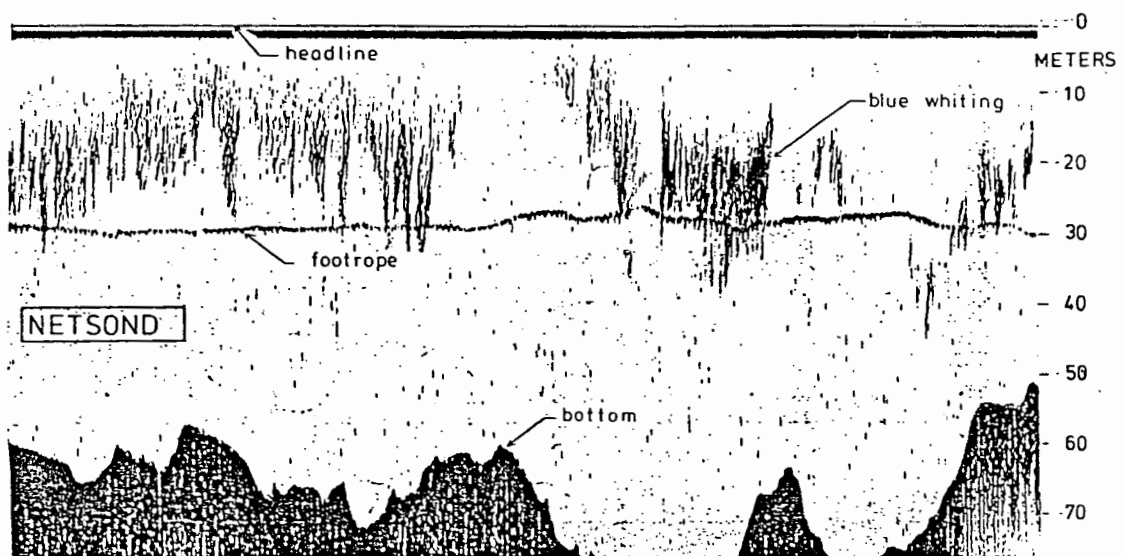
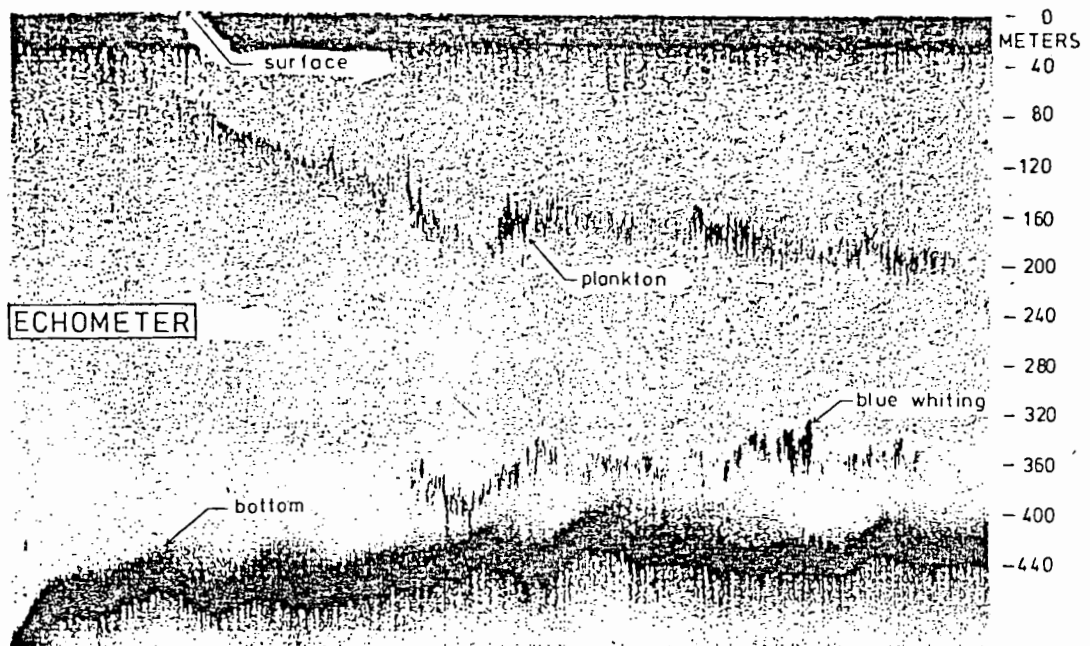


FIGURE 1.

Recordings of echometer and netsond on the "SCH 302"

POSITION: 60°34'N 6°01'W

DATE: 28 febr. 1978

CATCH: 11 m. tons blue whiting

09.45-10.50 GMT.

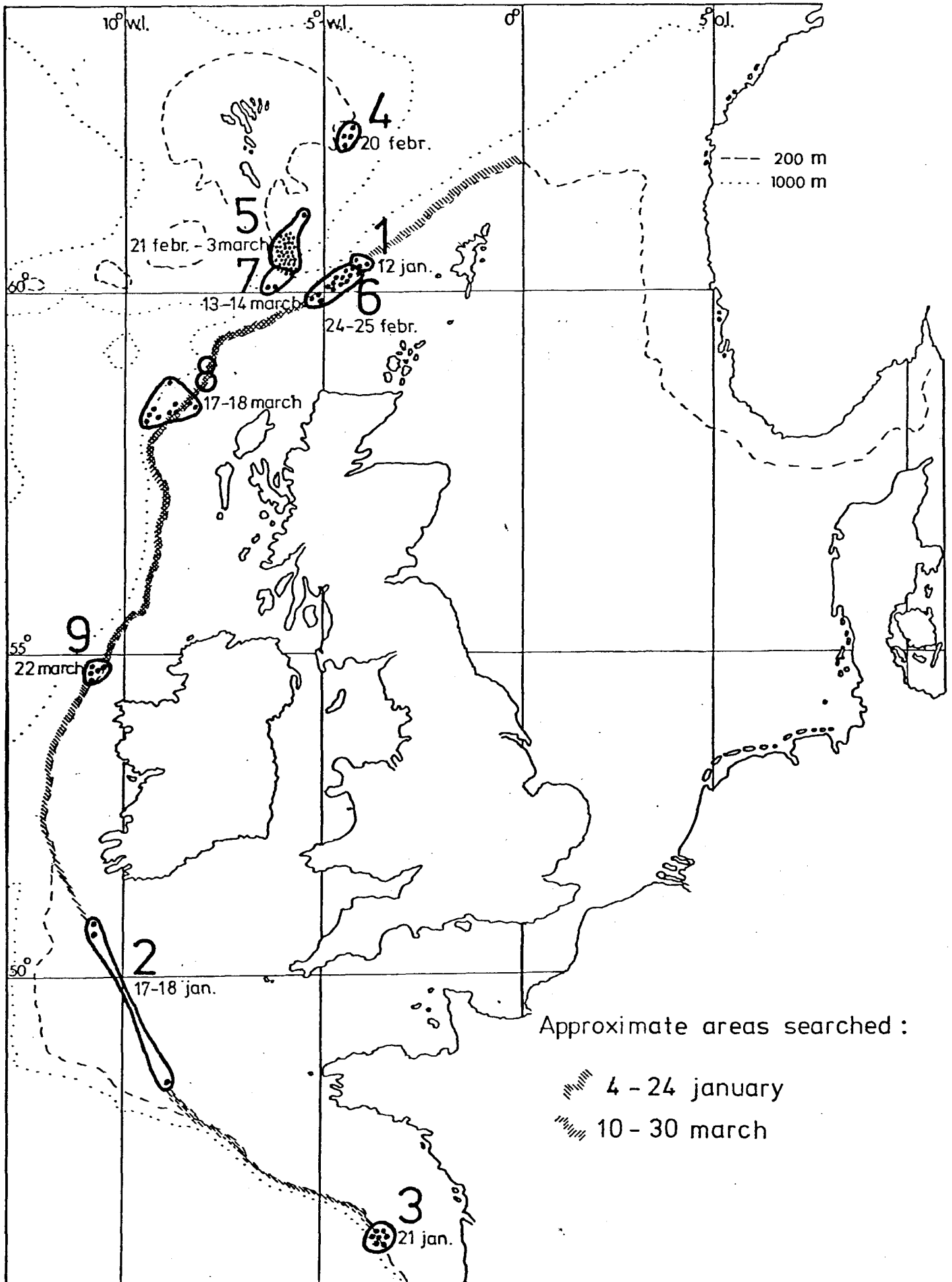


FIGURE 2. Shooting positions and time/area subdivision.