

PELAGIC FISH (NORTHERN) COMMITTEE

by K. Popp Madsen

1972

Belgium

(P. Hovart & R. De Clerck)



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A study on the mackerel population along the Belgian coast was carried out in August.

On a monthly basis the sprat population on the Belgian coast was studied by means of research vessel catches.

Canada

(S.H. Tibbo)

Herring

Total landings of the mobile herring fleet in Newfoundland in 1971-1972 were about 50 000 metric tons, about one quarter of the record 1969-1970 landings. The large decrease is attributed partly to severe ice and weather conditions, but in addition there has been no substantial recruitment recently to bolster the diminishing southwest Newfoundland herring stocks.

Mobile fleet landings in the Gulf of St Lawrence and Chedabucto Bay in 1972 were 33 902 and 26 500 metric tons, only about 26% and 50% respectively of the 1971 landings. The New Brunswick weir and purse seine fishery landed almost 4.5 times as many herring (56 000 tons) as in 1971. Southwest Nova Scotia landings increased by 25% to 62 000 tons (excluding gill net catches estimated to be between 5 000-10 000 tons).

Tag returns from an experiment in northwestern Newfoundland occurred in the southern part of the Gulf of St Lawrence and in southwestern Newfoundland.

Studies of biological characteristics and tag returns within Fortune Bay support the hypothesis that the spring-spawning herring in Fortune Bay, southern Newfoundland, are a relatively discrete stock with sharp differences from the spring-spawning component westward along the south coast of Newfoundland.

Studies of infestation levels of larval nematodes (Anisakis) in herring show substantial differences between the northern Scotian Shelf and the southwest Newfoundland-southern Gulf of St Lawrence stock complex.

The herring programme at the St Andrews Station was directed largely towards obtaining fisheries information and providing scientific advice required to formulate management proposals. Research was directed to the problems of stock identification and larval movements in the Bay of

Fundy. Detailed biological data (length, weight, age, sex and maturity) were collected from over 20 000 herring and over 6 800 herring were used for meristic studies (vertebrae and dorsal, pectoral and anal fin ray counts).

Two additional enzyme systems have been added to those already used as genetic markers to delineate herring stocks : leucine aminopeptidase and glucose-6-phosphate dehydrogenase.

Genotypic and phenotypic studies of 56 herring population samples indicate that herring stocks from Europe to Newfoundland to Virginia all have a common gene pool for muscle and heart enzymes. Genetically based blood protein and enzyme systems, however, may be able to isolate herring populations by biochemical means.

In a feeding study, raw or hydrogenated herring oil had no adverse effect on the hearts of weaned rats after 4 weeks as a graduated replacement for other fats. Analytical methods were also developed for the detailed study of the fatty acid composition of hydrogenated marine oils in edible oil products.

Mackerel.

A good 1967 year class resulted in a large increase in mackerel abundance in Newfoundland and Labrador coastal areas.

In August 1 450 mackerel were tagged in northeastern Newfoundland coastal waters. A subsequent recapture in December by a Polish vessel fishing on the southern part of Georges Bank indicates long distance migration.

Studies aimed at increasing the market potential for Atlantic species of fatty fish are now under way. These include an investigation of the mechanism by which rancidity develops in the dark and light muscle of mackerel and its affect on the quality and shelf-life of fresh, frozen and processed mackerel products, plus an investigation of the catalytic effects of lipases and lipoxidases and the role of natural and added antioxidants.

Capelin

Exploratory fishing with midwater trawlers and purse seiners in the Grand Bank, eastern Newfoundland, and Labrador regions indicated that an annual capelin fishery is possible during the offshore spawning season in summer and in the post-spawning period in the northern areas.

Barracudina

Barracudina oils and waxes have the same chemical qualities and could replace sperm whale oil required by the cosmetic, luxury candle and high pressure lubricant industries. Barracudina are not utilised at the present time and are relatively unknown to fishermen because they appear at the mid-water level where trawling is relatively new and still experimental. Substantial barracudina resources have been found in the Gulf of St Lawrence.

Publications

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Sampling

Mackerel

Area	Type of Fish	No. of Samples		No. of Fish	
		Research	Commercial	Measured	Aged
Eastern Nfld.	Adults	-	12	1 500	600
Southeast Nfld.	Adults	4	4	400	400
Western Nfld.	Juveniles	-	4	200	200
Northern Nfld.	Adults	-	4	200	200
Gulf of St Lawrence	Adults	8	8	926	120

Herring

Area	Type of Fish	No. of Samples		No. of Fish	
		Research	Commercial	Measured	Aged
Eastern Nfld.	Adults	21	48	8 337	3 450
Southeast Nfld.	Adults	13	100	12 350	5 650
Southwest Nfld.	Adults	1	53	6 150	2 700
Western Nfld.	Adults	2	51	2 850	2 650
Northern Nfld.	Adults	12	32	2 200	2 200
Gulf of St Lawrence	Adults	54	15	7 497	1 589
Chedabucto Bay	Adults	31	20	8 030	2 292
Southwest Nova Scotia	Mixed ^{x)}	72	54	20 516	6 671
Bay of Fundy-Gulf of Maine	Mixed ^{x)}	81	62	20 617	10 546

^{x)} A substantial proportion of these fish were < 2 years old.

Capelin

Area	Type of Fish	No. of Samples		No. of Fish	
		Research	Commercial	Measured	Aged
Offshore Banks (Nfld)	Adults	31	-	2 210	2 210
Inshore (Nfld)	Adults	8	-	550	550

TAGGING:

HERRING

<u>Area</u>	<u>Season</u>	<u>Type of Tags</u>	<u>No. Tagged</u>	<u>Type of Fish</u>	<u>Recoveries</u>
Southwestern Nfld.	Winter	External anchor	500	Adult	13
		External dart	3 000	Adult	68
		Internal	8 900	Adult	689
Southeastern Nfld.	Spring	External anchor	2 500	Adult	182
		External dart	3 000	Adult	94
		Internal	6 000	Adult	178
Eastern Nfld.	Spring	External anchor	4 500	Adult	9
		External dart	4 500	Adult	4
		Internal	14 500	Adult	1
Northeastern Nfld.	Summer	External anchor	750	Adult	0
		External dart	750	Adult	5
<u>MACKEREL</u>					
Northeastern Nfld.	Summer	External anchor	750	Adult	0
		External dart	750	Adult	5

Vessel	Area	Season	Objectives
"Marinus"	Southwest Newfoundland	Winter(January)	Herring tagging
"Cape Freels"	Southwest Newfoundland	Winter(January)	Echo-sounder survey for herring; hydrography
"A.T. Cameron"	Southwest Newfoundland	Winter(February)	Echo-sounder survey for herring; hydrography
"Marinus"	Fortune Bay, Newfoundland	Spring (April)	Herring tagging
"Marinus"	Eastern Newfoundland	Spring (May-June)	Herring tagging
"E.E. Prince"	Strait of Belle Isle, northern Gulf of St Lawrence	Autumn(October)	Echo-sounder, midwater-trawling and driftnet survey for herring
"Marinus"	Southern Newfoundland	Autumn (Nov.-Dec.)	Echo-sounder and gillnet survey for herring,hydrography
"E.E. Prince"	Bay of Fundy	Spring (April)	Herring larval survey
"Harengus"	Bay of Fundy	Autumn (September)	Herring larval survey
"E.E. Prince"	Bay of Fundy	Autumn (November)	Herring larval survey
"Harengus"	Gulf of St Lawrence	Summer (June)	Distribution and abundance mackerel eggs

Research Vessel Cruises - Pelagic Fishes - 1972

Denmark

(K. Popp Madsen)

Herring

The RV "DANA" participated in the international Young Herring Surveys in February 1972 and in herring larval surveys in September-October.

Tagging of herring has been carried out in the Sound in October.

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research	Market	Measured	Aged	Examined Racially
West of Shetland (02)	Jan-March	Immat.		3	133		
		Adults		1	118	118	118
	Jul-Sept.	immat.		1	30	30	
		adults		4	268	268	231
	Oct-Dec.	adults		7	379	379	213
NW North Sea (03)	Jan-March	immat.		9	122	76	
		adults		1	202	202	202
	Apr-June	immat.		4	53	53	
		adults		1	243	98	98
	Jul-Sept.	immat.		7	368	368	
		adults		1	96	96	96
	Oct-Dec.	immat.		7	313	313	313
		adults		2	291	291	291
NE North Sea (04)	Jan-March	immat.	2		25	23	23
		adults		2	224	224	224
	June	adults		1	107	107	107
	July	immat.		3	101	101	
		adults		2	200	200	200
Skager-rak (05)	Dec.	adults		1	122	122	122
	Jan-March	immat.		19	460	87	
	Apr.-June	immat.		26	608	606	
	Jul-Sept.	immat.		28	981	981	
		adults		1	105	105	105
S. Buchan (08)	Oct-Dec.	immat.		20	374	374	
	Jan-March	immat.		4	68		
Central North Sea (09)	Jul-Sept.	immat.		2	44	44	
	Jan-March	immat.	11	114	9969	3820	704
	Apr-June	immat.		5	131	131	
	Jul-Sept.	immat.		84	3905	3905	
Kattegat	Oct-Dec.	immat.		40	1863	1863	
	Jan-March	immat.		23	1083	433	
	Apr-June	immat.		18	895	884	
	Jul-Sept.	immat.		22	1592	1592	
Eastern Baltic	Oct-Dec.	immat.		12	729	729	
	Jan-March	immat.		8	529	30	
	Apr.-June	immat.		4	348	348	
Inner Danish Waters	Oct-Dec.	immat.		10	764	764	
	Nov.	adults		1	121	121	121
		immat.		3	11	11	11

Sprat

Sampling

Area	Season	Type of Fish	No. of samples		No. of fish		
			Research	Market	Measured	Aged	Examined Racially
W. of Shetland (02)	Febr.	immat.		1	2		
NW North Sea (03)	Jan-Mar.	immat.		6	30		
	Apr.	immat.		1	4		
	Sept.	immat.		1	1		
Skagerrak (05)	Jan-Mar.	immat.		15	1039	293	
	Apr-Jun.	immat.		4	423		
	Jul.	immat.		1	2		
	Oct-Dec.	immat.		8	81		
S. Buchan (08)	Jan-Mar.	immat.		3	11		
	Aug.	immat.		1	10		
Central North Sea (09)	Jan-Mar.	immat.	11	100	6992		
	Apr-Jun.	immat.		7	100		
	Jul-Sep.	immat.		44	1613		
	Oct-Dec.	immat.		23	1305		
Kattegat	Jan-Mar.	immat.		19	1211		
	Apr-Jun.	immat.		12	509		
	Jul-Sep.	immat.		8	231		
	Oct-Dec.	immat.		10	1116		
Eastern Baltic	Jan-Mar.	immat.		4	203		
	Apr-Jun.	immat.		4	392		
	Oct-Dec.	immat.		6	507		
Inner Danish Waters	Nov.	immat.		10	1025	1025	1025

Mackerel

Sampling

Area	Season	Type of Fish	No. of samples		No. of fish		
			Research	Market	Measured	Aged	Examined Racially
W. of Shetland (02)	Sept.	Adults		3	15		
	Oct.	adults		1	2		
NW North Sea (03)	Jan-Mar.	adults		3	23		
	Apr.	adults		1	16		
	Aug.	adults		3	10		
	Dec.	adults		1	1		
NE North Sea (04)	Jul.	adults		2	20		
Skagerrak (05)	Jul.	adults		1	2		
Central North Sea (09)	Jan-Mar.	adults		3	12		
	Apr-Jun.	adults		2	4		
	Jul-Sep.	adults		3	7		
	Oct-Dec.	adults		2	2		
Kattegat	Jan.	adults		1	1		
	Jun.	adults		1	3		
	Jul-Sep.	adults		3	8		

Federal Republic of Germany

(K. Schubert)

Herring

Sampling

Area	Season	Type of Fish x)	No. of Samples Research		No. of Fish measured	No. of Fish aged	No. of Fish examined racially
			Vessel	Market			
S-North Sea (12)	Jan.	1,2,7,8	1	-	100	100	100
NW-North Sea (03)	Febr.	1,2,3,8	3	-	257	147	147
S-Buchan (08)	"	1,2,3,8	3	-	271	98	98
Central North Sea (09)	"	1,2,3,8	10	-	4099	723	723
Central North Sea (09)	Nov.	1,2	2	-	200	200	200
Hebrides (01)	July	2,3,4,5	-	1	302	100	100
	Aug.	3,4,5	-	1	162	100	100
	Sept.	2,4,5,7,8	-	2	82	82	82
	Oct.	2,3,4,5,6,7,8	-	4	299	299	299
	Nov.	2,4,5,7,8	-	2	1042	172	172
W of Shetland (02)	Oct.	1,2,6,7	-	1	150	150	150

x) stage of maturity

Research Vessel Surveys

Area	Season	Objectives
S-Buchan (08)	2.-16.2.72	Young herring
NW-North Sea (03)		
Central North Sea (09)		

Finland

No report received.

France

(A. Maucorps)

Hareng

Echantillonnage

Région	Saison (mois)	Genre de Poisson	Nb. échantillons		Nb. de Poissons ^{x)}		
			Bateau de recherche	Marché	mesurés	dont âge déterminé	classés suivant race
IVc + VIId (12)	XI.72	adultes	-	3	-	257	-
IVc + VIId	XII.72	géné- teurs	-	6	1 077	270	-

Aucune recherche à la mer n'a été effectuée en 1972.

(^x) taille, poids, âge, maturité sexuelle, vertèbres).

Iceland

(J. Jakobsson)

Blue Whiting

Sampling

Area	Season	Type of Fish	No. of Samples		No. of Fish	
			Research Vessel	Market	measured	aged
Norv. Sea	Summer	Adult	5	-	500	500

Research Vessel Surveys

Area	Season	Objectives
Norwegian Sea	20.5 - 16.6.	Blue whiting survey

In addition the Icelandic research vessels participated in the international O-group survey in the Iceland-Greenland areas.

Herring
Sampling

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Fishing Vessel	measured	aged	examined racially
Iceland S.C.	Winter	Mixed	5	4	905	867	867
"	Summer	Mixed	-	3	212	205	205
"	Autumn	Mixed	3	2	459	453	453
Shetland Orkney	Summer/Autumn	Adult	3	24	2 600	2 539	2 539

Tagging

Area	Season	Type of Tags	No. Tagged	Type of Fish	Recoveries
15 n.m.E of H-Rona	Summer 22 July	Internal 1248751-1249700	950	Adult	38

Research Vessel Surveys

Area	Season	Objectives
Norw.Sea-Shetl.-Hebr.	23.6 - 25.7	Herring and environm.survey
Shetl.-Orkn.-Hebr.	5.9 - 1.10	Herring and larval survey
Shetl.-Orkney	16.10 -18.11	Herring survey
S.E.-Icel.&Norw.Sea	27.11 - 9.12	Herring survey

Capelin
Sampling

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Fishing Vessel	measured	aged	examined racially
Iceland	Winter	Adult & Recruit	31	20	5 000	5 000	-

Research Vessel Surveys

Area	Season	Objectives
N,E,SE Iceland	7.1 - 28.1	Capelin Survey
E,S-Iceland	2.2 - 20.2	Capelin Survey
S-Iceland	24.2 - 4.3	Capelin Survey
E, SE-Iceland	12.3 - 28.3	Capelin Survey
E, N-Iceland	10.4 - 20.4	Capelin Survey

Ireland
(J. Molloy)

Herring
Sampling

Sampling was continued on herring stocks along all coasts of Ireland along the same lines as previous years. Details of areas and numbers examined are given in the following table.

Area	Season	Type of fish	No. of samples		No of fish measured	No of fish aged	No of fish examined racially
			R. Vessel	Market			
N.W. Ireland	I - XII	Adult		40	2 900	2 900	3 930
W. Ireland	I - III	Adult		14	620	1 400	1 400
S.W. Ireland	IX - X	Adult		2	219	219	219
S. Ireland	I, II, XI, XII	Spawners		28	895	2,196	2 196
E. Ireland	IX - XI	Immature and Spawners		21	2 863	2 528	498

Research Vessel Surveys

Area	Season	Objectives
S. Ireland	VI	Young herring surveys
E. Ireland	VII - IX	do
N.W. Ireland	VII	do
W. Ireland	VII	do

Netherlands
(A. Corten)

Mackerel

Sampling

Area	Season	Type of Fish	No. of samples		No. of Fish	
			Market	Research Ship	Measured	Aged
Northern North Sea	Jan-Dec	Immat. & Adult	8	0	2 200	400
N.E. North Sea	Apr-Dec	" "	2	0	400	100
N.W. North Sea	June	" "	0	0	50	0
Central North Sea	Apr-Dec	" "	1	0	850	50
Southern North Sea	Apr-Dec	" "	7	0	2 100	350
Channel	Dec	" "	0	0	60	0
South Ireland	May-Nov	" "	3	0	950	150
North Ireland	June-Nov	" "	0	0	280	0

Tagging

Area	Season	No. tagged	Tag type	Recoveries
Channel	May-June	400	Floy	1
Southern North Sea	Aug-Sept	1 500	Floy	4

Research Vessel Cruises

Area	Season	Objectives
Engl. Channel	May - June	Serology, parasitology and tagging
Southern North Sea	Aug - Sept	Tagging

Herring
Sampling

Area (ICES 27.3.01.00 Herring)	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
(01) Hebrides	Autumn	Adult	-	15	± 3 200	750	750
(02) W. of Shetland	Summer	Adult	-	3	± 500	150	150
(03) N.W. North Sea	Spring	Adult	-	2	± 400	100	-
(04) N.E. North Sea	Winter/Spring	Adult	-	3	± 500	150	-
(06) N.W. of Ireland	Summer	Adult	-	6	± 1 100	300	300
(09) Central North Sea	All year	Adult	-	13	± 1 350	650	-
(09) Central North Sea	Autumn	Spawning	-	32	± 5 800	1 600	1 600
(10) W. of Ireland	Summer	Adult	-	2	± 400	100	100
(12) S. North Sea	Autumn/Winter	Adult	-	11	± 2 000	550	-
(12) S. North Sea	Autumn/Winter	Spawning	-	17	± 3 100	850	850
(13) S. of Ireland	Summer/Autumn	Adult	-	10	± 1 800	500	400
(13) S. of Ireland	Winter	Spawning	-	4	± 700	200	100
North Sea (Intern. Young Herring Survey)	Winter	Immatures	18	-	± 3 600	900	900
Total			18	118	± 24 450	6 800	5 150

Research Vessel Survey

Area	Month	Objectives
North Sea	February	Young herring survey
Central North Sea	October	Herring larvae
S. North Sea and Channel	Jan. and Dec.	Herring larvae
S. North Sea	March & May	Herring larvae
Central North Sea	September	Herring larvae
Central North Sea	18 Sept-29 Sept.	Herring larvae

Publications

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north-eastern North Sea in the period 1959-1969. Journal du Conseil
34 (3):455-465.

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Postuma, K.H., 1972. Het haringseizoen 1971 en de vooruitzichten voor het seizoen 1972. Visserij, 25 (4):248-255.

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Norway
(O. Dragesund)

Sampling
Blue Whiting

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Norwegian Sea	Throughout the year	Adults & Immat.	17	44	4 956	-	-
North Sea-Norw. Coast	"	"	46	84	11 285	797	-
Brit. West Coast	March-May	"	30	-	3 999	1040	-

Research Vessel Surveys

Area	Season	Objectives
Brit. West Coast	28.2. - 28.3.	Blue Whiting Survey
Norwegian Sea	8.7. - 17.7.	Blue Whiting Survey
North Sea	22.6. - 16.7.	Demersal and Pelagic Fish Survey
North Sea	26.9. - 12.10.	"

Publications

Jakupsstovu, S.H. and Middtun, L., 1972. Blue Whiting surveys northeast of the British Isles in February-March 1972. Fiskets Gang, 58:428-433.

Hamre, J., Jakupsstovu, S.H. and Nakken, O., 1972. Report on Blue Whiting fishing experiments in April-May 1972. Fiskets Gang, 58:689-696.

Sampling

Polar Cod

Area	Season Quarters	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Barents Sea	1	Adult Spawners Immature	1	-	194	-	-
	2	"	19	-	2 149	1 709	-
	3	"	23	-	1 912	1 326	-
	4	"	2	-	138	138	-

Research Vessel Surveys

Area	Season	Objectives
Barents Sea	March	Distribution
Barents Sea	May-June	Distribution, Sampling
Barents Sea	Aug.-Sept.	Stock Size, Distribution, Behaviour, Sampling
Barents Sea	Nov.-Dec.	Distribution

Publications

Dragesund, O. and Nakken, O., 1972. Lodde- og polartorskundersøkelser i Barentshavet i august-september 1971. Fiskets Gang, 58:145-148.

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Sampling

Herring

Area	Season Quarters	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Skagerak/ North Sea		Adult Spawners Immature					
02	1	"	-	2	200	200	93
02	2	"	-	2	200	200	-
02	3	"	-	3	300	292	95
02	4	"	-	1	100	100	91
03	1	"	5	1	590	590	193
03	3	"	2	3	500	487	329
04	1	"	1	1	122	122	100
04	2	"	1	-	47	45	44
05	1	"	-	1	100	100	96
05	2	"	1	-	100	100	92
05	3	"	-	1	91	88	-
05	4	"	1	-	100	100	-
06	3	"	-	1	100	100	-
09	1	"	7	4	896	846	292
North Sea	1-4	"	-	469 ^x)	ca. 30 000	-	-
Norwegian West Coast	Winter/ Spring	Spawners	2	7	875	856	-
Northern Norway	Autumn	Immature	56		4 595	4 500	-

^x) Samples obtained from oil- and meal factories.

Research Vessel Surveys

Area	Season	Objectives
Norwegian West Coast	Jan.-Feb.	Spawning Migration of the Norwegian Herring
North Sea	February	Young Herring Survey
Norwegian West Coast	April	Larval Survey
Norwegian Sea	June-July	Herring Migration
Barents Sea-West Spitsbergen	Aug.-Sept.	O-Group Fish Survey
Skagerak-North Sea	Sept.-Oct.	Fish Survey

Publications

- Bakken, E., Chakraborty, D., George, K.C. and Østvedt, O.J., 1972. Estimation of fish abundance by acoustics during the North Sea Young Herring Survey 1972. C.M.1972/H:10 (mimeo).
- Dahl, O. and Dragesund O., 1972. Norwegian herring investigations in 1971, the mature herring. Annales Biologiques 28.
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- Dahl, O. and Østvedt, O.J., 1972. The Norwegian fisheries in the North Sea and Skagerak 1971. Annales Biologiques, 28.
- Dragesund, O. and Ulltang, O., 1972. The collapse of the Norwegian spring spawning herring stock. C.M. 1972/H:11 (mimeo).

Sampling

Sprat (*Clupea sprattus*)

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Fjords of Western Norway	Spring	I-group	5	-	800	200	-
	Autumn	O-group	22	-	3 170	age from length frequency modes	-
North Sea	Spring		10	-	1 230	-	-

Research Vessel Surveys

Area	Season	Objectives
Fjords of Western Norway	Autumn	Distribution, relative abundance, acoustic survey
North Sea	Spring	Fish distribution

Publications

- Bakken, E., 1973. Målinger av brislingmengde med ekkointegrator i vestnorske fjorder høsten 1972. (Abundance estimates of sprat (*Clupea sprattus*) by echo integrator in fjords of western Norway in autumn 1972). Fiskets Gang, 59:146-153.

Sampling

Mackerel

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market ^x	Measured	Aged	Examined Racially
Shetland/ North Sea Skagerak	January October	All	-	676	36 706	-	-
Shetland	August Sept.	All	-	6	600	600	-
W. of Rona	March	All	-	2	200	200	-
West of the British Isles	May	All	11	-	862	348	-
North Sea/ Skagerak	January/ October	All	-	34	2 971	2 971	-

x) Samples obtained from the Fish Co-operative and meal and oil factories.

Tagging

Area	Season	Type of Tags	No. Tagged	Type of Fish	Recoveries
SW-W. of Ireland, W. of Shetland	May	Intern. steel	5 086	Adult	23
North Sea- Skagerak	Jul./ Aug.	Intern. steel	11 818	Adult	174

Research Vessel Surveys

Area	Season	Objectives
North Sea	February	Echo-survey of mackerel, other pelagic and demersal species, Hydrography
North Sea, W. Skagerak	April	Echo-survey of mackerel, Hydrography
W. of the British Isles	May/primo June	Mackerel taggings
East-Iceland, Faroes, Shetland, Northern North Sea	June-July	Plankton, egg-larvae survey, blue whiting survey, Hydrography
North Sea, Skagerak	July-August	Mackerel tagging
North Sea, Skagerak, W. of Orkneys-Shetland	Sept.-Oct.	Echo-survey of mackerel and other pelagic and demersal species. Hydrography

Sampling

Capelin

Area	Season Quarters	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Barents Sea	1	Immature	2	-	519	-	-
Barents Sea	1	Spawners	13	29	7 748	2 214	-
Grand Banks, Newfoundland	2	Mixed	42	-	6 465	1 622	-
Barents Sea	2	Mixed	27	-	2 465	152	-
Barents Sea	3	Mixed ^{x)}	127	-	14 095	2 079	-
Barents Sea	4	Mixed	17	-	3 469	508	-

^{x)} 0-group included

Tagging

Area	Season Quarters	Type of Tags	No. Tagged	Type of Fish	No. of Recoveries
Barents Sea	1	Internal	5 100	Spawners	344
Barents Sea	3	Internal	10 000	Immature	9

Research Vessel Surveys

Area	Season Quarters	Objectives
Barents Sea	1	Distribution, spawning, migration and tagging
Finmark Coast	1 & 2	Distribution, spawning, migration and tagging
Finmark Coast	2	Distribution of spawning capelin and capelin eggs. Study of spawning behaviour
Finmark Coast	2	Distribution of larvae
Newfoundland	2	Distribution & abundance
Barents Sea ^{x)}	3	Distribution & abundance
Barents Sea ^{x)}	3	Tagging
Barents Sea ^{x)}	3	0-group survey
Barents Sea	4	Distribution & abundance

^{x)} 2 vessels

Publications

- Bjørke, H., Gjøsæter, J. and Sætre, R., 1972. Undersøkelser på loddas gytefelt i 1972. (Investigations at the spawning grounds of capelin in 1972) Fiskets Gang, 58:710-716.
- Blindheim, J. and Monstad, T., 1972. Loddeinnsiget i 1972 (The spawning migration of capelin in 1972). Fiskets Gang, 58:519-524.
- Dragesund, O. and Monstad, T., 1972. Observations on capelin (Mallotus villosus) in Newfoundland waters. C.M. 1972/H:12 (mimeo).
- Gjøsæter, J., 1972. Recruitment of Barents Sea capelin 1951-1961. C.M. 1972/H:24 (mimeo).
- Gjøsæter, J., Midttun, L., Monstad, T., Nakken, O., Smedstad, O.M., Sætre, R. and Ulltang, O., 1972. Undersøkelser av fiskeforekomster i Barentshavet og ved Spitsbergen i august-september 1972. (Investigations on fish distribution and abundance in the Barents Sea and off Spitsbergen in August-September 1972). Fiskets Gang, 58:1010-1021.
- Midttun, L. and Nakken, O., 1972. Application of acoustic stock abundance estimation on capelin and blue whiting. C.M. 1972/B:16 (mimeo).

Poland

(J.Popiel)

Sampling

Herring

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially x)
Baltic	Spring	Immature	-	4	1 371	200	200
	Spring	Spawning	-	11	3 891	1 100	1 100
	Autumn						
North Sea	Spring	Feeding	-	38	25 076	3 800	3 800
	Summer						
	Autumn						
W. of British Isles			48	-	17 519	4 800	4 800
			27	-	20 968	2 700	2 700

Sampling

Sprat

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Baltic			-	22	39 348	2 150	-

x) Maturity, type of otolith

Sampling
Mackerel

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
North Sea W. of British Isles			-	15	12 746	1 496	-

Research Vessel Surveys

Area	Season	Objectives
North Sea	September-October	Herring larvae, Hydrography

Portugal
(J. de Ataide)

No research has been done in the northern area in 1972.

Spain
(O. Cendrero)

Aucun travail n'a été fait durant 1972.

Sweden
(H. Ackefors)

Sampling
Herring

K = Kattegat

Area	Season (Months)	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
K	I-II	Immature	11	-	2 919	985	985
K	III-V	Adult	-	4	1 356	350	350
K	VI-VIII	Adult	-	10	2 599	663	663
K	IX-XII	Immat. & Adult	7	ad. 8	4 081	1 025	1 025
K	I-XII		18	22	10 955	3 023	3 023

S = The Sound
Sk = Skagerak

Area	Season (Months)	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
S	I-II	Adult	-	2	71	200	200
S	III-V	Adult	-	1	98	100	100
S	VI-VIII	-	-	-	-	-	-
S	IX-XII	-	-	-	-	-	-
S	I-XII		-	3	169	300	300
Sk	I-II	Imm.&Adult	8	ad. 3	1 061	909	909
Sk	III-V	Adult	-	5	613	378	378
Sk	VI-VIII	-	-	-	-	-	-
Sk	IX-XII	Adult	-	7	1 065	629	629
Sk	I-XII		8	15	2 739	1 916	1 916

Research Vessel Surveys

Area	Season	Objectives
Kattegat-Skagerak	Winter (7.2.-3.3.)	Young Herring Survey (ICES)
Kattegat	Autumn 9.9. -27.10)	Adult and Immature Herring

Sampling

Sprat

Area	Season (Months)	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Inner Skagerak	I-III	Adults	3	5	4 251	1 147	-
	IX-XII	Adults	-	11	6 797	1 499	-
Skagerak	I-III	Adults	4	-	1 041	495	-
	IX-XII	Adults	1	1	388	275	-
Kattegat	I-III	Adults	9	-	3 113	1 295	-
	IX-XII	Adults	2	12	7 417	2 241	-
Baltic	I-III	Adults	-	2	1 743	300	-
	IX-XII	Adults	4	2	1 223	654	-

Sampling

Mackerel

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Inner Skagerak	June	Spawners	6	-	673	608	-

Research Vessel Surveys

Area	Season	Objectives
Inner Skagerak	January	Investigations on sprat stocks (trawling)
Inner Skagerak	June	Investigations on mackerel stocks (trolling and hook)

Sampling

Baltic Herring

Area	Season (Months)	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially ^{x)}
Bothnian Bay	III-IV	Adults & Immature	1	1	1 017	345	345
Bothnian Sea	IV-VI	Spawners	8	4	7 936	2 115	2 115
Åland Sea	IV-VI	Spawners	3	1	3 092	765	765
Northern and Central Baltic proper	II-VI	Adults & Spawners, Immature	2	11	8 916	2 180	2 180
"	IX-XI	Adults	2	-	344	286	286
Southern Baltic proper	II-V	Adults Spawners Immature	-	7	4 429	1 195	1 195
"	XI-XII	Adults	6	-	508	508	508

x) approximate figures

Tagging

Area	Season	Type of Tags	No. Tagged	Type of Fish	Recoveries (1.3.1973)
Southern Bothnian Sea	23.5.- 1.6.	Lea	1 850	Spawners	42
Åland Sea	25.5.	Lea	350	Spawners	4

United Kingdom

1. England and Wales (A.C. Burd)

Sampling

Herring

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Central North Sea	Jan-Mar	Immat.	17	-	2 897	1 182	1 182
	Apr-Jun	Imnat.	2	-	318	108	108
	Jul-Sept	Adults	-	1	269	170	170
	Oct-Dec	Immat.& Adults	3	-	471	274	274
S. North Sea (River Blackwater)	Jan-Mar	Adults	-	7	1 501	700	700
	Jul-Sept	Immat.& Adults	-	1	244	100	100
	Jul-Sept	Immat.& Adults	-	5	5 486	429	429
Irish Sea	Oct-Dec	Adults	-	7	1 697	97	97
	Jan-Mar	Adults	-	2	262	200	200
West Channel	Oct-Dec	Adults	-	1	144	100	100
	Apr-Jun	Immat & Adults	-	1	215	100	100
West of Scotland	Jul-Sept	Immat.& Adults	-	5	671	493	493

Tagging

Area	Season	Type of Tags	No. Tagged	Type of Fish	Recoveries
Southern North Sea (River Blackwater)	Spring	Hydrostatic	1 000	Adults	26

Research Vessel Surveys

Area	Season	Objectives
North Sea	Spring	ICES Young Herring Survey
Southern North Sea	Spring	ICES Herring Larval Survey
Central North Sea	Autumn	ICES Herring Larval Survey
Shetland	Autumn	ICES Herring Larval Survey
East Coast of England	Summer	O-Group Herring Survey

Other research activities : A total of 88 ovaries were taken from herring for fecundity studies.

Sampling
Mackerel

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
West Channel	Jan-Mar	Immat. & Adults	-	6	883	466	466
	Apr-Jun	Immat. & Adults	1	4	478	471	471
	Jul-Sept	Adults	-	6	778	538	538
	Oct-Dec	Immat. & Adults	-	13	1 310	933	1 031
Central North Sea	Jul-Sept	Adults	1	-	168	60	60

Tagging

Area	Season	Type of Tags	No. Tagged	Type of Fish	Recoveries
West Channel	Autumn	Hydrostatic	3 153	Adults	5

Other research activities: A total of 87 fish were examined for fat and moisture content.

Sampling
Sprat

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Central North Sea	Jan-Mar	Mixture of immat. & adults	7	9	5 918	1 205	400
	Apr-Jun	Mainly adults	2	-	658	149	-
	Jul-Sept	Mainly immat.	1	-	212	116	-
Southern North Sea	Jan-Mar	Mixture of immat. & adults	8	2	2 369	822	73
	Jul-Sept	Mainly immat.	6	-	2 087	519	-
West Channel	Jan-Mar	Mainly adults	-	18	4 668	1 372	902
Irish Sea	Apr-Jun	Mixture of immat. & adults	1	-	168	78	-

Research Vessel Surveys

Area	Season	Objectives
North Sea (Thames Estuary)	Winter	Echo-survey, sprat investigations, covering distribution and age composition.
North Sea (central and southern)	Summer	Echo-survey and distribution of sprat eggs and larvae in the central and southern North Sea.
North Sea (English east coast)	Summer	Inshore distribution and age composition.

Other research activities: A total of 51 fish from the central North Sea, 5 fish from the southern North Sea and 93 fish from the West Channel were examined for fat and moisture content.

2. Scotland (A. Saville)

Herring

Sampling

Statistics collection and sampling of the catches from the Scottish herring fisheries was continued in 1972 (see Table 1).

Samples of herring from the Scottish fisheries were examined for the incidence and intensity of infection by Anisakis sp.

Tagging

Tagging of herring from chartered and research vessel catches during 1972 is summarised in Table 2. During 1972 there were two further returns from the west coast tagging in February-March 1971 and 29 from the west coast tagging in September 1971. All were recaptured on the west coast. From the June 1971 tagging around Shetland, there have been 20 more returns from the Shetland area and one from the west coast.

Research Vessel Surveys

The surveys carried out by Scottish research vessels are shown in Table 3.

Other Research Activities

Experimental studies were begun to investigate the effects of a number of toxic pollutants on the development, growth and survival of herring eggs and larvae.

Sampling

Mackerel

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
West Channel	Jan-Mar	Immat. & Adults	-	6	883	466	466
	Apr-Jun	Immat. & Adults	1	4	478	471	471
	Jul-Sept	Adults	-	6	778	538	538
	Oct-Dec	Immat. & Adults	-	13	1 310	933	1 031
Central North Sea	Jul-Sept	Adults	1	-	168	60	60

Tagging

Area	Season	Type of Tags	No. Tagged	Type of Fish	Recoveries
West Channel	Autumn	Hydrostatic	3 153	Adults	5

Other research activities: A total of 87 fish were examined for fat and moisture content.

Sampling

Sprat

Area	Season	Type of Fish	No. of Samples		No. of Fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
Central North Sea	Jan-Mar	Mixture of immat. & adults	7	9	5 918	1 205	400
	Apr-Jun	Mainly adults	2	-	658	149	-
	Jul-Sept	Mainly immat.	1	-	212	116	-
Southern North Sea	Jan-Mar	Mixture of immat. & adults	8	2	2 369	822	73
	Jul-Sept	Mainly immat.	6	-	2 087	519	-
West Channel	Jan-Mar	Mainly adults	-	18	4 668	1 372	902
Irish Sea	Apr-Jun	Mixture of immat. & adults	1	-	168	78	-

Research Vessel Surveys

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North Sea (Thames Estuary)	Winter	Echo-survey, sprat investigations, covering distribution and age composition.
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Research Vessel Surveys

The surveys carried out by Scottish research vessels are shown in Table 3.

Other Research Activities

Experimental studies were begun to investigate the effects of a number of toxic pollutants on the development, growth and survival of herring eggs and larvae.

Sprat

Sampling

Collection of commercial statistics and sampling of catches of the Scottish sprat fisheries was continued in 1972 (Table 4). Weight data were recorded on a routine basis.

Research Vessel Surveys

Two echosounder and midwater trawling surveys were conducted for sprat in the Moray Firth and an egg and larval survey off the Scottish west coast in June (Table 5).

Mackerel

Sampling

Sampling of the Scottish commercial mackerel catches was continued in 1972 (Table 6).

Other Research Activities

Studies were carried out in 1972 on the abundance, distribution and growth of immature mackerel in the North Sea and on the maturation cycle and back calculated growth.

Table 1

Sampling

Herring

Area	Season	Type of Fish	No. of samples		Number of fish		
			Research vessel	market	measured	aged	Examined racially
Northwest North Sea 'N'	Jan-Mar	-	-	-	-	-	-
	Apr-Jun	Adult	-	40	1 962	1 962	1 962
	Jul-Sep	Adult	-	62	3 037	3 037	2 408
	Oct-Dec	Adult	-	18	882	882	882
Northwest North Sea 'S'	Jan-Mar	Immature	41	-	6 514*	1 607*	1 503
	Apr-Jun	-	-	-	-	-	-
	Jul-Sep	Spawners	-	6	300	300	300
	Oct-Dec	Immature	-	-	146*	5*	-
Moray Firth	Jan-Mar	Immature	-	11	1 307*	418*	172
	Jul-Sep	Immature	4	-	220	30	-
	Oct-Dec	Immature	7	-	244*	146*	-
West Coast	Jan-Mar	Adult	-	115	5 734	5 734	5 734
		Spawners	-	3	96	96	96
	Apr-Jun	Adult	-	43	2 090	2 090	2 090
		Spawners	-	1	44	44	44
	Jul-Sep	Adult	-	63	3 147	3 147	2 112
		Spawners	-	9	411	411	372
	Oct-Dec	Adult	-	97	4 720	4 720	4 604
		Immature	-	-	34*	28*	-
Clyde	Jan-Mar	Spawners	7	-	343	135	135
		Spawners	-	8	1 420	516	516
	Apr-Jun	Adult	-	21	1 703	1 090	590
	Jul-Sep	Adult	-	26	1 696	1 296	650
	Oct-Dec	Adult	-	22	1 416	1 085	550
		Immature	8	-	463	200	200
Irish Sea	Jan-Mar	Adult	-	8	1 368	482	482

* Includes herring in commercial sprat samples.

Table 2

Tagging

Herring

Area	Season	Type of Tag	No. Tagged	Type of Fish	Recoveries
West Coast	Feb-March	Scottish Comb. Internal	1 200 206	Adult	31 2
W. of Shetland	June-July	Scottish Comb. Internal	1 411 600	Adult	9 33
W. of Orkney	June-July	Scottish Comb. Internal	2 202 1 212	Adult	20 34
N. of N. Rona	June	Scottish Comb. Internal	2 000 1 650	Adult	54 105

Table 3

Research Vessel Surveys

Herring

Area	Season	Objectives
N. Sea	February	International Young Herring Survey
N. Sea	August-October	Herring larvae
West coast	September-October	Herring larvae
Clyde	February-April	Herring eggs and larvae
Clyde	December	O-group herring

Table 4

Sampling

Sprat

Area	Season	Type of Fish	No. of samples		Number of fish		
			Research vessel	market	Measured	aged	weighed
Moray Firth	Jan-Mar		7	34	8 476	905	913
	Apr-Jun		-	-	-	-	-
	Jul-Sep		9	-	1 113	76	-
	Oct-Dec		8	30	7 737	340	482
Firth of Forth	Jan-Mar		3	4	741	350	287
	Apr-Jun		-	-	-	-	-
	Jul-Sep		-	-	-	-	-
	Oct-Dec		-	7	1 384	184	184
North West North Sea (excluding Moray Firth)	Jan-Mar		12	1	2 446	428	429
	Apr-Jun		-	-	-	-	-
	Jul-Sep		-	-	-	-	-
	Oct-Dec		-	2	644	102	103
Central North Sea (excluding Firth of Forth, including Shields)	Jan-Mar		17	7	2 331	459	312
	Apr-Jun		-	-	-	-	-
	Jul-Sep		-	-	-	-	-
	Oct-Dec		-	-	-	-	-
Scottish West Coast (excluding Clyde)	Jan-Mar		-	5	952	251	254
	Apr-Jun		12	1	988	191	104
	Jul-Sep		-	-	-	-	-
	Oct-Dec		-	9	1 831	265	265
Clyde	Jan-Mar		5	-	676	-	58

Table 5

Research Vessel Surveys

Sprat

Month	Area	Objectives
June	West Coast	Egg and larval survey
September	Moray Firth	Pre-fishery acoustic and midwater trawling survey.
December	Inner Moray Firth	Acoustic and midwater trawling survey during fishery.

Table 6

Sampling
Mackerel

Area	Season	Type of Fish	Number of samples		Number of fish		
			Research Vessel	Market	Measured	Aged	Examined Racially
N. Sea	Jan-Mar	Immature	14	-	920	151	-
	April-June	Mixed	22	18	3 457	469	-
	July-Sept	Adult	1	4	566	58	-
	Oct-Dec	"	-	-	-	-	-
Minch	Jan-Mar	"	-	-	-	-	-
	April-June	"	-	-	-	-	-
	July-Sept	"	1	1	107	97	-
	Oct-Dec	"	-	-	-	-	-
Clyde	Jan-Mar	"	-	2	97	97	-
	April-June	"	-	9	1 140	237	-
	July-Sept	"	-	6	669	399	-
	Oct-Dec	"	-	1	146	73	-

U.S.S.R.

(A.S. Bogdanov)

In 1972 the Pelagic Fish Laboratory of PINRO (Polar Research Institute) continued investigations on the biology of herring in the Norwegian, Barents and White Seas as well as on the biology of blue whiting in the Norwegian Sea, in the area of Porcupine Bank and on the Irish Shelf, on the biology of polar cod and capelin in the Barents Sea and Atlantic saury in the North Atlantic between 25°N and 60°N. PINRO started investigations on snipefish in the area west of the Peninsula and north of the Azores Islands. Investigations on capelin in the area of the Grand Newfoundland Bank were continued as well.

Biostatistical data, results of observations on pelagic fish behaviour and distribution obtained in the course of cruises of scientific vessels "Akademik Knipovich", "Fridtjof Nansen", "Nikolai Maslov", "Gemma" and "Perseus III" provided the basis for studying regularities of stock abundance dynamics, causes of the change of migration routes and distribution areas as well as conditions and factors favouring the forming of dense concentrations of commercial fish.

In June the scientists of the Laboratory participated together with scientists from Iceland in a complex oceanographic survey in the Norwegian and Greenland Seas; in July-August in cooperation with the scientists from Iceland, England and Federal Republic of Germany they carried out investigations to determine

distribution peculiarities and relative abundance of the 0-group of commercial species in the area of Iceland; in similar investigations in the Barents Sea the scientists of the Laboratory cooperated in August-September with the Norwegian scientists; in November-December they cooperated with the Norwegian scientists to study peculiarities of capelin distribution in the Barents Sea.

In 1973 all investigations undertaken in 1972 will be continued.

Collected and Processed Material on Pelagic Fish in the Areas of the Northern Atlantic and the Arctic Ocean Seas in 1972

Area	Species	Mass Measurement	Biological Analysis	Fecundity No. of Samples	Ichthyoplankton (No. of Samples)
Norwegian Sea	Herring	129	116	21	394
Norwegian Sea	Capelin	1 431	368	-	-
Norwegian Sea	Blue Whiting	4 667	1 392	-	-
Irish Shelf	Blue Whiting	9 947	1 123	12	-
N.E. Atlantic	Atlantic Saury	379	362	45	-
N.E. Atlantic	Snipefish	3 716	-	-	-
Grand Newfoundland Bank	Capelin	28 576	5 827	198	-
"	Herring	740	200	-	-
Western Banquereau	Herring	-	100	-	-
Nova Scotian Shelf	Herring	-	100	-	-
Barents Sea	Herring	541	261	-	-
Barents Sea	Capelin	59 257	4 284	127	222
Barents Sea	Polar Cod	39 701	2 757	167	-
Barents Sea	Blue Whiting	35 014	1 073	-	-
White Sea	Polar Cod	869	239	44	-
Kara Sea	Polar Cod	4 199	290	-	-
Total		189 166	18 492	614	616

The North-East Atlantic Laboratory of the Atlantic Research Institute of Fisheries and Oceanography (AtlantNIRO) continued investigations in the North Sea and to the west of the British Isles.

Control counting surveys of spawn and larvae for studying abundance of herring and sprat generations on early stages of development, and the effect of changes in weather and hydrological conditions on their survival and on zooplankton abundance dynamics were conducted in the North Sea.

The collection of materials was carried out in the course of cruises from June to November. Trawl surveys from February to April provide for accounting of young herring of 0- and I-groups which composed the recruitment of commercial stock, and also studying of sprat population structure and age composition of commercial catches. Accumulation and analysis of materials on

biology, distribution and abundance dynamics of horsemackerel, mackerel and Norway pout were continued. The method of forecasting the atmospheric pressure fields over the North Sea was worked out.

Complex of investigations accompanied by oceanological observations on peculiarities of distribution, biology and relative abundance of horse-mackerel and mackerel year classes was carried out from December to May to the west of the British Isles and in the Bay of Biscay.

Conditions and efficiency of reproduction, larval and young distribution and ecology were studied in the eastern and northern Baltic Sea, the Gulf of Riga and the Gulf of Finland.

State, distribution and structure of Spring and Autumn herring and sprat stocks, and stock state of populations were investigated. Materials for estimation of the effect of fishery, and of predators (cod) on the state of sprat and herring stocks were collected.

The Institute of Animal Morphology of the Academy of Sciences conducted investigations on the intercorrelation between the White Sea and Murman species of herring. Meristic features of larvae and fingerlings of different stocks of the White Sea herring were investigated and differences between them were clarified.
