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Administrative Report

D e m e r s a l F i s h (N o r t h e r n) C o m m i t t e e

By G.V. NIKOLSKY

Belgium

(P. Hovart)

Report on the Activity of Belgium during 1966

Biological study of dab and whiting.

Programme for 1967

Continuation of the biological study of dab and whiting.

Biological study of the cod.

Tagging experiments on sole and plaice.

Denmark

(H. Knudsen & Å.J.C. Jensen)

Cod. A large material of length measurements and otoliths was collected at the Faroes from commercial catches and catches made by the research vessel "Jens Chr. Svabo". The stock seems to be rather large, mainly due to the presence of several good year-classes.

In the western Baltic the catches of cod were of the same size as in 1965. In the first part of the year they were dominated by the 1962 year-class, later on by the 1964 year-class.

Experiments on the ingestion and digestion of food in cod were made in aquaria.

Haddock. In collaboration with the Marine Laboratory, Aberdeen, tagging of haddock at the Faroes was continued.

Greater Weaver. Market sampling was continued. Quantitative sampling of larvae was carried out in Kattegat in July and October. 1,000 specimens were tagged north of Anholt in April.

Lumpsucker. 1,557 specimens were tagged in the southern Kattegat in April.

Eel. 2,000 silver eel were tagged in the Limfjord in September.

Plaice. Quantitative fishing for young plaice along the shore was carried out in July and August from the motorboat "Havkatten". In the northern Kattegat the number of small plaice was lower than in 1963-65, while in the southern part the number was higher than in the preceding years. In the Belt Sea the catches were small, while in the western Baltic a numerous year-class was found. The commercial catches in the Belt Sea and the western Baltic were of the same size as in 1965, the year-classes 1962 and 1963 made up most of the catches.

Measurements of plaice landed at Grenå were carried out each month, and statistics of catch-per-unit was collected. Corresponding investigations were carried out at Bornholm harbours in August.

Sole. Age analyses and catch/effort statistics were collected in North Sea ports. The 1963 year-class was much dominating in the trawlcatches, where it constituted about 80%.

Greenland (Sv.Aa. Horsted)

Cod. Larvae investigations by means of 2 m stramin net in July in the West Greenland area between 63°40'N and 66°50'N.

Occurrence of age-groups I, II and III studied by means of hand seining and visual observations in the districts of Godthåb, Frederikshåb and Julianehåb and from commercial pound-net catches in Holsteinsborg, Godthåb and Julianehåb districts.

Commercial-sized cod sampled from the Faroese trawler "Skálaberg" in May-June on West Greenland banks, from research cutters throughout the West Greenland coastal and offshore area and from Greenlanders' landings. 29 samples containing altogether 15,000 specimens (of these 12,645 from the offshore banks).

2,905 cod have been tagged in West Greenland. Of these 1,545 were small cod (less than 50 cm total length).

Redfish. Tagging of redfish in the Godthåb Fjord in May-June. 177 specimens were tagged.

France

Morue

Des échantillons ont été prélevés régulièrement à bord des chalutiers qui exploitent les fonds de la Manche orientale et du sud de la Mer du Nord. Des observations sur cette espèce ont aussi été effectuées à bord de la "Thalassa" en juin, dans la région du Dogger Bank, et en novembre-décembre, dans la région du Pas-de-Calais. Les données portent principalement sur la composition du stock en âge, le contenu stomacal, la croissance en poids et en taille, la maturité sexuelle et les caractères raciaux.

Des marquages portant sur un nombre total de 1,391 morues ont été faits en Mer du Nord au cours des campagnes de la "Thalassa".

Merlan

L'étude du merlan de la Mer du Nord a été poursuivie sur des échantillons prélevés à bord de chalutiers ou à bord de la "Thalassa" (campagnes de juin et de novembre-décembre).

Des marquages (542 poissons) ont été effectués principalement dans la région du Dogger Bank et du Farn Deeps. Les faibles pourcentages de recapture obtenus jusqu'à présent, malgré l'emploi d'une chambre de libération en profondeur, montrent que la mortalité de marquage du merlan est beaucoup plus importante que celle de la morue, espèce dont la technique de marquage semble par contre tout à fait variable.

Autres espèces

Des marquages et des observations sur le stock de lieu noir, dans la région des Shetland, ont été réalisés à bord de la "Thalassa" en juin.

Iceland

(Jón Jónsson)

Work at Sea

The R.V. "María Júlía" was mainly concerned with work on species belonging to this Committee. She made several cruises during the year, including experimental trawling, tagging experiments and general ichthyological work.

Work on Fish

The following table includes both market sampling and sampling on board research vessels:

Species	Measured	Otolithed	Tagged
cod	17,808	5,569	1,924
haddock	13,072	4,140	2,229
whiting	260	163	
saithe	40	100	
plaice	8,757	5,246	4,599
dab	11,175		
lemon sole	3,060		
long rough dab	3,097		
halibut	69	65	
redfish	1,506	487	
lumpsucker	13	78	
catfish	298	178	45

Besides this, material was collected of 23 other species of fish.

From East Greenland otoliths were collected from 596 cod and 1,115 were measured.

Ireland

(J.P. Hillis & D. de Griffith)

Whiting. The east coast commercial catch was sampled, with special reference to weight/length data for different ages. During the autumn, rejection of undersized fish at sea was studied by comparison of total and landed catches. The research vessel "Cú Feasa" was used for quarterly small-meshed cod-end stock surveys at ten standard stations on the Irish Sea grounds, and for a survey during May and June of fish eggs and larvae of the northern Irish Sea and adjacent areas.

Plaice. Tagging was continued in the northern Irish Sea in March, when 2,051 fish were released. During the summer, mesh-selection experiments were carried out and parallel trials were conducted with the two research vessels "Cú Feasa" and "Cú na Mara" so that indices of relative fishing power might be calculated. Throughout the year investigations into the serum and haemoglobin proteins were carried out, using agar gel and starch-agar gel electrophoresis.

Netherlands

(P. Korringa)

Work at Sea

The R.V. "Willem Beukelsz" made 19 cruises in the Committee's area. Eleven cruises were mainly devoted to work within the scope of the Demersal Fish (Northern) Committee.

Work on Fish

Plaice. The stock analysis by means of market sampling and the tagging experiments on spawning plaice (in the Southern Bight, the Texel area, the German Bight and the Flamborough area) was continued.

In addition to an English-Dutch programme of transplantation experiments between spawning areas in 1964 and 1965, a number of short and medium distance transplantations were carried out.

In spring and summer a number of cruises was devoted to transplantation experiments with juvenile and adult plaice in order to study their sense of homing. The serological analysis of the various populations, continued for several years, was concluded.

Sole. The stock analysis by means of market sampling and racial investigations on sole from different localities in the southern North Sea was continued. Tin-townet cruises were made in the Channel and in the coastal areas of Belgium, Netherlands, Germany and Denmark in order to localize the spawning grounds and to get information on the yearly egg production. An analysis of the catches of undersized sole in the Dutch coastal area on a standard network of stations was made in order to be able to predict commercial catches.

Comparative fishing was carried out by the R.V. "Willem Beukelsz" using its standard gear for sole-catch prediction studies and by the commercial sole cutter "TX 13" using beam trawls.

In summer sole were tagged and transplantation experiments were carried out.

Turbot and Brill. Occasionally turbot and brill were tagged together with plaice and sole.

Whiting. The stock analysis by means of market sampling was continued.

Sweden

(G. Otterlind)

Cod. From the Baltic 6 samples comprising 588 fish have been examined and about 2,200 cod have been tagged (with Lea tag) in the Baltic and in the Sound. Transportation experiments were performed to study cod migration especially in the Sound area.

Flounder. Investigations concerning flounder were continued in the Baltic, above all in the central part. 2,300 fish were tagged (with Petersen discs) and 5 samples (826 fish) investigated. A study of serum types of different populations was started.

Plaice. About 500 plaice were tagged (with Petersen discs) from the south-western Baltic to northern Kattegat in order to study migrations in the Sound.

Silver eel. At the central coast of the Hanö Bay 970 eel were marked with silver tags during the autumn.

United Kingdom

I. England & Wales

(M.J. Holden)

The market sampling was continued, the number of fish measured and otolithed being given in Table 1 (page 5).

Two cruises were made to the Faroes to make stock and pre-recruit surveys of haddock. Coalfish and cod were also tagged. The R.V. "Ernest Holt" made one cruise to the Barents Sea, where in conjunction with research vessels from Norway and U.S.S.R., a survey of the distribution of 0-group fish was made.

The R.V. "Clione" made one cruise to Iceland where plaice were tagged. Spiny dogfish were tagged south of Ireland to determine the relationship of the stocks there to the Scottish-Norwegian stock. In the North Sea cod tagging was continued to evaluate stock problems. Surveys of 0-group and I-group plaice were continued in bays along the coast of North Wales. The number of fish tagged by species and areas was:-

Species	Iceland	Faroes	North Sea	South of Ireland
cod		3,367	70	
coalfish		802		
plaice	2,205		241	
spiny dogfish				1,486

Table 1. Total Demersal Fish Measurements and Otoliths Taken during 1966 in the ICES Areas.

Species \ Area	N.E. Arctic		Iceland		Faroes		North Sea		West of Scotland		English Channel		Total	
	M	O	M	O	M	O	M	O	M	O	M	O	M	O
Cod	101,566	3,472	64,678	2,322	24,329	2,405	70,061	2,332	13,325	117			273,959	10,648
Haddock	50,819	1,287	47,860	1,348	19,872	1,029	23,681	-	15,492	174	-	-	157,724	3,838
Coalfish	9,972	838	3,824	1,111	4,228	837	1,066	299	4,157	513	-	-	23,247	3,598
Plaice	8,331	190	23,296	1,145	-	82	89,491	3,662	15,491	559	8,901	-	145,510	5,638
Sole	-	-	-	-	-	-	28,241	1,426	9,814	178	12,215	-	50,270	1,604
Whiting	-	-	-	-	-	-	22,903	600	14,733	1,213	12,371	1,237	50,007	3,050
Spurdogfish[x]	-	-											9,289	1,859 (spines)
Skates[x] and Rays	-	-	-	-									12,995	1,264 (vertebrae)
Hake[x]	-	-	-	-	-	-							43,293	-
Turbot	-	-	-	-	-	-	6,368	-	-	-	-	-	6,368	-
Brill	-	-	-	-	-	-	663	43	-	-	-	-	663	43
Halibut	-	-	-	-	-	191	-	-	-	-	-	-	-	191
Lemon soles	-	-	-	-	-	346	-	-	-	-	-	-	-	346
Total	170,688	5,787	139,658	5,926	48,429	4,890	242,474	8,362	73,012	2,754	33,487	1,237	773,325	32,079

x) All areas combined. M = measured, O = otolithed.

U.S.S.R.

(G.V. Nikolsky)

Polar Institute of Sea Fisheries and Oceanography (PINRO)

In 1966 sampling for the determination of abundance, size and age composition and distribution of cod, haddock, redfish and Greenland halibut depending upon environmental factors was continued. In addition sampling was carried out concerning other fish (catfish, halibut, plaice, long rough dab and saithe) but the samples were not studied in detail.

Investigations on the gametogenesis in Greenland halibut in relation to migrations and reproduction have been completed. Samples for histological study of the hypophysis and thyroid have been collected.

Data on the biology and abundance of commercial fish were obtained in the Barents Sea (sub-area 1), the Bear Islands - Spitsbergen area (Division 2b) and also off the north-western coast of Norway (Division 2a). Figures given in Tables 1-3 (page 9-10) show the data collected in the areas. Information was gathered on board research vessels and scouting ships.

Atlantic Institute of Sea Fisheries and Oceanography (AtlantNIRO)

In 1966 investigations on the hydrological regime and the biology of haddock and whiting of the North Sea were continued. Fisheries statistics were collected.

The following material on biological composition of the catches was received:-

a) Haddock

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Samples measured	800	2,700	1,600	6,344	352	900	1,303	1,200	1,500	122	96	-	18,121
Biological analysis, numbers	5,936	12,737	8,276	10,124	1,937	50	5,898	10,041	2,000	500	1,300	-	58,819
Age determination, numbers	-	-	-	-	-	200	500	400	400	271	100	-	1,871

b) Whiting

Months	1	2	3	4	5	6	7	8	9	10	11	12	Total
Samples measured	984	1,165	95	593	3,091	1,270	3,154	12,040	4,220	-	-	-	26,612
Biological analysis, numbers	300	400	200	300	1,200	470	700	1,100	500	100	-	-	5,270
Age determination, numbers	-	200	-	-	200	100	172	568	-	-	-	-	1,240

In Atlantic and Baltic Institutions the following studies were made:-

1. Baltic Cod

The regularities of the dynamics of abundance, composition and distribution of Baltic cod.

a) the yield of cod year-classes and the causes which determine it: the size of the adult stock, conditions of spawning, abundance and mortality of eggs and larvae, abundance of young groups 0+ and I+, age composition of the spawning stock;

b) the influence of fisheries on the abundance of cod of different age-groups;

c) feeding of cod and its influence on the size of fish and the ripening of the gonads; interrelations between the abundance of herring and sprats and the condition of the cod stock;

d) regularities of cod distribution as to depth, seasons and regions; the main factors of the hydrological regime and the conditions of the stock which determine these regularities.

Forecasts of the abundance and conditions of the cod stock of 1967-69 and of the catches in the eastern Baltic were given.

Methods for forecasting the cod distribution, as well as catches according to regions and depth, and the catch composition in winter, spring and autumn periods were worked out. Material for calculation of the total and fishery mortality of the cod in different seasons and for different age-groups was collected.

2. Baltic Flatfishes

Material for determination of the condition and age-composition of the plaice stock for studying its reproduction (calculation of egg and larvae, determination of its mortality, time of spawning, growth-rate etc.) was collected.

The distribution of flounder as to regions and seasons in the eastern part of the Baltic was studied. Investigations of the race composition of plaice were started by means of immunological analysis.

In the ichthyological laboratory of the Murman Marine Biological Institute the studies of the biology of demersal fish of the Barents Sea (cod and plaice) were continued in 1966:

1. The adaptation of fish species to temperature conditions;
2. The trophic adaptations of fish species;
3. Morpho-physiological studies of the receptors and their role in fish behaviour.

In 1966 work was conducted on determination of the upper temperature threshold of the young of gadoids. 20 tests using 101 specimens of cod were performed.

Investigations on the changes in thermostability of young cod and the dependence of such changes on environment showed that the thermostability of young cod became higher with age.

Work on determination of the comparative thermostability of the tissue of cod was conducted. To elucidate the influence of age and season on the thermostability of cod and saithe, 128 tests were conducted, 41 of which were undertaken on yearlings and two-year-old cod, and 87 tests on two-year-old saithe. Heart and gills muscles were used for the tests.

In 1966 the experimental investigations on feeding of plaice were finished. The data obtained allowed us to ascertain that dab, plaice, flounder and rock flounder have strongly marked ability for choosing food, which is negatively showed to the organisms with hard shells. With equal accessibility and absolute absence of movements of food, plaice prefer to feed by organisms with soft coverings.

In 1966 the literature data for many years and the data from personal investigations on the influence of low temperature on cod of the Barents Sea and trophic adaptations of species of gadoid fish were generalised.

At the chair of ichthyology of Moscow State University studies were undertaken on the structure of populations (age-composition, character of growth, maturation, fecundity etc.), biochemical composition of organs and tissues (protein and lipid composition of blood serum, composition of lipids of sex products, liver and body), the regularities of ovogenesis and embryonal development of Baltic and White Sea flounder, Arctic flounder and cod and navaga of the White Sea.

The systematic interrelations of the forms of the White Sea cod were studied.

Attention has been paid to the methods for age-determination of cod by otoliths, and to the possibility of using the peculiarities of the construction of otoliths for studying the population structure of the White Sea and Barents Sea cod.

In the Institute of Animal Morphology, U.S.S.R. Academy of Sciences, investigations on changeability, fatness, growth and feeding of some stocks of cod of the north-eastern part of the Atlantic.

Table 1. Data on Cod and Haddock Collected in 1966 (numbers).

Area	Mass measurements				Age samples				Quantitative analysis of feeding and sexual maturity		Fattening		Fish tagged	
	Adult fish		Young stages		Adult fish		Young stages							
	cod	haddock	cod	haddock	cod	haddock	cod	haddock	cod	haddock	cod	haddock	cod	haddock
Barents Sea (Sub-area I)	283,936	80,519	50,794	25,364	15,644	8,156	5,350	2,552	34,129	16,037	6,474	3,737	6,378	937
Bear Island-Spitsbergen area (Division 2b)	103,849	2,531	14,894	184	5,480	543	4,028	46	14,161	825	1,749	199	2,937	83
NW coast of Norway (Division 2a)	6,316	5,150	349	619	770	597		10	1,671	1,042	344	30		
Total	394,101	88,200	66,037	26,167	21,894	9,296	9,378	2,598	48,961	17,904	8,567	4,236	9,315	1,020

Table 2. Data on Redfish Collected in 1966 (numbers).

Area	Mass measurements		Age samples		Quantitative analysis of feeding and sexual maturity
	Sebastes marinus	Sebastes mentella	Sebastes marinus	Sebastes mentella	
Barents Sea (Sub-area I)	9,140	5,463	602	558	663
Bear Island-Spitsbergen area (Division 2b)	6,231	79,850	600	4,130	7,148
NW coast of Norway (Division 2a)	5,228	6,364	818	173	1,538
Total	20,599	91,677	2,020	4,861	9,349

Table 3. Data on Greenland Halibut Collected in 1966 (numbers).

Area	Mass measurements	Age	Quantitative analysis of feeding	Fish tagged
Barents Sea (Sub-area I)	2,355	24	143	119
Bear Island-Spitsbergen area (Division 2b)	36,870	1,829	3,698	1,001
NW coast of Norway (Division 2a)	92		24	
Total	39,317	1,853	3,865	1,120