

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 W. CIEGLEWICZ

1968

Belgium

(P. Hovart)

- Biological study of cod.
- Biological study of whiting.

Canada

(W. Templeman & F.D. McCracken)

Groundfish. Landings of cod, haddock, American plaice, witch flounder, Greenland halibut, and redfish from the Canadian offshore and coastal areas were sampled for length, age, sex, sexual maturity and food. Location of capture and catch and effort statistics were collected from the offshore fleet and in a number of coastal localities.

Research-vessel surveys with the "A.T. Cameron" and the "E.E. Prince" provided information on pre-recruit strengths of the various groundfish species from Labrador to Georges Bank and on the relation of groundfish concentrations to area, depth, temperature and food.

Work on distribution and survival of larvae of demersal fish in the Gulf of St. Lawrence was continued. Time of disappearance of ice cover, differences in water temperature, relative surface drift, damage or deformity of early egg stages, and availability of food for larval fish, were all important factors in producing annual variations in survival.

Denmark

(H. Knudsen)

Cod. Trawling from "Dana" in April and August-September showed that the year-classes 1965 and 1964 dominated in the Baltic east of Bornholm while the year-classes 1966 and 1965 were the most important west of Bornholm. In the western Baltic investigations in December with the standard trawl gave as result that the year-class 1968 was of normal strength and the year-class 1967 very small. In the western Baltic and the Belt Sea the commercial catches showed a considerable increase in catch per hour's trawling compared with the previous year.

996 cod were tagged in the Baltic on "Dana's" cruise in April.

At the Faroes length measurements and otoliths were collected both from commercial catches and from catches made by "Jens Chr.Svabo".

Whiting. 1000 whiting were tagged in the western Baltic in February. The sampling from landings for industrial purposes in Frederikshavn was continued.

Greater weaver. The sampling from commercial catches was continued. Hauls with a ring-trawl in August gave only a small amount of larvae.

Lumpsucker. 3,029 individuals were tagged in April.

Eel. 800 silver eel were tagged in Roskilde Fjord in August and  
2,000 silver eel were tagged in the Limfjord in September.  
200 yellow eel were tagged in Roskilde Fjord.

Plaice. Quantitative fishing for young plaice along the shore was carried out in July and August from the motor boat "Havkatten". The number per haul of plaice of the year-class 1968 was below the mean in the western Kattegat, much higher than normal in the southern Kattegat and about normal in the Belt Sea and the western Baltic.

In the commercial fishery in the Belt Sea the mean catch per hour's trawling increased with 20-25% from 1967 to 1968.

Greenland (Sv. Aa. Horsted)

Cod. Hauls with 2 m stramin net on various sections off West Greenland showed spawning to take place in April-May along the western slopes of the fishing banks. Catches of cod larvae in July suggest the 1968 year-class to be a medium one.

Surveys on small cod of age-groups I, II and III by means of hand seine and commercial pound nets showed rather great quantities of year-class 1965 in inshore waters between Godthåb and Holsteinsborg.

Commercial sized cod have been sampled offshore on a Faroese trawler in May-June, offshore and inshore from research vessels throughout the year and inshore from Greenlanders' commercial catches. Altogether about 24,000 cod have been sampled. 5,082 of these have been aged. The 1963 year-class was by far the most important in the 1968 catches. The big 1961 year-class has decreased rapidly but was still important in 1968. Greenlanders' cod fishery was about 24% less than in 1967.

2,562 cod have been tagged, of these 1,513 were small cod (less than 50 cm) tagged in inshore waters from pound-net catches and hand seine.

Redfish. 489 specimens caught in pound nets in Godthåb Fjord were tagged. About 6,000 specimens (10 samples) caught mainly in prawn trawl by research vessel were measured.

Greenland halibut. 97 specimens were tagged in the Godthåb district. About 4,200 specimens (13 samples) caught by research vessel by various trawls and by long lines were measured.

American plaice. 515 specimens (2 samples) were measured.

Wolffish (A. lupus). 185 specimens (2 samples) were measured.

France

(Cl. Nédélec)

Morue. Des observations portant principalement sur les caractères biologiques, métriques et méristiques, ainsi que sur les paramètres de l'otolithe, ont été effectuées sur des échantillons de morues prélevés régulièrement à bord des chalutiers artisanaux opérant dans la région du Pas-de-Calais. Dans le courant de l'année, cette étude a été étendue aux autres populations de la Mer du Nord septentrionale.

Les relevés statistiques des apports réalisés tant par les chalutiers hauturiers que par les chalutiers côtiers ont été poursuivis. Le dépouillement de la composition des apports en provenance de la Mer du Nord centrale et méridionale a permis de suivre régulièrement les distributions en taille et âge de ces deux populations.

Au cours de la campagne de "La Pélagia", en décembre 1968, 122 morues marquées ont été libérées dans la région du Pas-de-Calais.

Merlan. Une étude du stock de merlans du sud de la Mer du Nord a été entreprise. Des données ont été recueillies sur la taille, l'âge, la maturité sexuelle, le contenu stomacal, la croissance relative, le rapport hépato-somatique et la teneur en lipides. Ces observations sont maintenant complétées par des numérations des branchiospines et des rayons des nageoires. D'autre part, les statistiques des apports ont été régulièrement analysées.

Germany  
(A. Meyer)

Continuation of the biological studies on:-

<u>Cod</u>	(Baltic, North Sea, (900 taggings) Iceland, E-Greenland, Norwegian coast, Bear Island and Barents Sea).
<u>Haddock</u>	(North Sea, Iceland, Norwegian coast, Barents Sea).
<u>Saithe</u>	(Iceland, Faroes, Norwegian coast).
<u>Whiting</u>	(North Sea).
<u>Redfish</u>	(Iceland, E-Greenland, Norwegian coast) with research on ageing techniques.
<u>Sole</u>	(North Sea).
<u>Plaice</u>	(North Sea (3,000 taggings), Baltic).
<u>Dab</u>	(North Sea, Baltic).
<u>Flounder</u>	(Baltic).

Research trips of "Anton Dohrn"

<u>January</u>	Norwegian coast, Bear Island, Barents Sea; cod, haddock and saithe (tagging).
<u>April</u>	Central part of the Baltic Sea; 3,000 cod taggings, pelagic cod.
<u>July</u>	Bear Island, Spitsbergen; cod, selection experiments.
<u>October</u>	Iceland, East Greenland; cod, haddock, redfish and saithe.

Iceland  
(J. Jónsson)

As in previous years sampling was made from commercial catches and research-vessel catches. The main species investigated were cod, haddock, plaice, catfish and redfish.

The samples from commercial catches were collected in the main fishing ports and so far the cod is concerned they cover all the main gears in use. This sampling chiefly covers the spawning fishery but some sampling was also done in the summer and autumn fishery for cod.

The R.V. "Hafthor" made several cruises during the year. A great number of trawling stations were worked during these trips and material collected on age- and length-distribution of all the most important commercial species.

About 600 cod were bled and sent to Dr. Jamieson in Lowestoft for blood analysis. These samples represent a cod grown up in Icelandic waters and also cod of Greenlandic origin caught on the Icelandic spawning grounds.

A total of 5,665 cod were tagged at various localities around Iceland.

Netherlands  
(P. Korringa)

Work at sea

The R.V. "Willem Beukelsz" and "Tridens" made 21 cruises in the Committee's area. 8 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 was continued. In summer a cruise was devoted to transplantation experiments with juvenile and adult plaice for the study of homing. The trematode causing abnormal pigmentation in juvenile plaice appeared to be Cryptocotyle lingua. Studies were initiated into its possible harmful effects on 0- and I-group plaice.

Sole. The stock analysis by means of market sampling and racial investigations on sole from different localities in the southern and central North Sea was continued. An analysis of the catches of undersized sole in the Dutch, German and Danish coastal areas on a standard network of stations was made in order to be able to predict commercial catches. Adult and juvenile soles were tagged on a number of occasions.

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

Cod. Tagging experiments of cod in the central and southern North Sea were continued. The predator-prey relationship was studied by means of stomach contents and by tank experiments in the laboratory. A start was made with the stock analysis by means of market sampling.

Haddock and whiting. The stock analysis by means of market sampling was continued.

### Norway

(A. Hylen)

Otoliths, length measurements and maturity stages were collected on a similar scale as in earlier years from cod, haddock and saithe in commercial catches and landings from Sub-area 1, Divisions IIa and IIb.

Tagging experiments of the same species were continued in Norwegian coastal waters.

The distribution and abundance of spawning cod were studied on surveys made in the period 22nd February - 16th March along the coast from Lofoten to North Cape.

Abundance and distribution of cod and haddock eggs and larvae were studied up to the end of June in the area Lofoten-Andenes. These investigations were followed by 0-group fish surveys during August/September in the Barents Sea and in the Bear Island - West Spitsbergen area (in co-operation with U.K. and U.S.S.R.) and in coastal areas from Lofoten to Nordkyn.

### Poland

(W. Ciegiewicz)

## Baltic

Cod. Routine sampling and stock analysis were carried out every month from the commercial catches in the southern Baltic. A total of 35,442 cod were measured and 6,208 otoliths were collected. Weight, sex and stage of maturity of these fish were determined.

The abundance of cod was studied by means of 96 hauls with standard trawl in the southern Baltic.

Flatfish. The length of 6,700 flounder and 1,450 plaice from the Gdańsk Bay and Hornholm basin was measured and the otoliths from 2,800 flounder and 1,450 plaice were collected.

Freshwater species. The length and age-composition of the catches of freshwater species in the Firth of Vistula and Firth of Odra were examined.

## North Sea

The examination of the composition of the by-catch of protected species in the 143 hauls made with herring trawl was carried out during 6 cruises made from April till November 1968 in the North Sea.

### Sweden

(G. Otterlind)

## Cod

In the Baltic 5,745 cod have been tagged (Lea tags), the main part in the beginning of December, to study the relation between migration and hydrographical factors. This activity will continue throughout 1969 to have advantage of the hydrographical "Baltic Year 1969-70". In collaboration with Dr. A. Jamieson, Fisheries Laboratory, Lowestoft, about 1,300 blood samples of cod have been obtained in the Baltic in order to investigate the haemoglobin and transferrin type frequencies in different parts of this sea. For meristical characters about 1,100 cod have been analysed and sampling has been performed to study the stock of young cod. The latter indicates that the year-class 1968 is small.

## Flatfish

Investigations concerning esterases and transferrines have been continued in flounder and plaice. About 300 plaice have been tagged mainly south of Öland in the Baltic.

## Eel

In the Hano Bay 830 silver eel were tagged in the autumn, and additional 600 in the Kalmar Sound. In the southern part of the Sound 1,000 yellow eel were tagged in May and August, off Västervik in the Baltic 850 tagged yellow eel were released in May and September.

### United Kingdom

#### 1. England and Wales

(M.J. Holden)

The market sampling of the fish landings, and the collection of otoliths, spines (from spiny dogfish) and vertebrae (from rays) for age determination were continued during 1968 at a similar level to the previous year. A total of 769,011 fish were measured and 32,983 otoliths, spines and vertebrae collected.

The research ship "Ernest Holt" worked west of Scotland in June; 1,200 cod, 373 haddock and 199 coalfish were tagged. The survey for 0-group fish in the north-east Arctic was carried out during August and September in company with research vessels from Norway and the USSR.

A survey of the distribution of the plaice stocks around north-west Scotland was carried out during November and 2,120 plaice were tagged.

A survey of the distribution of the adult plaice population in the North Sea throughout the year, together with tagging in selected areas, was carried out in a series of cruises by the research vessels "Clione" (March) and "Corella" (June, October, November).

Fecundity studies on ray off the north coast of Norfolk were carried out during five cruises of the research vessel "Tellina" from March to September; also, 460 rays were tagged off the Suffolk coast in November.

## 2. Scotland

(R. Jones)

Routine sampling of demersal fish in the North Sea, west of Scotland and Faroes was carried out as usual by research ships. F.R.S. "Scotia" sampled the North Sea in April/May, June/July, and November. F.R.S. "Explorer" sampled Faroese grounds in June/July and the west coast of Scotland in November.

Cod, haddock and whiting were sampled at the principal Scottish trawl and seine ports as in previous years. The fish sampled were measured and scale and otolith samples were taken for age determination.

These data were used to provide forecasts for the major Scottish fisheries and formed the basis of material supplied to Annales Biologiques, the ICES Statistical News Letters and the U.K. Fish Stock Record.

Tagging of cod, haddock and whiting was continued throughout the year in Scottish and Faroese waters. Thanks are again due to the staff of the Fisheries Laboratory in Torshavn for their co-operation in this programme.

In connection with the tagging programme, attempts have been made to improve the survival rate of gadoids at the time of tagging. This has been done by trying to improve on traditional methods of capture and handling, and also by tagging fish underwater.

Haddock again spawned in the Laboratory's aquarium, and also whiting for the first time. Work was continued on the mating and spawning behaviour which involves sound production. Further work was carried out on the sensitivity of fish to different frequencies of sound, and at the most sensitive range, detection is limited only by ambient sea-noise.

Further work has been conducted on the mechanics of the haddock swimbladder as part of the study of initial post-tagging mortality. This has provided information necessary for the development of improved methods of fish capture and underwater tagging techniques.

During the year a number of cruises were made to Rockall to investigate the abundance and distribution of blue whiting.

Further aquarium work has been done to investigate the relationship between rate of feeding and stomach content weight in cod, haddock and whiting.

Fecundity determinations of whiting have been continued with particular reference to comparisons of the fecundity of whiting from different areas.

## U.S.S.R.

(G.V. Nikolsky)

In 1968 as in the previous years the Polar Institute of Fisheries and Oceanography carried out sampling for determination of the abundance, size, age-composition and distribution of cod, haddock, redfish, Greenland halibut and other bottom fish. The data collected by areas are shown in Table 1.

Information was gathered on board research and scouting ships.

In 1968 the Institute continued the work on determination of stock conditions of the main commercial fish by all available methods; and on the conditions of the survival of young on different stages of development. The Institute worked out the fisheries forecasts and continued to improve the methods.

The Atlantic Institute continued to collect data on Gadidae from all areas of the North Sea during the whole of 1968. Trawl surveys in the northern and central areas of the North Sea were continued in order to estimate the abundance of Gadidae. The first survey was made in March-April, the second one in October.

General Amount of Material

1. Mass measurements from commercial trawls:			
	Haddock .....	16,663	specimens
	Whiting .....	5,861	"
	Coalfish .....	4,844	"
2. Mass measurements during control trawl surveys:			
	Haddock .....	146,151	"
	Whiting .....	31,074	"
3. Age determination:			
	Haddock .....	1,926	"
	Whiting .....	1,459	"
4. Haddock race analysis .....		374	"

(Data collected at the end of 1968 by the vessels staying at sea were not included in the report).

The Ichthyological Laboratory, Moscow State University, continued to work on the White Sea (Kandalaksha Bay).

Material was gathered on:

1. The interrelation between the lipid composition of muscles of the White Sea cod and the growth-rate.
2. The comparative investigations of lipid composition of the flounder muscles of the White and Black Seas.

Baltic Institute of Fisheries

Cod. Materials were collected during different seasons of the year in the Baltic from Ventpils to Bornholm for investigation of the abundance of stock of Baltic cod: catch on a force on the regions and depth, age, growth, weight and sex composition of catches, growth-rate, maturation of gonads, food composition and feeding intensity. We paid great attention to studying the peculiarities of distribution of cod and the factors determining its migration. The interrelation between the system "stock-catch" and the system "cod (predator) - sprat and herring (prey)" were investigated.

Estimates of the yield of cod generations of 1966-1968 and the forecasting of the stock conditions for 1969-1971 were made. Forecasts were made of the distribution of the cod stock by areas of the sea and by seasons for 1969. The forecasts for 1968 came true.

Flounder. In 1968 the Institute continued to collect material for the characteristics, the distribution and the age- and size-composition of the flounder stock in the eastern Baltic, including the egg and larvae calculation on the spawning grounds and tagging during the different seasons of the year. In order to determine the migrations of flounder in the eastern Baltic a number of flounders were tagged during 1966-1968; the intensity of flounder fisheries was studied, and different populations were also studied.

Table 1. Biological material collected and analysed in 1968 (Barents Sea).

Species	No. measured		A g e				Field food analyses	No. tagged	Ring trawl		Egg net		Net attached to trawl	
	Grown-up fish	Young fish	Grown-up fish	Young fish	Grown-up fish	Young fish			Collected	Ana-lysed	Collected	Ana-lysed	Collected	Ana-lysed
Cod	545,473	4,133	31,201	2,101	30,041	2,101	50,385	14,032						
Haddock	68,334	1,550	9,921	458	9,921	458	13,374	494						
Redfish	85,908	8,651	9,000	2,353	1,803	600	13,320							
Halibut	68,977		4,177		500		13,702	3,833						
Others	53,466		1,020				4,590	7						
In all	822,158	15,334	55,319	4,912	42,270	3,159	95,371	18,366	463	463	3,258	1,684	42	42