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French Research Report for 1984

by

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I - Subarea 0

A - Status of the fisheries.

A French (M) fishery for northern deepwater shrimps was conducted in 1984 by one freezer trawler in Division 0A. Reported catches were 417 tons from July to November. The best catch-rates were obtained in July (283 kg/hour) and August (208 kg/hour).

B - Special research studies.

No biological data was available for the deepwater shrimp.

II - Subarea 1

A - Status of the fisheries.

In 1984, the French (M) fishery for northern deepwater shrimps off west Greenland was conducted by one freezer trawler. The total catch was 405 tons and no catch rate was available.

B - Special research studies.

No biological data was available in 1984 for the deepwater shrimp in this subarea.

III - Subarea 3

A - Status of the fisheries.

The total catch of cod reported from the French fishery (M and SPM) in Subdivision 3Ps was 10 770 tons in 1984. No other information was available.

B - Special research studies.

As in previous years, research was carried out in Subarea 3 and three surveys were conducted on board the R/V Cryos :

- in Subdivision 3Pn in February 1984
- in Subdivision 3Ps in February-march and October-November 1984.

1. Hydrographic studies.

In Subdivision 3Ps, 91 hydrographic stations (XBT) were occupied from February 25th to March 18th and 100 from October 10th to November 11th 1984.

In winter 1984, cold surface waters has been reported in the northern part of Halibut Channel. Surface layer temperatures were positive and warmer than those observed in 1982 and 1983. The intermediate layer was not well identified. A strong positive thermic gradient which occured about 150 m depth on the slope of St-Pierre Bank separated this layer and the slope waters (7° to 9° C) which was observed between 150 and 300 meters depth. This layer was warmer than previous years. The bottom water (between 5° and 6° C) occured deeper.

No ice has been observed and the winter 1984 showed higher temperature compared to 1983.

As usual, in autumn 1984, temperatures of the surface layer reached 16° C in the Laurentian Channel. This value slowly decreased from West to East reaching 6° C only on the northern part of the Green bank. This layer was separated from the intermediate waters by a strong negative thermal gradient near 50 m. This intermediate layer was represented by a cold lobe along the slope of the Saint-Pierre Bank between 50 and 160 m depth and also occured in the eastern part of the Green Bank and in Halibut Channel. Under this layer, the slope water (6° to 7° C) occured from 170 m.

The surface temperatures observed in autumn 1984 were much lower than those observed in autumn 1983 as well as those of the intermediate layer that showed a large spread and very cold temperatures (below -1° C).

2. Biological studies.

a) Cod.

In Subdivision 3Pn, a total of 10 trawling stations were occupied during the stratified-random survey of the R/V Cryos in February 1983.

Cod represented only 23 % of the total catch. The largest catch rate (677 kg/30 min) was observed by 180 meters depths. A total of 1 041 cod were sexed and measured from research catches in Subdivision 3Pn. The length frequency analysis indicated the presence of a mode at 57 cm (year class 1978).

As in previous years, two stratified research surveys were conducted on board the R/V Cryos during winter and autumn 1984 in Subdivision 3Ps.

In winter, a total of 85 trawling stations (30 min duration) were occupied in 3Ps Subdivision. The higher catch rates were observed on the southwest slope of Saint-Pierre Bank (4832 kg/30 min). A total number of 4856 cod were sexed and measured and 655 pairs of otoliths were sampled.

The distribution of catch rates are indicated in the following table :

Strata (m)	No. of sets	Catch rates (kg/30 min)
31-55	6	20
56-92	19	115
93-183	24	372
184-275	18	71
276-366	15	130
367-549	3	1
Total	**85**	**98**

Length frequency distributions analysis showed the presence of modes at 20, 44 and 62 cm LT corresponding respectively to the 1982, 1980 and 1978 year-classes.

In October and November 1984, 92 trawling stations (30 min duration) were occupied on Saint-Pierre, Burgeo and Green Banks.

The best catch rates were observed on Saint-Pierre Bank shelf (1932 kg/30 min). The mean catch rates obtained by strata were as follows :

Strata (m)	No. of sets	Catch rates (kg/30 min)
31-55	9	389
56-92	18	79
93-183	27	43
184-275	20	37
276-366	15	1
367-549	3	0
Total	**92**	**92**

A total number of 4663 cod were sexed and measured, 500 pairs of otoliths were sampled for analysis of age structure. Length distribution analysis indicated the presence of three modes :

- the first at 27 cm LT was corresponding to 1982 year-class
- the second at 42 cm grouped fishes from 1981 year-class
- the third at 63 cm represented the 1978 year-class.

The totality of the results obtained for cod in the Subdivision 3Ps in 1984 confirmed the strength of the 1978 and 1980 to 1982 year-classes.

b) Redfish.

During the winter 1984 stratified research survey, redfish was observed in abundance in Hermitage Channel (640 kg/30 min) and on the southern slope of Halibut Channel (1985 kg/30 min). In autumn, similar catch rates were observed in the same strata.

Length frequency distributions of the research catches of the R/V Cryos showed the presence of a very important mode at 15-20 cm LT in winter and in autumn. Secondary modes can be seen at 30 cm LT and 40 cm LT. As very few fishes less than 10 cm have been caught, 1982 year-class and younger seem to be weak.

c) American plaice.

As in previous years, this species was observed in the totality of the surveyed area in Subdivision 3Ps during both winter and autumn stratified-random surveys of the R/V Cryos.

During the winter cruise, best catch rates were obtained at depth between 100 and 200 meters, particularly in Halibut Channel (788 kg/30 min).

In autumn, the highest catch rates were observed also in Halibut Channel (1460 kg/30 min) and in the northern part of Saint-Pierre Bank (590 kg/30 min).

Length frequency distributions by sex showed modes at 14 and 23 cm LT for males and 14, 25 and 38 cm LT for females.

In both cruises, large numbers of small individuals less than 20 cm LT were noted indicating good recruitment rates.

d) Witch flounder.

A few witch flounder have been caught on the slopes of the banks during winter and autumn stratified-random surveys of the R/V Cryos in Subdivision 3Ps. The observed catch rates were very low (generally less than 10 kg/30 min).

Length frequency analysis for each sex indicated that most of the research catches were composed of adult individuals (length between 30 and 50 cm LT). Modes of juveniles individuals can be seen at 12 and 20 cm. These young classes seem to be more abundant than in previous years.

e) Other finfish.

During the two research cruises of the R/V Cryos in Subdivision 3Ps observations were made on all commercial species (skate, silver hake, haddock, pollock, halibut, yellowtail flounder, angler fish,...).

Very high catch rates of haddock were obtained during both cruises. Length composition for this species indicated the presence of a single important mode at 40 cm LT in winter and 47 cm LT in autumn corresponding to the 1981 year-class. More than 20 tons have been caught in one set during the autumn cruise along the western slopes of Saint-Pierre Bank.

The thorny skate was observed in the totality of the area surveyed. Abundance is low on Burgeo Bank while the larger catch rates were obtained on the western slopes of Saint-Pierre Bank.

For the silver hake, a very strong 1983 year-class has been noticed. The mode was at 15 cm in winter and at 23 cm during autumn cruise. This strong year-class comes after a lack of several years in recruitment.

For halibut, the increasing of catch rates due to arrival of young classes is going on.

f) Shellfish.

As in previous years, studies were conducted on scallops (Placopecten magellanicus and Chlamys islandicus) in Subdivision 3Ps. 106 standard dredging tows (10 min duration) were made during the autumn cruise.

The catch rates of Placopecten were higher on the northern part of Saint-Pierre Bank than on the southern part where scallop were bigger (modes at 11 and 13 cm).

The very fast decrease of the catch rate has been going on since 1983 particularly on the northern part of Saint-Pierre Bank. Less than 25 % of the scallops from strong year-classes 1977 and 1978 are remaining there after two years of active exploitation (mode at 11 cm). Although these classes are still making the bulk of the research catches.

IV - Subarea 4

A - Status of the fisheries.

No information available.

B - Special research studies.

In 1984, research was carried out in Subarea 4 during two stratified-random surveys on board the R/V Cryos :

- in Division 4R in January
- in Division 4VWX in September.

1. Hydrographic studies.

a) From 24 January to 14 February, 59 hydrographic stations (XBT) were occupied in the eastern Gulf of St.Lawrence in Division 4R.

It was observed that cold water surface layer (-1.5° to -1.0° C) down to about 70 meters was present in this area. After this depth, water temperature were increasing progressively with the depth.

b) In September, during the survey of the R/V Cryos on the Nova Scotia Banks (Divisions 4VWX), 125 XBT casts were made and three ICNAF standard transects were realized (25 stations with temperature and salinity observations).

The usual three layers structure was observed :

- a surface layer down to 20-30 m depth with temperature and salinity of respectively 15 to 20° C and 29 to 31 ‰,
- an intermediate cold water layer (2° to 5° C) slightly more salted (30 to 33 ‰) of depth down to 100 m and sometimes more (deeps north of the banquereau),
- a deep warmer layer with salinity of 33 to 35 ‰ and temperature 7 to 10° C along the edge of the shelf and occupying the depressions.

2. Biological studies.

a) Cod.

A total of 52 trawling stations were occupied in Division 4R during the stratified-random survey of the R/V Cryos in January-February 1984.

Cod catches represented 88 % of the total catches compared to 55 % on January 1983, 76 % on January 1982 and 61 % on January 1981. The higher catch rates were observed west of St-Georges Bay (9,100 kg/30 min) at 130 meters depth, 5,551 kg/30 min at 120 m depth and 4,234 kg/30 min at depth from 145 to 234 m depth in the same area.

The mean catch rates by strata were as follow :

Strata (m)	No. of sets	Catch rates (kg/30 min)
94	5	470
94-185	19	1208
186-278	17	225
279-370	6	122
370	2	73
Total	**49**	**612**

A total of 12,315 cod were sexed and measured and 600 pairs of otoliths sampled during this survey for analysis of length and ages structures.

Two modes were observed on length frequency distribution of research catches at 33-36 cm LT and 54-57 cm LT. The 1980 year-class represented 19 % of the total number of individual caught and the 1977 year-class 15 %.

b) Squid.

In Divisions 4VWX, the areal expansion method was used to estimate the minimum trawlable biomass, 121 tows distributed in 22 strata were considered. Relative biomasses indices, compared to a basis 100 in 1980 were respectively for the following years : 32, 3, 9 and 4 in 1984 which shows a return to a very low level after a sligh recovery in 1983.

In the length frequency distribution, the mode is located between 19 and 20 cm for males as for females, with little small and large individuals (26 % of males and 20 % of females under 18 cm mantle length). The general pattern of these distributions are much alike those observed in 1983.

The proportions of sexually mature animals remained in 1984 as low as in 1982 and 1983 (11 % of males has reached stage II in 1984, 6 % in 1983 and 9 % in 1982) compared those observed in 1981 and 1980 (33 % and 44 % respectively).