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Greenland Halibut in the Gulf of St. Lawrence -  
From Immigrants to Emigrants

by

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ABSTRACT

Landings have increased from less than 1000 t in 1969 to a high of 9000 t in 1979. Catches in 1980 were about 6800 t. Up until 1969, 55-66% of the catch was taken in Div. 4S by gillnetters with 30% taken by trawlers in Div. 4R. Since then more than 65% has been taken by gillnetters in Div. 4T. Biomass estimates indicated a general reduction since 1978 based upon winter surveys. Considering the similarity between year-class abundance within the Gulf of St. Lawrence and those in the Labrador region there may be considerable immigration to the Gulf area from Labrador through the Strait of Belle Isle and emigration from the Gulf area when these fish approach maturity.

RESUME

Les débarquements de flétan du Groenland ont augmenté, passant de moins de 1 000 t en 1969 à un maximum de 9 000 t en 1979. Les prises de 1980 ont été d'environ 6 800 t. Jusqu'en 1969, 55-66 % des prises provenaient de la division 4S et étaient capturés aux filets maillants, alors que 30 % étaient capturés dans la division 4R par les chalutiers. Depuis, plus de 65 % sont capturés par filets maillants dans la division 4T. La biomasse estimée à la suite des relevés d'hiver accuse une diminution générale depuis 1978. La ressemblance entre l'abondance des classes d'âge à l'intérieur du golfe du Saint-Laurent et dans la région du Labrador donne à croire qu'il y a immigration du Labrador au Golfe par le détroit de Belle-Isle et émigration dans le sens inverse quand ces poissons approchent la maturité.

## THE FISHERY

A small fishery for Greenland halibut has existed in the northern Gulf of St. Lawrence since about 1969 with landings in the order of 600-1000 t annually. Substantial increases in recorded landings appeared in 1977 when landings arose to a level of 4000 t and increased to 6200 t in 1978 and an all-time high of 9000 t in 1979 (Table 1.).

Provisional landings for 1980 show that catches have dropped back to 6800 t, still the second highest recorded annual catch. Up until 1979 the major portion of the catch occurred in Division 4S (55-66%) by Quebec with 30% taken in Division 4R by the Newfoundland trawler fishery where Greenland halibut are concentrated along with cod and grey sole southwest of St. Georges' Bay in the Esquiman Channel. The remaining small portion of the landings was taken in Division 4T.

In 1979 and 1980 the fishing pattern changed and more than 65% of the total catch was taken in the Gaspé area by Quebec fishermen. The reduced catches in 1980 is probably a reflection of the movement of large trawlers from the northern Gulf region. Early landing reports from trawler logs up to the end of March 1981 indicate that only about 70 t of Greenland halibut have been taken in the trawler fishery and indications are that this may be close to the total trawler landings for 1981 for this area. The main reason for this is the curtailment of the large trawler fishery from the cod fishery in the northern Gulf of St. Lawrence where such species as Greenland halibut and grey sole (witch flounder) formed large by-catches of this fishery in the recent past. It would appear then that the fishery for Greenland halibut in 1981 at least is likely to be exclusively by the Quebec inshore fishermen.

## BIOMASS SURVEYS

For the past 4 years (1978-81) stratified-random biomass surveys for groundfish have been carried out in the northern Gulf of St. Lawrence particularly in Divisions 4R and 4S by the Canadian research vessel "Gadus Atlantica". The stratification scheme used in the surveys is shown in Fig. 1. Since Greenland halibut are most abundant in depths greater than 100 fath, the survey area in Division 4R can be considered total for the 4 years under consideration. The same would apply to Division 4S with the exception of the 1979 survey which was considerably incomplete especially in areas where Greenland halibut are most abundant. The average numbers and weights per set were calculated for each stratum by year and is presented in Table 2. Also in Table 2 are estimates of mean trawlable biomass for each division separately and combined for 1978-81 with the exception of Division 4S in 1979.

## DISTRIBUTION AND ABUNDANCE

For the distribution in January-February the areas of concentration appears similar for the four surveys conducted (Table 2; Fig. 1). Three areas of concentration seem to occur according to research survey results. The largest is in the area southwest of St. George's Bay in the Esquiman Channel. Secondly, they appear in substantial numbers along the south coast of Anticosti in Strata 803, 804, 806, and 805, the mouth of the St. Lawrence River. The

third area of abundance occurs in Stratum 801, a deep hole in the northern portion of the Esquiman Channel.

Estimates of biomass show a decreasing trend in both Division 4R and 4S (Table 2). Estimates for Division 4R have gone from almost 15,000 t in 1978 to less than 3000 t in 1981. For Division 4S the biomass has decreased from just over 9000 t in 1978 to less than 3000 t in 1981. For Divisions 4RS combined the biomass has decreased from just over 24,000 t in 1978 to less than 6000 t in 1981, less than 25% of the 1978 level. Since the pattern of the commercial fishery has shifted dramatically over the last couple of years it is a possibility that the distribution of the stock has changed somewhat and these biomass estimates in the last couple of years are underestimated, however, the author does not feel that this is the case.

Length distributions (Fig. 2) and age distributions from the Newfoundland commercial trawler fishery (Fig. 3 and 4) and age distributions from research survey results up to 1980 (Fig. 5 and 6) as taken from Bowering (1980) indicate that this fishery is comprised of mainly 5 year-classes of the early 1970's (i.e. 1970-74). These year-classes are of enormous strength in the large northern Greenland halibut stock of Labrador and eastern Newfoundland. With this in mind, it was suggested by Bowering (1980) that immigrants from this area into the Gulf of St. Lawrence through the Strait of Belle Isle of these large year-classes may be the main contributors to this fishery. These fish seem to disappear at a young age from the area as well as suggesting that emigration from the region may also occur probably as they approach maturity.

Until the relationship between this stock and the northern stock has been established, to place a TAC on this stock may bring about an unnecessary loss of yield particularly, if the main portion of the fishery is supported by immigrants which later become emigrants and contribute nothing to future recruitment in the Gulf of St. Lawrence.

#### REFERENCES

- Bowering, W. R. 1980. The Greenland halibut fishery in the Gulf of St. Lawrence. CAFSAC Res. Doc. 80/24, 18 p.

Table 1. Greenland halibut landings in the Gulf of St. Lawrence 1969-79.

Year	4S	4R	4T	4RS	4RST
1969	345	248	209	593	802
1970	496	381	235	877	1112
1971	450	300	204	750	954
1972	379	199	105	578	683
1973	431	216	116	647	763
1974	752	167	92	919	1011
1975	1102	195	247	1297	1544
1976	1367	517	135	1884	2019
1977	2298	1108	555	3406	3961
1978	3549	1344	1354	4893	6247
1979	251	2858	5867	3109	8976
1980*					6847

\*Provisional

Table 2. Biomass surveys by research vessel Gadus Atlantica, Greenland halibut.

Stratum	Div. 4R Av. No. Set				Av. Wt. Set. (kg)			
	1978	1979	1980	1981	1978	1979	1980	1981
801	17.67	14.67	19.00	6.00	24.97	14.98	14.75	9.25
802	257.00	246.00	56.67	41.00	420.18	368.19	96.08	78.50
809	2.93	5.67	0.67	2.50	5.15	9.38	0.68	7.50
810	29.67	3.00	2.75	0.00	48.88	5.45	6.13	0.00
811	0.00	0.60	0.50	0.00	0.00	0.64	0.65	0.00
812	5.00	2.00	0.67	0.29	6.22	3.50	0.12	0.16
813	1.00	2.75	1.50	0.33	0.91	2.38	0.65	0.25
814	1.33	1.67	-	-	1.44	2.65	-	-
820	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
821	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
822	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
823	0.00	0.00	0.33	-	0.00	0.00	1.13	-
824	-	-	0.50	0.00	-	-	0.20	0.00
825	0.00	0.00	-	-	0.00	0.00	-	-
826	-	-	-	-	-	-	-	-
<u>Div. 4S</u>								
803	17.50		24.43	5.50	21.11		32.14	8.75
804	19.33		17.00	2.67	18.92		16.25	4.58
805	12.58		19.67	7.13	12.72		18.58	7.81
806	4.67		3.33	1.25	5.45		3.93	2.06
807	5.33	2.00	2.00	0.00	7.11	2.95	3.50	0.00
808	2.33	2.33	1.00	1.00	3.86	1.79	1.67	1.17
815	6.67	1.50	2.67	0.42	4.69	1.02	2.30	0.40
816	46.40	10.33	3.67	0.74	33.69	6.51	2.33	0.62
819	0.50	0.00	0.33	0.00	0.57	0.00	0.25	0.00
<u>Mean Trawlable Biomass (tons)</u>								
Div. 4R	14,984	12,477	3,502	2,888				
Div. 4S	9,263	-	9,079	2,836				
Div. 4RS	24,247	-	12,581	5,724				
(for the above strata)								

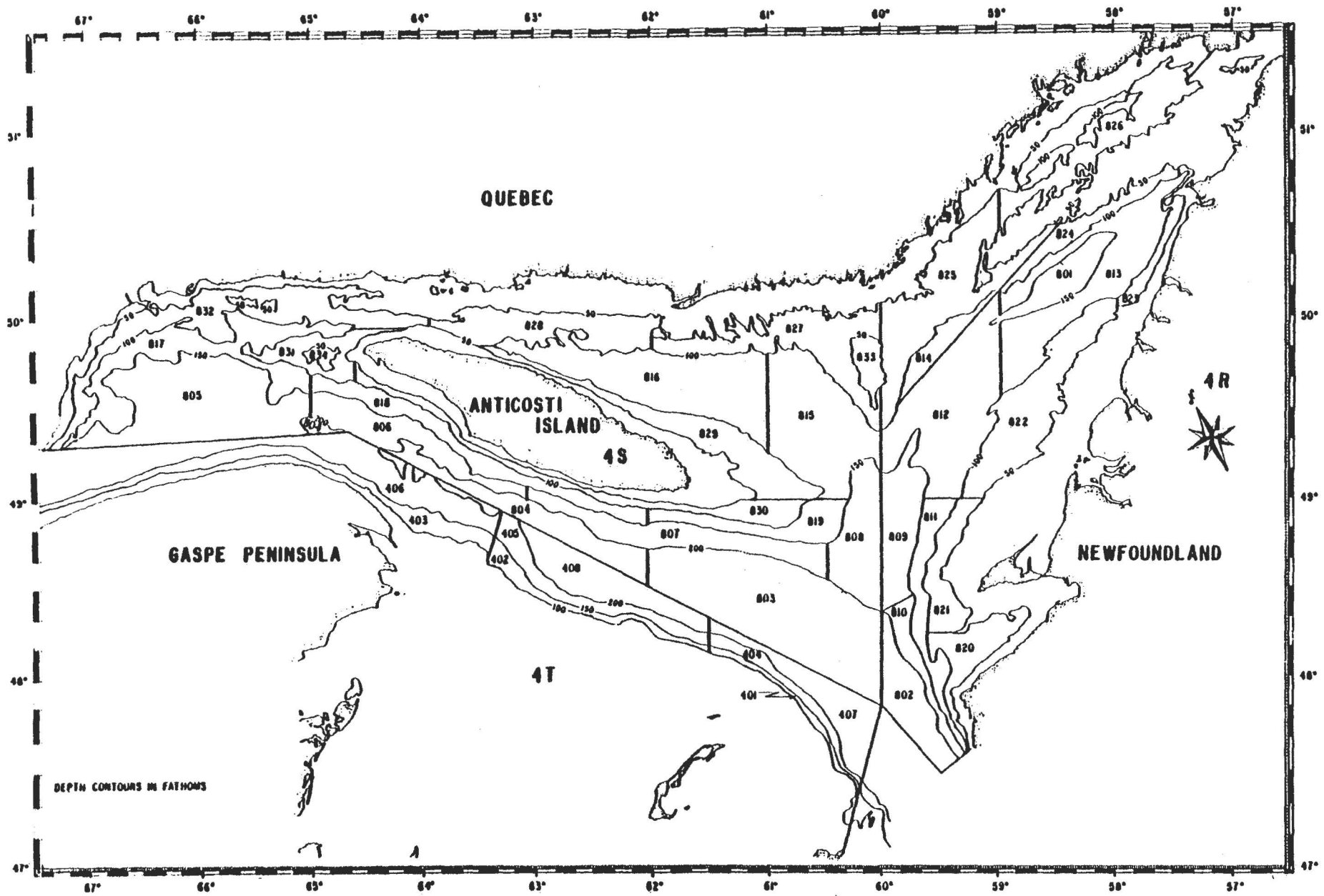


Figure 1. Stratification scheme for the northern Gulf of St. Lawrence.

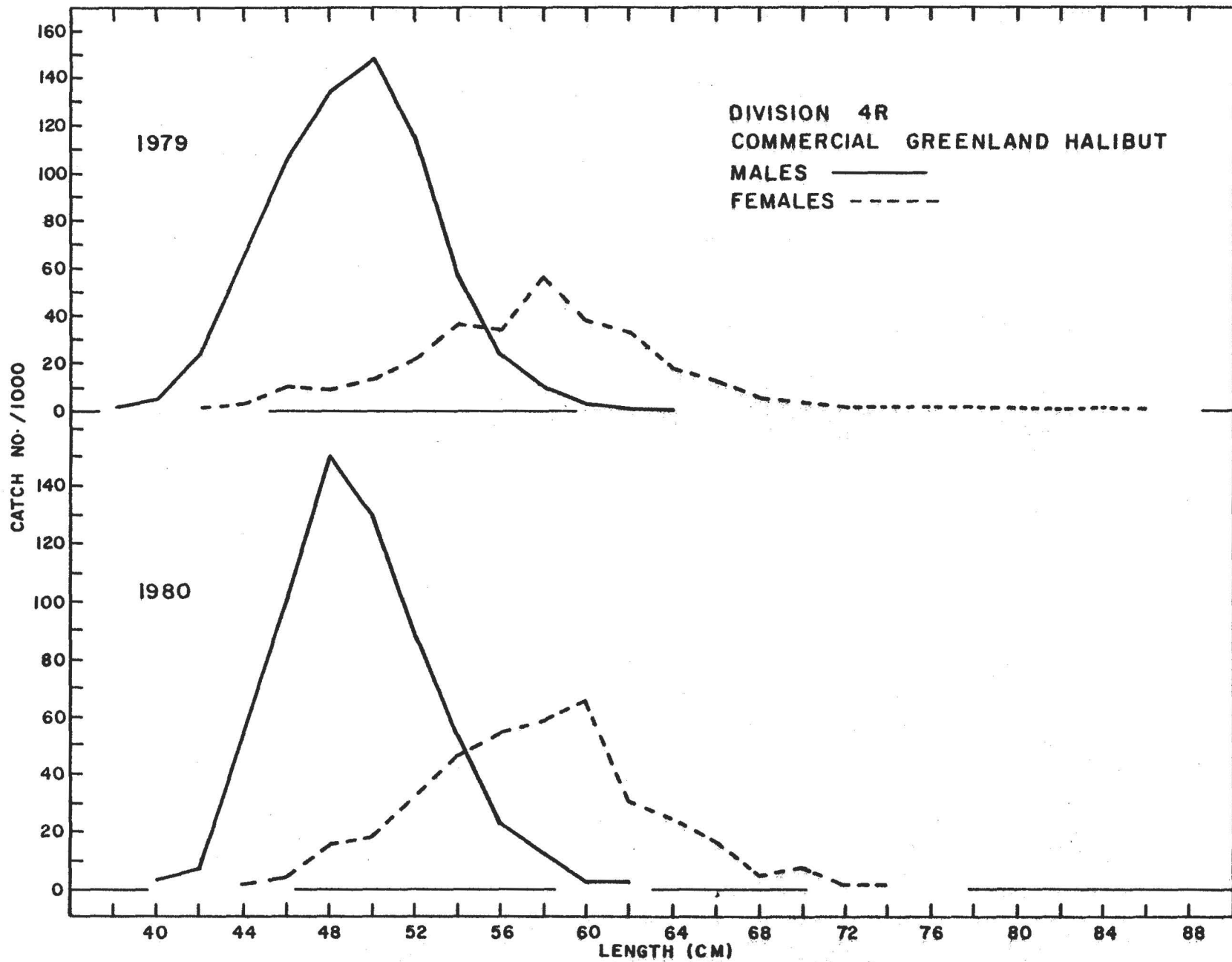


Figure 2. Length composition of commercial male and female Greenland halibut for 1979 and 1980. 1st quarter - Division 4R.

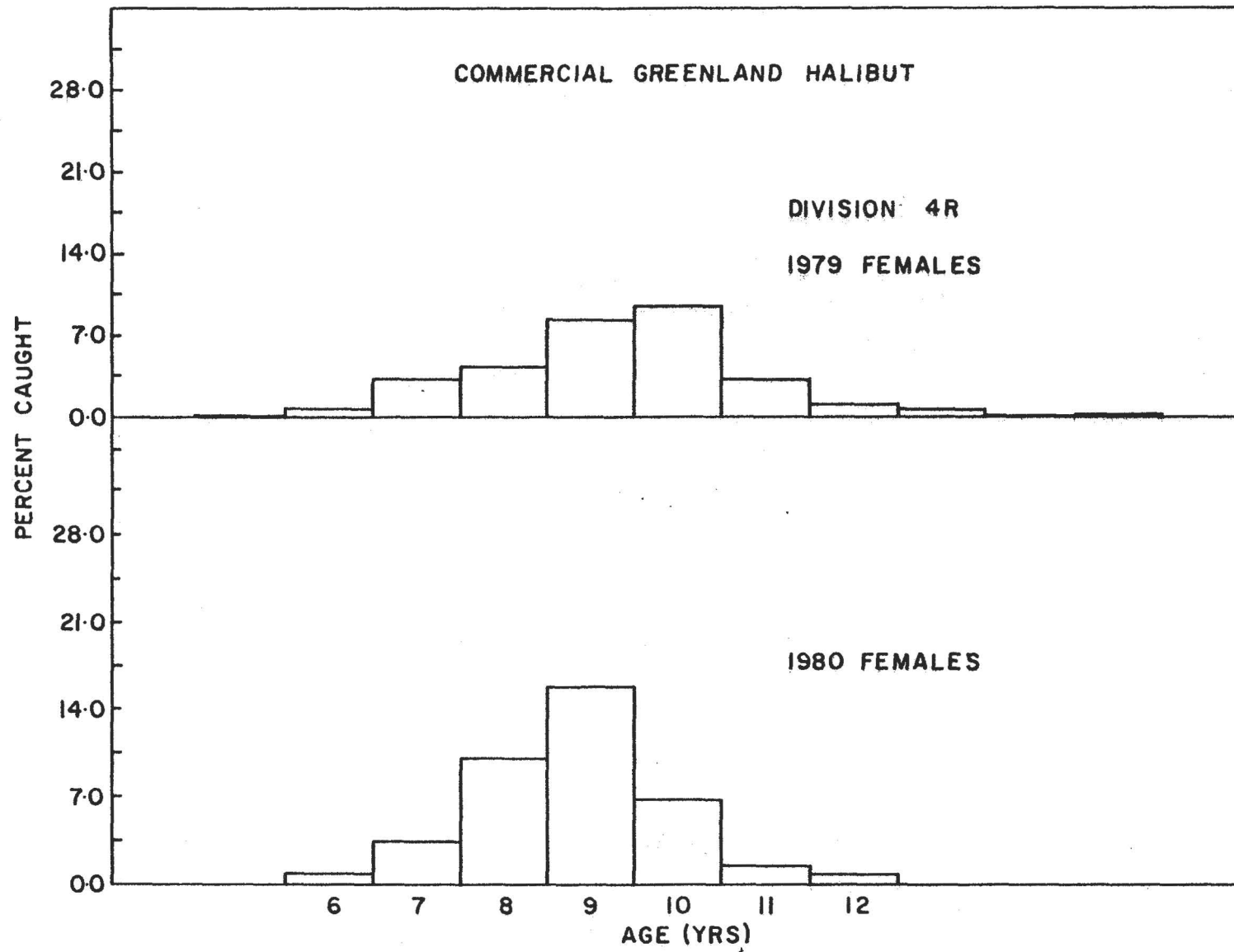


Figure 3. Age composition of female Greenland halibut for 1979 and 1980, 1st quarter - Division 4R.



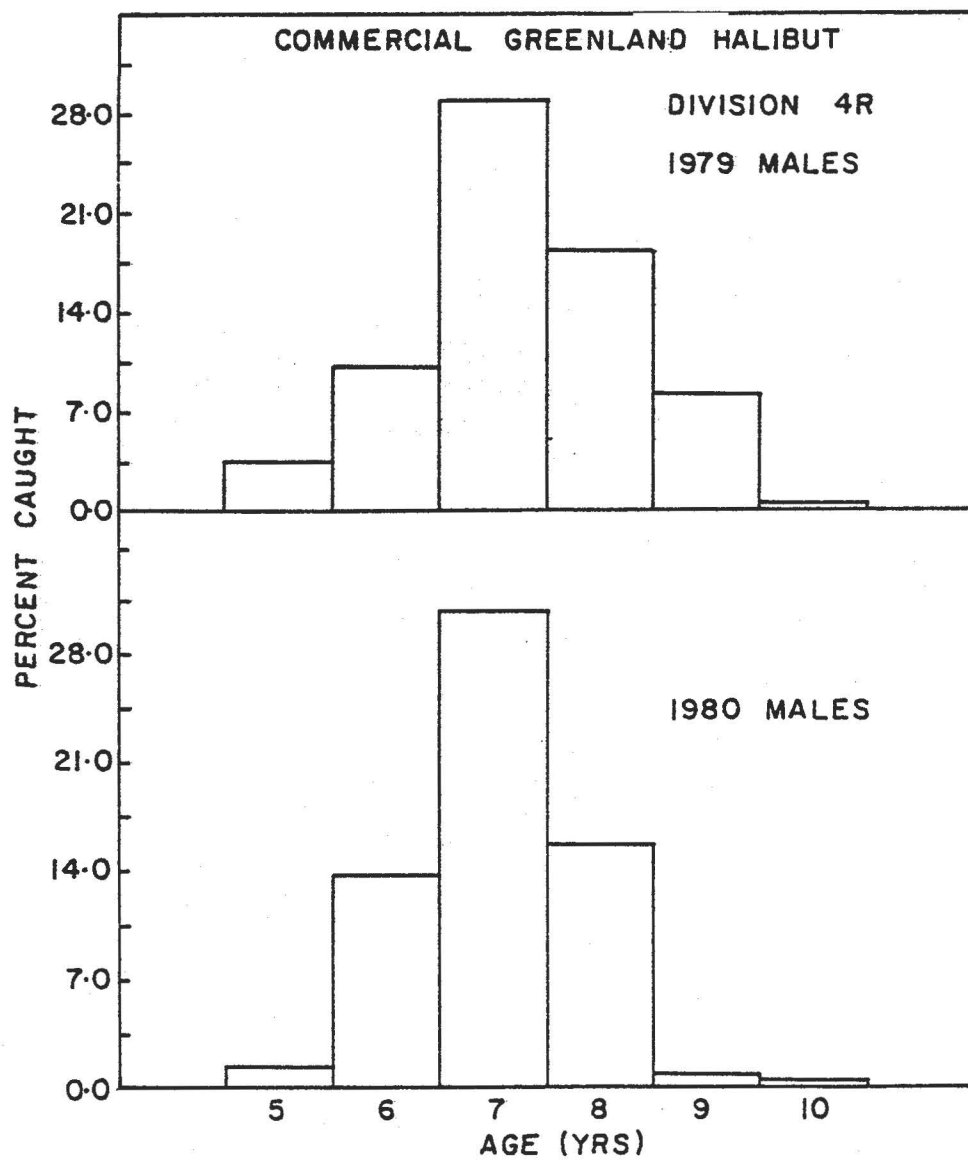


Figure 4. Age composition of male Greenland halibut for 1979 and 1980 1st quarter - Division 4R.

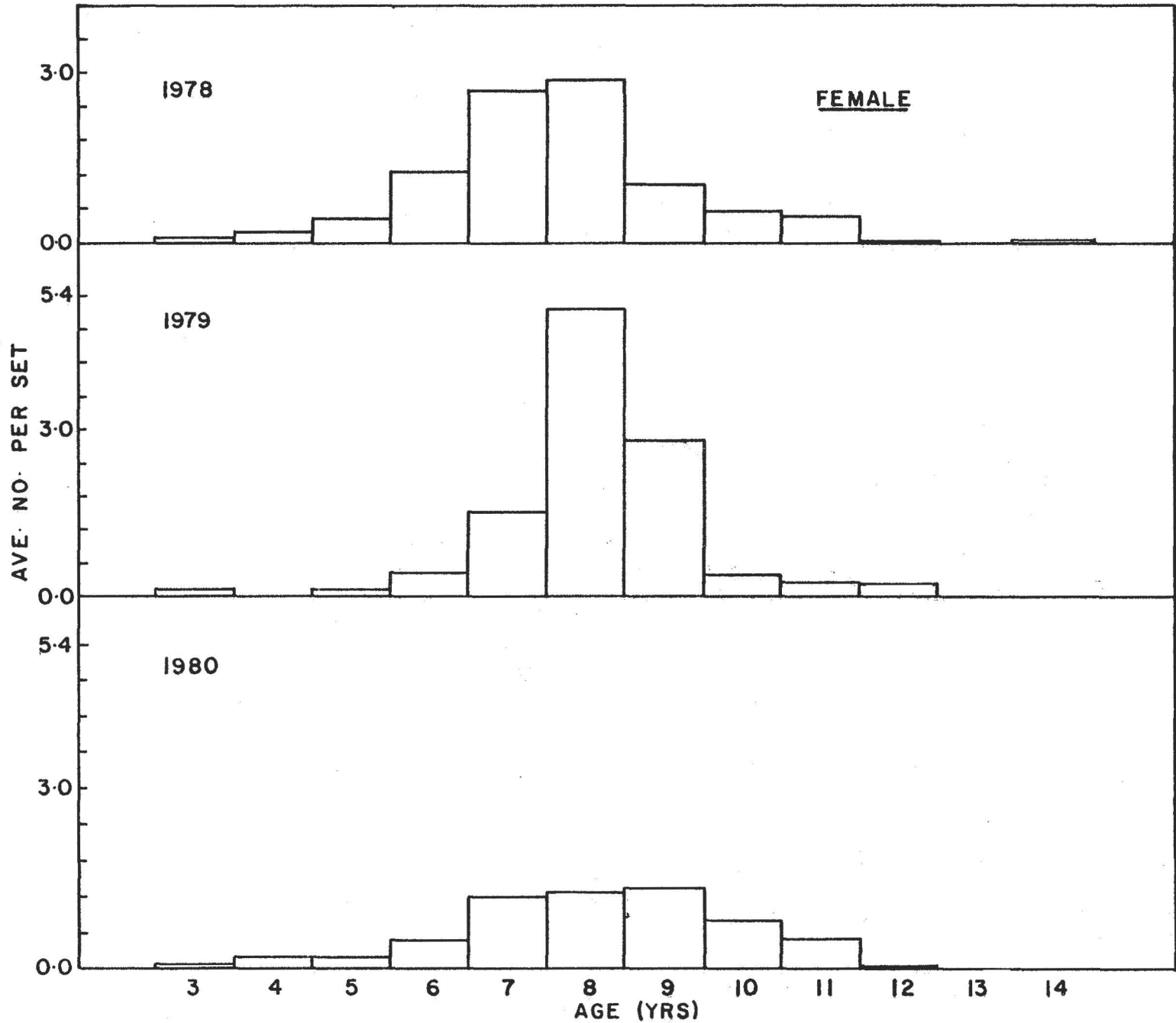


Figure 5. Age composition of female Greenland halibut from biomass surveys in Division 4R for Jan. 1978-80.

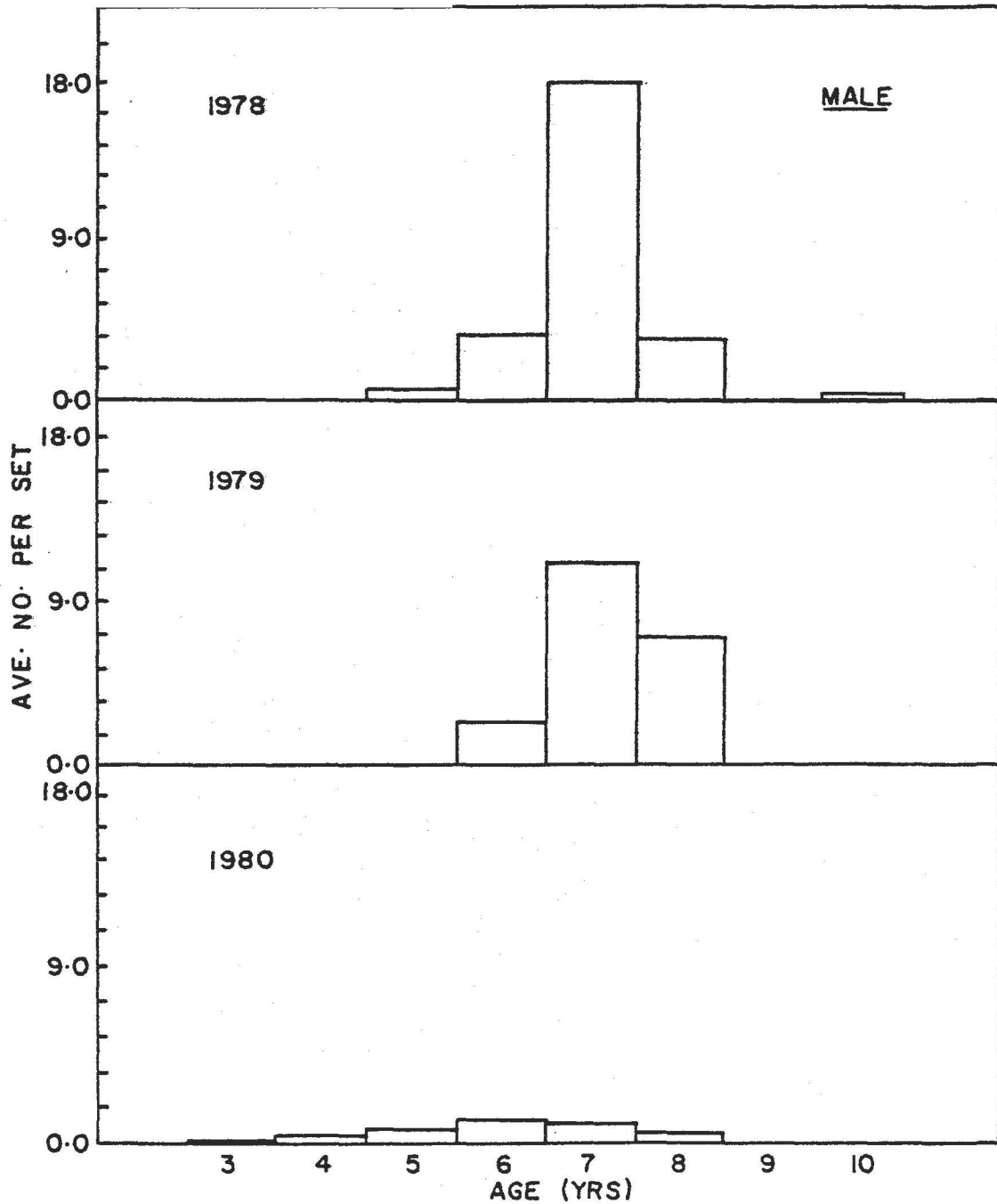


Figure 6. Age composition of male Greenland halibut from biomass surveys in Division 4R for Jan. 1978-80.