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1985 Biological update for the Canadian swordfish fishery

by

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ABSTRACT

Swordfish landings by longline and harpoon of 499 t were recorded in 1984. Landings were lower than in 1983 (1088 t) and well below the quota of 3500 t. Lower landings are thought to be the result of poor market conditions and reduced fishing effort (many licensed vessels were inactive) but CPUE (t/day) was also slightly lower than in 1983. Assessment of this fishery is hampered by a number of factors including a shortage of biological data.

RÉSUMÉ

Les débarquements d'espadons pêchés à la palangre et au harpon se sont chiffrés à 499 t en 1984. Ils sont moins importants que les débarquements de 1983 (1 088 t) et de beaucoup inférieurs au quota fixé (3 500 t). Cette baisse serait due à la faiblesse du marché et à la diminution de l'effort de pêche (de nombreux bateaux dont les propriétaires détenaient un permis sont demeurés inactifs); toutefois, les PUE (t/jour) aussi étaient légèrement moins importantes qu'en 1983. L'évaluation de cette pêche est difficile à réaliser en raison de divers facteurs, notamment le manque de données d'ordre biologique.

HISTORY OF THE FISHERY

A fishery for swordfish was developed in the 1800's off southern New England and extended north of Cape Cod in 1867. A Canadian fishery began in 1903 and overtook that of the USA in importance after 1940. Before 1963 this was a harpoon fishery (prosecuting large, almost exclusively female fish) with an average catch (Canada + USA; 1910-59) of 1600 t dressed weight. In 1957, the fleet consisted of over 160 vessels.

Longlining was introduced in 1962 and the fleet rapidly converted. The fishing area expanded and the season was extended by this more versatile gear. Catch increased dramatically to about 8000 t in 1963, then dropped to about 5000 t (by approximately 100 vessels) during the late 1960's. During the 1960's the average size of fish landed decreased and catches included both males and females.

The fishery all but ceased in 1971 as a result of information on the mercury content of swordfish tissues and restriction of the sale in both Canada and the USA to fish with less than 0.5 ppm mercury levels (Table 1). A limited fishery soon revived in certain US states, landing fish reportedly caught within 3 miles of the coast (within state jurisdiction). Some of this is known to have been transhipped from Canadian vessels which had continued fishing but were prohibited from landing their catch in either country. Relaxation of the mercury regulations in 1978 (USA) and 1979 (Canada) was accompanied by an increase in Canadian catches to as high as 2970 t, driven by market demand (Table 1).

RECENT CATCH AND EFFORT

Available catch and effort information for the years 1980-84 is presented in Tables 2 and 3. Recent landings have been determined to a large extent by market conditions. The low effort and small catch in 1984 are thought to have the result of poor swordfish availability and markets; several vessels with licenses did not fish for swordfish (Joe Forbes, DFO, Liverpool, pers. comm.).

ASSESSMENT AND MANAGEMENT CONSIDERATIONS

Assessment of this fishery is hampered by a number of factors. The fish is highly migratory and its stock structure is poorly understood. There is evidence that the fish taken in the Canadian fishery are part of a single Northwest Atlantic stock, spawning in the Carribean and migrating into northern waters (to the Flemish Cap) to feed (Berkeley 1983). On the other hand, morphometric differences between nearby areas, different catch rates and average sizes between adjacent areas and tag recaptures made near the point of release even after several years at large suggest a more complex stock structure (Beckett 1974, Berkeley 1983). Taken in its widest context, the stock extends offshore and its management should include consideration of third party (mostly Japan) longliner activity in international waters.

There is a shortage of data, especially on the biological characteristics of fish landed in recent years, and temporal trends have been masked by the radical change of gear in the 1960's and by the cessation of the fishery in the 1970's.

Prior to 1971, this fishery was unmanaged. From 1971-78 landings in the USA and Canada (and movement of landed fish) were regulated by mercury restriction. In 1979 Canada introduced licensing and a quota (3000 t in 1979; 3500 t in 1980) for Canadian vessels, although the quota may have been exceeded by transshipping to American vessels at sea.

The change to a longline fishery in the early sixties, resulted in a decrease in the mean size of fish caught. In 1983 and 1984 approximately 60% of the fish landed in the Canadian swordfish fishery were less than 45.5 kg (Tables 3 and 4) but the average weight (1983 = 64 kg; 1984 = 55.4 kg) is above that of 1970 (40 kg; Hurley and Iles 1980). The catch of small swordfish in the USA has prompted a proposal of a variable season closure to be implemented in 1985.

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Table 1. Canadian swordfish landings (t round weight), 1969-84. Data are from two sources; A = Canadian national Annual Reports to ICCAT and B = Scotia Fundy Region Statistics Branch records.

Year	Quota	A: ICCAT Reports Catch = Longline + Harpoon			B: Statistics Branch Catch = Longline + Harpoon		
1969		4328					
1970		4812					
1971		31					
1972		0					
1973		10					
1974		2					
1975		21					
1976		15					
1977		113					
1978		2314			3053	3053	0
1979	3000	2970			2970	2963	7
1980	3500	1885	1794	91	1308	1276	32
1981	3500	561	542	19	443	402	41
1982	3500	554	542	12	905	869	36
1983	3500	1088	960	128	892	785	107
1984	3500	499	465	34	499	465	34

Table 2. Catch per unit effort in the Canadian swordfish longline fishery 1980-84. Data from DFO, Scotia Fundy Region Statistics Branch.

Year	Longline t	Day	t/day
1980	1220.4	539	2.26
1981	389.6	261	1.49
1982	861.8	332	2.60
1983	780.3	352	2.22
1984	458.2	305	1.50

Table 3. Landings and effort in recent years of the Canadian swordfish fishery. Source: J. Forbes, DFO, Liverpool, N. S.

Landings	1983	1984
Total number of fish landed	15012	8123
Total weight of fish (t dressed)	727	378
Total weight round (dressed x 1.32)	960	499
Avg. weight/fish (kg round)	64	55
No. of fish >45.45 kg (dressed)	6230	3210
- avg. weight (kg dressed)	70	76
No. of fish <45.45 kg (dressed)	8782	4913
- avg. weight (kg dressed)	28	28

Effort		1983	1984
Longline vessels	Licensed	56	59
	Active	38	30
Harpoon vessels	Licensed	441	474

Table 4. Distribution by weight of the 1984 Canadian swordfish landings, based upon samples from two longline vessel trips (n=111; source: J. Forbes, DFO, Liverpool, N. S.).

Weight pounds (dressed)	Frequency in sample		Distribution of 1984 catch in no. of fish
	Fish	Percentage	
0-10	1	0.900	73
10-20	0	0.000	0
20-30	4	3.603	293
30-40	13	11.711	951
40-50	12	10.810	878
50-60	8	7.207	585
60-70	13	11.711	951
70-80	10	9.009	732
80-90	4	3.603	293
90-100	8	7.207	585
100-110	5	4.504	366
110-120	2	1.801	146
120-130	7	6.306	512
130-140	3	2.702	219
140-150	1	0.900	73
150-160	7	6.306	512
160-170	2	1.801	146
170-180	5	4.504	366
180-190	0	0.000	0
190-200	0	0.000	0
Over 200	6	5.405	439
TOTALS	111	99.99%	8120