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Witch Flounder on St. Pierre Bank (NAFO Subdivision 3Ps)

by

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### Abstract

The fishery for witch flounder in Subdivision 3Ps has essentially been a by-catch of other groundfish on St. Pierre Bank by otter trawls and in Fortune Bay by Danish and Scottish seiners. Fishing effort towards witch flounder in Subdivision 3Ps in recent years however has been negligible with annual landings over the past few years being less than 500 t. Estimates of biomass from research vessel surveys on St. Pierre Bank indicate that minimum trawlable biomass levels are now between 4,000-6,000 t. Age compositions from both research surveys and the commercial fishery indicate a range in age up to 13-14 years with most of the population in the 8-10 year old range.

### Résumé

Dans la subdivision 3Ps, la pêche à la plie grise n'a consisté essentiellement qu'en prises secondaires accompagnant d'autres poissons de fond qu'on a pêchés au chalut à panneaux, dans le banc St-Pierre, et à la senne danoise ou écossaise, dans la baie de Fortune. Ces dernières années, cependant, l'effort de pêche déployé pour capturer de la plie grise dans la subdivision 3Ps a été négligeable : les débarquements annuels ces quelques dernières années étaient inférieurs à 500 t. Selon les estimations établies d'après les relevés effectués dans le banc St-Pierre, la biomasse chalutable minimum se chiffre actuellement à 4 000-6 000 t. D'après les relevés et les résultats de la pêche commerciale, les gammes d'âges vont jusqu'à 13-14 ans et la plus grande partie de la population appartient à la gamme des 8-10 ans.

### The commercial fishery

The fishery for witch flounder in the St. Pierre Bank area has generally been a by-catch of other groundfish such as redfish. A small Danish seiner fishery occurs in the Fortune Bay area where witch is caught as a mixed catch of cod, American plaice, and Greenland halibut. Landings peaked at 4,800 t in 1967, but in recent years (1981-84) have been less than 500 t annually (Fig. 1).

Due to the very low levels of commercial catch in recent years, obtaining age-length data from the commercial fishery has been next to impossible. In 1984, however, a sample from the commercial otter trawl fishery on St. Pierre Bank as well as a sample from the Danish seine fishery in Fortune Bay were secured (Fig. 2). The otter trawl catches ranged from 6 to 13 years old with a mode at age 9. About half of the catch occurred at ages 9-10. The Danish seine catches ranged from 6 to 12 years old with over 40% of the catch occurring at age 9. About 70% of the total Danish seine catch occurred at ages 8-9.

### Estimates of biomass from research vessel surveys

From 1972-82 research vessel surveys using stratified-random design have been conducted on St. Pierre Bank by the A. T. CAMERON in February-March. In 1983 and 1984 these surveys were conducted by the research vessel ALFRED NEEDLER although using different gear and surveying a couple of months later in the year.

With the exception of 1983, the surveys have never been complete, especially in the deeper strata where most witch are likely to occur. On the other hand, except for 1982 where some key strata were missed, the 1980-84 surveys were probably acceptable for biomass estimates of witch (Table 1). It would appear that during the last several years estimates of biomass of witch flounder are probably somewhere between 4,000 t and 6,000 t on St. Pierre Bank (Table 1).

In order to standardize the survey data, a mean catch per 30 minute tow (kg) was calculated for strata surveyed in all years. These mean weights were weighted by stratum area (Table 2; Fig. 3). Except for the anomalous 1982 point, the mean weight per tow since 1980 appears to be relatively stable or possibly even increasing.

The age composition from the 1984 survey is presented in Fig. 2. The ages ranged from 2 to 14 and peaked at age 10. In 1983 the ages ranged from 2 to 13 and peaked at age 9, a shift of one year. This is not too surprising considering the very low fishing intensity. The age composition of the survey data is very similar to that of commercial otter trawl, however, the survey has a higher abundance of young fish.

Table 1. Witch - average weight (kg) per 30 minute set - NAFO Subdivision 3Ps. (No. of sets shown in parentheses.)

Stratum	* ATC 247 and 248 1976	ATC 261 1977	ATC 273 and 275 1978	ATC 287 1979	ATC 302 1980	ATC 316 1981	ATC 330 1982	A. Needler 009 1983	A. Needler 26 1984
306	1.10(6)	3.21 (6)	1.49(9)	2.63(5)	1.72(2)	2.43(3)	0.70(3)	3.30 (4)	0.15(2)
307	0.34(4)	2.21 (4)	0.03(7)	0.0 (4)	0.45(2)	0.0 (3)	0.0 (4)	0.38 (4)	1.00(2)
308	0.0 (2)	0.0 (4)	0.0 (2)	0.0 (4)	0.0 (2)	0.0 (2)	0.0 (2)	0.0 (3)	0.00(2)
309	1.91(7)	6.14 (6)	3.38(9)	3.97(6)	0.0 (2)	3.75(2)	0.0 (2)	3.00 (3)	1.95(2)
310	2.84(4)	6.94 (6)	6.63(9)	4.01(6)	4.09(2)	6.00(2)	4.00(3)	1.67 (3)	3.25(2)
311	9.91(6)	24.29 (4)	1.25(8)	1.47(4)	0.22(2)	0.25(2)	0.0 (3)	0.0 (3)	3.00(2)
312	0.09(5)	0.91 (4)	0.0 (2)	0.0 (3)		0.0 (2)	0.35(2)	0.0 (3)	0.50(2)
313	9.88(6)	8.32(10)	17.07(5)	6.17(5)	22.24(2)	25.00(2)	8.50(2)	10.17 (3)	2.50(2)
314	0.0 (2)	0.28 (4)	0.0 (3)		0.0 (2)	0.0 (5)	0.0 (5)	0.0 (7)	0.00(4)
315	0.0 (2)	0.34 (4)		0.0 (3)	0.0 (4)	0.0 (2)	0.40(3)	1.20 (8)	2.20(5)
316	5.45(4)	33.33 (6)	15.17(6)	18.76(3)	5.90(2)	16.50(2)		41.00 (4)	30.50(2)
317	39.50(4)	11.55 (4)	6.98(4)	0.0 (3)	4.43(2)	0.15(2)	5.17(3)	98.33 (3)	119.75(2)
318	1.91(7)	6.05 (6)	5.90(2)	14.74(2)	7.26(2)		0.95(2)	10.07 (3)	0.95(2)
319	1.25(4)	1.59 (6)	1.82(4)	0.91(2)	18.84(4)	16.50(2)	0.93(7)	1.00 (7)	2.08(6)
320	0.15(3)				0.0 (6)	0.0 (2)	0.0 (4)	0.86(14)	0.00(8)
321	0.68(2)		0.0 (3)		0.0 (5)	0.0 (2)	0.0 (4)	0.0 (10)	0.00(6)
322	0.0 (4)		0.0 (2)	0.0 (2)	0.77(8)	0.0 (2)	0.31(8)	0.18(11)	0.44(8)
323	0.0 (4)	93.36(2)	0.15(3)		0.0 (3)	3.75(2)	1.00(2)	9.50 (6)	0.38(4)
324	0.0 (2)			0.0 (2)	0.0 (2)		0.0 (2)	0.0 (4)	0.00(3)
325	0.0 (2)		0.0 (2)	0.0 (2)	0.0 (4)	0.0 (2)	0.0 (5)	0.0 (8)	0.18(5)
326			0.0 (2)	0.0 (2)	0.0 (2)	0.0 (2)	0.0 (2)	0.0 (3)	0.00(2)
705	6.02(4)	7.15(4)	3.99(5)	13.39(4)	7.94(2)	12.50(2)		4.93 (3)	3.75(2)
706	8.55(3)	20.56(4)	8.63(2)	24.64(3)	9.99(2)	17.75(2)	2.40(4)	11.30 (5)	8.50(2)
707	3.29(6)	1.29(4)	10.90(2)	11.13(2)	9.53(2)			6.10 (3)	5.75(2)
708	13.77(3)	6.23(4)		4.31(2)	0.80(2)			2.75 (2)	3.57(2)
709	3.29(2)							0.15 (2)	0.20(2)
710								1.79 (3)	1.50(2)
711	12.49(2)				4.77(2)	7.30(2)	2.95(2)	5.49 (8)	4.40(5)
712	2.73(2)			8.39(2)	6.13(2)	10.25(2)	1.30(3)	3.73 (7)	-
713					4.31(2)	2.67(6)	1.20(2)	2.48 (7)	-
714	2.39(2)		4.20(2)		4.54(2)	5.70(8)	1.32(6)	1.31(10)	-
715	3.81(5)	2.67(4)	9.08(6)	4.69(3)	3.29(2)	2.35(2)	1.50(2)	6.33 (3)	2.25(2)
716	4.09(2)	8.32(6)	4.47(6)	8.11(4)	3.63(2)	11.25(4)	1.50(2)	5.00 (4)	4.47(3)
Total tons	3396	8090	2052	2983	4330	5475	1124	4955	3738

\*ATC is the research vessel the A.T. Cameron.

Table 2. Weighted mean weight (kg) per tow of witch from strata common to each annual survey in NAFO Subdivision 3Ps.

Stratum	307	309	310	311	313	317	319	Weighted Mean Wt/tow
Area (Sq.N.Mi)	(395)	(296)	(170)	(317)	(165)	(193)	(984)	T=2,520
YEAR								
1972	0.0	1.31	9.53	0.85	6.58	4.99	5.22	3.75
1973	0.0	17.86	6.81	0.0	6.19	2.98	1.57	3.80
1974	0.76	10.84	6.70	8.68	20.43	25.99	11.80	10.87
1975	0.0	2.02	1.92	4.77	33.29	9.48	0.41	4.03
1976	0.34	1.91	2.84	9.91	9.88	39.50	1.25	5.88
1977	2.21	6.14	6.94	24.29	8.32	11.55	1.59	6.64
1978	0.03	3.38	6.63	1.25	17.07	6.98	1.82	3.37
1979	0.0	3.97	4.01	1.47	6.17	0.0	0.91	1.68
1980	0.45	0.0	4.09	0.22	22.24	4.43	18.84	9.53
1981	0.0	3.75	6.00	0.25	25.00	0.15	16.50	8.97
1982	0.0	0.0	4.00	0.0	8.50	5.17	0.93	1.59
1983	0.38	3.00	1.67	0.0	10.17	98.33	1.00	9.11
1984	1.00	1.95	3.25	3.00	2.50	119.75	2.08	10.97

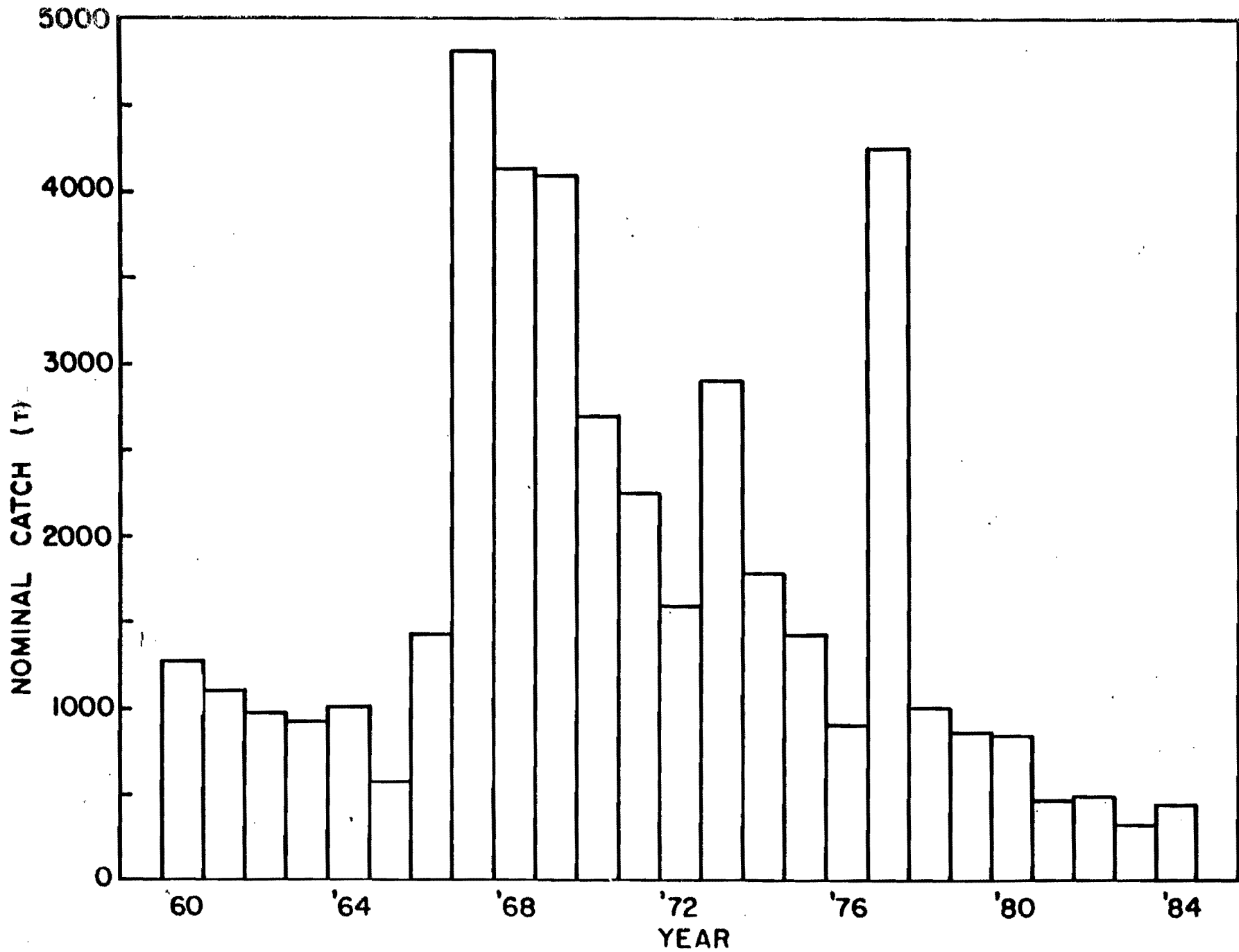


Fig. 1. Nominal catches of witch flounder in NAFO Subdivision 3Ps (1983 and 1984 provisional).

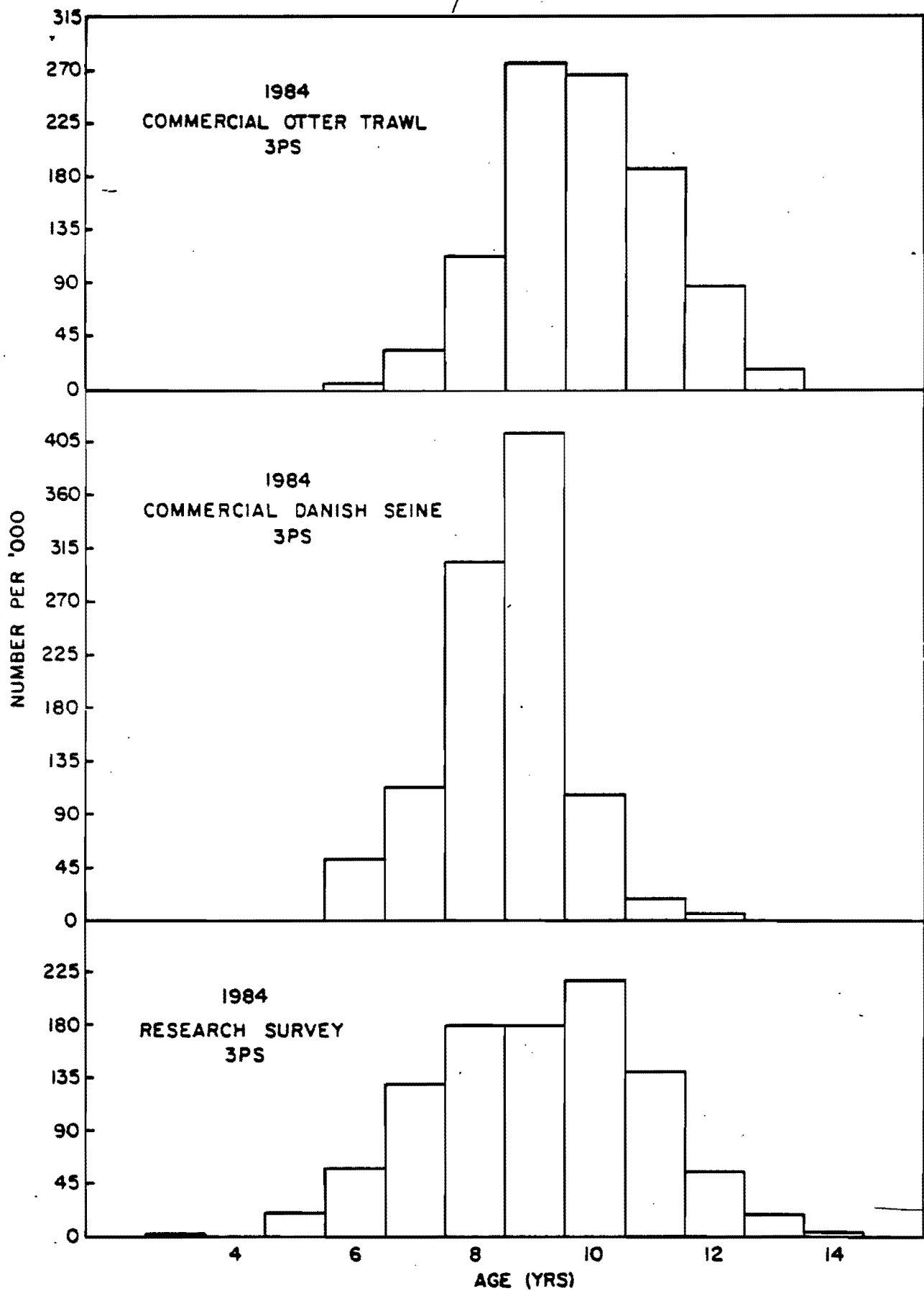


Fig. 2. Age distribution of witch flounder in NAFO Subdivision 3Ps from the commercial fishery and research survey in 1984.

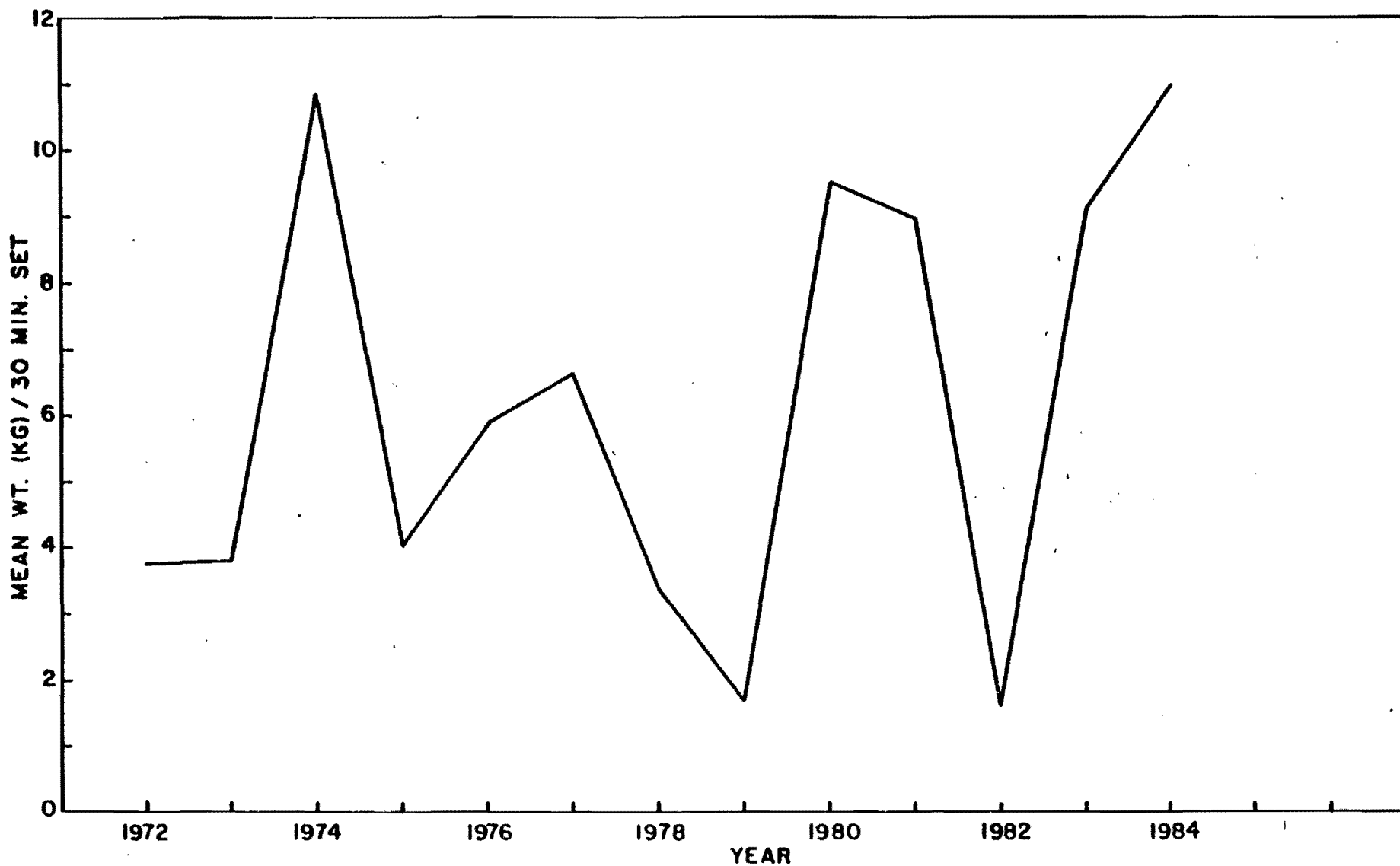


Fig. 3. Mean weight (kg) per 30 minute tow of witch flounder on St. Pierre Bank (NAFO Subdivision 3Ps) from surveys 1972-84. Only strata surveyed in all years are used in the calculations.