

Trends in Stock Structure of Witch Flounder on St. Pierre Bank  
from Biomass Surveys

by

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Abstract

Landings of Witch flounder on St. Pierre Bank has fluctuated from 570 t to 4805 t over the past 17 years. It is mainly a by-catch fishery of other species such as cod and redfish, however, years of high catch were probably more a directed fishery when it was not possible to fish other species. Incomplete biomass surveys indicated relative stability in the stock over the past several years, however, it was not possible to obtain biomass estimates for the whole stock area. It was found that the numbers of old fish found in the catches of earlier years now appear to have been removed almost entirely.

Résumé

Les débarquements de plie grise du banc St. Pierre ont fluctué entre 570 t et 4,805 t au cours des 17 dernières années. Il s'agit surtout de prises fortuites de pêches dirigées vers d'autres espèces, telles que la morue et le sébaste. Toutefois, dans les années de prises abondantes, il y avait pêche plus dirigée quand on ne pouvait exploiter d'autres espèces. Des relevés incomplets de biomasse indiquent des conditions relativement stables du stock depuis plusieurs années. Il a toutefois été impossible d'obtenir des estimations de biomasse pour toute l'aire du stock. On a constaté que les poissons âgés présents dans les prises des années antérieures semblaient avoir presque complètement disparu.

### Commercial landings

Landings of witch flounder from St. Pierre Bank have fluctuated over the past 17 years from as low as 570 tons in 1965 to as high as 4805 tons in 1967. The main reason for these fluctuations is that this fishery has nearly always been a by-catch fishery of such species as cod, redfish and American plaice. Only in years when catch quotas of other species were taken early or ice hampered popular fishing zones was any directed fishery placed upon this stock. Because of the nature of this fishery, it has been virtually impossible to secure adequate commercial samples since the small catches pass through the processing plants almost immediately, particularly in 1978 and 1979 (Table 1).

### Trends in numbers and weights per set from biomass surveys

Biomass surveys have been conducted for the research vessel A.T. Cameron on the St. Pierre Bank since 1972. However, it has been difficult in most years to survey the entire area. Only 5 strata from a depth range of 101-150 fathoms were fished in all years from 1972 up to and including 1980 and the average numbers and weights per set weighted by stratum were calculated. These values are presented in Table 2 and Fig. 1.

A similar exercise was carried out for three strata in the depth range from 151-200 fathoms. The average weights and numbers per set are presented in Table 3 and Fig. 2.

#### Average numbers caught at age per set

The age compositions for males and female witch were presented as average numbers per set at age for each year of 1972-80 in Fig. 3, 4, 5, and 6. These are similar to those presented in last year's document (CAFSAC Res. Doc 79/13) with the inclusion of the 1980 survey.

#### Results

The average numbers and weights per set in the 101-150 fathom strata appear to be following the same gentle decline since 1977. The deeper strata indicated the opposite up to 1980 with a very slight decline in 1980.

The age composition from 1979 to 1980 show a marked difference (Fig. 4-7) for both sexes and both depth ranges, with the numbers caught at age not even remotely similar to that of 1979. The 1980 survey is made up of much younger fish with very few fish caught beyond age 10. Whether this is an indicator of good recruitment or simply an anomalous distribution of the species in the area is difficult to ascertain.

It is difficult to determine what type of fishing pressure a stock such as this could sustain. However, considering the relatively minor importance of this stock, harsh restrictive measures would probably result in inhibiting the fishery for more lucrative species. With the small by-catches over the past couple of years, a change in the present management regime does not appear warranted.

Table 1. Nominal catches of witch flounder, ICNAF Division 3Ps 1963-79.

Year	CAN	FRA	USSR	UK	PORT	TOTAL
1963	771	131	-	22	-	924
1964	963	-	-	48	-	1011
1965	555	-	-	15	-	570
1966	1344	-	79	21	-	1444
1967	3790	-	982	33	-	4805
1968	2561	106	1464	-	-	4131
1969	2309	95	1691	1	-	4096
1970	2591	111	-	-	-	2702
1971	2193	57	-	-	-	2250
1972	1517	69	8	-	-	1594
1973	2341	112	443	10	-	2906
1974	1699	2	-	-	40	1741
1975	1370	40	4	-	13	1427
1976	866	32	3	-	2	903
1977	4168	-	-	-	-	4168
1978	963	-	-	-	-	963
1979						814*

\*Provisional catch statistics from quota report

Table 2. Witch biomass surveys 1972-80 Subdivision 3Ps.

Stratum	309	310	313	316	318	Total Area:	Weighted Mean:
Area (sq. n. miles)	(296)	(170)	(165)	(189)	(123)	943	
1972	*No.	2.43	21.39	17.50	50.56	33.70	22.21
	*Wt.	1.27	9.27	6.40	21.02	12.06	8.98
1973	No.	36.00	13.00	12.25	51.60	40.50	31.41
	Wt.	17.86	6.81	6.19	18.89	25.88	15.08
1974	No.	29.62	14.75	56.60	74.33	54.00	43.80
	Wt.	10.84	6.70	20.43	27.69	25.88	17.11
1975	No.	4.20	3.98	120.67	126.50	4.97	49.15
	Wt.	2.02	1.92	33.29	37.79	1.69	14.60
1976	No.	5.13	5.25	27.17	13.75	6.55	10.92
	Wt.	1.91	2.84	9.88	5.45	1.91	4.18
1977	No.	13.56	13.94	20.73	91.06	14.50	30.54
	Wt.	6.14	6.94	8.32	33.33	6.05	12.10
1978	No.	9.56	16.44	34.20	42.67	16.50	22.65
	Wt.	3.38	6.63	17.07	15.17	5.90	9.05
1979	No.	8.17	8.33	14.40	43.67	37.00	20.16
	Wt.	3.97	4.01	6.17	18.76	14.74	8.73
1980	No.	0.00	9.00	31.50	14.00	16.00	12.03
	Wt.	0.00	4.09	22.24	5.90	7.26	6.76

\*No. = Av. No./Set (Weighted by Stratum area)

\*Wt. = Av. Wt./Set (Weighted by Stratum area)

Table 3. Witch biomass surveys 1975-1980 - ICNAF Subdivision 3Ps

Stratum	705	707	715	Total Area:	Weighted Mean:
Area (Sq. N. Miles)	(195)	(93)	(132)	420	
1975					
*No.	25.81	65.25	19.00		32.40
*Wt.	3.97	20.32	6.65		8.43
1976					
No.	18.50	5.50	10.50		13.11
Wt.	6.13	2.27	5.90		5.20
1977					
No.	20.75	4.62	6.25		12.62
Wt.	7.15	1.29	2.67		4.44
1978					
No.	10.80	27.00	15.50		15.86
Wt.	3.99	10.90	9.08		7.12
1979					
No.	33.50	22.50	9.33		23.47
Wt.	13.39	11.13	4.69		10.16
1980					
No.	25.50	18.50	9.50		18.92
Wt.	7.94	9.53	3.29		6.83

\*Average number per set (Weighted by Stratum Area)

\*Average weight per set (Weighted by Stratum Area)

Figure 1. Witch Division 3Ps  
Strata 309, 310, 313, 316, 318

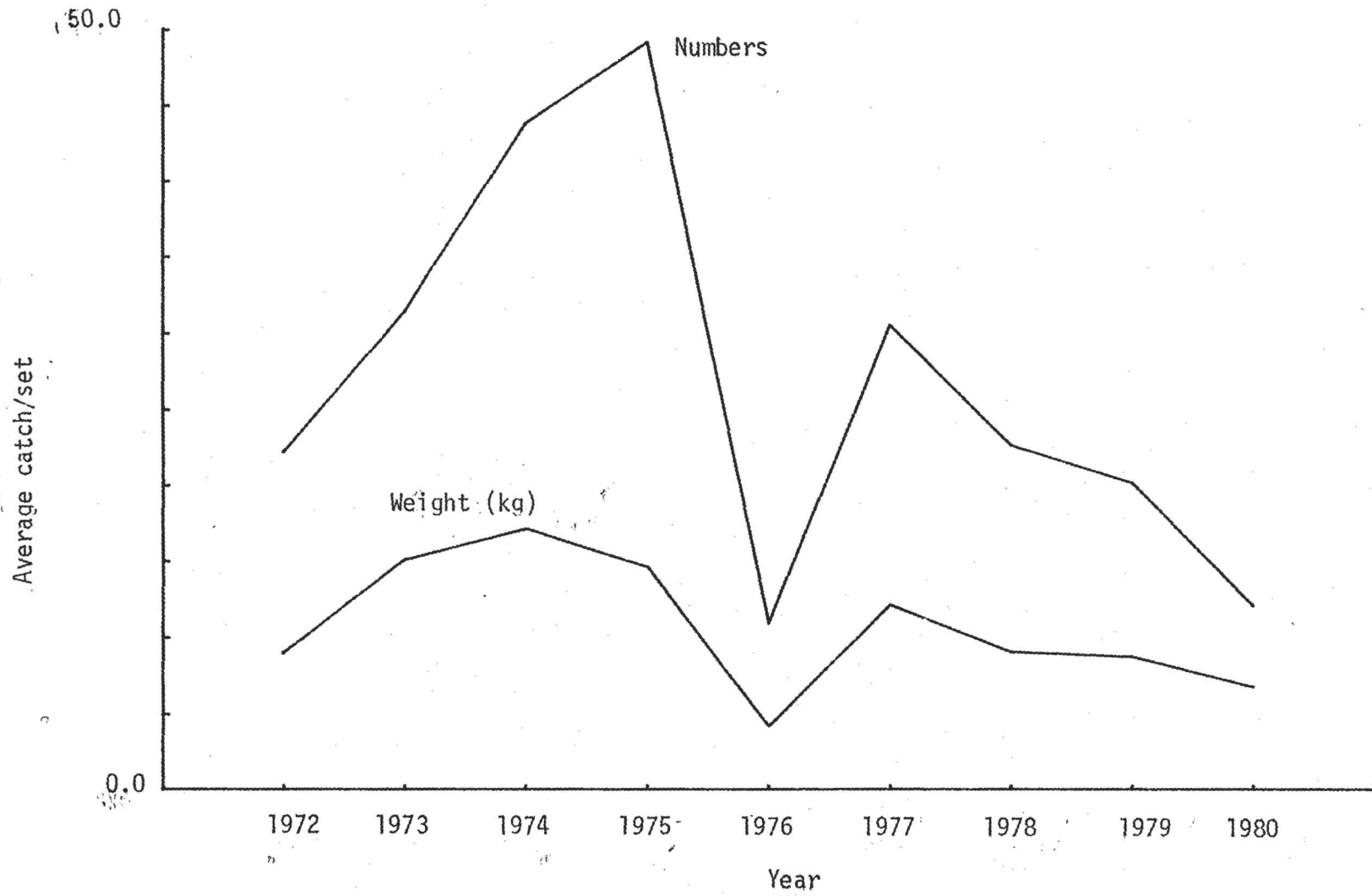
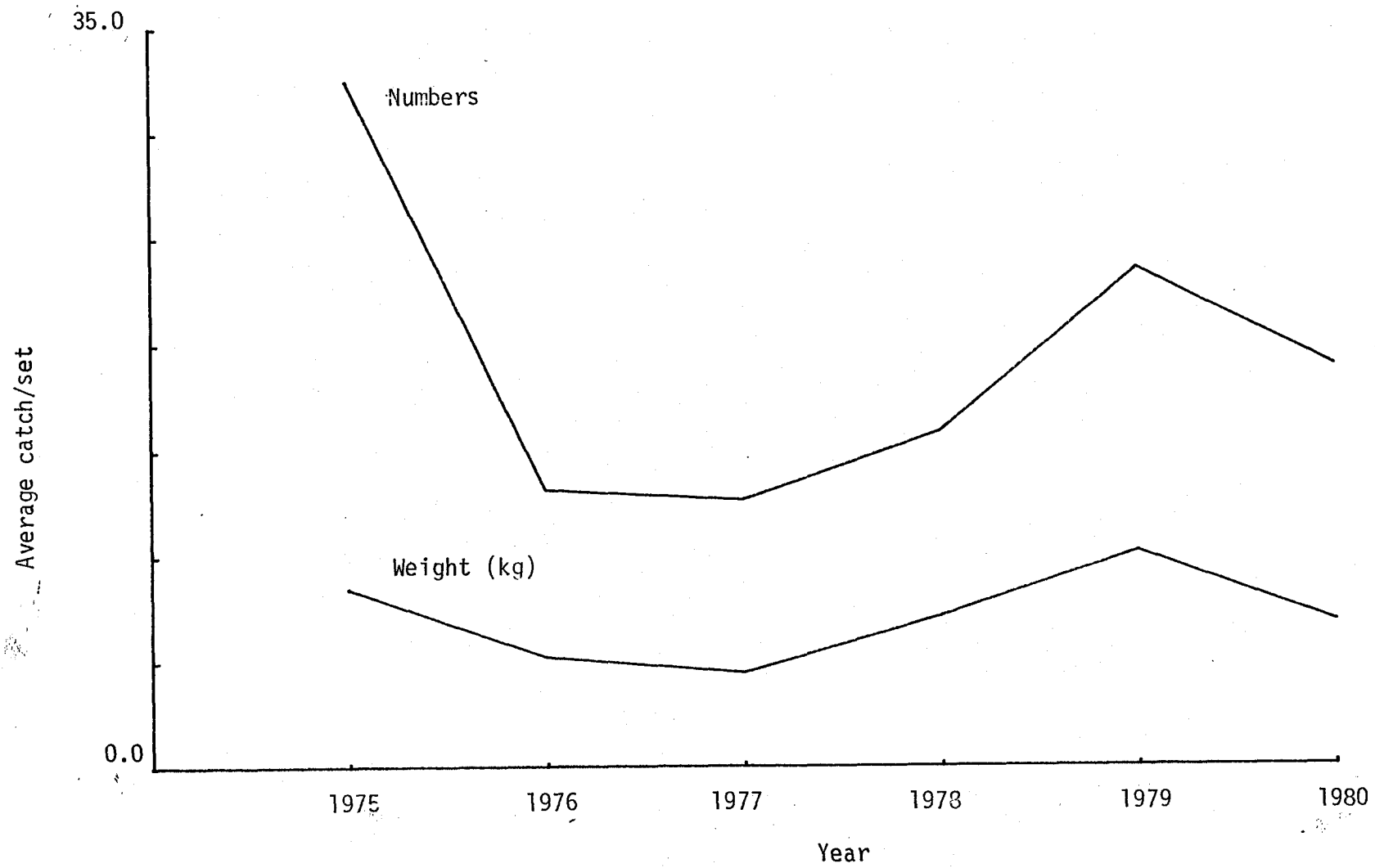


Figure 2. Witch Division 3Ps  
Strata 705, 707, 715





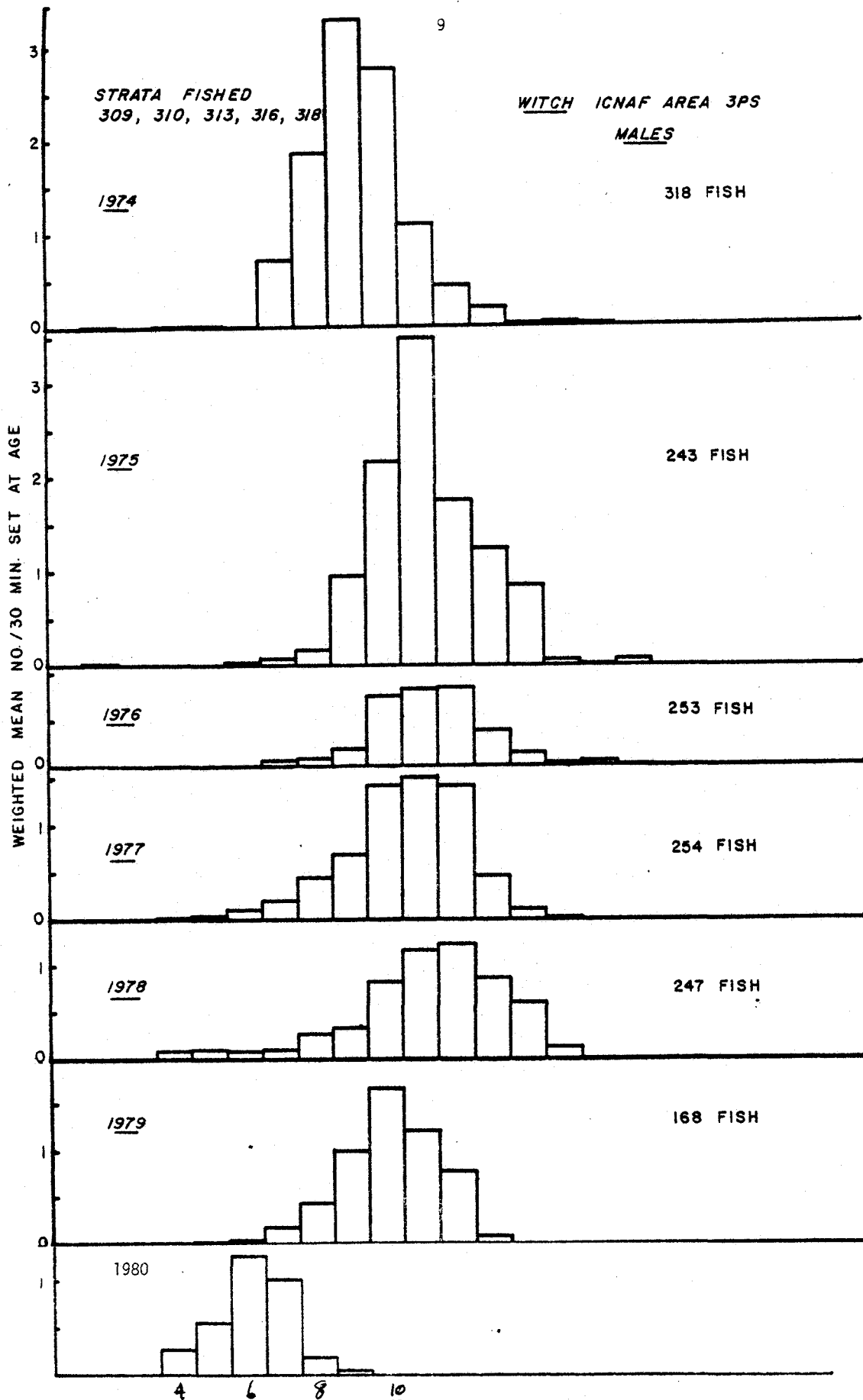


Fig. 3. Weighted average number of male witch per set at age from stratified random surveys on St. Pierre Bank from 1974-80. Values are based upon 5 strata from 101-150 fathoms.

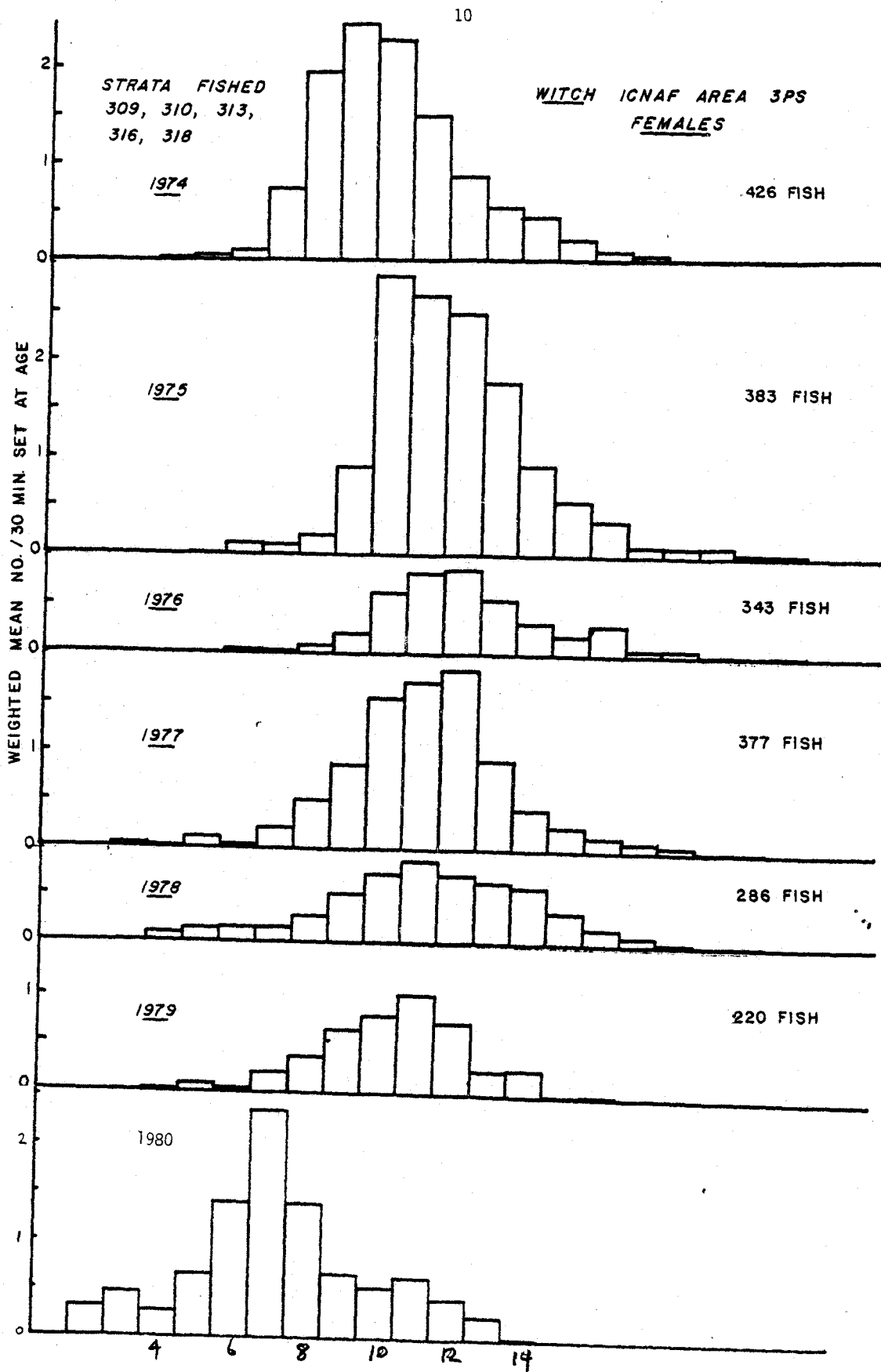


Fig. 4: Weighted average number of female witch per set at age from stratified random surveys in St. Pierre Bank from 1974-80. Values are based upon 5 strata from 101-150 fathoms.

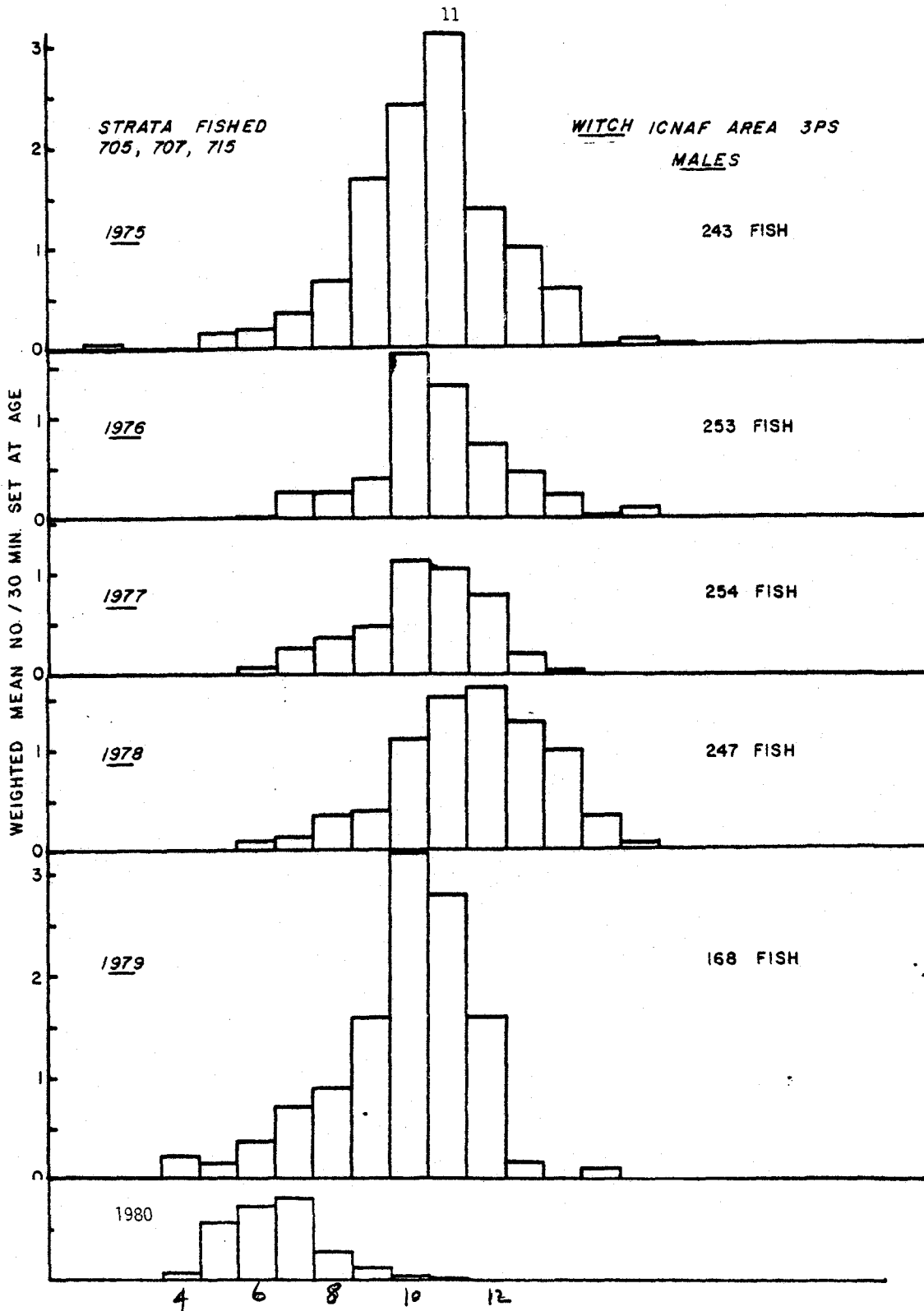


Fig. 5. Weighted average number of male witch per set at age from stratified random surveys on St. Pierre Bank during 1975-80. Values are based upon 3 strata from 151-200 fathoms.

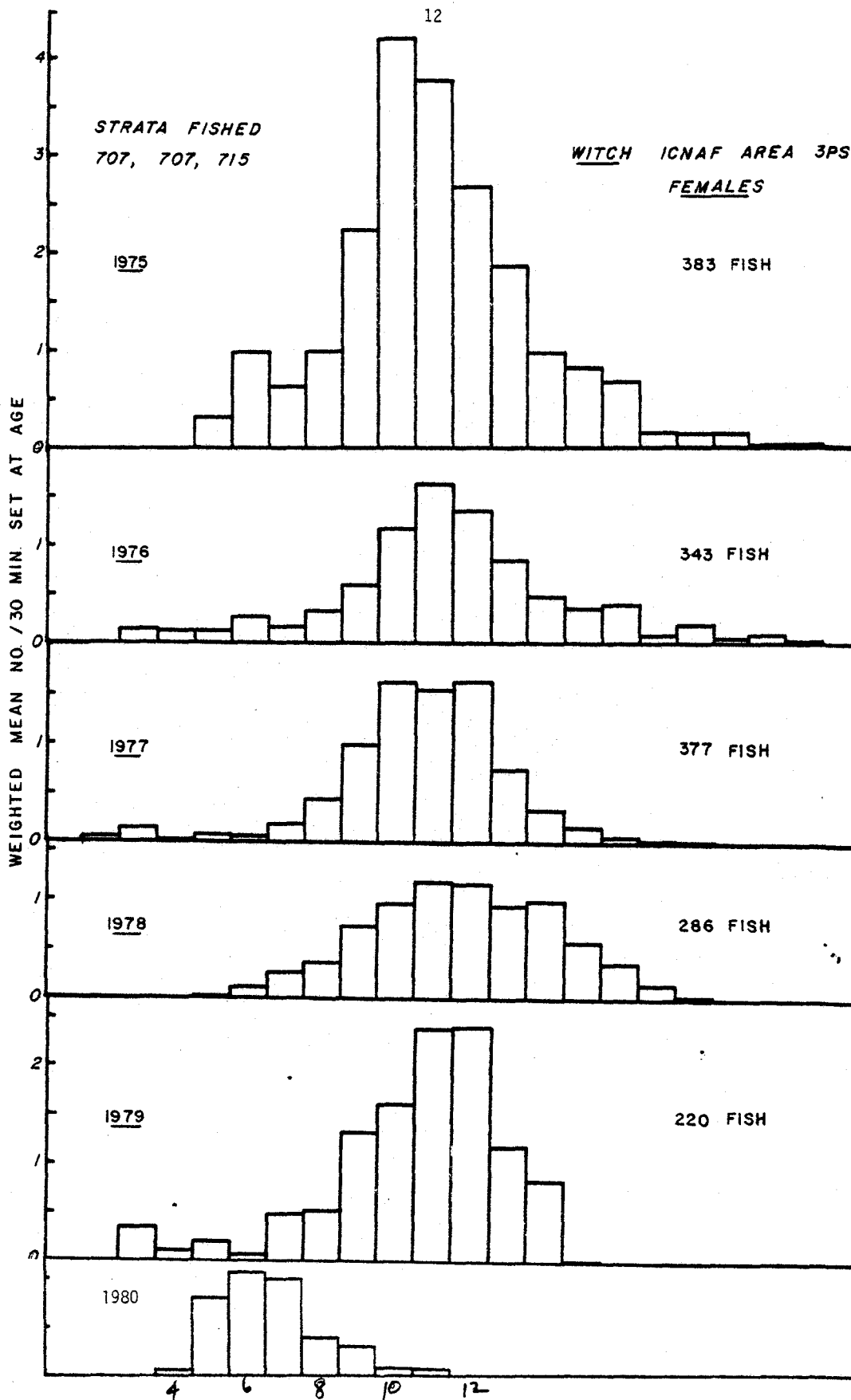


Fig. 6. Weighted average number of female witch per set at age from stratified random surveys on St. Pierre Bank during 1975-80. Values are based upon 3 strata from 151-200 fathoms.