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Witch Flounder in Divisions 3N0

by

W. R. Bowering

Dept. of Fisheries and Oceans, Science Branch, P. O. Box 5667
St. John's, Newfoundland, Canada A1C 5X1

Introduction

Reported catches of witch flounder from 1970 to 1984, ranged from about 2,400 t in 1980 and 1981 to 9,200 t in 1972 (table 1; Fig. 1). With increased effort mainly by EEC countries in 1985 and 1986, particularly Spain and Portugal, catches rose rapidly to 8,800 and 8,500 t respectively. This increased effort was concentrated mainly in the Regulatory Area of Div. 3N. Other nonmember countries such as the USA, Korea, and the Cayman Islands, and Panama also contributed to increased catches. In 1987 and 1988, the catch was 7,600 and 6,100 t respectively and was taken mainly by Canada, EEC (Spain and Portugal) and the USSR. With reduced catch rates for flatfish generally outside the Canadian 200 mile limit, some countries have diverted effort towards other species such as redfish, and this may explain some of the reduction in catch in 1987 and 1988 compared to the very high levels during 1985 and 1986. The preliminary catch for 1989 is 3465 t (Table 2) which is near the lowest in 10 years, however, this would not include any catch from non-reporting countries. For catches reported the largest portion is taken by EEC followed by Canada. Only 3 t was reported by the USSR although historically the USSR has been a major prosecutor of this fishery, particularly in Div. 3N.

Catch and effort

Catch and effort statistics for Canada (N) from 1972 to 1989 were available from the fishery conducted in Div. 3Ø. Canadian catch rates declined from 0.72 t/hr in 1972 to a low of 0.19 t/hr in 1979 (Table 1; Fig. 2). Between 1979 and 1984 catch rates fluctuated from 0.19 t/hr and 0.67 t/hr. The catch rates declined somewhat over the 1985-87 period, however, were still considerably above those levels experienced during the late-1970s. For 1988, on the other hand the catch rate fell to 0.27 t/hr near the lowest level for the period, with a slight increase in 1989 to 0.31 t/hr. It is recognized, of course, that for some years the proportion of main species catch on which the figures are based is very low and precision of such data as indices of stock size is questionable.

Research vessel data

Results of Canadian stratified-random groundfish surveys in Div. 3N and 3Ø are presented in Tables 3 and 4 respectively. The results are presented as mean weight (kg) of witch per 30-minute sets for each stratum. The numbers in parentheses signify the numbers of successful sets upon which each mean is based. It is important to realize that these surveys do not cover some important depths for witch and are, therefore, presented to examine for trends only. This is particularly evident for Div. 3N where the catches apparently are greater than the actual estimates of biomass and thus Div. 3N data may not be particularly useful. Also, prior to 1984 different vessel-gear types were used and may not be directly comparable to more recent years. Estimates of biomass in Div. 3Ø varied between 4,700 t in 1986 to 13,700 t in 1985 for the more recent period and years of high biomass estimates (1985 and 1988) are apparently related to high catches in strata 337 and 338 on the southwestern Grand bank area. It would appear then that the fluctuations in biomass may be largely a result of distributional changes as fish move in and out of the survey area for some unknown reasons. It is worth noting that the years of high estimates yield similar values and as well the years of low estimates yield somewhat similar values. It is possible, therefore, that both are indicators of some stability in the stock although such a conclusion should be treated with a great deal of caution.

Table 1. Catch effort statistics for witch flounder in Divisions 30, 1972-89 from Canada (N) based trawlers (TC5).

Year	CPUE (t/hr)	Main species catch (t)	Total catch in 3N0	% Main species
1972	0.716	2751	9177	30
1973	0.502	4080	6691	61
1974	0.337	1015	8045	13
1975	0.252	595	6156	10
1976	0.271	1291	6035	21
1977	0.365	2436	5806	42
1978	0.249	452	3454	13
1979	0.186	25	3051	1
1980	0.267	25	2419	1
1981	0.352	177	2425	7
1982	0.667	601	3729	16
1983	0.379	816	3616	23
1984	0.310	152	2809	5
1985	0.544	1756	8771	20
1986	0.424	1098	9131	12
1987	0.414	2052	7596 ^a	27
1988	0.268	565	6088 ^a	9
1989	0.310	367	3465 ^a	9

^aProvisional.

Table 2. Witch 3N0 - nominal catches in 1989 (preliminary).

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Can (SF) (INS) (OFF)	5	9	30	5	17	3	21			2		6	98
Can (N) (INS) (OFF)	4		20	258	212	233	229	37	28	31	28	39	1119
Can (Q)													
Can (G)													
Japan						1							1
GDR													
Poland													
EEC													1990*
Faroes													
USSR	3												3
USA			7	66	89	92							254
Total													3465

*Monthly totals equal 1100 -- 890 less than given total

Can (N) (OFF) 3N (INS)				4	5	9	8	8	5	1			40
Can (N) (OFF) 30 (INS)	4		20	258	208	228	220	29	20	26	27	39	1079

Table 3. Average weight per set of witch flounder in NAFO Division 3N from research vessel surveys from 1971-89.

Stratum	ATC										WT 59	WT 70	WT 82					
	ATC 187	ATC 199	208-9	ATC 222	ATC 233	ATC 245	ATC 263	ATC 277	ATC 289	ATC 304				327-329	AN 27	WT 29	WT 47	1986
357.	-	-	1.20(2)	-	-	7.26(2)	-	6.50(3)	2.05(3)	8.50(2)	1.00(2)	4.25(2)	5.40(2)	7.00(1)	0.25(2)	1.60(2)		
358	-	2.95(4)	2.42(3)	-	-	6.02(2)	-	1.13(2)	0.27(3)	2.50(2)	2.00(2)	11.0(2)	1.20(2)	4.50(2)	0.75(2)	0.95(2)		
359	-	8.47(3)	20.88(3)	-	43.28(3)	1.82(2)	-	2.72(4)	1.38(4)	6.00(2)	6.00(2)	1.1(2)	1.90(2)	0.88(2)	4.00(2)	4.20(2)		
360	-	0.11(4)	-	0.0(4)	1.36(4)	0.17(4)	2.61(4)	3.23(9)	1.18(11)	5.86(7)	5.57(7)	0.27(16)	1.80(13)	1.63(15)	4.00(12)	0.45(15)		
361	0.0(2)	0.0(3)	0.0(4)	0.0(4)	1.46(4)	0.0(5)	0.0(4)	0.14(8)	0.50(7)	0.17(6)	0.60(5)	0.0(7)	0.00(10)	0.13(9)	0.26(7)	0.00(10)		
362	1.82(2)	0.0(4)	0.0(5)	0.0(4)	0.0(3)	0.0(5)	0.0(5)	0.08(12)	0.14(11)	0.00(8)	0.00(7)	0.23(11)	0.20(14)	0.05(12)	0.51(10)	0.00(13)		
373	0.0(4)	0.0(4)	0.0(4)	0.0(4)	-	0.0(5)	0.0(4)	0.31(4)	0.08(11)	0.00(8)	0.00(5)	0.00(7)	0.00(14)	0.00(13)	0.00(10)	0.00(13)		
374	0.0(2)	0.0(2)	0.0(4)	0.0(2)	0.0(2)	-	0.0(3)	0.0(4)	0.0(4)	0.00(3)	0.00(4)	0.0(4)	0.00(6)	0.00(5)	0.00(5)	0.00(5)		
375	0.30(3)	0.0(3)	0.0(3)	0.0(3)	0.0(3)	-	0.0(4)	0.09(5)	0.0(5)	0.00(4)	0.00(5)	0.0(8)	0.00(8)	0.00(8)	0.00(6)	0.00(8)		
376	1.13(2)	0.0(2)	0.0(3)	0.0(3)	0.0(2)	0.0(3)	0.0(2)	0.0(4)	0.00(3)	0.00(3)	0.00(7)	0.00(4)	0.00(9)	0.06(8)	0.00(6)	0.00(8)		
377	0.45(2)	0.0(2)	0.0(2)	1.13(3)	0.0(2)	-	13.17(2)	0.0(2)	1.29(3)	2.51(4)	0.00(2)	1.00(2)	0.00(2)	5.00(2)	0.20(2)	2.25(2)		
378	0.0(3)	0.45(2)	1.36(2)	2.88(3)	-	-	4.81(2)	11.81(2)	7.57(3)	2.50(2)	2.00(2)	1.13(2)	1.70(2)	8.75(2)	1.35(2)	1.60(2)		
379	0.68(2)	-	0.68(2)	1.82(2)	-	-	14.30(2)	4.77(2)	5.60(3)	2.80(3)	1.50(2)	4.00(2)	1.80(2)	1.00(2)	2.70(2)	1.40(2)		
380	-	5.56(2)	2.12(3)	1.99(4)	-	-	6.81(2)	-	4.20(2)	1.33(3)	-	0.50(2)	0.00(3)	9.50(2)	2.00(2)	0.45(2)		
381	-	0.91(4)	0.0(3)	0.0(3)	1.08(2)	-	5.45(2)	11.35(3)	2.57(3)	1.25(4)	1.00(2)	0.3(2)	1.50(3)	4.00(2)	2.75(2)	0.00(2)		
382	-	0.0(4)	0.0(3)	0.0(2)	-	0.0(2)	0.61(3)	0.0(3)	0.0(3)	0.81(4)	0.00(2)	0.0(4)	0.00(4)	0.13(3)	0.00(2)	0.00(3)		
383	-	0.0(2)	0.0(2)	-	-	0.0(3)	0.0(3)	0.0(3)	0.0(3)	0.00(4)	0.00(2)	0.00(3)	0.00(4)	0.42(3)	0.00(3)	0.00(3)		
723	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
724	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
725	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
726	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
728	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total wt	432	409	754	776	218	1674	768	973	165	569	1722	1655	638	974	1265	316		
(tons)																		

1
3
1

Table 4. Average weight per set of witch flounder in NAFO Division 3Ø from research vessels surveys from 1973-89.

	1973	1975	1976	1977	1978	1979	1980	1981	1982	1984	1985	1986	1987	1988	1989
Stratum	ATC 209	ATC 233	ATC 245	ATC 263	ATC 277	ATC 291	ATC 303	ATC 318-319	ATC 327-329	AN 27	AN 43	WT 47	WT 58-59	WT 70	WT 82
329	0.0(2)	-	29.96(2)	1.36(3)	0.96(5)	0.04(6)	0.0(2)	0.0(2)	0.0(6)	0.0(5)	0.0(8)	0.00(8)	0.00(9)	3.29(7)	0.24(9)
330	0.15(6)	0.15(3)	0.0(3)	0.0(3)	0.42(6)	1.62(7)	0.0(2)	1.13(4)	0.0(7)	0.0(4)	0.0(10)	0.00(9)	0.00(11)	0.08(9)	0.00(11)
331	0.0(2)	0.0(2)	0.0(2)	-	6.14(2)	0.76(3)	6.25(2)	-	0.07(4)	28.83(3)	5.5(3)	0.50(4)	0.03(2)	6.50(2)	0.00(2)
332	-	3.40(2)	12.41(3)	9.69(3)	10.76(3)	0.40(4)	15.50(2)	-	72.75(4)	19.0(2)	61.5(5)	15.50(6)	22.96(5)	40.48(4)	10.35(5)
333	-	0.68(2)	1.59(2)	0.23(2)	1.51(3)	0.34(2)	3.25(2)	-	19.38(4)	0.40(2)	2.38(2)	0.30(3)	0.00(2)	2.95(2)	0.40(2)
334	-	-	1.36(2)	0.11(2)	1.36(3)	0.38(3)	1.75(2)	-	9.07(4)	0.0(2)	3.25(2)	2.50(2)	0.07(2)	0.81(2)	1.55(2)
335	0.0(2)	-	4.62(3)	-	0.79(2)	0.0(2)	7.17(3)	-	2.25(2)	0.0(2)	12.15(2)	1.90(2)	0.01(2)	6.25(2)	2.50(2)
336	0.61(3)	1.25(2)	15.89(2)	6.81(2)	1.59(2)	0.28(4)	12.50(2)	-	15.00(2)	0.50(2)	0.5(2)	2.00(2)	1.30(2)	2.50(2)	0.00(2)
337	2.80(3)	0.68(3)	6.54(2)	3.63(2)	1.25(2)	0.0(4)	2.17(3)	-	1.67(3)	0.45(2)	29.7(5)	11.60(5)	4.88(5)	7.58(4)	12.33(5)
338	13.26(5)	5.90(2)	10.74(3)	3.63(4)	0.14(5)	0.32(7)	4.40(5)	-	0.28(5)	0.70(5)	32.22(9)	5.30(9)	9.79(10)	12.13(8)	8.50(10)
339	2.95(2)	0.0(2)	-	-	2.95(2)	2.42(3)	-	6.75(2)	0.45(4)	4.00(2)	0.0(3)	0.10(3)	3.40(3)	1.83(3)	0.00(3)
340	-	0.0(3)	2.19(6)	0.0(3)	0.57(2)	3.15(7)	0.0(2)	0.40(3)	0.07(6)	0.13(4)	0.64(9)	0.00(8)	0.11(9)	0.00(7)	0.00(9)
341	0.0(2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351	0.14(5)	0.67(4)	0.0(4)	0.32(5)	0.0(5)	0.91(11)	0.65(10)	19.50(4)	0.39(9)	2.23(6)	0.87(9)	1.60(14)	0.86(13)	3.24(10)	0.74(13)
352	0.09(5)	2.83(4)	0.17(4)	0.23(5)	0.34(4)	0.87(6)	3.14(11)	-	0.61(7)	0.29(7)	3.32(11)	0.70(14)	4.34(13)	4.20(11)	2.02(13)
353	18.77(3)	7.42(3)	11.80(2)	8.78(3)	11.36(3)	1.59(5)	7.50(4)	-	23.83(3)	25.00(2)	8.33(6)	7.70(7)	12.08(6)	43.70(5)	17.32(7)
354	22.40(3)	-	14.07(3)	2.27(2)	-	1.19(4)	8.50(3)	0.25(2)	7.50(2)	8.00(2)	2.0(3)	17.00(3)	4.25(2)	6.50(2)	0.47(2)
355	0.23(2)	2.72(2)	4.99(2)	-	-	0.45(4)	2.75(2)	1.90(2)	12.75(2)	4.00(2)	13.0(2)	2.60(2)	4.75(2)	0.15(2)	6.10(2)
356	0.91(2)	-	-	-	-	0.68(2)	27.50(2)	0.85(2)	-	0.50(2)	8.75(2)	2.10(2)	2.15(2)	0.75(2)	2.90(2)
717	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
718	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
719	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
720	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
721	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
722	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total wt.	4,899	2,609	9,025	2,808	2,760	1,425	4,309	4,240	9,187	6,014	13,735	4,675	6,100	12,175	5,237

Commercial Catch of Witch in Div. 3NO (All Countries)

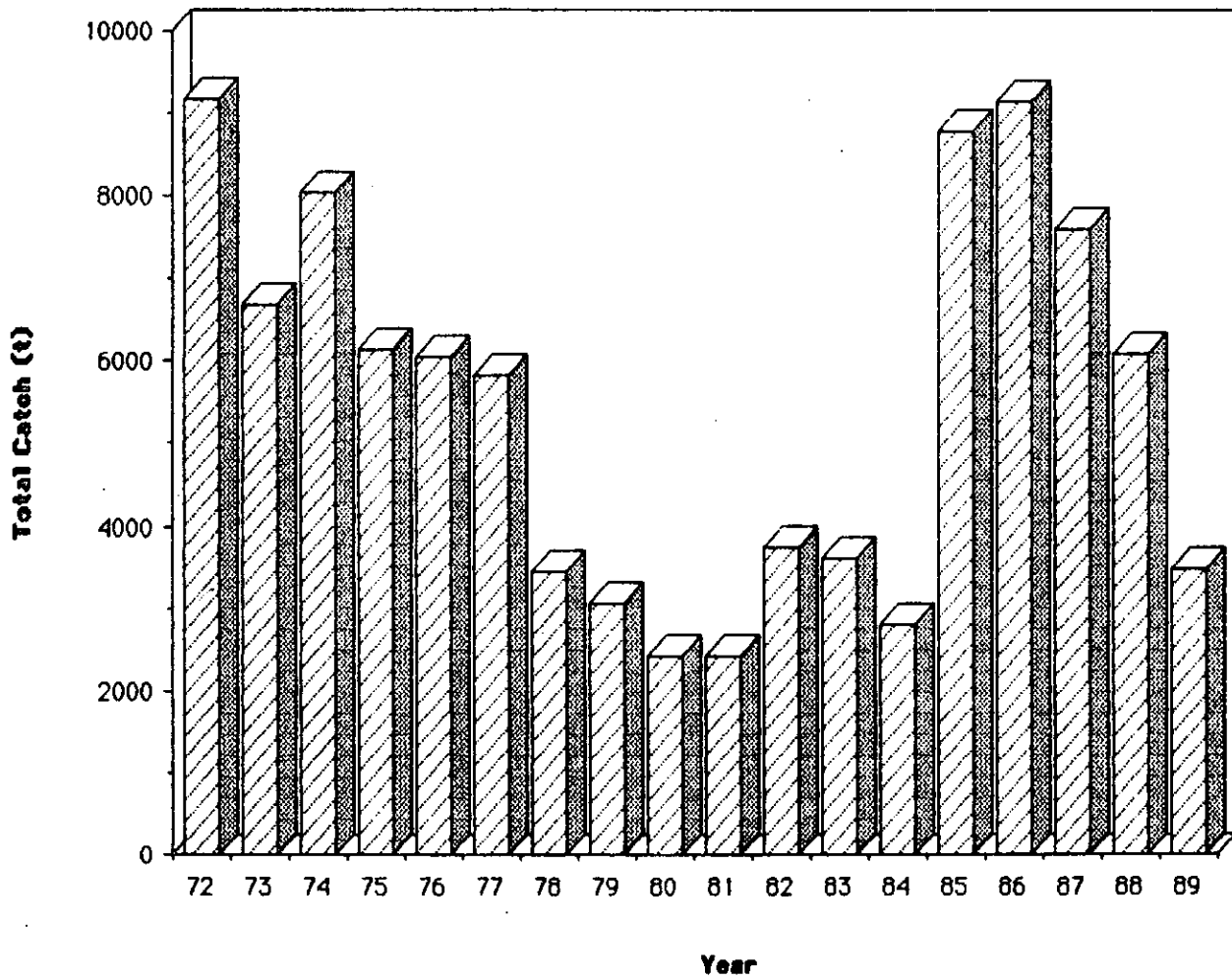


Fig. 1. Commercial catch of witch in Div. 3NO by all countries and gears from 1972-89 (1988-89 are preliminary).

Witch Div. 3NO CPUE 1972-89

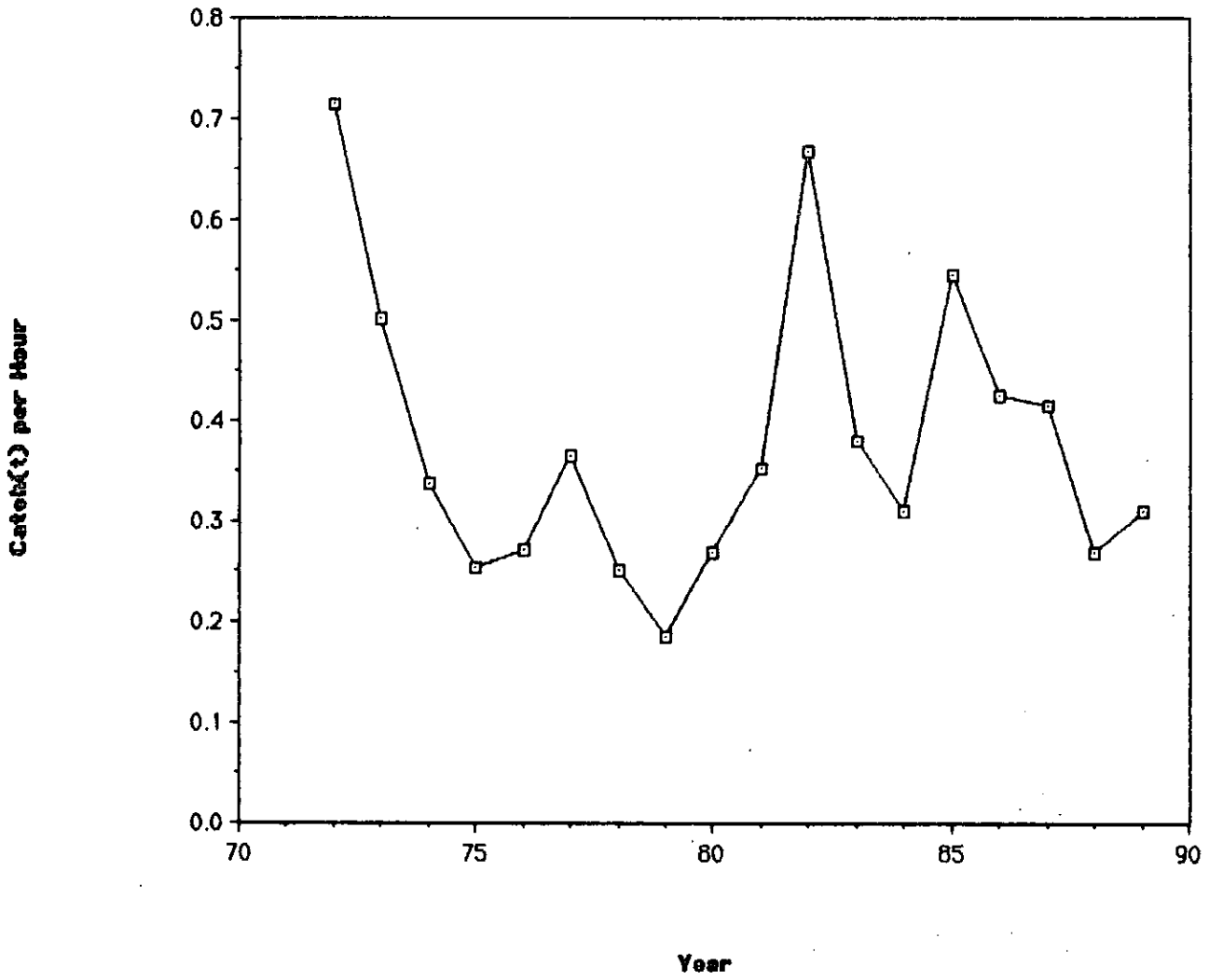


Fig. 2. Canadian commercial catch rates of TC5 trawlers in Div. 30 from 1972-89.