

Not to be cited without  
permission of the authors<sup>1</sup>

Canadian Atlantic Fisheries  
Scientific Advisory Committee

CAFSAC Research Document 87/69

Ne pas citer sans  
autorisation des auteurs<sup>1</sup>

Comité scientifique consultatif des  
pêches canadiennes dans l'Atlantique

CSCPCA Document de recherche 87/69

## A Brief Biological Update on the 1986 4VWX Flatfish Fisheries

John D. Neilson and Peter Perley  
Marine Fish Division  
Department of Fisheries and Oceans  
Biological Station  
St. Andrews, New Brunswick E0G 2X0  
Canada

<sup>1</sup>This series documents the scientific basis for fisheries management advice in Atlantic Canada. As such, it addresses the issues of the day in the time frames required and the Research Documents it contains are not intended as definitive statements on the subjects addressed but rather as progress reports on ongoing investigations.

Research Documents are produced in the official language in which they are provided to the Secretariat by the author.

<sup>1</sup>Cette série documente les bases scientifiques des conseils de gestion des pêches sur la côte atlantique du Canada. Comme telle, elle couvre les problèmes actuels selon les échéanciers voulus et les Documents de recherche qu'elle contient ne doivent pas être considérés comme des énoncés finals sur les sujets traités mais plutôt comme des rapports d'étape sur les études en cours.

Les Documents de recherche sont publiés dans la langue officielle utilisée par les auteurs dans le manuscrit envoyé au secrétariat.

## ABSTRACT

Landings of flatfish (exclusive of the halibuts) in NAFO Divisions 4VWX remained at comparatively low levels in 1986 relative to those obtained in the late 1960's and early 1970's. However, it is doubtful whether this reflects decreased stock abundance. It was therefore concluded that there were insufficient grounds to suggest a change in the existing total allowable catch of 14,000 t.

## RESUME

Les débarquements de poisson plat (à l'exclusion des flétans) dans les divisions 4VWX de l'OPANO sont demeurés à des niveaux faibles, en 1986, comparativement à ceux enregistrés à la fin des années 60 et au début des années 70. Cependant, on ne sait pas si cela reflète une diminution de l'abondance des stocks. Par conséquent, on a conclu que les indications étaient insuffisantes pour proposer qu'il y ait changement dans le total actuel des prises admissibles fixé à 14 000 t.

Four members of the Pleuronectidae (exclusive of the halibuts) are exploited commercially on the Scotian Shelf. Listed in order of decreasing landings in 1985, they are:

American plaice (Hippoglossoides platessoides)  
 Witch flounder (Glyptocephalus cynoglossus)  
 Yellowtail flounder (Limanda ferruginea)  
 Winter flounder (Pseudopleuronectes americanus)

Of these, only American plaice, witch flounder and yellowtail flounder are under quota management. The landings of winter flounder, a coastal species, are comparatively low, only abundant along the Nova Scotia coast and in the Bay of Fundy. The only significant offshore fishery for winter flounder is around Sable Island (Halliday MS 1973).

Details of landings by gear component and month are given in Neilson and Perley (1986).

### Landings

Landings of Scotian Shelf flatfish were 8346 t in 1986, down from last year's level of 10,409 t, and continued the downward trend from the 1984 landings of 13,403 t (Table 1). Among the species complex comprising Scotian Shelf flatfish, American plaice landings were down from 4259 last year to 3620 t this year, with 4V plaice landings decreasing to the greatest extent (Table 2). However, witch landings have increased considerably from 2152 t in 1985 to 2885 t in 1986 (Table 3). Yellowtail flounder landings are down slightly from 965 t in 1985 to 804 t in 1986 (Table 4). Winter flounder catches have increased slightly from 823 to 1037 t over the same period (Table 5). The nominal catches of the various flatfish are also presented in Tables 6-9, where they are aggregated by gear type.

### Commercial CPUE

The directed catch of 4V American plaice continued at a low level, making the interpretation of CPUE statistics difficult (Table 10).

### Research Vessel CPUE

The stratified catch per tow for 4V American plaice has declined markedly in 1986 compared with 1985. However, both witch and yellowtail flounder abundance indices have increased compared with 1985 values (Table 11). Trends in abundance indices have not always tracked landings well, hence such indicators of abundance must be viewed with caution.

### Management Considerations

While landings of flatfish species under TAC management continued at a low level compared with those of the mid 1960's to mid 1970's, we view this as being not necessarily indicative of reduced stock abundance. It seems more likely that decreased catches reflect decreased effort towards those species. We recommend no change to the TAC of 14,000 t for 1988.

## ACKNOWLEDGMENTS

We thank Dr. R. L. Stephenson for a review of an earlier version of this paper. Brenda Fawkes provided the word processing service.

## LITERATURE CITED

- Halliday, R. G. MS 1973. The flatfish fisheries on the Scotian Shelf. ICNAF Res. Doc. 73/102: 20 p.
- Neilson, J. D., and P. Perley. 1986. A review of the status of the 4WX flatfish stocks (exclusive of the halibuts). CAFSAC Res. Doc. 86/48: 31 p.

Table 1. Total landings (t) for 4VWX flatfish between 1963-86.

Year	American plaice	Witch flounder	Yellowtail flounder	Winter flounder	Flatfish (N.S.)	Total
1963	2309	7486	3972	696	-	14,463
1964	3082	8629	5399	1311	194	18,615
1965	8198	12943	6104	1339	90	28,674
1966	14206	14512	4851	1346	30	34,945
1967	10770	7816	5196	944	-	24,726
1968	19265	21682	13128	1181	-	55,256
1969	13735	14093	3826	1416	-	33,070
1970	8358	6048	3682	1530	11	19,629
1971	14301	17864	1775	3084	1	37,025
1972	10653	11351	1485	1454	723	25,666
1973	12432	13969	1513	1909	873	30,696
1974	16772	7415	939	2756	817	28,699
1975	11747	8922	1568	1374	1122	24,733
1976	11147	5742	904	1297	1043	20,133
1977	7752	2431	1443	1257	944	13,827
1978	6756	2291	1628	1207	1060	12,942
1979	6354	2071	2090	1088	1303	12,906
1980	7572	2321	2491	1174	1887	15,445
1981	6772	1741	2889	1448	1577	14,427
1982	5697	1473	2623	1236	1774	12,803
1983	6105	1659	2423	993	2071	13,251
1984 <sup>1</sup>	6127	1932	2462	881	2001	13,403
1985 <sup>1</sup>	4259	2152	965	823	2210	10,409
1986 <sup>1</sup>	3620	2885	804	1037	-	8,346

<sup>1</sup>Provisional (Maritime catches only).

Table 2. American plaice landings (t) for NAFO Division 4VWX for 1963-86.

Year	4V	4W	4X	Total	Canadian catch	Foreign catch
1963	1376	683	250	2309	2108 (91) <sup>2</sup>	201 (9)
1964	1967	603	512	3082	2838 (92)	244 (8)
1965	4707	2797	694	8198	5542 (68)	2656 (32)
1966	8167	5313	726	14206	9113 (64)	5093 (36)
1967	8884	780	1106	10770	10524 (98)	246 (2)
1968	10489	7830	946	19265	9828 (51)	9437 (49)
1969	8076	4789	870	13735	9300 (68)	4435 (32)
1970	5242	2481	635	8358	6303 (75)	2055 (25)
1971	7765	5991	545	14301	7513 (53)	6788 (47)
1972	6912	3175	566	10653	6855 (64)	3798 (36)
1973	8686	3407	339	12432	5146 (41)	7286 (59)
1974	11363	4951	458	16772	6967 (42)	9805 (58)
1975	7336	4115	296	11747	6623 (56)	5124 (44)
1976	8488	2350	309	11147	6932 (62)	4215 (38)
1977	6711	592	449	7752	7654 (99)	98 (1)
1978	5501	743	512	6756	6679 (99)	77 (1)
1979	5028	498	828	6354	6329 (100)	25 (0)
1980	6293	598	681	7572	7490 (99)	82 (1)
1981	5677	581	514	6772	6586 (97)	186 (3)
1982	4920	400	377	5697	5621 (99)	76 (1)
1983	5095	428	582	6105	5964 (98)	141 (2)
1984 <sup>1</sup>	5509	284	334	6127	5939 (97)	188 (3)
1985 <sup>1</sup>	3772	205	282	4290	4259 (99)	31 (1)
1986 <sup>1</sup>	2792	268	560	3620	3620 (100)	-

<sup>1</sup>All countries except USA.

<sup>2</sup>Percentage of total catch.

Table 3. Witch flounder landings (t) for NAFO Division 4VWX for 1963-86.

Year	4V	4W	4X	Total	Canadian catch	Foreign catch
1963	4971	2440	75	7486	6972 (93) <sup>2</sup>	514 (7)
1964	5808	2564	257	8629	8406 (97)	223 (3)
1965	5068	7454	421	12943	7710 (60)	5233 (40)
1966	5241	9047	224	14512	7046 (49)	7466 (51)
1967	5740	1693	383	7816	7496 (96)	320 (4)
1968	7598	13349	735	21682	8772 (40)	12910 (60)
1969	4338	8963	792	14093	6671 (47)	7422 (53)
1970	3282	1959	807	6048	4920 (81)	1128 (19)
1971	5640	11083	1141	17864	6816 (38)	11048 (62)
1972	4894	5759	698	11351	5909 (52)	5442 (48)
1973	6572	6862	535	13969	5854 (42)	8115 (58)
1974	4913	2004	498	7415	5830 (79)	1585 (21)
1975	3284	5307	331	8922	3406 (38)	5516 (62)
1976	2718	2683	341	5742	2466 (43)	3276 (57)
1977	1555	455	421	2431	2307 (95)	124 (5)
1978	1540	563	188	2291	2139 (93)	152 (7)
1979	1572	209	290	2071	2057 (99)	14 (1)
1980	1801	189	331	2321	2298 (99)	23 (1)
1981	1123	156	462	1741	1687 (97)	54 (3)
1982	789	101	583	1473	1411 (96)	62 (4)
1983	878	126	655	1659	1474 (87)	185 (13)
1984	1191	149	592	1932	1737 (89)	195 (11)
1985 <sup>1</sup>	1587	113	452	2152	2088 (97)	64 (3)
1986 <sup>1</sup>	2224	108	553	2885	2885 (100)	-

<sup>1</sup>All countries except USA.

<sup>2</sup>Percentage of total catch.

Table 4. Yellowtail flounder catch (t) for NAFO Division 4VWX for 1963-86.

Year	4V	4W	4X	Total	Canadian catch	Foreign catch
1963	1740	2148	84	3972	3784 (95) <sup>2</sup>	188 (5)
1964	4084	1165	150	5399	5288 (98)	111 (2)
1965	4330	1550	224	6104	5378 (88)	726 (12)
1966	3521	1164	166	4851	3770 (78)	1081 (22)
1967	3808	1163	225	5196	5152 (99)	44 (1)
1968	6953	5970	205	13128	5377 (41)	7751 (59)
1969	2491	1134	201	3826	1263 (33)	2563 (67)
1970	670	2686	326	3682	947 (26)	2735 (74)
1971	889	668	218	1775	1033 (58)	742 (42)
1972	697	624	164	1485	1007 (68)	478 (32)
1973	980	394	139	1513	424 (28)	1089 (72)
1974	573	130	236	939	593 (63)	346 (37)
1975	1101	254	213	1568	1083 (69)	485 (31)
1976	473	201	230	904	610 (67)	294 (33)
1977	1101	40	302	1443	1424 (99)	19 (1)
1978	1085	156	387	1628	1610 (99)	18 (1)
1979	1655	144	291	2090	2088 (100)	2 (0)
1980	2158	78	255	2491	2486 (100)	5 (0)
1981	2539	123	227	2889	2881 (100)	8 (0)
1982	2360	51	212	2623	2620 (100)	3 (0)
1983	2043	59	321	2423	2422 (100)	1 (0)
1984 <sup>1</sup>	2239	51	171	2461	2449 (100)	12 (0)
1985 <sup>1</sup>	877	15	73	965	959 (99)	6 (1)
1986 <sup>1</sup>	671	22	111	804	804 (100)	-

<sup>1</sup>All countries except USA.

<sup>2</sup>Percentage of total catch.



Table 5. Winter flounder catch (t) for NAFO Division 4VWX for 1963-86.

Year	4V	4W	4X	Total	Canadian catch	Foreign catch
1963	17	65	614	696	668 (96) <sup>2</sup>	28 (4)
1964	12	19	1280	1311	1282 (98)	29 (2)
1965	32	179	1128	1339	1237 (92)	102 (8)
1966	55	34	1257	1346	997 (74)	349 (26)
1967	37	5	902	944	926 (98)	18 (2)
1968	10	28	1143	1181	1128 (96)	53 (4)
1969	4	12	1400	1416	1392 (98)	24 (2)
1970	8	44	1478	1530	1480 (97)	50 (3)
1971	237	1364	1483	3084	1430 (46)	1654 (54)
1972	78	551	825	1454	824 (57)	630 (43)
1973	480	655	774	1909	904 (47)	1005 (53)
1974	777	1005	974	2756	1321 (48)	1435 (52)
1975	179	525	670	1374	802 (58)	572 (42)
1976	235	345	717	1297	908 (70)	389 (30)
1977	226	9	1022	1257	1244 (99)	13 (1)
1978	186	137	884	1207	1202 (100)	5 (0)
1979	228	13	847	1088	1085 (100)	3 (0)
1980	30	10	1134	1174	1173 (100)	1 (0)
1981	26	11	1411	1448	1448 (100)	-
1982	82	10	1144	1236	1231 (100)	5 (0)
1983	72	8	913	995	992 (100)	3 (0)
1984 <sup>1</sup>	2	5	874	881	877 (100)	4 (0)
1985 <sup>1</sup>	27	2	794	823	823 (100)	- (0)
1986 <sup>1</sup>	2	4	1031	1037	1037 (100)	- (0)

<sup>1</sup>All countries except USA.

<sup>2</sup>Percentage of total catch.

Table 6. Nominal catch (t) of American plaice by gear in NAFO Division 4V for all countries, 1972-86 (# of Canadian commercial fishery samples indicated in parentheses).

Year	Side otter trawl	Stern otter trawl <sup>3</sup>	Danish and Scottish seine	Longline	Other <sup>1</sup>	Total
1972	3012 (4)	3267	364	189	80	6912 (4)
1973	1971 (2)	5987 (2)	482	152	94	8686 (4)
1974	2193 (7)	8318	510	125	217	11363 (7)
1975	2779 (5)	3455 (1)	657	171	274	7336 (6)
1976	2438 (4)	4678 (3)	1178 (8)	87	107	8488 (15)
1977	2661 (5)	2285 (4)	1443 (17)	218	104	6711 (26)
1978	1766 (9)	2150 (6)	1222 (11)	164	199	5501 (26)
1979	1745 (11)	2201 (4)	806 (1)	192	84	5028 (16)
1980	1871 (12)	2674 (9)	1523 (3)	211	14	6293 (24)
1981	2080 (14)	2222 (7)	941 (1)	431 (4)	3	5677 (26)
1982	1868 (12)	1546 (8)	716 (3)	786 (1)	4	4920 (24)
1983	1159 (1)	2192 (14)	1020 (7)	702 (2)	22	5095 (24)
1984 <sup>2</sup>	1336 (4)	2326 (11)	1270 (1)	559 (3)	18	5509 (19)
1985 <sup>2</sup>	41 (2)	2380	723 (4)	614 (2)	14	3772 (8)
1986 <sup>2</sup>	34 (3)	1339 (3)	670 (3)	679	70	2792 (9)

<sup>1</sup>Includes NK and MISC gears.

<sup>2</sup>All countries except USA.

<sup>3</sup>On the basis of purchase slip information and log records, catches recorded as unspecified otter trawl were assumed to be from stern otter trawlers. This assumption also holds for data in Tables 7-9.

Table 7. Nominal catch (t) of witch flounder by gear in NAFO Division 4W for all countries; 1972-86 (# of Canadian commercial fishery samples taken indicated in parentheses).

Year	Side otter trawl	Stern otter trawl	Danish & Scottish seine	Other <sup>1</sup>	Total
1972	2459 (2)	6925	1257 (2)	12	10,653 (4)
1973	2194 (2)	9700 (1)	1464 (1)	76	13,434 (4)
1974	1968 (4)	3675 (2)	1221 (2)	53	6,917 (8)
1975	1121 (5)	6360 (4)	995 (1)	115	8,591 (10)
1976	751	3709 (2)	869 (12)	72	5,401 (14)
1977	272 (2)	785 (6)	838 (8)	115	2,010 (16)
1978	406 (11)	715 (3)	930 (12)	52	2,103 (26)
1979	419 (1)	512 (1)	792 (7)	58	1,781 (9)
1980	290 (7)	791 (5)	866 (5)	43	1,990 (17)
1981	342 (6)	354 (3)	564 (1)	19	1,279 (10)
1982	164 (1)	209 (1)	511 (2)	6	890 (4)
1983	95	218 (6)	678 (6)	13	1004 (12)
1984 <sup>2</sup>	55 (3)	245 (5)	1017 (2)	23	1340 (10)
1985 <sup>2</sup>	9 (1)	460 (2)	1197 (7)	34	1700 (10)
1986 <sup>2</sup>	13	718 (2)	1551 (9)	49	2331 (11)

<sup>1</sup>Includes NK and MISC gears.

<sup>2</sup>All countries except USA.

Table 8. Nominal catch (t) of yellowtail flounder by gear in NAFO Division 4VWX for all countries, 1972-86 (# of Canadian commercial fishery samples taken indicated in parentheses).

Year	Side otter trawl	Stern otter trawl	Danish and Scottish seine	Longline	Other <sup>1</sup>	Total
1972	787 (1)	622	63	11	2	1485 (1)
1973	327 (1)	1094	71	20	1	1513 (1)
1974	208 (1)	640	56	32	3	939 (1)
1975	647	832 (1)	40	49	-	1568 (1)
1976	209	610	61	24	-	904
1977	769 (3)	444 (3)	141	14	75	1443 (6)
1978	684 (6)	729 (1)	92 (3)	18	105	1628 (10)
1979	1239	653	132	42	24	2090
1980	1306 (10)	837 (6)	299	11	38	2491 (16)
1981	1622 (19)	1032 (10)	174	13	48	2889 (29)
1982	1853 (18)	694 (7)	62	14	-	2623 (25)
1983	1390 (9)	746 (19)	187	32	68	2423 (28)
1984 <sup>2</sup>	1305 (6)	791 (12)	313	38	14	2461 (18)
1985 <sup>2</sup>	9 (1)	622	246	82	6	965 (1)
1986 <sup>2</sup>	6	490 (5)	148	133	28	805 (5)

<sup>1</sup>Includes NK and MISC gears.

<sup>2</sup>All countries except USA.

Table 9. Nominal catch (t) of winter flounder by gear in NAFO Division 4VWX for all countries, 1972-86 (# of Canadian commercial fishery samples taken in parentheses).

Year	Side otter trawl	Stern otter trawl	Longline	Danish and Scottish seine	Other <sup>1</sup>	Total
1972	249	1135	39	1	30	1454
1973	527 (2)	1290	39	2	51	1909 (2)
1974	784	1818	2	98	54	2756
1975	456	810	14	32	62	1374
1976	546 (10)	661 (1)	41	15	34	1297 (11)
1977	566	480 (3)	40	2	169	1257 (3)
1978	512	575	50	8	62	1207
1979	290	635 (1)	70	18	75	1088 (1)
1980	2 (1)	962	52	21	137	1174 (1)
1981	18	1303 (9)	57	8	62	1448 (9)
1982	72	1064 (13)	35	7	58	1236 (13)
1983	-	882 (13)	11	7	93	993 (13)
1984 <sup>2</sup>	3	728 (13)	6	3	141	881 (13)
1985 <sup>2</sup>	11	710 (6)	6	11	85	823 (6)
1986 <sup>2</sup>	18	918 (7)	0	2	98	1036 (7)

<sup>1</sup>Includes NK and MISC gears.

<sup>2</sup>All countries except USA.

Table 10. Commercial CPUE for 4V American plaice 1968-86.

Year	OTB1 TC 4		OTB2 TC 4		OTB2 TC 5	
	Catch (mt)	Effort (hr)	Catch (mt)	Effort (hr)	Catch (mt)	Effort (hr)
1968	1542	4967	0	0	161	507
1969	735	2202	29	74	597	1817
1970	246	848	198	404	184	480
1971	417	1724	174	635	113	551
1972	742	1883	0	0	173	565
1973	279	1234	36	416	98	576
1974	658	2733	43	178	569	2057
1975	520	1889	68	221	668	1441
1976	329	1463	64	217	359	1144
1977	779	2684	11	111	334	1343
1978	428	1768	25	127	477	1498
1979	445	1915	113	608	241	638
1980	314	2252	113	691	227	452
1981	244	1256	30	80	98	223
1982	127	881	2	13	10	7
1983	152	1511	5	8	5	8
1984	298	1287	20	148	17	42
1985	0	0	10	12	95	99
1986	-	-	35	97	57	451

Table 11a. American plaice research<sup>1</sup> CPUE in NAFO Division 4V for 1970-86.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Research																	
#/tow	79.83	79.11	70.79	40.75	98.66	60.69	82.56	57.21	26.16	88.46	115.84	90.70	75.91	83.16	97.43	69.93	48.07
Smoothed	79.83	76.67	73.43	70.55	68.29	66.68	66.75	68.09	72.30	80.89	87.50	89.13	88.31	85.16	79.02	67.64	50.29

Table 11b. Witch flounder commercial and research<sup>1</sup> CPUE in NAFO Division 4VW for 1970-86.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Canadian																	
OTB1/TC4																	
(t/h)	.137	.161	.182	.251	.243	.126	.059	.016	.076	.065	.049	.022	.236	.242	.097		
Smoothed	.192	.192	.193	.194	.180	.136	.083	.057	.051	.051	.070	.107	.125	.125	.125		
Research																	
#/tow	2.27	6.06	4.26	9.11	19.35	5.55	2.82	3.48	3.10	1.64	3.44	3.80	3.43	3.80	3.44	4.55	12.10
Smoothed	2.27	5.23	7.18	7.75	7.47	6.22	4.40	3.38	3.21	3.24	3.32	3.45	3.48	3.45	4.12	6.54	10.66

Table 11c. Yellowtail flounder commercial and research<sup>1</sup> CPUE in NAFO Division 4VWX for 1970-86.

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Canadian																	
OTB1/TC4																	
(t/h)	.133	.340	.276	.125	.103	.203	.125	.087	.139	.181	.160	.176	.344	.332	.244		
Smoothed	.212	.217	.211	.186	.147	.126	.123	.125	.135	.152	.181	.224	.255	.262	.262		
Research																	
#/tow	4.68	17.94	4.84	4.42	6.40	6.53	21.67	50.84	4.08	5.68	13.27	18.85	25.67	11.39	3.38	3.96	5.67
Smoothed	4.68	4.68	4.81	5.06	6.93	10.74	13.13	13.28	12.94	12.77	13.15	13.91	13.95	11.60	7.77	5.81	5.67

<sup>1</sup>Summer cruises, values calculated using the "STRAP" program.