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A Review of the
4VWX3NOPs Halibut Stock

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¹La présente série documente les bases scientifiques des évaluations des ressources halieutiques sur la côte atlantique du Canada. Elle traite des problèmes courants selon les échéanciers dictés. Les documents qu'elle contient ne doivent pas être considérés comme des énoncés définitifs sur les sujets traités, mais plutôt comme des rapports d'étape sur les études en cours.

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Abstract

A precautionary TAC of 1,500 t was in place for the 1994 halibut fishery. The domestic landings were below the TAC at 1,023 t. Allocations in 1994, under the 1,500 t TAC, were restrictive only to the 4VWX <65' fixed gear fleet and the <65' mobile gear fleet bycatch fishery on the Scotian Shelf. The EU continues to report very variable halibut catches outside the 200 mile limit that are not accounted for under the current management plan. Small longliners account for over 70 % of the landings. Commercial catch rates for this fleet have declined gradually in the 4VWX area, while showing stability since 1990 for 3NOPs. Total effort showed a declining trend from 1985 to 1992 and has remained more or less stable since. It appears that a large scale redirection of effort to halibut as a result of closures in other fisheries is not evident, and as halibut are a long lived species prospects for the 1995 and 1996 fishery are not likely to be greatly different from 1994. Research surveys indicated an increase between 1983 and 1991 and have declined since. The surveys generally catch smaller halibut than the commercial fishery, and may prove to be an indicator of recruitment rather than fishable biomass. The FRCC recommended a TAC of 850 t for the 1995 fishery. It will be necessary to maintain the present restrictions on the fishery for several years before it can be determined whether they are having the desired positive effect on stock status.

Résumé

Un TAC prudent de 1 500 t a été imposé à la pêche du flétan de 1994. Les débarquements canadiens, de 1 023 t, ont été inférieurs au TAC. Les allocations de 1994, accordées en vertu du TAC de 1 500 t, n'ont été limitatives que pour la flottille des moins de 65 pieds à engins fixes de 4VWX et pour la pêche accessoire de la flottille des moins de 65 pieds à engins mobiles du plateau néo-écossais. L'UE continue de signaler des prises de flétan très variables à l'extérieur de la zone de 200 milles; cette pêche n'est pas visée par le plan de gestion actuel. Plus de 70 % des débarquements sont faits par de petits palangriers. Les taux de prises commerciales de cette flottille ont diminué graduellement en 4VWX, mais sont demeurés stables en 3NOPs depuis 1990. L'effort total présente une tendance à la baisse de 1985 à 1992, mais est plus ou moins stable depuis lors. Il ne semble pas y avoir eu une importante réorientation de l'effort vers la pêche du flétan depuis la fermeture des autres pêches et comme le flétan est une espèce qui atteint un âge important, les pêches de 1995 et 1996 ne devraient pas différer beaucoup de celle de 1994. Les relevés de recherche ont indiqué une augmentation de l'abondance de 1983 à 1991 qui a été suivie d'un déclin. Les relevés donnent généralement lieu à la capture de plus petits flétans que la pêche commerciale et pourraient donc être un meilleur indice du recrutement que de la biomasse exploitable. Le CCRH a recommandé un TAC de 850 t pour la pêche de 1995. Les limitations actuelles devront être maintenues pendant encore plusieurs années avant qu'il ne soit possible de déterminer s'ils ont eu les effets souhaités sur le stock.

Introduction

Atlantic halibut (4VWX3NOPs) is the most highly valued groundfish species occurring in the Northwest Atlantic. Prior to 1988 the Atlantic halibut fishery was unregulated. This was mainly due to a shortage of stock assessment data, and a lack of interest in halibut management prior to that time. A halibut working group was formed at that time to look at management alternatives for the 1988 fishery. With increased interest in the fishery, and concerns expressed by industry, a precautionary TAC of 3,200 t was set in 1988 based largely on recent catch levels. A declining longline catch rate was noted as well. The TAC remained at this level until 1994 at which time, after reviewing the 1993 assessment information, the FRCC recommended that, as a precautionary measure, the 1994 TAC should be set at 1,500 t, rather than the previous 3,200 t. Due to concerns that the stock was still declining and that redirection of effort would result in higher mortality on halibut, the 1995 TAC was reduced to 850 t.

The Industry working group also recommended, and industry then requested, a minimum size limit of 81 cm for Atlantic halibut (Anon. 1987). This size limit was generally not enforced prior to 1990. Difficulties were encountered in determining the actual size of the landed fish, as many were landed without head, and/or tail. Mandatory landing of all groundfish was introduced for the 1993 fishery, thus eliminating the minimum size regulation for halibut. Fixed gear interests then requested that halibut be exempted from the mandatory landing regulation. Regulation 93.3 was subsequently amended to permit the discarding of dogfish, skate, lumpfish and undersized halibut, i.e., <81 cm. Licence conditions have since been used to enforce the regulation for the less than 65' fleets, making it mandatory to throw back small halibut whether dead or alive, and current conditions also require halibut to be landed complete with head and tail. However, for halibut landed with a head off length greater than 81 cm this condition is not enforced. For the less than 65' mobile gear fleet, once their halibut bycatch quota is taken, licence conditions require them to discard all Atlantic halibut regardless of size. The offshore fleet may release undersized halibut but currently is not required to do so by licence condition.

Commercial Landings

Halibut landings declined from 3,274 t in 1961 to 1,059 t in 1976 (Tables 1 and 2, Figs. 1a, b) but, between 1977 and 1985 landings increased steadily to a high of 4,031 t. Since 1985 total landings declined to 1,373 t in 1992, rose to 1,618 t in 1993 due to high landings by EU countries, then dropped again in 1994 to 1,106 t as foreign landings again declined. Foreign landings, especially in 3NO, increased considerably after 1982 (Fig. 2a). These foreign landings, reported by EA vessels, have a high interannual variability. Foreign landings are not accounted for under the current management plans.

Canadian domestic landings reached a peak in 1985 (3,531 t), declined to 1,189 t in 1993 and to 1,023 t in 1994 (Fig. 2c). Scotian Shelf landings for 1994 remained similar to 1993; however, the Southern Grand Banks fishery declined by about 50% (Fig. 2b). The 1988-1993 precautionary TAC of 3,200 t has never limited the fishery for any gear sector (Fig. 2c) with the

exception of the less than 65' mobile gear fleet bycatch fishery. The 1994 precautionary TAC of 1,500 t, was not fully caught as a result of some sectors not fully utilizing their allocations, but no sector fished unrestrained. Mobile gear fleets operated on a bycatch-only system and the <65' longline fleet took slightly over their allocation and could have taken more.

Although in the past 4X accounted for the largest proportion of the landings, in recent years (1989-1992) landings in 4X and 4W have been similar and together accounted for approximately 50% of Canadian landings for all areas. In 1993 landings in 4W dropped significantly from 380 t to 284 t, while 4X landings increased from 352 t to 391 t. In 1994 landings by area on the Scotian Shelf remained stable with 4V landings increasing slightly and 4W and 4X declining somewhat. The initial drop in 4W was likely the result of reduced effort due to the cod moratorium first imposed in 1993. Table 3 gives halibut landings by quarter and indicates that the Canadian fishery is prosecuted mainly in the spring and summer in 4VWX (Table 3a), and primarily in the spring in 3NOPs (Table 3b). Foreign landings (Table 3c, 3d) are incidental on the Scotian Shelf taken as bycatch in the silver hake fishery, while the EU prosecutes a spring and summer fishery in 3NO outside the 200 mile limit. Although not included in the stock area, 5Zc landings for 1994 were 23 t. According to the Management Plan, landings from 5Zc are counted against the quota even though 5Zc is not considered part of the official stock area.

Small vessels (tonnage class TC) 1-3 i.e. <150 grt using longline gear are the dominant fleet in the Scotian Shelf fishery accounting for over 70% of the landings (Table 4, Fig. 3 a). In 1994 over 90% of the Scotian Shelf landings can be attributed to this fleet. Landings by the less than 65' mobile gear fleets in 4X were restricted by their small allocation as they are not permitted to direct for halibut. Longliners also account for most of the Canadian landings in 3NOPs (Table 5, Fig. 3b). Landings in that area for both small and large longliners dropped significantly. This drop may be related to the closed directed cod fishery in 3NO for 1994.

Management

The 1994 landings were 457 t less than the TAC set. Fixed gear less than 65' fishing on the Scotian Shelf caught 103% of their allocation, while on the Southern Grand Banks only 42% of the allocation was taken. The mobile gear fishery by >65' boats, took less than 10% of their 294 t allocation. The less than 65' mobile gear fleet was the only other gear sector to exceed their allocation and their halibut fishery was closed on August 22, 1994. Quota allocations, associated catch for 1994, and pertinent licence conditions are presented in Table 6. Landings to March 31, 1995, reached 135 t similar to the 1994 spring fishery of 147 t. The 1995 TAC of 850 t under present allocations is very restrictive to the <65' fixed gear fleet and has resulted in a bycatch fishery for halibut in 1995.

With the introduction of a precautionary TAC in 1988, the halibut fishery has been regulated by quotas on five gear sectors: 1) fixed gear less than 65'; 2) mobile gear less than 65'; 3) fixed gear 65-100'; 4) mobile gear 65-100'; and, 5) all gear greater than 100'. Longliners are the only gear type vessels which direct for halibut, with the mobile fleets restricted to bycatch fisheries.

Allocations to these various fleet sectors were generally based on a five year catch history. Since 1984, special permits were given to inshore fixed gear vessels from Scotia-Fundy to allow the access to the halibut fishery in 3NO. A special allocation of cod, permits sufficient bycatch to pursue the halibut and hake fishery. Due to weather conditions Scotia-Fundy vessels got a late start in this fishery, and often the cod bycatch was limited depending on the amount taken by Newfoundland vessels earlier in the season. To remedy this situation, for the 1993 fishery, each sector's fleet had its own cod quota. Under 1994 management, no directed cod fishery was allowed in 3NO. The fishery was limited to a 5% or 1,250 kg cod bycatch, observer presence, and use of a #14 or greater hook was mandatory.

Industry Consultations

In discussions with industry in 1994 and early 1995, fishermen emphasized the large numbers of small halibut that were being released, and the potential high survival of these fish. They indicated that the release program may have had a negative impact on the commercial catch rates, especially since 1992 as enforcement improved. Fishers felt that although halibut stocks were low, the 850 t TAC recommended by the FRCC for 1995 was too low. They indicated that the large numbers of small halibut being released were a sign of increased abundance and should be taken into consideration when discussing declining catches. Industry groups are also considering a proposal to release large halibut greater than 57 kg, as well as for the less than 81 cm fish in order to protect and enhance the spawning stock, assuming that this would allow the more fecund animals to spawn.

Industry discussions also resulted in a cooperative Industry/Science tagging program being initiated. Groups of halibut fishermen from three areas (i.e., Shelburne, ENS and Cape Breton) have been supplied with tagging equipment, and will tag undersized halibut during the 1995 fishery. To date over 100 halibut have been tagged by the ENS group, with no recoveries recorded to date. Discussions with industry were held to try to improve halibut sampling along the Eastern Shore. Fishermen belonging to the FSRS have indicated a willingness to provide some supplementary information. This possibility will be investigated during 1995.

Commercial Catch Rates

A commercial catch per unit of effort (CPUE) series, based on halibut directed longline catch and fishing effort (in thousands of hooks), was estimated from zonal interchange format (ZIF) data for 1985 to 1994 for 4VWX, 4VWX&3NOPs and 3NOPs alone. For the years prior to 1985, data for 4VWX was provided from the 1987 assessment by Neilson *et al.* (1987), using regional data (Table 7, Fig. 4a). Catch data from all tonnage classes of longliners for the whole year was used in developing the series. It should be noted that prior to 1988, longline effort was collected as lines fished and since has been reported as thousands of hooks.

Commercial catch rates have declined gradually in the 4VWX area for the directed longline fishery in recent years while showing stability since 1990 for 3NOPs. For the stock area as a whole, catch rates reflect the decline in 4VWX where most of the fishery takes place. The sharp increase in the mid 1980s was thought to be due to the introduction of the more efficient circle hook.

The release of undersized halibut likely had a negative effect on these estimates of the commercial catch rates. Preliminary data on the release of small halibut from the Fishermen and Scientist Research Society (FSRS) indicated that the amount released could be as high as 25% by weight of the total, for the less than 65' longline fleet landings (Table 9). Although the numbers of vessels examined was small it does give some indication of the magnitude of the release of small halibut. The data from the FSRS will have to be investigated more thoroughly before it can be used to increase our estimates of catch rates.

With the reduced quotas in place for 1995, <65' fixed gear Management Harvesting Plans, only permit halibut to be fished as a bycatch, in order to allow their fishery to continue throughout the year. The absence of a directed halibut fishery will impact our ability to use the commercial catch rate series to assess the halibut stocks.

Commercial Fishing Effort

Total estimated effort derived by dividing total landings by the directed CPUE (Table 8, Fig. 4b) for the whole stock area has shown a declining trend from 1985 to 1992, and remained more or less stable between 1992 and 1994. For 4VWX, total effort increased between 1992 and 1994 while effort decreased during the same time period in 3NOPs. Thus the increased effort in the 4VWX area was largely compensated for by the decrease in effort in the 3NOPs area.

Size Composition of Commercial Landings

Very limited commercial sampling indicates that both longline vessels and mobile gear vessels less 65' are landing halibut greater than the 81 cm size limit (Figs. 5a, b). This change for mobile gear may be related to the use of dockside monitors for the ITQ fleet and better enforcement of the minimum size regulation. A total of seven halibut samples were collected for 1994 which was an improvement over previous years (Table 9). Nonetheless, sampling halibut landings continues to be difficult due to the small numbers landed, the difficulty handling the fish, and the practice of removing the head and tail prior to landing.

Observer length frequencies for catches of large otter trawlers (>65') indicate that halibut continue to be caught below the legal size (Fig. 5c). There is no requirement under the licence condition for the large offshore fleet to release undersized halibut. By regulation they may release them if they wish.

Geographical Distribution of Commercial Catches

Halibut catch distributions for the 1994 commercial longline fishery were compared to that for 1993. As available log book information was used the data are generally limited to the fishery distribution of the 45-65' fixed gear vessels, i.e., those that kept log books indicating positional information. It does not reflect the distribution of bycatches or that of the directed fishery by smaller longliners. The 4X fishery in 1993 was conducted in the Brown Bank area, while in 4VW it was a shelf edge and Gully fishery (Fig. 6). However, in 1994 no catches with associated positional information were reported from Browns Bank. This is likely due to no positional information being collected for vessels that reported to the Barrington Passage Monitoring Company and not the absence of fishing in that area.

Geographical Distributions of Research Vessel Survey Catches

Research vessel survey distributions of Atlantic halibut (1970-1992) were examined last year (Annand and Beanlands 1993). In the spring, halibut in 4VW concentrate along the shelf edge and in the deeper water in the vicinity of the Gully and along the edge of Western Bank. In 4X halibut are most concentrated near Baccaro and Browns Banks, and as well extend up into the Bay of Fundy. Fall distribution is similar although concentrations in the Bay of Fundy are reduced. Summer distributions show reduced concentrations overall, but with a similar pattern. These patterns remained similar over time including in 1993 and 1994. However, in both 1993 and 1994 fewer halibut were caught east of the Gully and along the edge in 4VSc (Fig. 7). Mean numbers per tow by strata for the summer survey are given in Table 11, and indicated that over time highest concentrations of halibut on the Scotian Shelf were found in strata 452 (The Gully), 463 (Emerald Basin) and 480 (Browns Bank).

Research Vessel Catch Rates

Mean numbers per tow (1970-1994) obtained from summer research vessel surveys on the Scotian Shelf (Table 12a, Fig. 8a) increased between 1970 and 1980 and subsequently declined to 1983. Since that time survey numbers per tow increased gradually to 1991 and declined thereafter. Spring and fall surveys (Table 12b, Fig. 8b) in 4VWX (1979-84) show a declining trend in numbers per tow to 1984, while the 4VW survey (1986-1995) was variable, with the 1995 survey point the lowest in the time series. Typically, the RV surveys catch very few fish making it difficult to interpret the results in terms of resource abundance. The survey gear catches a different size distribution of halibut (generally smaller) than those directed for in the longline fishery (Fig. 9). Thus, the survey catch rates may prove to be more useful as an indicator of recruitment to the commercial fishery rather than fishable biomass, but more data and analyses are necessary to evaluate this possibility.

Prognosis

Domestic landings have declined slightly to about 1,000 t in 1994. Catch rates declined gradually in recent years (about 15 % over the last five years) and total effort for the whole stock area remained relatively stable since 1992. Thus, a large scale redirection of fishing effort to halibut as a result of closures in other fisheries is not evident. The reduction in the TAC in 1995 to 57% of the 1994 level, if proportional allocations among fleet sectors remains the same, will be restrictive to the directed fishery and catches will likely be substantially less than 850 t. This reduction in catch from levels of 1,000 t in 1994 and 1,300 t on average over the last five years should be ample to reduce effective fishing effort, and thus fishing mortality substantially; as advised last year. Halibut is a long lived species and stock conditions in 1996 are not expected to be greatly different from those in 1995. It will be necessary to maintain present restrictions on the fishery for several years before it can be determined whether these are having the desired positive effects on stock status.

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Table 1. Halibut landings (t round fresh) by country for divs. 4VWX and divs. 3N0 and 3Ps.

Year	4VWX			3N0Ps			Total 4VWX + 3N0Ps
	Canada	Foreign	Total	Canada	Foreign	Total	
1961	1498	78	1576	1230	468	1698	3274
1962	1660	40	1700	1194	339	1533	3233
1963	1453	80	1533	674	222	896	2429
1964	1461	90	1551	373	583	956	2507
1965	1574	35	1609	167	414	581	2190
1966	1030	146	1176	318	212	530	1706
1967	1236	12	1248	368	568	936	2184
1968	1175	42	1217	415	285	700	1917
1969	1024	57	1081	413	256	669	1750
1970	818	12	830	664	25	689	1519
1971	946	59	1005	481	100	581	1586
1972	825	25	850	402	89	491	1341
1973	765	9	774	452	42	494	1268
1974	641	13	654	345	136	481	1135
1975	638	12	650	332	87	419	1069
1976	708	6	714	269	76	345	1059
1977	705	8	713	576	27	603	1316
1978	1082	10	1092	337	8	345	1437
1979	1224	-	1224	420	3	423	1647
1980	1454	4	1458	255	40	295	1753
1981	1389	6	1395	217	27	244	1639
1982	1720	5	1725	468	54	522	2247
1983	1827	5	1832	253	193	446	2278
1984	1954	40	1994	871	182	1053	3047
1985	1940	28	1968	1591	472	2063	4031
1986	1609	23	1632	1492	221	1713	3345
1987	1161	22	1183	801	589	1390	2573
1988	1263	3	1266	765	277	1042	2308
1989	1156	2	1158	669	115	784	1942
1990	1094	6	1100	702	299	1001	2101
1991*	990	59	1049	429	690	1119	2168
1992*	931	42	973	338	62	400	1373
1993*	867	38	905	322	391	338	1618
1994*	861	1	862	162	82	244	1106

* Data from DFO Statistics Branch; provisional data for countries other than Canada.

Table 2. Halibut landings by division and year for all countries combined.

Year	4V	4W	4X	Total 4VWX	3N	3O	3Ps	Total 3N0Ps	Total
1961	415	544	617	1576	212	840	646	1698	3274
1962	294	621	785	1700	67	1180	286	1533	3233
1963	214	479	840	1533	125	561	210	896	2429
1964	332	358	861	1551	88	335	533	956	2507
1965	486	458	665	1609	66	341	174	581	2190
1966	527	318	331	1176	112	225	193	530	1706
1967	380	322	546	1248	234	372	330	936	2184
1968	250	363	604	1217	118	284	298	700	1917
1969	192	433	456	1081	91	298	280	669	1750
1970	115	349	366	830	133	246	310	689	1519
1971	231	360	414	1005	164	241	176	581	1586
1972	178	216	456	850	104	254	133	491	1341
1973	147	226	401	774	79	228	187	494	1268
1974	123	127	404	654	20	267	194	481	1135
1975	115	159	376	650	93	169	157	419	1069
1976	144	148	422	714	76	182	87	345	1059
1977	88	177	448	713	36	178	389	603	1316
1978	244	283	565	1092	43	137	165	345	1437
1979	230	358	636	1224	49	213	161	423	1647
1980	339	371	748	1458	46	104	145	295	1753
1981	250	379	766	1395	42	64	138	244	1639
1982	342	476	907	1725	63	288	171	522	2247
1983	419	546	867	1832	173	117	156	446	2278
1984	496	572	926	1994	279	463	311	1053	3047
1985	606	620	742	1968	516	1032	515	2063	4031
1986	553	579	500	1632	394	907	412	1713	3345
1987	345	354	484	1183	750	457	183	1390	2573
1988	298	360	608	1266	656	245	141	1042	2308
1989	300	415	443	1158	334	227	223	784	1942
1990	278	369	453	1100	492	325	184	1001	2101
1991*	221	456	372	1049	770	237	112	1119	2168
1992*	199	380	352	973 ¹	164	175	61	400	1373
1993*	192	284	391	905 ¹	113	547	53	713 ¹	1618
1994*	219	282	361	862	84	92	68	244	1106

* Data from DFO Statistics Branch; provisional data for countries other than Canada.

¹ Includes catch where area not known.

Table 3a. Halibut landings for Canada (Maritimes and Quebec) for divisions 4VWX by quarter of year for 1970 - 1994.

Year	4V					4W					4X					Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	
1970	59	19	23	7	108	122	119	88	18	347	44	134	121	64	363	818
1971	110	44	56	8	218	124	114	61	15	314	49	111	180	74	414	946
1972	58	31	83	6	178	26	77	78	12	193	38	135	220	61	454	825
1973	53	23	57	10	143	56	102	57	10	225	49	128	160	60	397	765
1974	43	27	40	8	118	7	47	67	6	127	21	96	184	95	396	641
1975	45	19	39	5	108	23	66	57	11	157	23	124	162	64	373	638
1976	50	45	44	3	142	8	88	47	4	147	35	113	179	92	419	708
1977	21	15	33	15	84	11	78	64	23	176	69	166	147	63	445	705
1978	35	88	55	66	244	24	139	99	14	276	54	206	224	78	562	1082
1979	47	90	62	31	230	20	253	78	7	358	65	260	206	105	636	1224
1980	83	140	74	40	337	40	209	91	31	371	85	317	196	148	746	1454
1981	75	86	72	13	246	78	197	73	31	379	127	273	242	122	764	1389
1982	44	154	113	31	342	69	199	176	31	475	117	283	335	168	903	1720
1983	48	227	104	39	418	86	277	164	18	545	129	289	340	106	864	1827
1984	103	197	140	18	458	61	199	295	17	572	119	176	442	187	924	1954
1985	143	313	123	14	593	52	252	279	23	606	90	179	374	98	741	1940
1986	107	322	96	12	537	47	252	259	14	572	62	128	248	62	500	1609
1987	71	153	88	16	328	37	176	127	9	349	49	172	211	52	484	1161
1988	84	114	71	26	295	11	155	188	6	360	80	201	263	64	608	1263
1989	99	121	52	26	298	75	133	191	16	415	83	137	174	49	443	1156
1990	116	106	37	16	275	52	108	190	16	366	73	128	192	60	453	1094
1991*	65	98	46	5	214	29	118	233	27	407	70	159	93	47	369	990
1992*	62	69	41	27	199	36	138	176	30	380	54	130	112	56	352	931
1993*	68	79	43	2	192	18	99	153	14	284	84	123	143	41	391	867
1994*	37	90	74	19	220	50	111	108	13	282	32	103	151	75	361	862

Table 3b. Halibut landings for Canada (Maritimes and Quebec) for divisions 3NOPs by quarter of year for 1970 - 1994.

Year	3N					3O					3Ps					Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	
1970	82	32	14	5	133	141	34	21	50	246	162	16	44	63	285	664
1971	34	69	18	7	128	58	25	51	58	192	86	52	15	8	161	481
1972	4	20	12	7	43	56	36	32	104	228	61	20	27	23	131	402
1973	1	4	40	11	56	86	73	34	32	225	87	26	36	22	171	452
1974	5	3	4	3	15	71	63	18	2	154	59	74	27	16	176	345
1975	0	34	21	16	71	36	34	18	17	105	32	88	30	6	156	332
1976	8	47	2	1	58	54	51	18	5	128	16	22	32	13	83	269
1977	4	13	0	4	21	43	36	39	55	173	59	168	30	125	382	576
1978	10	16	6	8	40	25	74	22	12	133	20	67	55	22	164	337
1979	1	23	13	12	49	20	102	41	50	213	55	69	17	17	158	420
1980	10	7	9	20	46	4	25	46	21	96	22	37	30	24	113	255
1981	0	9	13	11	33	27	16	12	9	64	50	47	20	3	120	217
1982	0	2	7	26	35	71	193	8	7	279	21	81	33	19	154	468
1983	3	17	3	2	25	55	33	17	4	109	38	39	31	11	119	253
1984	3	80	131	1	215	63	174	96	85	418	44	78	40	76	238	871
1985	25	94	93	74	286	182	394	167	134	877	120	155	94	59	428	1591
1986	0	57	199	7	263	376	255	180	32	843	149	167	59	11	386	1492
1987	21	142	160	7	330	115	177	41	5	338	46	53	27	7	133	807
1988	72	182	153	30	437	84	100	22	30	236	45	19	19	9	92	765
1989	59	136	77	11	283	69	101	35	7	212	64	75	26	9	174	669
1990	22	116	54	8	200	110	130	65	13	318	79	77	23	5	184	702
1991*	2	46	17	19	84	58	132	25	18	233	55	29	24	4	112	429
1992*	15	35	40	12	102	53	68	37	17	175	11	35	7	8	61	338
1993*	22	24	14	1	61	63	61	34	49	207	26	11	15	2	54	322
1994*	11	8	0	0	19	20	33	12	9	74	9	38	17	4	68	161

* Provisional - 1993 data from IOP.

1 Area not known.

Table 3c. Halibut landings for all Foreign Countries combined for divisions 4VWX by quarter of year for 1970 - 1994.

	4V						4W						4X						Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quar t.	1st Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	NK	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	NK	Total	
1970	3	2	2	0		7	-	2	-	-		2	0	2	0	1		3	12
1971	0	0	6	7		13	2	44	0	0		46	-	-	-	-		-	59
1972	-	-	-	-		-	1	1	0	1	20	23	2	0	0	0		2	25
1973	3	1	0	0		4	0	1	0	0		1	2	1	0	1		4	9
1974	0	0	2	3		5	-	-	-	-		-	6	2	0	0		8	13
1975	3	1	3	-		7	0	1	0	0	1	2	1	0	0	0	2	3	12
1976	2	-	-	-		2	0	0	0	0	1	1	1	0	0	0	2	3	6
1977	4	-	-	-		4	-	1	-	-		1	1	0	0	0	2	3	8
1978	-	-	-	-		-	-	-	4	3		7	1	0	0	0	2	3	10
1979	-	-	-	-		-	-	-	-	-		-	-	-	-	-	-	-	-
1980	2	-	-	-		2	-	-	-	-		-	0	0	0	1	1	2	4
1981	3	1	0	0		4	-	-	-	-		-	0	0	1	0	1	2	6
1982	-	-	-	-		-	-	-	1	-		1	0	0	1	0	3	4	5
1983	1	-	-	-		1	-	-	1	-		1	0	0	0	0	3	3	5
1984	32	-	2	4		38	-	-	-	-		-	0	0	0	0	2	2	40
1985	1	6	1	5		13	-	14	-	-		14	0	0	0	0	1	1	28
1986	4	4	5	3		16	0	7	0	0		7	-	-	-	-	-	-	23
1987	1	4	12	0		17	0	5	0	0		5	-	-	-	-	-	-	22
1988	0	1	1	1		3	-	-	-	-		-	-	-	-	-	-	-	3
1989	-	-	1	1		2	-	-	-	-		-	-	-	-	-	-	-	2
1990	-	-	3	-		3	-	3	-	-		3	-	-	-	-	-	-	6
1991*	-	-	-	-	7	7	-	-	-	-	49	49	-	-	-	-	3	3	59
1992*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42 ¹
1993*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38 ¹
1994*	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1

Table 3d. Halibut landings for all Foreign Countries combined for divisions 3NOPS by quarter of year for 1970 - 1994.

Year	3N						30						3Ps						Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	NK	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	NK	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	NK	Total	
1970	-	-	-	-		-	-	-	-	-		-	17	6	2	0		25	25
1971	-	15	21	0		36	0	48	1	0		49	14	1	0	0		15	100
1972	18	7	2	34		61	0	14	0	12		26	2	0	0	0		2	89
1973	1	3	19	0		23	0	0	3	0		3	2	7	6	1		16	42
1974	0	0	5	0		5	51	17	45	0		113	11	5	0	2		18	136
1975	15	0	7	0		22	5	47	12	0		64	1	-	-	-		1	87
1976	18	-	-	-		18	54	-	-	-		54	-	1	3	-		4	76
1977	-	5	10	-		15	5	-	-	-		5	5	2	-	-		7	27
1978	-	2	-	1		3	-	4	-	-		4	1	-	-	-		1	8
1979	-	-	-	-		-	-	-	-	-		-	2	1	-	-		3	3
1980	-	-	-	-		-	-	2	-	6		8	6	7	8	11		32	40
1981	0	1	6	2		9	-	-	-	-		-	5	4	0	9		18	27
1982	2	19	5	2		28	-	7	2	-		9	6	11	-	-		17	54
1983	17	100	4	27		148	6	2	-	-		8	1	24	9	3		37	193
1984	-	19	11	34		64	-	1	6	38		45	53	15	4	1		73	182
1985	41	85	74	29	1	230	66	25	25	39		155	33	48	6	-		87	472
1986	52	43	26	7	3	131	11	28	15	10		64	9	8	6	3		26	221
1987	66	187	72	94	1	420	37	47	27	8		119	19	22	1	8		50	589
1988	91	83	16	16	13	219	0	5	0	4		9	37	8	1	3		49	277
1989	-	-	-	-	51	51	-	-	-	-	15	15	-	-	-	-	49	49	115
1990	60	84	73	75	-	292	-	1	5	1	-	7	-	-	-	-	-	-	299
1991*	-	-	-	-	686	686	-	-	-	-	4	4	-	-	-	-	-	-	690
1992*	-	-	-	-	62	62	-	-	-	-	-	-	-	-	-	-	-	-	62
1993*	-	-	-	-	52	52	-	-	-	-	339	339	-	-	-	-	-	-	391
1994*	7	27	17	13	-	64	1	8	3	6	-	18	-	-	-	-	-	-	82

* Provisional - 1993 data from IOP.

¹ Area not known.

Table 4a. Halibut landings by otter trawlers <150 grt by quarter of year for 1970 - 1994 for Canada (Maritimes and Quebec).

Year	4V					4W					4X					Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	
1970	-	-	-	-	-	-	1	-	-	1	5	7	1	1	14	15
1971	-	-	-	-	-	-	1	-	-	1	1	8	19	1	29	30
1972	-	-	-	-	-	-	-	-	-	-	0	2	0	0	2	2
1973	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1974	-	-	-	-	-	-	-	-	-	-	0	3	1	0	4	4
1975	-	-	-	-	-	-	1	-	-	1	-	11	6	2	19	20
1976	-	-	-	-	-	-	-	-	-	-	0	2	1	1	4	4
1977	-	-	-	-	-	0	0	0	1	1	1	7	6	2	16	17
1978	-	-	-	-	-	-	-	-	-	-	1	7	6	2	16	16
1979	-	-	-	-	-	0	0	2	-	2	3	35	13	5	56	58
1980	0	1	0	0	1	0	5	0	0	5	4	43	12	8	67	73
1981	-	-	-	-	-	1	3	0	0	4	14	18	19	4	55	59
1982	-	-	-	-	-	3	5	0	0	8	7	28	16	6	57	65
1983	-	-	-	-	-	1	2	0	0	3	15	36	20	4	75	78
1984	-	-	-	-	-	0	2	0	-	2	16	20	19	1	56	58
1985	-	-	-	-	-	0	2	0	0	2	9	15	8	2	34	36
1986	1	0	0	0	1	-	-	-	-	-	10	8	4	1	23	24
1987	-	-	-	-	-	0	2	0	0	2	11	11	4	0	26	28
1988	-	-	-	-	-	0	6	0	0	6	21	34	3	2	60	66
1989	-	-	-	-	-	0	5	0	0	5	28	17	2	1	48	53
1990	4	5	1	0	10	0	0	0	0	0	25	16	16	14	71	81
1991*	0	0	0	0	0	0	1	1	0	2	31	29	10	18	88	90
1992*	0	0	0	0	0	0	0	0	0	0	27	27	14	15	83	83
1993*	-	0	0	0	0	0	-	-	-	0	61	41	5	1	108	108
1994*	0	1	1	0	2	0	0	0	0	0	17	13	8	0	38	40

Table 4b. Halibut landings by otter trawlers of 150+ grt by quarter of year for 1970 - 1994 for Canada (Maritimes and Quebec).

Year	4V					4W					4X					Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	
1970	16	7	2	6	31	49	27	16	7	99	18	28	7	19	72	202
1971	31	15	4	0	50	87	40	8	4	139	35	31	5	8	79	268
1972	22	10	2	0	34	16	7	11	9	43	20	15	8	2	45	122
1973	8	2	0	1	11	22	10	3	3	38	36	10	1	3	50	99
1974	12	11	1	3	27	2	0	1	2	5	3	2	5	10	20	52
1975	10	16	6	1	33	3	10	-	3	16	4	9	20	17	50	99
1976	14	12	20	2	48	0	2	1	3	6	16	13	36	26	91	145
1977	7	9	13	14	43	3	5	11	13	32	35	21	2	13	71	146
1978	20	62	23	10	115	12	32	15	8	67	20	22	4	9	55	237
1979	21	26	20	30	97	4	21	16	3	44	24	22	3	41	90	231
1980	30	45	31	35	141	33	35	16	28	112	22	6	3	33	64	317
1981	23	38	19	13	93	45	42	8	8	103	25	11	0	13	49	245
1982	27	65	47	26	165	15	31	8	7	61	18	5	5	10	38	264
1983	16	30	29	30	105	19	29	13	1	62	16	3	3	1	23	190
1984	33	19	8	5	65	6	7	1	0	14	6	2	1	0	9	88
1985	61	55	15	8	139	0	1	1	0	2	3	0	0	0	3	144
1986	19	48	8	4	79	1	0	0	1	2	1	1	0	0	2	83
1987	19	15	8	1	43	-	-	-	-	-	1	0	0	0	1	44
1988	8	6	0	0	14	2	0	1	0	3	-	-	-	-	-	17
1989	4	3	4	1	12	-	-	-	-	-	-	-	-	-	-	12
1990	14	11	0	1	26	0	0	0	0	0	0	0	0	0	0	26
1991*	16	15	5	1	37	0	1	40	6	47	0	1	2	1	4	88
1992*	7	5	0	3	15	2	27	0	0	29	1	1	0	0	2	46
1993*	6	5	-	1	12	0	5	19	0	24	0	1	1	0	2	38
1994*	3	2	1	1	7	0	1	1	0	2	0	1	0	1	2	11

* Data from DFO Statistics Branch.

Table 4c: Halibut landings by longline and handline boats <150 grt by quarter of year for 1970 - 1994 for Canada (Maritimes and Quebec).

Year	4V					4W					4X					Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	
1970	36	8	21	1	66	64	88	70	11	233	18	88	108	43	257	556
1971	62	19	36	-	117	29	67	51	11	158	12	63	149	65	289	564
1972	21	7	65	0	93	0	53	58	3	114	18	97	198	59	372	579
1973	37	11	49	2	99	32	80	49	7	168	13	116	157	57	343	610
1974	25	7	21	0	53	2	43	57	2	104	18	83	172	83	356	513
1975	28	2	24	-	54	12	47	57	8	124	19	100	134	45	298	476
1976	28	16	24	1	69	7	77	44	1	129	19	91	140	63	313	511
1977	14	6	16	1	37	8	67	47	7	129	32	122	119	44	317	483
1978	14	10	11	0	35	10	91	71	2	174	32	155	196	58	441	650
1979	25	27	32	1	85	16	213	57	4	290	35	167	183	51	436	811
1980	34	39	28	2	103	6	159	55	3	223	57	241	172	106	576	902
1981	17	39	44	0	100	32	149	62	21	264	87	231	210	102	630	994
1982	3	72	53	4	132	49	159	166	24	398	90	242	308	150	790	1320
1983	10	180	75	6	271	62	243	148	13	466	97	242	301	97	737	1474
1984	41	171	132	12	356	48	165	292	17	522	96	153	416	176	841	1719
1985	47	254	103	5	409	51	249	277	22	599	71	155	360	91	677	1685
1986	40	271	88	6	405	42	245	251	13	551	45	111	232	54	442	1398
1987	21	134	78	4	237	37	173	126	8	344	37	146	206	52	441	1022
1988	39	107	71	26	243	8	149	185	4	346	59	167	254	62	542	1131
1989	30	114	43	9	196	75	121	189	16	401	55	120	171	48	394	991
1990	28	89	36	7	160	52	107	189	15	363	45	112	173	46	376	899
1991*	26	78	40	1	145	29	115	189	21	354	38	124	79	27	268	767
1992*	36	62	40	23	161	32	107	172	30	341	25	100	96	41	262	764
1993*	42	72	40	0	154	18	93	133	13	257	22	79	136	39	276	687
1994*	38	84	72	18	207	49	109	107	13	278	14	86	141	73	314	799

Table 4d. Halibut landings by longline and handline boats of 150+ grt by quarter of year for 1970 - 1994 for Canada (Maritimes and Quebec).

Year	4V					4W					4X					Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	
1970	7	4	-	-	11	9	3	-	-	12	3	1	-	-	4	27
1971	17	10	16	8	51	8	4	1	-	13	1	-	-	-	1	65
1972	15	14	16	6	51	10	9	3	0	22	0	7	0	0	7	80
1973	8	10	8	7	33	1	9	2	0	12	-	-	-	-	-	45
1974	6	8	15	3	32	3	0	1	0	4	0	1	0	0	1	37
1975	7	1	9	4	21	7	6	-	-	13	-	-	-	-	-	34
1976	7	17	0	0	24	1	8	0	-	9	-	-	-	-	-	33
1977	0	0	4	0	4	0	2	-	-	2	0	2	-	-	2	8
1978	1	11	20	2	34	1	2	1	1	5	-	-	-	-	-	39
1979	1	37	10	0	48	0	6	0	0	6	1	1	0	4	6	60
1980	19	55	15	3	92	1	3	18	0	22	2	3	0	0	5	119
1981	35	9	9	0	53	0	1	1	0	2	-	-	-	-	-	55
1982	14	17	13	1	45	2	4	0	0	6	-	-	-	-	-	51
1983	22	17	0	3	42	4	1	0	3	8	-	-	-	-	-	50
1984	29	7	0	1	37	7	21	0	-	28	1	0	0	9	10	75
1985	35	4	5	1	45	1	0	0	0	1	5	0	0	3	8	54
1986	47	2	0	2	51	1	0	0	0	1	-	-	-	-	-	52
1987	31	4	2	11	48	-	-	-	-	-	-	-	-	-	-	48
1988	37	1	0	0	38	-	-	-	-	-	-	-	-	-	-	38
1989	65	4	5	16	90	-	-	-	-	-	-	-	-	-	-	90
1990	70	1	0	8	79	-	0	-	1	1	-	-	-	-	-	80
1991*	23	5	1	2	31	-	0	-	0	0	-	-	-	-	-	31
1992*	19	2	1	1	23	2	1	1	-	4	0	0	-	-	0	27
1993*	20	2	2	1	25	0	0	-	1	1	-	0	-	0	0	26
1994*	1	2	0	-	3	0	0	-	-	0	0	0	0	-	0	3

* Data from DFO Statistics Branch.

Table 4e. Halibut landings for other gear, all tonnage classes combined by quarter of year for 1970 - 1994 for Canada (Maritimes and Quebec).

Year	4V					4W					4X					Canadian Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	
1970	-	-	-	-	-	-	-	2	-	2	-	10	5	1	16	18
1971	-	-	-	-	-	-	2	1	-	3	-	9	7	-	16	19
1972	-	-	-	-	-	0	8	6	0	14	0	14	0	0	28	42
1973	-	-	-	-	-	1	3	3	0	7	0	2	2	0	4	11
1974	0	1	3	2	6	0	4	8	2	14	0	7	6	2	15	35
1975	-	-	-	-	-	1	2	-	-	3	-	4	2	-	6	9
1976	1	0	0	0	1	0	1	2	0	3	0	7	2	2	11	15
1977	-	-	-	-	-	0	4	6	2	12	1	14	20	4	39	51
1978	0	5	1	54	60	1	14	12	3	30	1	22	18	9	50	140
1979	-	-	-	-	-	0	13	3	0	16	2	35	7	4	48	64
1980	-	-	-	-	-	0	7	2	0	9	0	24	9	1	34	43
1981	-	-	-	-	-	0	2	2	2	6	1	13	13	3	30	36
1982	-	-	-	-	-	0	0	2	0	2	2	8	6	2	18	20
1983	-	-	-	-	-	0	2	3	1	6	1	8	16	4	29	30
1984	-	-	-	-	-	0	4	2	0	6	0	1	6	1	8	14
1985	-	-	-	-	-	0	0	1	1	2	2	9	6	2	19	21
1986	0	1	0	0	1	3	7	8	0	18	6	8	12	7	33	51
1987	-	-	-	-	-	0	1	1	1	3	0	15	1	0	16	19
1988	-	-	-	-	-	1	0	2	2	5	0	0	6	0	6	11
1989	-	-	-	-	-	0	7	2	0	9	0	0	1	0	1	10
1990	0	0	0	0	0	0	1	1	0	2	3	0	3	0	6	8
1991*	0	1	0	0	1	0	1	3	0	4	1	5	2	1	9	14
1992*	0	0	0	0	0	-	1	3	0	3	-	2	3	0	4	7
1993*	0	1	0	-	1	-	1	1	0	2	1	1	2	1	5	8
1994*	0	0	0	-	0	-	0	0	0	0	0	0	0	1	1	1

* Data from DFO Statistics Branch.

Table 5a. Halibut landings by longline and handline boats <150 grt by quarter of year for 1970 - 1994 for Canada (Maritimes and Quebec).

Year	3N					30					3Ps					Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	
1970	70	23	-	-	93	79	34	-	-	113	5	7	5	-	17	223
1971	34	69	7	-	110	39	21	38	7	105	16	26	14	-	56	271
1972	1	0	0	0	1	42	20	6	1	69	37	13	7	1	58	128
1973	-	-	-	-	-	7	14	24	11	56	5	14	3	3	25	81
1974	-	-	-	-	-	12	15	6	1	34	10	6	3	2	21	55
1975	-	3	1	-	4	7	12	12	2	33	6	6	10	1	23	60
1976	0	14	1	1	16	13	4	3	0	20	3	2	3	0	8	44
1977	-	-	-	-	-	4	3	2	0	9	4	11	8	0	23	32
1978	-	-	-	-	-	1	3	5	0	9	0	12	4	2	18	27
1979	-	-	-	-	-	0	12	0	1	13	1	3	0	0	4	17
1980	-	-	-	-	-	3	13	0	0	16	2	10	7	3	22	38
1981	-	-	-	-	-	-	-	-	-	-	1	14	1	1	17	27
1982	-	-	-	-	-	-	-	-	-	-	2	12	14	1	29	29
1983	-	-	-	-	-	0	3	15	-	18	6	28	10	0	44	62
1984	0	79	56	0	135	1	74	56	2	133	5	53	9	0	67	335
1985	19	32	64	32	147	0	143	120	47	310	1	87	35	2	125	582
1986	0	32	170	3	205	0	55	146	0	201	41	114	50	3	208	614
1987	0	87	93	3	183	8	31	24	0	63	2	26	6	1	35	281
1988	0	80	105	1	186	6	44	13	1	64	15	5	16	0	36	286
1989	8	87	55	5	155	5	60	19	0	84	14	54	4	0	72	311
1990	3	77	23	2	105	10	52	30	1	93	4	10	7	0	21	219
1991*	-	7	-	-	7	3	28	6	7	44	1	9	19	1	30	81
1992*	-	7	14	-	21	1	22	27	-	50	11	13	3	1	28	99
1993*	1	20	6	1	28	2	29	11	-	42	2	7	0	0	9	79
1994*	-	8	-	0	8	-	22	1	-	23	-	-	-	0	0	31

Table 5b. Halibut landings by longline and handline boats 150+ grt by quarter of year for 1970 - 1994 for Canada (Maritimes and Quebec).

Year	3N					30					3Ps					Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	
1970	7	6	-	-	13	7	-	-	-	7	6	-	-	-	6	26
1971	-	-	-	-	-	14	4	2	1	21	6	21	-	-	27	48
1972	3	18	0	0	21	3	2	3	1	9	6	0	7	1	14	44
1973	0	3	30	0	33	11	40	4	8	63	18	1	2	8	29	125
1974	-	-	-	0	-	14	33	8	1	56	14	5	9	6	34	90
1975	-	27	-	-	28	28	4	2	14	48	5	2	5	2	14	90
1976	0	23	0	0	23	29	1	0	5	35	3	1	1	0	5	63
1977	0	10	0	1	11	17	6	5	13	41	1	1	3	0	5	57
1978	9	9	0	0	18	15	2	0	2	19	0	1	8	0	9	46
1979	-	14	-	-	14	15	0	0	0	15	6	0	0	0	6	35
1980	10	3	5	0	18	0	0	0	11	11	0	0	4	0	4	33
1981	0	8	0	0	8	16	2	1	4	23	2	6	4	1	13	44
1982	0	1	0	0	1	14	9	0	0	23	0	12	9	0	21	45
1983	0	14	0	2	16	10	13	2	1	26	3	6	9	0	18	60
1984	0	0	74	0	74	9	98	36	0	143	26	8	0	14	48	265
1985	2	57	27	39	125	8	59	19	19	105	36	19	7	3	65	295
1986	0	19	24	0	43	36	119	18	23	196	27	11	0	4	42	281
1987	21	50	59	3	133	57	47	15	2	121	15	18	12	4	49	303
1988	72	102	46	27	247	53	42	9	29	133	15	7	2	6	30	410
1989	51	47	21	5	124	46	23	14	5	88	40	8	20	4	72	284
1990	19	39	31	6	95	65	42	33	11	151	48	48	16	5	117	363
1991*	2	37	16	19	74	33	27	19	10	89	19	10	3	3	35	198
1992*	15	28	25	12	80	28	30	7	10	75	10	9	2	6	27	182
1993*	20	3	8	0	31	53	22	18	1	94	13	2	12	1	28	153
1994*	11	0	-	0	11	18	3	7	8	36	9	24	13	1	47	94

* Data from DFO Statistics Branch.

Table 5c. Halibut landings for all other gears by quarter of year for 1970 - 1994 for Canada (Maritimes and Quebec).

Year	3N					3O					3Ps					Total
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	
1970	5	3	14	5	27	55	-	21	50	126	151	9	39	63	262	415
1971	0	0	11	7	18	5	0	11	50	66	64	5	1	8	78	162
1972	0	2	12	7	21	11	14	23	102	150	18	7	13	21	59	230
1973	1	1	10	11	23	68	19	6	13	106	64	11	31	11	117	246
1974	5	3	4	3	15	45	15	4	0	64	35	63	15	8	121	200
1975	0	4	20	15	39	1	18	4	1	24	21	80	15	3	119	182
1976	8	10	1	0	19	12	46	15	0	73	10	19	28	13	70	162
1977	4	3	0	3	10	22	27	32	42	123	54	156	19	125	354	487
1978	1	7	6	8	22	9	69	17	10	105	20	54	43	20	137	264
1979	1	9	13	12	35	5	90	41	49	185	48	66	17	17	148	368
1980	0	4	4	20	28	1	12	46	10	69	20	27	19	21	87	184
1981	0	1	13	11	25	11	14	11	5	41	47	27	15	1	90	156
1982	0	1	7	26	34	57	184	8	7	256	19	57	10	18	104	394
1983	3	3	3	0	9	45	17	0	3	65	29	5	12	11	57	131
1984	3	1	1	1	6	53	2	4	83	142	13	17	31	62	123	271
1985	4	5	2	3	14	174	192	28	68	462	83	49	52	54	238	714
1986	0	6	5	4	15	340	81	16	9	446	81	42	9	4	136	597
1987	0	5	8	1	14	50	99	2	3	154	29	9	9	2	49	217
1988	0	0	2	2	4	25	14	0	0	39	15	7	1	3	26	69
1989	0	2	1	1	4	18	18	2	2	40	10	13	2	5	30	74
1990	0	0	0	0	0	35	36	2	1	74	27	19	1	0	46	120
1991*	0	3	0	0	3	22	77	1	0	100	35	9	2	1	47	150
1992*	0	0	0	0	0	24	16	3	6	49	22	8	1	1	32	81
1993*	0	0	1	0	1	9	10	5	48	72	11	3	3	0	17	90
1994*	0	0	0	0	0	2	7	4	0	12	0	13	3	2	18	30

* Data from DFO Statistics Branch.

Table 6. Management Table for halibut 1994. (Allocation and catch)

Year	Fleet	Quota (t)	Reported catch (t) Quota Reports	Percent taken (%)	Remarks
1994	All Vessels	1500	1043	70	
	3N0 FG<65'	82	32	57	
	3Ps FG<65'	38	3	8	
	4VWX FG <65'	792	814	103	
	3Ps MG <65'	5	3	60	bycatch fishery only
	4VWX MG <65'	39	43	110	bycatch fishery only
	3N0Ps, 4VWX FG 65-100'	295	115	39	
	3N0Ps, 4VWX MG 65-100'	5	1	20	bycatch fishery only
	3NOPs, 4VWX All Vessels >100'	244	16	7	bycatch fishery only - 5% up to 4500 kg per trip

Stock	Gear	Date	Licence Condition	Remarks
<u>Vessels <65'</u>				
4VsW halibut	FG <45'	January 1	Closed	
	FG 45-65'	January 1	Licence Condition	#14 circle hook or larger 10% combined cod and haddock
	FG <65'	February 16	Licence Condition	#14 circle hook for halibut 10% bycatch each cod and haddock
		April 15	Licence Condition	#14 circle hook for halibut cod 10% or 225 kg 10% haddock only
4VWX halibut	FG <65' (A10) class	March 2	Licence Condition	#14 circle hook or larger 10% each cod and haddock
	MG <65' ITQ (C1-C6000) class	August 22	Variation Order	fishing closed mandatory discard
4X5 halibut	FG <65			#14 circle hook for halibut Halibut fishery - dependent on 4X haddock - A & B group conditions and closures, See Annand & Hansen (1995)
3N0 halibut	FG <65' (A10)	March 25	Licence Condition	cod > of 5% or 1250 kg #14 hook
	(A10)	May 20	Licence Condition	no more permits
	(A1-A10) ¹	May 26	Newfoundland	closed
	(A1-A10)	September 28	New	cod > of 5% or 1250 kg - observer #14 hook required
<u>Vessels >65'</u>				
3N0 halibut	B1-B7 B9-B220	April 29	Newfoundland	Bycatch Closure
	B1-B220	September 28		10% haddock - observer coverage required cod > of 5% or 1250 kgs

¹ Refers to vessel classes within fixed gear sector.

Table 7. Atlantic halibut CPUE 3NOPs for LL all TC where halibut was main species.

Year	Catch	Effort (000' hooks)	CPUE
1985	480	6899	.069
1986	406	3292	.123
1987	233	1647	.141
1988	266	1810	.147
1989	185	1414	.131
1990	173	1782	.097
1991	127	1602	.079
1992	123	1269	.097
1993	111	1259	.089
1994	64	699	.096

Atlantic halibut CPUE 4VWX 3NOPs for LL all TC where halibut was main species.

Year	Catch	Effort (000' hooks)	CPUE
1985	1265	17083	.074
1986	1096	14323	.076
1987	536	6385	.083
1988	530	4937	.107
1989	432	5174	.084
1990	356	4463	.080
1991	257	3814	.067
1992	334	4414	.076
1993	290	4557	.063
1994	187	2815	.066

Atlantic halibut CPUE (4VWX) for LL all TC where halibut was main species (data prior to 1986 from Neilson *et al.* 1987).

Year	Catch	Effort (000' hooks)	CPUE
1970	131	2374	.055
1971	146	2277	.064
1972	199	3099	.064
1973	212	3653	.058
1974	172	3198	.054
1975	111	2082	.053
1976	110	1848	.060
1977	82	1477	.056
1978	68	1127	.060
1979	179	1991	.088
1980	176	2004	.092
1981	115	1253	.078
1982	220	2820	.075
1983	606	8040	.077
1984	800	11985	.067
1985	785	10185	.077
1986	691	11031	.061
1987	303	4738	.063
1988	264	3127	.084
1989	247	3760	.066
1990	183	2681	.068
1991	129	2212	.058
1992	210	3145	.067
1993	177	3298	.054
1994	122	2146	.057

Table 8. Estimated total domestic effort (000's hooks).

Year	4VWX	3NOPs	4VWX3NOPs
1985	22584	12710	35351
1986	23770	7276	30855
1987	16984	4142	19927
1988	13916	4735	14429
1989	16378	4542	19952
1990	14397	6000	19512
1991	13758	3531	16075
1992	11805	2896	14105
1993	13203	2606	15000
1994	14070	1302	14045

Table 9. Data on quantities of undersized halibut released in March 1995 (F.S.R.S. Database).

	# of Vessels	# of Sets	Estimated Total Catch (before discards) (lbs.)	Estimated Discard Weight (lbs.)
Directed Vessels	18	310	12415	2965
All Vessels Combined	26	1096	43224	11865

Table 10. Halibut samples for 4VWX.

Year	Longline	Otter Trawl
1990	1	-
1991	1	1
1992	-	1
1993	1	1
1994	6	2

Table 11. Mean number/tow for 4VWX halibut in Canadian summer bottom trawl surveys (Strata 440 - 495)¹.

Stratum	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.26	0	0	-	
441	0	0	0	0	0	0	0	0	.28	0	0	0	0	0	0	.21	0	0	0	0	0	0	0	0	-	
442	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
443	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
445	0	.49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
446	0	0	0	0	0	0	.32	0	.25	0	0	0	0	.32	0	.26	0	0	0	0	.32	.34	5.15	0	.27	
447	0	0	0	0	0	0	.23	0	0	0	.17	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
448	0	0	0	.45	0	0	0	0	0	0	.22	0	0	0	.24	0	0	0	0	0	0	0	0	0	-	
449	0	.49	0	1.75	.39	0	0	0	0	.55	1.97	.49	0	0	.49	0	0	0	0	0	0	.51	0	0	-	
450	0	0	.31	0	.63	1.54	.34	3.65	.32	1.17	1.48	1.98	2.39	1.72	.32	.32	.34	0	1.03	.34	.69	.34	0	0	-	
451	0	.88	1.17	2.19	0	2.02	3.83	.97	0	1.94	.42	0	.34	0	0	0	0	1.64	0	3.83	2.09	-	1.49	0	4.96	
452	0	0	.58	0	0	1.92	1.46	0	1.94	5.51	1.47	0	2.57	1.90	2.70	0	0	.69	3.80	6.18	2.38	8.00	2.06	6.69	1.55	
453	0	.44	0	.92	0	.29	0	.34	.32	2.92	.45	.36	0	1.09	1.56	0	0	0	0	.51	0	1.09	.49	0	1.52	
454	0	0	1.01	.53	0	.34	1.17	0	.97	0	.31	0	0	1.03	0	0	2.06	1.03	.51	1.54	.32	0	0	0	0	
455	0	0	.13	.27	1.06	.15	0	0	.25	.69	0	.61	.26	0	.14	.14	0	.27	.58	.14	0	0	0	0	.10	
456	0	0	0	.40	.58	.79	.23	.21	.16	.17	.29	.59	0	0	.17	0	.59	1.04	0	.17	0	.15	.14	.11	.39	
457	0	0	0	.51	0	0	.95	.51	0	0	.40	1.49	0	0	0	0	0	.27	0	0	.24	1.03	0	.49	0	
458	0	0	0	.58	0	0	.61	1.10	.58	0	0	0	0	0	0	.34	0	0	0	.32	.27	0	0	0	0	
459	0	0	0	0	0	0	.20	0	0	.29	.51	.58	0	0	.26	0	0	0	0	.22	.21	.22	.32	0	0	
460	0	0	0	0	0	0	0	0	0	2.02	0	1.03	0	0	0	0	0	0	0	.34	0	0	0	.33	0	
461	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
462	.58	0	0	0	0	0	.55	.19	0	.24	.31	.44	.82	0	0	0	0	0	0	.76	.19	1.07	.24	.50	0	
463	1.32	.97	1.31	.49	0	3.58	1.46	2.30	2.10	1.26	.38	1.03	0	0	.51	0	1.03	5.15	3.83	0	2.47	.51	1.52	.46	0	
464	.80	0	.39	.52	.34	1.29	1.32	.65	.27	.51	.17	.40	.50	0	.62	1.37	1.45	.16	1.20	.61	.12	.59	.42	.14	.42	
465	.31	.58	0	0	0	.29	.96	.39	0	.84	.32	0	.45	.18	.44	.19	1.44	.68	.13	1.17	.49	.53	.60	.30	.60	
466	0	0	.32	0	0	0	0	0	0	.36	0	0	.69	0	0	0	0	0	0	0	0	0	0	.50	0	
470	0	0	0	0	0	0	0	.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.49	0	0	
471	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
473	0	0	0	0	.36	.46	0	1.61	.51	.51	0	0	.51	0	0	0	0	.51	0	0	0	0	.24	0	.74	
474	.51	.49	1.31	1.26	3.28	.92	3.09	4.01	3.09	1.17	1.03	.49	.51	0	0	0	0	1.06	0	0	0	0	0	0	0	
475	.55	.80	.67	0	2.81	1.02	1.34	1.09	.42	2.16	.92	.46	.51	.98	-	.49	.51	0	1.03	0	1.46	0	.49	.49	0	
476	0	0	0	0	0	0	0	.27	0	1.03	1.17	0	0	0	0	.51	0	0	0	0	0	0	.49	0	0	
477	.38	.55	.82	0	.42	0	1.06	0	2.52	0	.31	2.26	.92	0	.51	.49	.51	.64	0	.73	1.03	.97	.57	.76	.40	
478	.49	0	0	0	0	0	0	.22	.58	1.90	.36	.83	.75	.36	1.03	0	.36	0	0	0	0	0	.93	0	0	
480	1.40	5.35	.77	2.21	1.66	3.65	3.36	18.55	4.62	.24	2.32	1.54	.51	0	0	1.90	1.99	.53	.81	4.97	2.96	.42	0	1.27	.50	
481	.19	0	.23	.21	.95	0	1.22	0	.59	0	.36	.49	.26	0	1.47	0	0	.51	2.02	.50	.13	.78	.43	.11	.33	
482	0	0	0	0	0	0	0	0	0	0	0	0	.44	0	0	0	0	0	0	0	0	0	0	.34	0	
483	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.44	0	0	0	0	0	0	0	0	0	0	
484	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
485	0	0	0	0	0	0	0	0	0	0	0	0	.49	0	0	0	0	0	.63	0	0	.88	.32	0	0	
490	.51	0	0	0	3.06	1.71	0	.27	.56	1.15	2.16	0	0	0	0	0	.36	0	.26	0	2.33	.73	1.09	.45	1.00	
491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
492	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.32	0	0	0	0	0	0	0	0	0	
493	0	0	0	0	0	0	0	0	0	.49	0	0	0	0	0	0	0	0	0	0	0	.31	0	1.03	.32	0
494	0	0	.63	0	0	2.18	0	.58	0	0	0	0	.46	0	0	.49	.51	0	0	0	0	0	0	0	0	
495	0	0	0	2.19	0	0	0	0	0	2.19	.58	0	.49	0	0	0	0	0	.46	.55	0	1.38	0	0	0	

¹ Survey Vessels 1970-1981 A.T. Cameron
 1982 Lady Hammond
 1983-1994 Alfred Needler

Table 12a. Halibut (Summer Survey) 1970 - 1994 4VWX

Year	Mean Number/Tow (Standard Error)	Mean Weight/Tow (kg) (Standard Error)
1970	.12 (.04)	.38 (.15)
1971	.13 (.06)	.23 (.08)
1972	.10 (.02)	.28 (.10)
1973	.15 (.04)	.26 (.07)
1974	.21 (.06)	.40 (.14)
1975	.22 (.05)	.29 (.07)
1976	.38 (.09)	.86 (.24)
1977	.41 (.11)	.85 (.26)
1978	.25 (.05)	.98 (.21)
1979	.33 (.06)	1.24 (.30)
1980	.39 (.08)	1.07 (.21)
1981	.31 (.08)	1.22 (.35)
1982	.23 (.06)	1.06 (.29)
1983	.07 (.02)	.77 (.52)
1984	.20 (.05)	1.22 (.43)
1985	.13 (.03)	.36 (.11)
1986	.20 (.06)	.33 (.09)
1987	.19 (.04)	.40 (.16)
1988	.25 (.08)	.75 (.41)
1989	.33 (.07)	.84 (.26)
1990	.21 (.05)	.42 (.11)
1991	.31 (.07)	.57 (.14)
1992	.25 (.07)	1.04 (.39)
1993	.18 (.05)	.85 (.26)
1994	.15 (.03)	.50 (.13)

Table 12b. Halibut Spring and Summer Surveys

Year	Mean Number/Tow (Standard Error)	Mean Weight/Tow (kg) (Standard Error)
Halibut Spring Survey 4VW 1986-1994		
1986	.25 (.09)	1.08 (.37)
1987	.37 (.11)	2.25 (1.35)
1988	.63 (.24)	2.76 (1.28)
1989	.37 (.13)	1.40 (.53)
1990	.23 (.05)	2.09 (1.02)
1991	.61 (.19)	2.24 (.83)
1992	.31 (.14)	.88 (.43)
1993	.30 (.07)	1.31 (.58)
1994	.20 (.06)	1.07 (.74)
1995	.16 (.04)	.71 (.43)
Spring 4VWX 1979-1984		
1979	1.04 (.16)	3.64 (.76)
1980	.37 (.07)	2.07 (1.03)
1981	.62 (.10)	2.77 (.60)
1982	.48 (.08)	2.06 (.48)
1983	.44 (.08)	2.35 (.53)
1984	.26 (.07)	1.32 (.51)
Fall 4VWX 1979-1984		
1979	.30 (.04)	.79 (.11)
1980	.41 (.09)	1.76 (.50)
1981	.22 (.04)	.92 (.22)
1982	.31 (.06)	1.75 (.38)
1983	.09 (.03)	.33 (.13)
1984	.10 (.04)	.54 (.29)

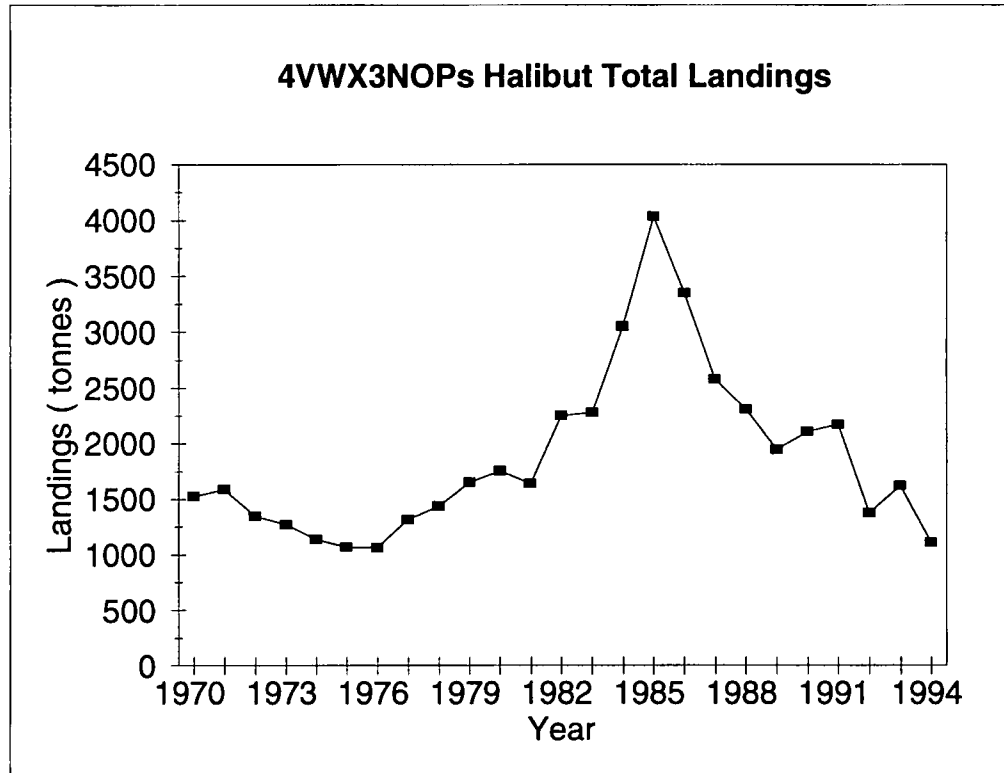


Fig. 1a

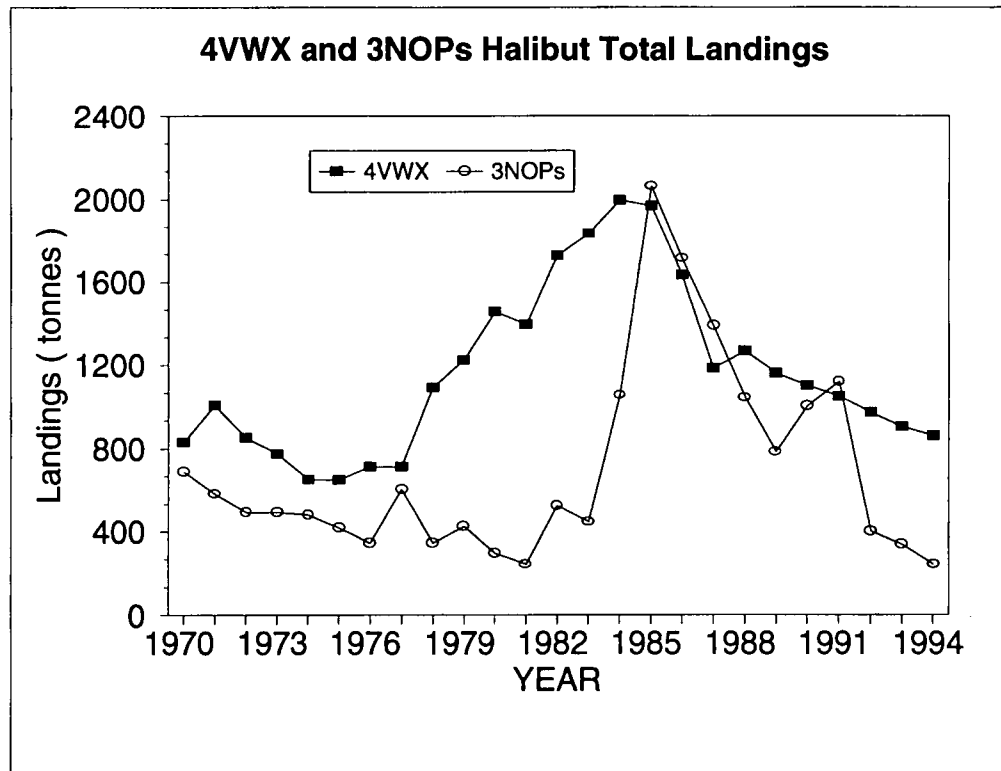


Fig. 1b

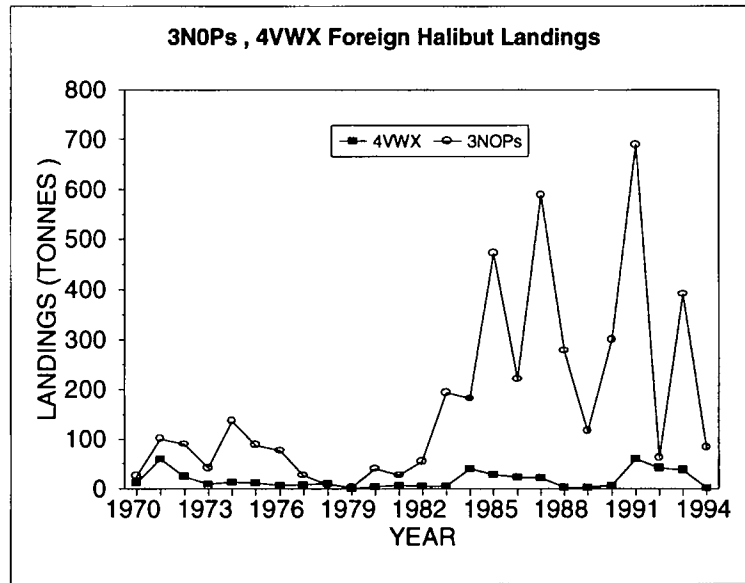


Fig. 2a

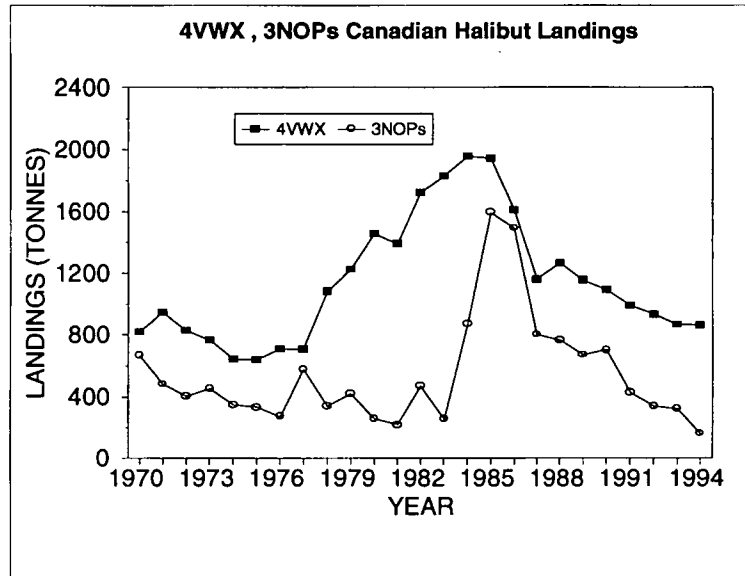


Fig. 2b

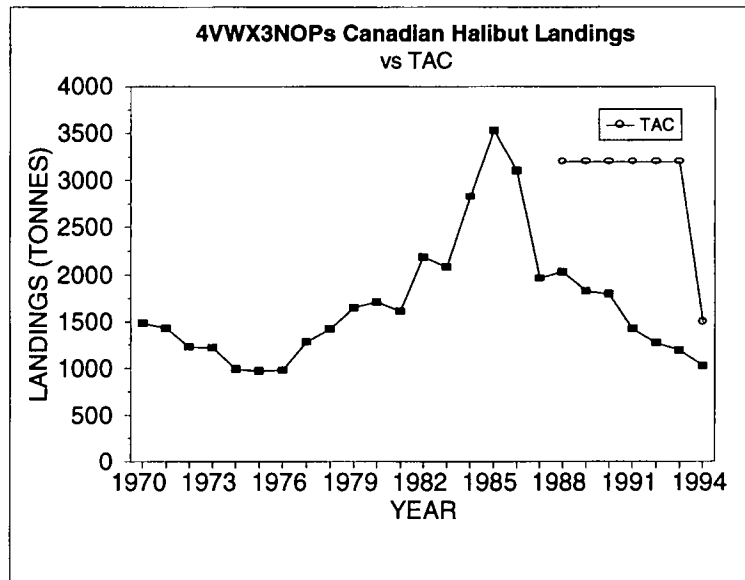


Fig. 2c

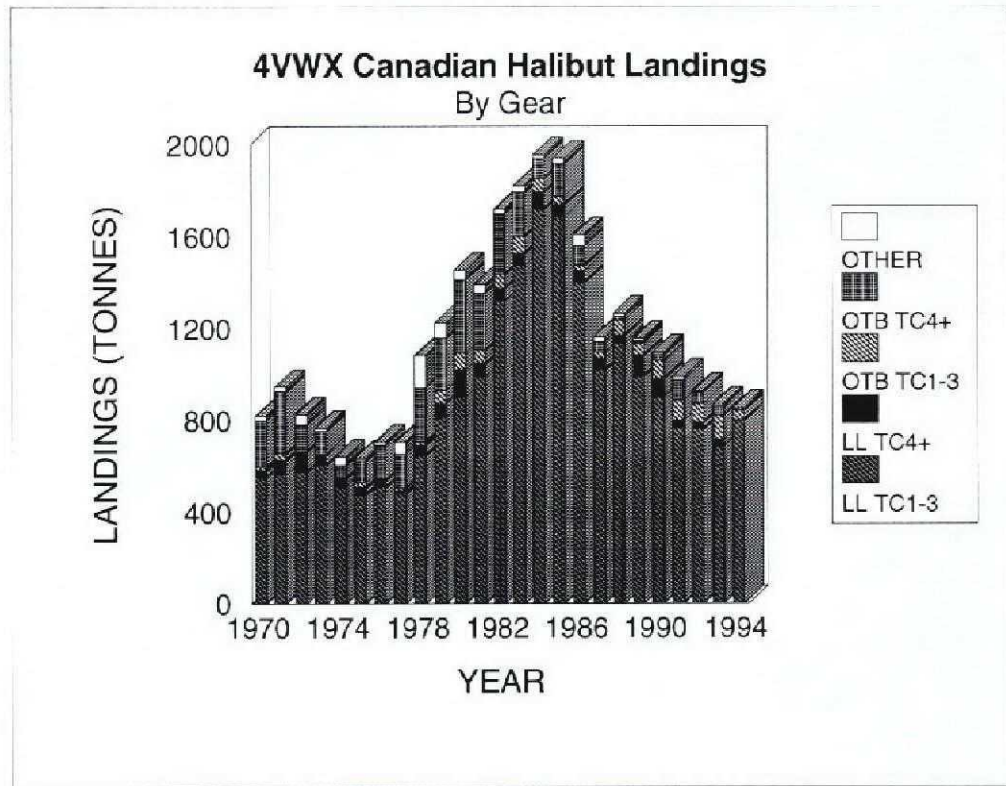


Fig. 3a

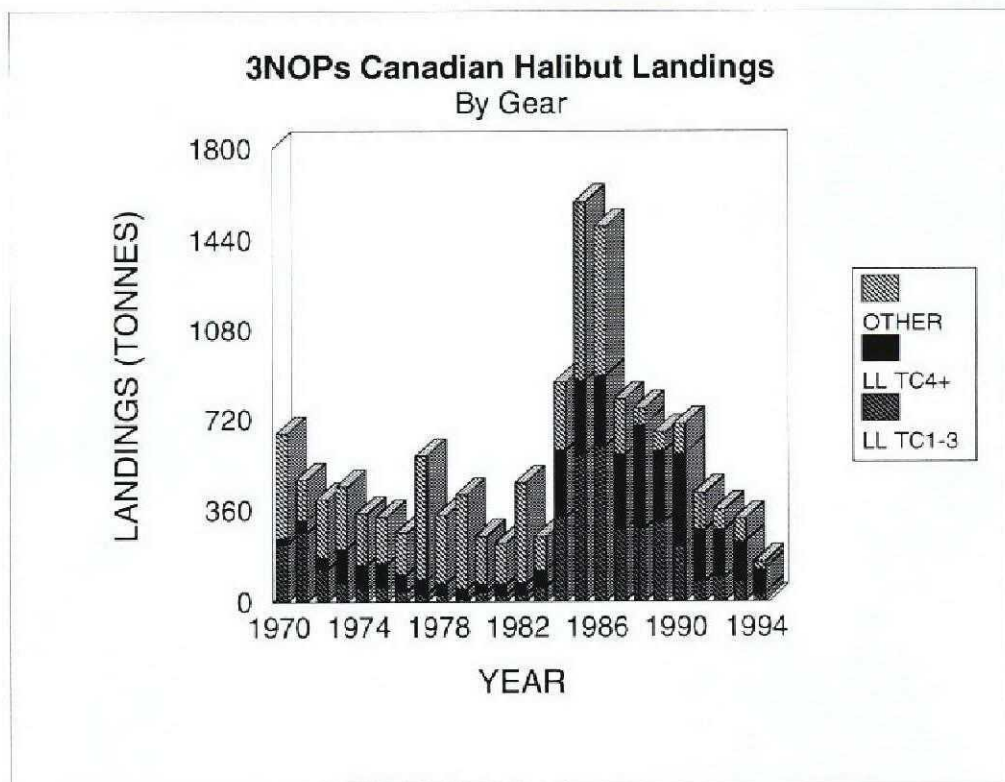


Fig. 3b

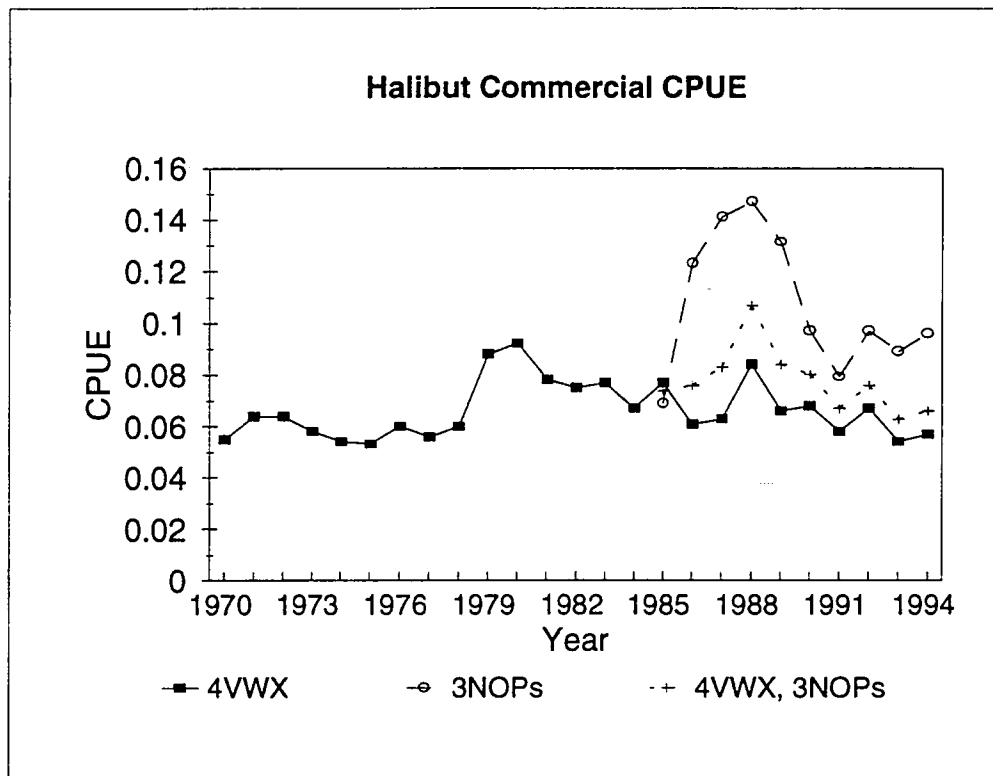


Fig. 4a

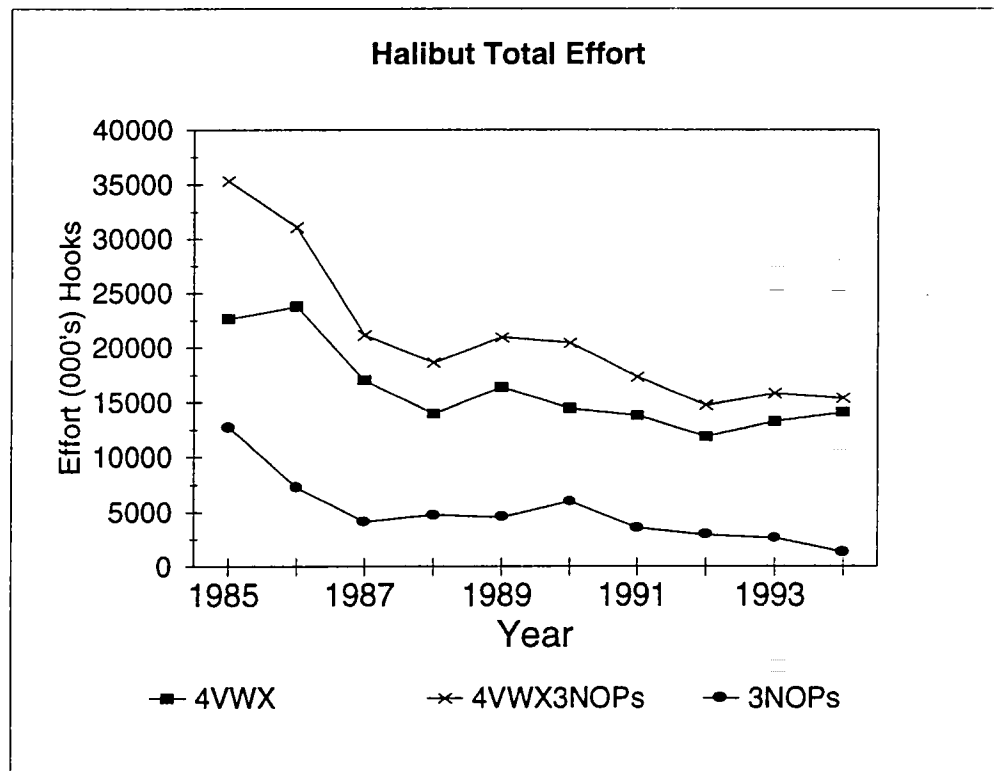


Fig. 4b

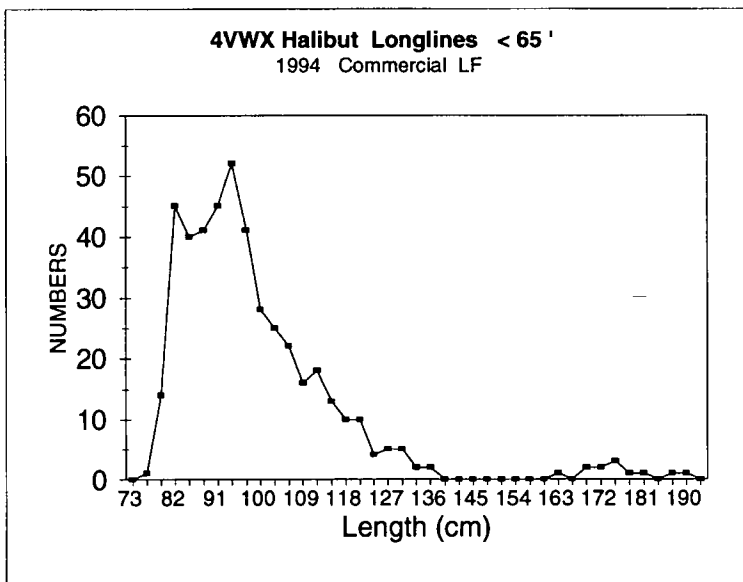


Fig. 5a

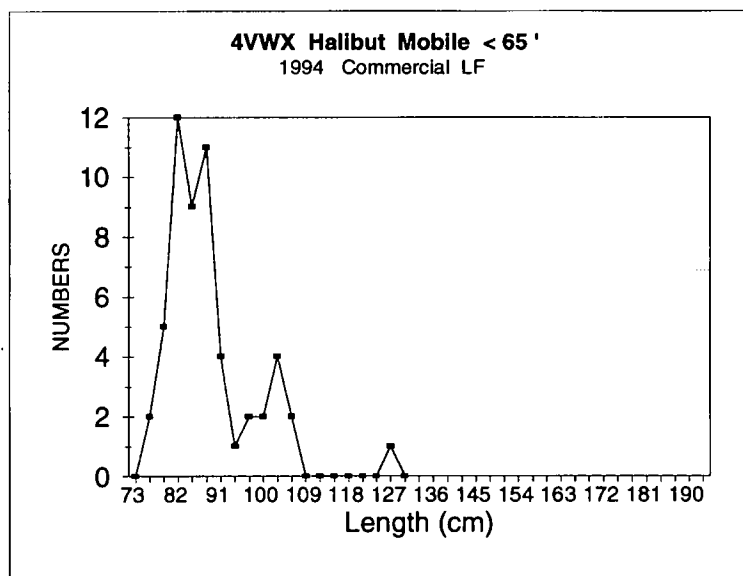


Fig. 5b

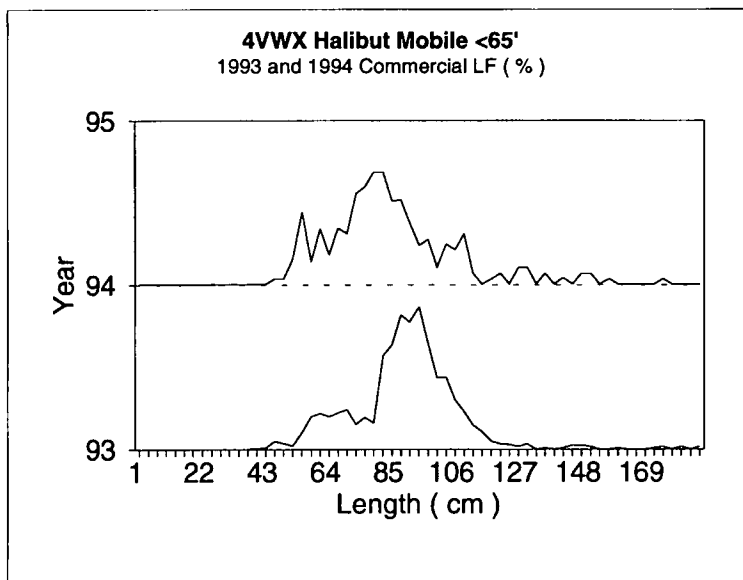


Fig. 5c

1993 Commercial Catch for Halibut

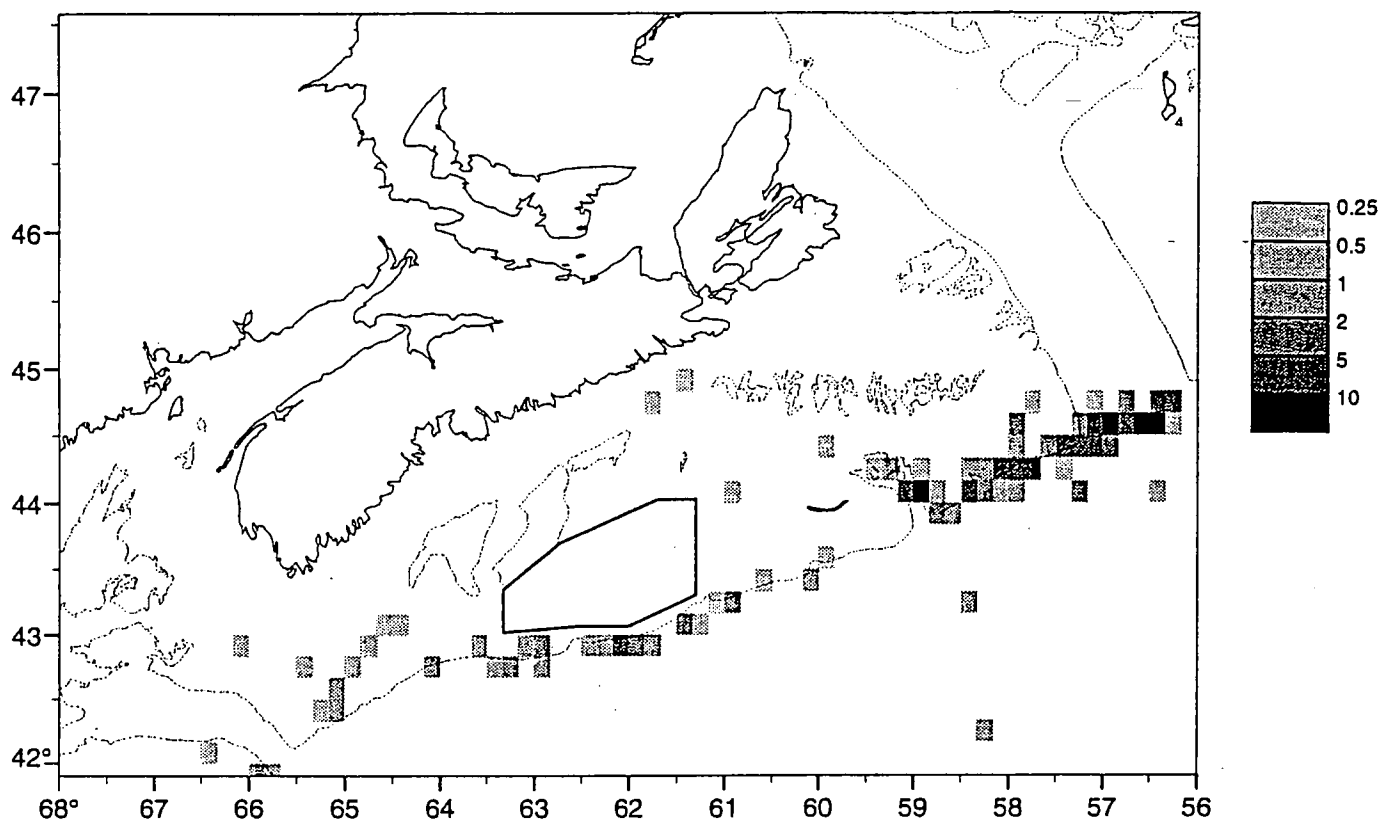


Fig. 6a

1994 Commercial Catch for Halibut

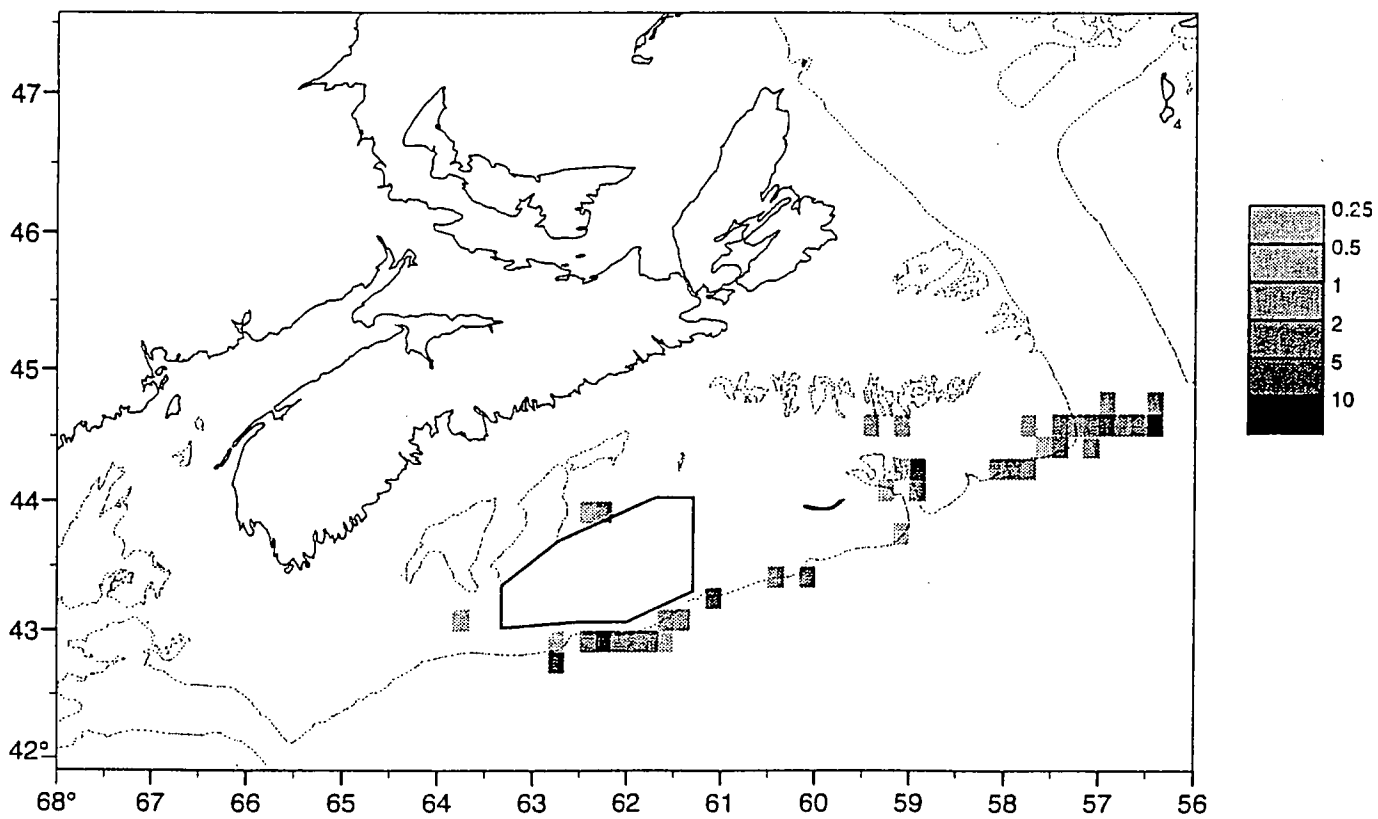


Fig. 6b

4VWX HALIBUT CATCHES (KG) FROM SCOTIA FUNDY SUMMER 93 GROUND FISH SURVEY

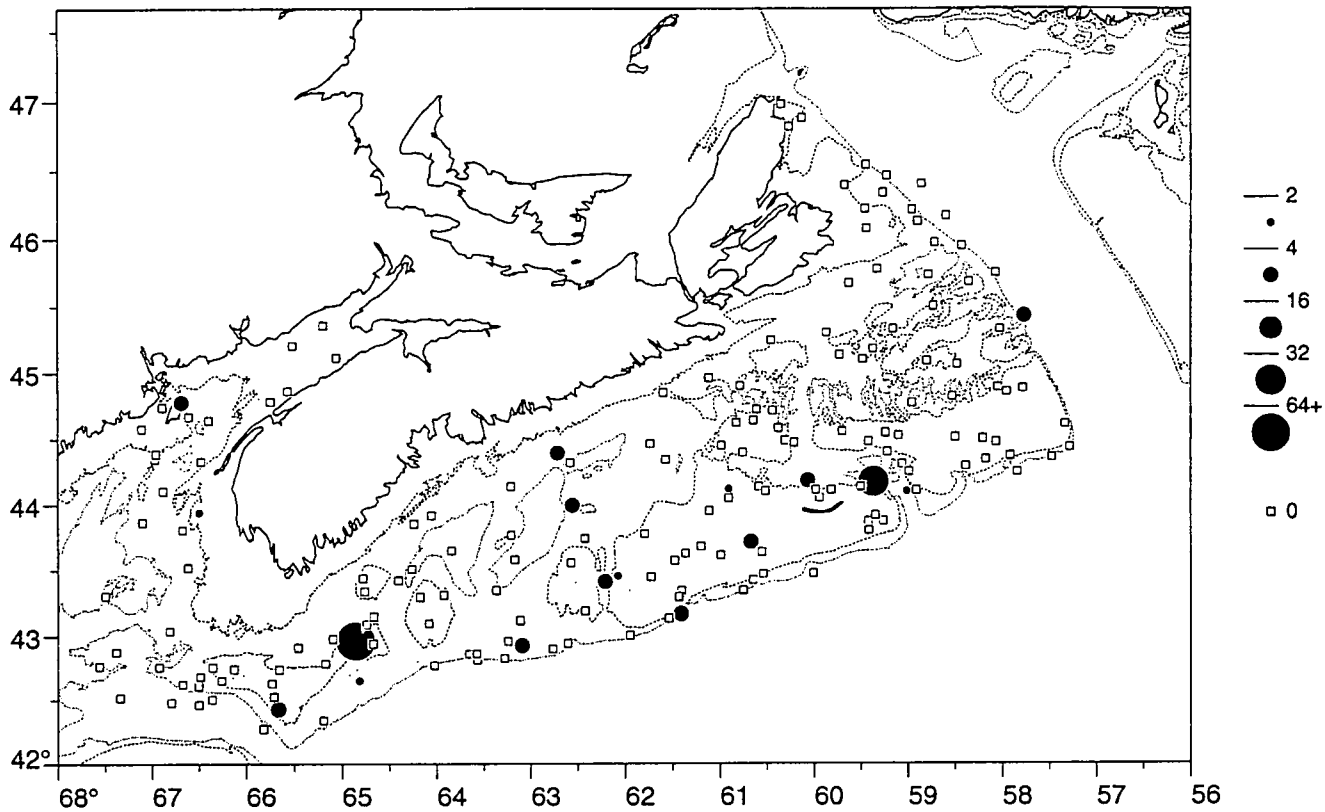


Fig. 7a

4VWX HALIBUT CATCHES (KG) FROM SCOTIA FUNDY SUMMER 94 GROUND FISH SURVEY

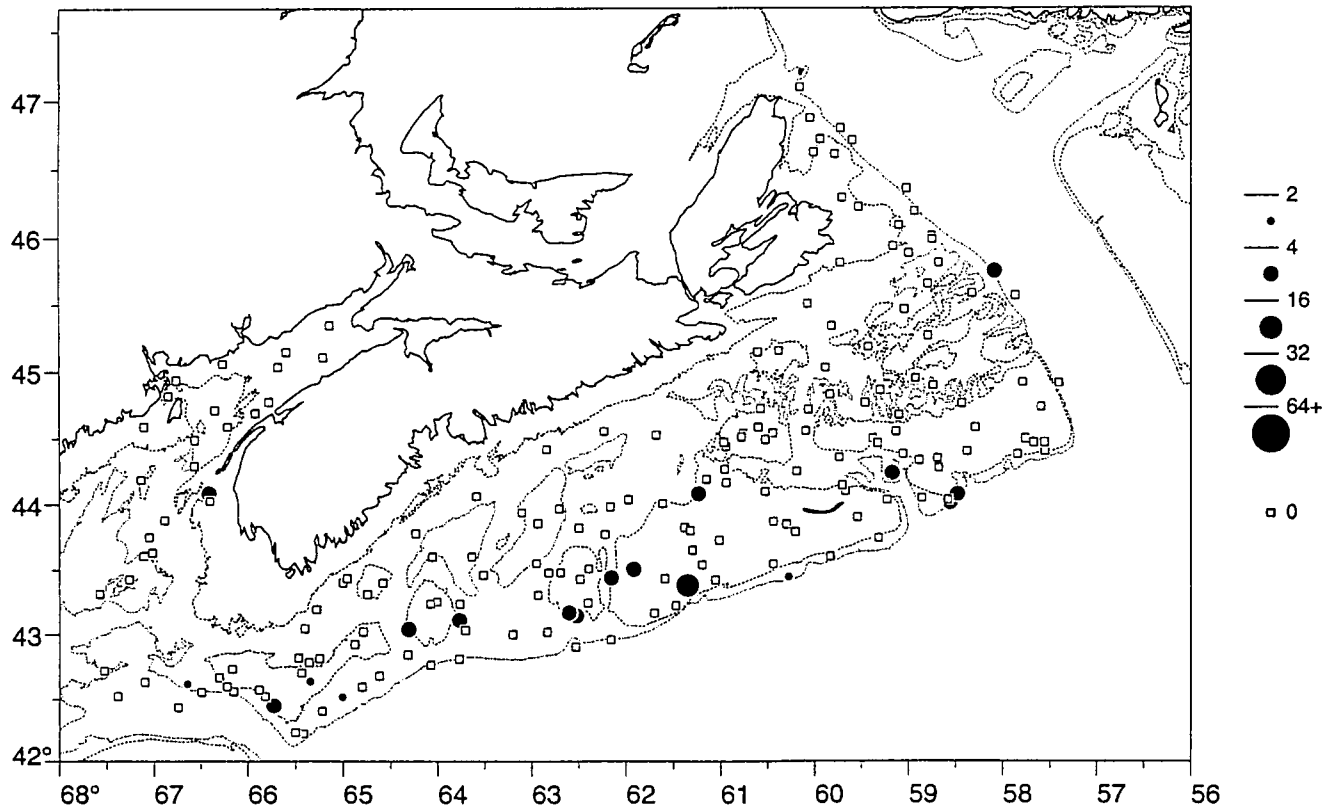


Fig. 7b

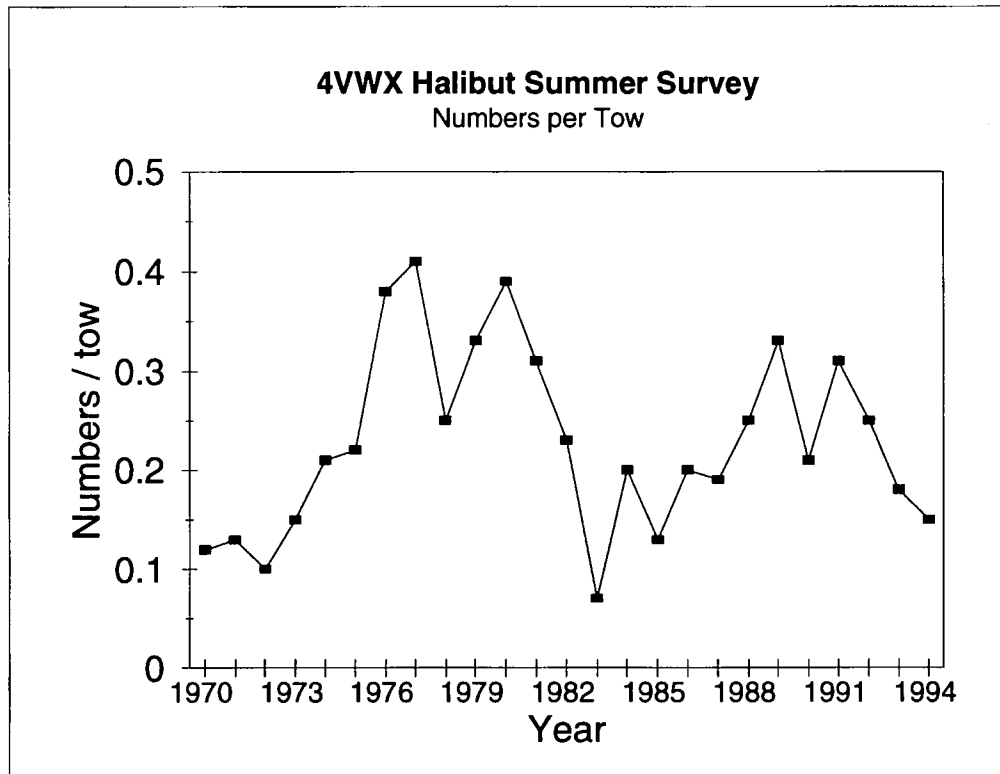


Fig. 8a

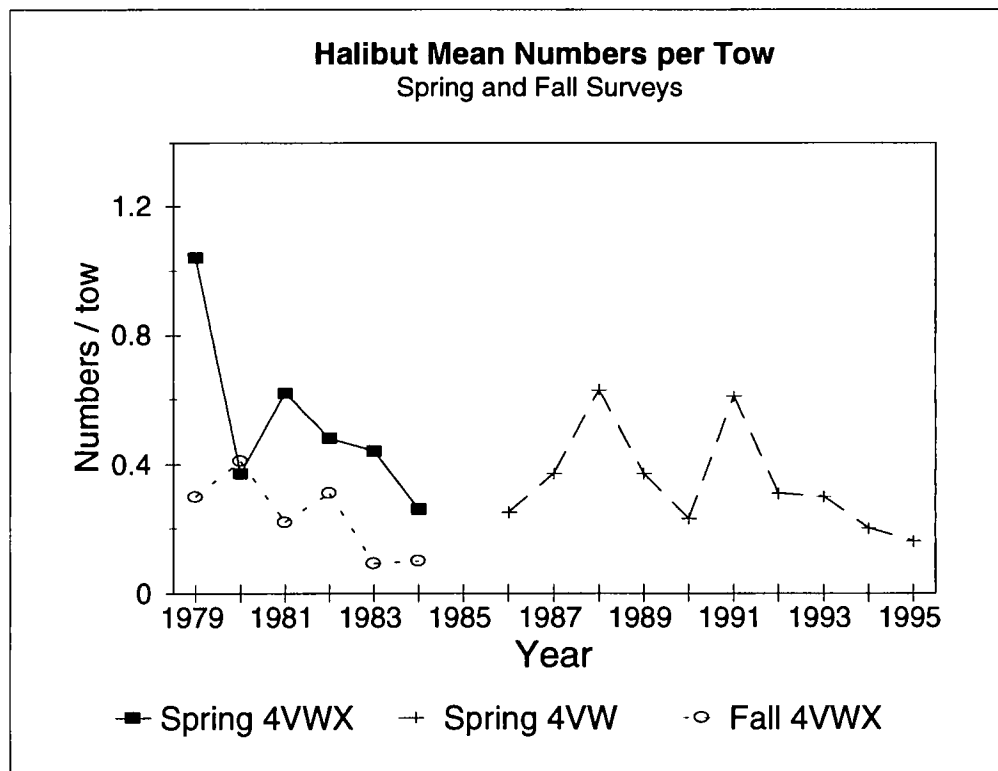


Fig. 8b

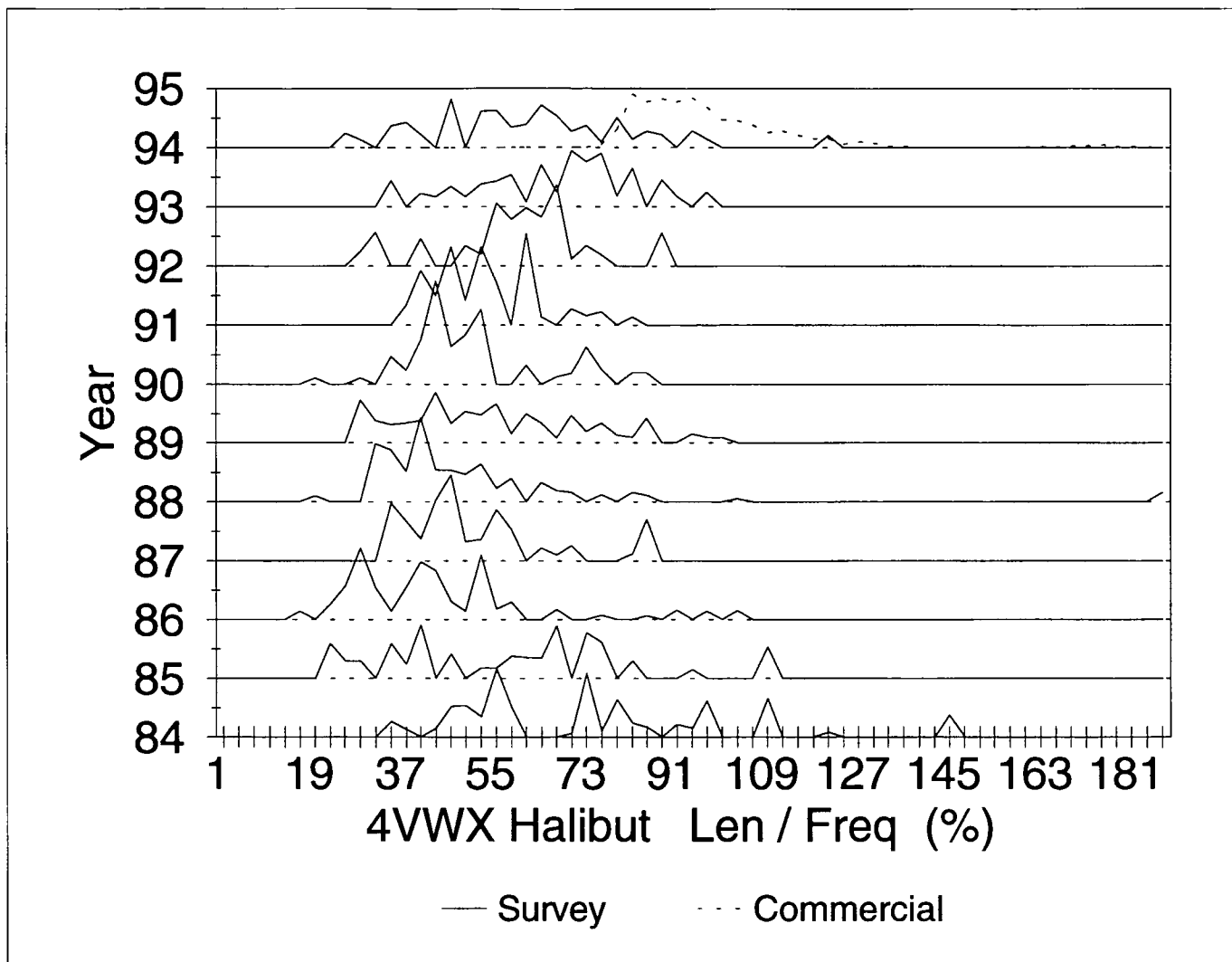


Fig. 9