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Estimates of discarding by the Newfoundland offshore fleet in 1984 with reference to trends over the past four years

by

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ABSTRACT

The rate of discarding by the Newfoundland offshore fleet (plus 90 ft LOA) while still relatively low has increased steadily since 1981, the first year of observations. This upward pattern is consistent for commercial, semi and non-commercial species. The total estimated discards, commercial or otherwise, was estimated at 12,000 t representing a slight decrease from 1983. However, discarding of primary commercial species increased to 4.9% of the catch in 1984, nearly double the 1981 level. Skate and wolffish species continued to dominate in the semi or non-commercial discarded fraction which amounted to an estimated 3609 t.

Dumping or non-selective removal of both directed species and by-catch, particularly in the 2J+3KL cod fishery, was once again identified as a major contributor to the upward trend in overall discarding. The species most affected were the smaller stocks overlapping the spring 3K cod fishery, particularly redfish. Estimates of dumping for all species but most particularly the above-mentioned overlapping stocks must be considered as minimum considering evidence of more extensive dumping on vessels not carrying observers. Other problem fisheries in terms of discarding of non-commercial sizes of fish were 4Vn cod, 3LN redfish, and the 3LNO plaice/yellowtail. These and the 3K fisheries have contributed to the upward trend over the past four years. Discarding in all other fisheries remained below 5%. Length samples indicated that sizes of discarded fish have changed little from 1983, the smaller non-marketable classes making up the majority.

INTRODUCTION

Discarding of non-marketable species, undersized, or damaged fish has long been the practice of the Newfoundland offshore fleet. Recently, as some groundfish stocks have become more abundant and size of catch per tow has increased, large fractions or whole catches are more commonly dumped back into the sea. Kulka (1985) found that when less desirable species were taken as by-catch with very large directed catches or when catches at trips end exceeded boat quotas, then dumping occurred. Both in terms of discarding and dumping, this element of mortality most often goes unrecorded in nominal catch statistics and as such is not accounted for in the stock assessment process. The problem is intensified with respect to discarding by a general dominance of younger year-classes or "pre-recruits" resulting in the loss of significant numbers of future marketable fish.

Prior to 1977, little information was available regarding the discard practices of the Newfoundland offshore fleet because pertinent data were seldom if ever recorded in the fishing records. Kulka (1984 and 1985) reviewed the available literature for the period following 1977. These two papers summarized results of a broad coverage study initiated in 1981, utilizing Canadian fishery observers to collect data for all offshore stocks. Considering that there currently exists no other reliable source of information on discarding and that discarding in certain fisheries can sometimes be a significant component of mortality, an

extension of this discard study to a fourth year was indicated. The purpose of this paper is not only to set forth the detailed data on discarding collected by fishery observers for 1984 but also to examine recent trends and identify the reasons for significant levels of discarding.

METHODS

In 1984 set, catch and discard data were collected by Canadian fishery observers from 12.2% of the offshore fishery (Newfoundland landings from vessels greater than 90 ft LOA). Collection of this data using standard methods (Kulka and Firth 1985) facilitated quantification of fleet discard practices. In addition, length and age data collected from both landed and discard components permitted estimates of total numbers and size structure of discards in relation to landings, for certain species.

Data were compiled by species, month, and NAFO division. The kept component of observed catch was compared to actual landed weights supplied by the regional Statistics Branch of Fisheries and Oceans in order to determine percent of fishery observed. The proportion of observed kept weight to total landed weight was then applied to observed discard weights, weighted by month and NAFO division, to derive discard estimates for both directed and by-catch species using the methods outlined in Kulka (1984).

RESULTS AND DISCUSSION

Estimates of discards and total removals for the Newfoundland offshore fleet by month, area, and corresponding aggregates are presented in Tables 1 through 7 for the 21 stocks of cod, redfish, American plaice, yellowtail, Greenland halibut, witch, and semi-commercial species. Table 8 presents a four year summary of discarding for the major commercial stocks and Fig. 1 illustrates the four year pattern for each of commercial and total species rates of discarding. Except in 1984 the trend for estimated percent of total removals (all species) that were discarded has been upward. The discard rate for commercial species has nearly doubled to 4.9% from 1981.

Discarding in 1984, as in previous years, varied depending on stock and season. The following sections set forth a discussion of observed discard patterns by stock in order to define areal and temporal trends and determine which fisheries were contributing most to the upward trend. In general, seasonal trends were much less pronounced than areal differences which were related to the mix of less desirable by-catch among areas. The most significant problem was the discarding of by-catch from the spring cod fishery.

COD

Table 8 provides a summary of discard rates by stock. Except for 4Vn all estimated rates of discarding for cod were less than 5%. The rate in 4Vn was 8.2%, up substantially from the previous year. However, coverage of this fishery was low and several key months were missed. No seasonal trend was apparent in 1984, the majority of discarding corresponding to the peak February-March period of directed fishing. Most of the estimated 100,000 discarded fish were of non-marketable size.

In other fisheries of note, the discarding of 2J+3KL cod continued to increase from previous years. The 3.8% rate in 1984 was more than 2.5 times higher than that of 1981 and an estimated 3224 t or 5.4 M fish were dumped or discarded mainly during the January to July 3K directed fishery. Very little discarding of cod occurred at other times of the year or in other directed fisheries. Similar to 1983 (Kulka 1985) discarded fish ranged between 28 and 58 cm but with a slightly greater proportion of larger fish in 1984. Discards greater than 46 cm constituted an estimated 27% of the total. However, the proportion of large fish being discarded is underestimated in the samples because dumped catches are not brought on board and therefore are not acccessible for sampling.

The practice of dumping directed species and by-catch has become increasingly common over the past four years probably as a result of improved catch rates. As in previous years (Kulka 1985) whole or large portions of cod directed catches were returned to the sea particularly from sets at the end of trips. Heresay evidence in the form of radio messages once again supported the contention that dumping was greater on unobserved vessels suggesting that the 3.8% rate for cod on observed vessels was likely a minimum estimate. However, given the average annual recruitment of 225 million fish for the 2J+3KL stock, even a substantially higher rate of discarding would likely not have a significant effect.

Previously on the decline, the discard rate for 3NO cod went up to 4.7% in 1984. Discarding was greatest in 3N particularly in May, June, and July in the directed fishery.

With a pattern of sizes similar to 2J3KL cod, the 283 t of discards translated to about 450,000 fish with a mean size of 42 cm.

REDFISH

Table 2 shows that discard rates for 4 of 6 stocks were less than 1%, similar to previous years. The highest rate, 11.6% for 3LN redfish was attributed mainly to discarding in January and February in 3L. Both directed fishery discards and by-catch redfish discards in the 3L cod fishery contributed to the an estimated 135 t or 275,000 fish discarded. Although the rate was quite high, in terms of the TAC the amount was insignificant.

The discard rate for redfish in the directed 2+3K fishery was only 0.4%. However, less than 1% of the estimated 785 t or 1.5 M fish were discarded from the directed fishery. The remaining larger fraction constituted discarded by-catch, mainly from the 3K cod directed fishery. As in 1983 (Kulka 1985), observer narrative reports indicated that discarding of redfish was likely greater for unobserved vessels directing for cod (based on radio reports from various vessels). From the observed portion (13%) of the directed 2J+3KL cod fishery it was estimated that 6,700 t of redfish was caught. While 91% of these by-catch redfish were retained on unobserved vessels, a much greater portion of this less valuable species were likely discarded on other vessels particularly where cod catch rates were very high. As such, the true level of discarding for redfish probably lies between 786 t, the estimated total discards for observed vessels, and 6,700 t the total estimated by-catch with cod plus amount discarded in the redfish fishery (less than 50 t). The exact amount depends on what proportion of the 12,222 t of the reported redfish landings actually constituted cod fishery by-catch. Given the relatively higher commercial value and great abundance of cod in 1984 it is likely that a large portion of the by-caught redfish was discarded. Unreported removals as high as 6750 t would be significant with respect to the 2+3K redfish TAC of 35,000 t.

PLAICE/YELLOWTAIL

Tables 3 and 4 indicate that rates of discarding were relatively high for all four observed stocks. The rate for 2+3K plaice increased significantly from previous years (Kulka 1985) to 25%. The 116t or 470,000 discards, as in the case of 2+3K redfish, was attritutable in part to increased discarding of by-catch in the cod fishery, mainly in 3K. As well, a reduced directed plaice fishery shifted more emphasis of discard estimates to the by-catch in other fisheries. As was the case for other species the dumping activity in the directed cod fishery was curtailed to an extent by the presence of observers. Also, plaice by-catch was usually small preventing a problem similar to redfish.

The 1633 t or 5.5 M discarded 3LNO plaice and 613 t or 2.5 M discarded yellowtail constituted mainly unmarketable sizes taken with the respective directed fisheries. However, a greater proportion of commercial sized plaice were discarded in 1984, the average size about 15% bigger than in 1983 (Kulka 1985). Also, consistent with previous years, observed discarding was 2 times lower in 3N than in 3LO and was relatively stable over the duration of the fishery. In contrast to the above fisheries, discarding of 3Ps plaice jumped to 12.5% from less than 2% in the previous year. The low rate in 1983 may be related more to low percent of the fishery observed than actual discard rate.

OTHER FLATFISH

With one exception the discard rates for all Greenland halibut and witch stocks were less than 2% in 1984. The exception, 29% for 2J+3KL, witch is likely biased because the estimate was based almost exclusively on by-catch discarded in other fisheries and was missing most of the directed effort where retainment is expected to be higher. Specifically, no observations were made in June where 60% of the landings were generated. Observed discard rates for the shoulder months of the directed fishery, May and July were 2-3%, similar to those recorded in previous years. With respect to the cod fisheries large proportions of by-caught flatfish species were discarded but actual amounts were insignificant in terms of tonnage.

OTHER SPECIES

Similar to past years, two species groups, skates and wolffishes comprised 84% of the discarded non or semi-commercial species. Table 7 indicates that skate, mainly thorny was a significant, sometimes dominant by-catch, particularly in the plaice and cod fisheries. The 3 wolffish species were discarded in varying amounts; spotted usually retained, striped 50 to 60% discarded and northern mainly discarded. Other species such as white hake, pollock, grenadier, capelin, squid, crab, eelpouts, and sculpins among others made up the other 16% of an estimated 3609 t of discarded semi or non-commercial species (Fig. 1). This amount, significantly less than the 5419 t discarded in the 1983 fishery (Kulka 1985), is due to

smaller estimated by-catches of semi and non-commercial species, particularly skate. Relative proportions of these species discarded did not change significantly. Relatively low sampling coverage of 12.2% overall may also have had an affect on estimates of minor by-catch particularly where amounts were small.

CONCLUSIONS

The 1984 estimate of total discards for the offshore Newfoundland groundfish fishery amounted to 12,000 t or 6.8% of the total catch weight, a slight reduction from the previous year. However, discarding of major species, cod, redfish, and flatfish continued to increase, the rate nearly doubling to 4.9% (8,400 t) from 1981. Much of this increase over the past four years can be attributed to increased dumping practices, particularly in the spring cod fishery in 2J3KL. It appears that as cod became more abundant, the main by-catches were dumped in greater amounts. Greater selectivity in the retention of less valuable species and sizes of fish appears to be the result of the improved catch rates, particularly for the 2J+3KL cod stocks. Also, as in past years, estimates of discarding must be regarded as minimum values because of deterrence to this practice brought about by the surveillance aspects of observer duties. Heresay evidence in the form of radio messages from unobserved vessels tended to support this hypothesis. In particular, discarding of redfish in 3K may be considerably higher. Therefore as in 1983 increased dumping continues to be the most significant trend with respect to overall discarding practices in the domestic fleet and could have a pronounced effect on the much smaller stocks overlapping with 2J3KL cod.

REFERENCES

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Table 1. Estimates of discarded cod in Newfoundland fisheries in 1984.

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Stock 2GH								
Aug.	2H(2GH)	1.00	0	0	5.00	0	20	20
Sept.	2H(2GH)	0.43	0	0	3.07	0	14	14
Dec.	2H(2GH)	4.64	1.82	28.17	100.00	1.82	4	7
1984	2GH	6.07	-	4.55	15.97	1.82	38	40
Stock 2J+3KL								
Jan.	2J	0	-	0	0	-	26	-
	3K	185.79	3.46	1.83	4.97	69.61	3738	3808
	3L	991.71	11.57	1.15	14.68	78.81	6755	6834
	2J+3KL	1177.50	-	1.26	11.19	148.79	10519	10668
Feb.	3K	1339.54	69.81	4.95	14.44	483.31	9274	9757
	3L	668.87	14.53	2.13	8.13	178.72	8227	8406
	2J+3KL	2008.41	-	4.03	11.48	734.93	17501	18236

Table 1 (Cont'd.)

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Mar.	2J	532.83	0	0	21.49	0	2480	2480
	3K	1178.91	67.93	5.45	29.67	228.99	3974	4203
	3L	269.74	11.11	3.96	4.46	249.19	6050	6299
	2J+3KL	1981.48	-	3.84	15.85	498.78	12504	13003
Apr.	2J	410.25	10.75	2.55	24.39	44.07	1682	1726
June	2J	0	-	0	0	-	44	-
	3K	0	-	0	0	-	3213	-
	3L	104.89	3.28	3.03	3.21	102.13	3266	3368
	2J+3KL	104.89	-	3.03	1.61	203.98	6523	6727
July	2J	0	-	0	0	-	500	-
	3K	94.65	11.98	11.24	5.48	218.59	1727	1946
	3L	79.12	11.65	12.84	3.11	374.00	2540	2914
	2J+3KL	173.77	-	11.97	3.65	662.03	4767	5429
Aug.	2J	87.83	0	0	55.24	0	159	159
	3K	0	-	0	0	-	201	-
	3L	0	-	0	0	-	774	-
	2J+3KL	87.83	-	0	7.75	0.00	1134	1134
Sept.	2J	90.46	1.48	1.61	100.00	1.48	70	92
	3K	46.08	0.27	0.58	24.25	1.11	190	191
	3L	61.00	0	0	8.75	0	697	697
	2J+3KL	197.54	-	0.88	20.64	8.48	957	965
Oct.	2J	138.49	0.85	0.61	94.21	0.90	147	148
	3K	26.01	0.03	0.12	8.85	0.34	294	294
	3L	379.76	12.56	3.20	56.43	22.26	673	695
	2J+3KL	544.26	-	2.41	48.86	27.51	1114	1142
Nov.	2J	75.51	0.32	0.42	82.98	0.39	91	91
	3K	16.25	0.17	1.04	58.04	0.29	28	28
	3L	526.11	5.81	1.09	74.73	7.77	704	712
	2J+3KL	617.87	-	1.01	75.08	8.39	823	831
Dec.	2J	508.20	0	0	100.00	0	345	508
	3K	124.45	0	0	28.28	0	440	440
	3L	429.11	0	0	15.40	0	2786	2786
	2J+3KL	1061.76	-	0	29.73	0	3571	3571
1984	2J+3KL	9841.61	-	3.77	12.75	3023.83	77193	80217
Stock 3NO								
Jan.	3N	0	-	0	0	-	34	-
	30	0	-	0	0	-	455	-
	3NO	0	-	0	0	-	489	-
Feb.	3N	0.02	0	0	0.06	0	36	36
	30	9.25	0	0	2.57	0	360	360
	3NO	9.27	-	0	2.34	0	396	396
Mar.	3N	1.96	0	0	3.77	0	52	52
	30	32.01	0.10	0.31	4.47	2.24	716	718
	3NO	33.97	-	0.29	4.42	2.26	768	770
Apr.	3N	20.67	0.13	0.63	5.33	2.44	388	340
	30	0.58	0	0	1.32	0	44	44
	3NO	21.25	-	0.61	4.92	2.64	432	435

Table 1 (Cont'd.)

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
May	3N	61.78	5.20	7.76	5.87	88.63	1053	1142
	3O	3.80	0.21	5.24	5.35	3.92	71	75
	3NO	65.58	-	7.62	5.84	92.72	1124	1217
June	3N	14.75	0.80	5.14	2.16	37.10	684	721
	3O	0	-	0	0	-	201	-
	3NO	14.75	-	5.14	1.67	48.00	885	933
July	3N	25.77	2.40	8.52	5.21	46.10	495	541
	3O	7.29	2.30	23.98	6.13	37.54	119	157
	3NO	33.06	-	12.45	5.38	87.29	614	701
Aug.	3N	0	-	0	0	-	138	-
	3O	0	-	0	0	-	3	-
	3NO	0	-	0	0	-	141	-
Sept.	3N	0.70	0	0	70.00	0	1	1
	3O	0.92	0	0	6.57	0	14	14
	3NO	1.62	-	0	10.80	0	15	15
Oct.	3N	0	-	0	0	-	4	-
	3O	56.86	0.41	0.72	37.41	1.10	152	153
	3NO	56.86	-	0.72	36.45	1.13	156	157
Nov.	3N	17.36	0.45	2.53	23.15	1.94	75	77
	3O	28.94	0.31	1.06	6.40	4.84	452	457
	3NO	46.30	-	1.62	8.79	8.65	527	536
Dec.	3N	0	-	0	0	-	15	-
	3O	0	-	0	0	-	168	-
	3NO	0	-	0	0	-	183	-
1984	3NO	282.66	-	4.70	4.93	282.82	5730	6013
Stock 3Ps								
Jan.	3Ps(3Ps)	79.95	3.85	4.59	100.00	3.85	60	84
Feb.	3Ps(3Ps)	60.69	1.00	1.62	21.60	4.63	281	286
Mar.	3Ps(3Ps)	1.79	0.01	0.56	9.94	0.10	18	18
Apr.	3Ps(3Ps)	7.45	0	0	100.00	0	5	7
May	3Ps(3Ps)	0.35	0	0	35.00	0	1	1
June	3Ps(3Ps)	0.27	0	0	9.00	0	3	3
July	3Ps(3Ps)	0.94	0.06	6.00	31.33	0.19	3	3
Aug.	3Ps(3Ps)	0	-	0	0	-	10	-
Oct.	3Ps(3Ps)	0.20	0	0	3.33	0	6	6
Nov.	3Ps(3Ps)	0.35	0	0	0.16	0	215	215
Dec.	3Ps(3Ps)	0	-	0	0	-	198	-
1984	3Ps	151.99	-	1.46	19.00	11.85	800	812

Table 1 (Cont'd.)

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Stock 4RS+3PN								
Feb.	3Pn	0.75	0	0	4.69	0	16	16
	4R	79.83	5.39	6.32	14.49	37.20	551	588
	4R+3Pn	80.58	-	6.27	14.21	37.93	567	605
Mar.	3Pn	0.05	0	0	0.56	0	9	9
	4R	105.62	3.35	3.07	34.70	9.83	310	320
	4RS+3PN	105.67	-	3.07	33.12	10.11	319	329
Apr.	4R	25.53	0.47	1.81	37.54	1.25	68	69
	4S	0	-	0	0	-	20	-
	4RS+3PN	25.53	-	1.81	29.01	1.62	88	90
May	3Pn	0	-	0	0	-	18	-
	4R	101.29	1.34	1.31	11.97	11.19	846	857
	4RS+3PN	101.29	-	1.31	11.72	11.43	864	875
June	4R (4RS+3PN)	6.14	0.03	0.49	21.93	0.14	28	28
July	4R (4RS+3PN)	0.70	0.07	9.09	1.37	5.1	51	56
Sept.	4R (4RS+3PN)	0	-	0	0	-	1	-
Oct.	3PN (4RS+3PN)	0	-	0	0	-	10	-
Nov.	4R (4RS+3PN)	0	-	0	0	-	3	-
1984	4RS+3PN	319.91	-	3.34	16.57	66.81	931	998
Stock 4Vn								
Jan.	4Vn(4Vn)	0	-	0	0	-	137	-
Feb.	4Vn(4Vn)	75.69	14.66	16.23	43.01	34.09	176	210
Mar.	4Vn(4Vn)	25.50	6.35	19.94	7.26	87.41	351	438
Apr.	4Vn(4Vn)	15.63	0	0	1.89	0	827	827
May	4Vn(4Vn)	0	-	0	0	-	33	-
July	4Vn(4Vn)	0.17	0	0	1.55	0	11	11
Aug.	4Vn(4Vn)	0	-	0	0	-	1	-
Sept.	4Vn(4Vn)	0	-	0	0	-	26	-
Dec.	4Vn(4Vn)	0	-	0	0	-	252	-
1984	4Vn	116.99	-	8.18	6.45	161.47	1814	1975
Stock 4VWX								
Mar.	4Vs (4VWX)	13.28	0	0	6.21	0	214	214

Table 1 (Cont'd.)

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Apr.	4Vs	44.66	0.35	0.78	6.71	5.22	666	671
	(4VWX)							
May	4Vs	1.23	0.76	38.19	0.21	357.14	578	935
	4W	0	-	-	0	-	51	-
	(4VWX)	1.23	-	38.19	0.20	388.65	629	1018
June	4Vs	0	-	0	0	-	251	-
	(4VWX)							
July	4Vs	0	-	0	0	-	125	-
	(4VWX)							
Aug.	4Vs	0	-	0	0	-	21	-
	(4VWX)							
Sept.	4Vs	0	-	0	0	-	8	-
	4W	0	-	0	0	-	113	-
	(4VWX)	0	-	0	0	-	121	-
Nov.	4Vs	0	-	0	0	-	31	-
	(4VWX)							
Dec.	4Vs	0	-	0	0	-	1	-
	(4VWX)							
1984	4VWX	59.17	-	2.07	2.87	537.43	2059	2596

Table 2. Estimates of discarded redfish in Newfoundland fisheries in 1984.

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Stock 2+3K								
Jan.	3K	64.89	2.27	3.38	8.17	27.77	794	822
	(2+3K)							
Feb.	3K	231.30	24.11	9.44	19.18	125.71	1206	1332
	(2+3K)							
Mar.	2J	0	-	0	0	-	20	-
	3K	270.08	56.96	17.42	21.62	263.41	1249	1512
	2+3K	270.08	-	17.42	21.28	267.63	1269	1537
Apr.	2J	4.33	0.77	15.10	72.17	1.07	6	7
	3K	282.64	2.80	0.98	11.63	24.08	2431	2455
	2+3K	286.97	-	1.23	11.78	30.32	2437	2467
May	2J	0	-	0	0	-	2	-
	3K	23.18	3.29	12.43	1.69	195.16	1375	1570
	2+3K	23.18	-	12.43	1.68	195.44	1377	1572

Table 2 (Cont'd.)

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
June	3K (2+3K)	0	-	0	0	-	467	-
July	2J	0	-	0	0	-	9	-
	3K	122.60	2.18	1.75	16.89	12.91	726	739
	2+3K	122.60	-	1.75	16.68	13.07	735	748
Aug.	2J	11.52	0.22	1.87	25.04	0.88	46	47
	3K	0	-	0	0	-	679	-
	2+3K	11.52	-	1.87	1.59	13.87	725	739
Sept.	2H	0	-	0	0	-	6	-
	2J	2.57	0.75	22.59	100.00	0.75	1	3
	3K	144.40	1.62	1.11	18.23	8.89	792	801
	2+3K	146.97	-	1.59	18.39	9.71	799	809
Oct.	2J	3.38	0.76	18.36	100.00	0.76	3	4
	3K	345.28	0	0	21.58	0	1600	1600
	2+3K	348.66	-	0.22	21.75	3.49	1603	1606
Nov.	3K(2+3K)	60.45	0.80	1.31	13.29	6.02	455	461
Dec.	2J	6.74	0.03	0.44	100.00	0.03	3	7
	3K	30.93	6.68	17.76	8.79	76.02	352	428
	2+3K	37.67	-	15.12	10.61	63.23	355	418
1984	2+3K	1604.29	-	6.04	13.13	786.30	12222	13008
Stock 3LN								
Jan.	3L(3LN)	17.57	0.84	4.56	8.25	10.18	213	223
Feb.	3L(3LN)	16.00	2.46	13.33	21.05	11.69	76	88
Mar.	3L(3LN)	3.60	0.07	1.91	4.68	1.50	77	79
Apr.	3L(3LN)	0.50	0.50	50.00	0.54	93	93	186
May	3L(3LN)	0	-	0	0	-	12	-
June	3L(3LN)	0	-	0	0	-	63	-
July	3L(3LN)	0	-	0	0	-	1	-
Aug.	3L	0	-	0	0	-	2	-
	3N	0	-	0	0	-	1	-
	3LN	0	-	0	0	-	3	-
Sept.	3L(3LN)	32.94	1.63	4.72	22.89	7.13	144	151
Oct.	3L(3LN)	108.61	0	0	34.92	0	311	311
Nov.	3L(3LN)	11.78	0.06	0.51	73.63	0.08	16	16
Dec.	3L(3LN)	4.92	0.29	5.57	24.60	1.18	20	21
1984	3LN	195.92	-	11.61	19.04	135.13	029	1164

Table 2 (Cont'd.)

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Stock 30								
June	30(30)	0	-	0	0	-	105	-
July	30)30)	15.50	0	0	48.44	0	32	32
1984	30	15.50	-	0	11.31	0	137	137
Stock 3PN								
Feb.	3Pn(3Pn)	73.70	0	0	100.00	0	64	74
May	3Pn(3Pn)	0	-	0	0	-	11	-
June	3Pn(3Pn)	16.60	0	0	44.87	0	37	37
July	3Pn(3Pn)	7.50	0	0	12.93	0	58	58
Aug.	3Pn(3Pn)	0	-	0	0	-	3	-
Oct.	3Pn(3Pn)	0	-	0	0	-	206	-
1984	3Pn	97.80	-	0	25.80	0	379	379
Stock 3PS								
Feb.	3Ps(3Ps)	25.70	0.06	0.23	73.43	0.08	35	35
Mar.	3Ps(3Ps)	5.50	0	0	100.00	0	5	6
Apr.	3Ps(3Ps)	0.93	0	0	93.00	0	1	1
May	3Ps(3Ps)	193.63	0.45	0.23	100.00	0.45	88	194
June	3Ps(3Ps)	33.78	0	0	7.97	0	424	424
July	3Ps(3Ps)	173.27	2.50	1.42	26.91	9.29	644	653
Aug.	3Ps(3Ps)	0	-	0	0	-	82	-
Oct.	3Ps(3PS)	0.95	0.01	1.04	19.00	0.05	5	5
Nov.	3Ps(3Ps)	0.95	0.04	4.04	15.83	0.25	6	6
Dec.	3Ps(3Ps)	0	-	0	0	-	1	-
1984	3Ps	434.71	-	0.83	33.67	10.81	1291	1302
Stock 4RST								
Feb.	4R (4RST)	2.24	0	0	4.31	0	52	52
Mar.	4R (4RST)	0.82	0.06	6.82	11.71	0.51	7	8
Apr.	4R	0	-	0	0	-	5	-
	4S	0	-	0	0	-	2	-
	4T	0	-	0	0	-	1	-
	4RST	0	-	0	0	-	8	-

Table 2 (Cont'd.)

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
May	4R	75.41	0.08	0.11	43.09	0.19	175	175
	4S	80.53	0	0	100.00	0	70	81
	4RST	155.94	-	0.05	63.65	0.12	245	245
June	4R	539.61	0	0	63.11	0	855	855
	4S	9.20	0	0	100.00	0	9	9
	4RST	548.81	-	0	63.52	0	864	864
July	4R (4RST)	55.43	0	0	8.88	0	624	624
Aug.	4R (4RST)	0	-	0	0	-	196	-
Sept.	4R (4RST)	0	-	0	0	-	125	-
Nov.	4R (4RST)	0	-	0	0	-	201	-
1984	4RST	763.24	-	0.04	32.87	0.82	2322	2323
Stock 4VN								
Feb.	4Vn(4Vn)	0.34	0.02	5.56	4.25	0.47	8	8
Apr.	4Vn(4Vn)	0	-	0	0	-	1	-
May	4Vn(4Vn)	0	-	0	0	-	1	-
June	4Vn(4Vn)	0	-	0	0	-	45	-
July	4Vn(4Vn)	10.70	0	0	11.03	0	97	97
Aug.	4Vn(4Vn)	0	-	0	0	-	2	-
Sept.	4Vn(4Vn)	0	-	0	0	-	1	-
Oct.	4Vn(4Vn)	0	-	0	0	-	7	-
1984	4Vn	11.04	-	0.45	6.81	0.73	162	163
Stock 4VWX								
Apr.	4Vs (4VWX)	10.94	0	0	100.00	0	6	11
May	4Vs (4VWX)	33.52	0	0	76.18	0	44	44
June	4Vs (4VWX)	0	-	0	0	-	8	-
July	4Vs	0	-	0	0	-	4	-
	4W	0	-	0	0	-	2	-
	4X	0	-	0	0	-	5	-
	4VWX	0	-	0	0	-	11	-
Aug.	4Vs 4VWX	0	-	0	0	-	85	-
1984	4Vs 4VWX	44.46	-	0	28.87	0	154	154

Table 3. Estimates of discarded plaice in Newfoundland fisheries in 1984.

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Stock 2+3K								
Jan.	3K (2+3K)	0.12	0.16	57.14	6.00	2.67	2	5
Feb.	3K (2+3K)	2.41	1.37	36.24	17.21	7.96	14	22
Mar.	3K 2+3K)	2.42	1.51	38.42	3.51	43.05	69	112
Apr.	3K (2+3K)	10.34	1.85	15.18	33.36	5.55	31	37
May	3K (2+3K)	1.84	0.14	7.07	4.60	3.04	40	43
June	3K (2+3K)	0	-	0	0	-	104	-
July	2J	0	-	0	0	-	22	-
	3K	0	-	0	0	-	31	-
	2+3K	0	-	0	0	-	53	-
Aug.	2J	10.33	0.10	0.96	73.79	0.14	14	14
	3K	0	-	0	0	-	5	-
	2+3K	10.33	-	0.96	54.37	0.19	19	19
Sept.	2J	3.64	0.49	11.86	91.00	0.54	4	5
	3K	0.53	0.04	7.02	53.00	0.08	1	1
	2+3K	4.17	-	11.28	83.40	0.63	5	6
Oct.	2J	0.71	0.11	13.42	71.00	0.15	1	1
	3K	2.29	0	0	100.00	0	1	2
	2+3K	3.00	-	3.54	100.00	0.07	2	3
Dec.	2J	18.60	1.67	8.24	100.00	1.67	4	20
	3K	1.57	0.02	1.26	26.17	0.08	6	6
	2+3K	20.17	-	7.73	100.00	0.84	10	22
1984	2+3K	54.80	-	25.02	15.70	116.33	349	465
Stock 3LNO								
Jan.	3L	7.99	0.44	5.22	0.61	71.64	1301	1373
	3N	0	-	0	0	-	497	-
	30	0	-	0	0	-	98	-
	3LNO	7.99	-	5.22	0.42	104.40	1896	2000
Feb.	3L	36.11	1.44	3.83	9.81	14.68	368	383
	3N	0.20	0.01	4.76	0.14	7.35	147	154
	30	85.56	5.10	5.63	7.84	56.09	1092	1157
	3LNO	121.87	-	5.10	7.58	86.37	1607	1693
Mar.	3L	133.93	3.40	2.48	5.06	67.24	2649	2716
	3N	39.97	1.62	3.90	14.17	11.43	282	293
	30	54.90	6.44	10.50	10.54	61.11	521	582
	3LNO	228.80	-	4.77	6.63	172.90	3452	3625
Apr.	3L	57.77	4.39	7.06	2.70	162.62	2140	2303
	3N	65.47	3.80	5.49	5.68	66.92	1153	1220
	30	17.66	1.03	5.51	18.40	5.60	96	102
	3LNO	140.90	-	6.14	4.16	221.76	3389	3611

Table 3 (Cont'd.)

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
May	3L	131.02	20.38	13.46	5.41	376.74	2422	2799
	3N	104.45	5.98	5.42	8.43	70.93	1239	1310
	3O	15.75	1.24	7.30	5.94	20.86	265	286
	3LNO	251.22	-	9.90	6.40	431.32	3926	4357
June	3L	62.81	4.50	6.69	2.18	206.55	2883	3090
	3N	49.34	0.40	0.80	2.29	17.49	2158	2175
	3O	0	-	0	0	-	174	-
	3LNO	112.15	-	4.19	2.15	231.77	5215	5447
July	3L	101.33	5.58	5.22	3.17	176.22	3200	3376
	3N	159.10	7.65	4.59	6.51	117.51	2444	2562
	3O	3.82	0.35	8.39	1.48	23.64	258	282
	3LNO	264.25	-	4.89	4.48	303.31	5902	6205
Aug.	3L	0	-	0	0	-	711	-
	3N	0	-	0	0	-	419	-
	3O	0	-	0	0	-	14	-
	3LNO	0	-	0	0	-	1144	-
Sept.	3L	11.39	0.13	1.13	11.28	1.15	101	102
	3N	0.60	0	0	3.16	0	19	19
	3O	1.20	0	0	5.46	0	22	22
	3LNO	13.19	-	0.98	9.29	1.40	142	143
Oct.	3L	1.40	0.02	1.41	11.67	0	12	12
	3N	0	-	0	0	-	24	-
	3O	4.55	0.01	0.22	11.38	0.09	40	40
	3LNO	5.95	-	0.50	7.83	0.13	76	76
Nov.	3L	33.67	0.89	2.58	24.22	3.67	139	143
	3N	42.87	0.57	1.31	9.83	5.80	436	442
	3O	0.25	0.02	7.41	0.40	4.96	62	67
	3LNO	76.79	-	1.89	12.05	12.28	637	649
Dec.	3L	17.58	0	0	10.79	0	163	163
	3N	0	-	0	0	-	23	-
	3O	0	-	0	0	-	9	-
	3LNO	17.58	0	0	9.01	0	195	195
1984	3LNO	1240.69	-	5.59	4.50	1633.39	27581	29214
Stock 3Ps								
Jan.	3Ps(3Ps)	106.15	19.97	15.83	85.61	23.33	124	147
Feb.	3Ps(3Ps)	341.48	41.06	10.73	17.68	232.19	1931	2163
Mar.	3Ps(3Ps)	3.90	2.11	35.11	3.94	53.56	99	153
Apr.	3Ps(3Ps)	4.49	0.98	17.92	56.13	1.75	8	10
June	3Ps(3Ps)	0	-	0	0	-	48	-
July	3Ps(3Ps)	0.04	0.00	0.00	0.25	0.00	16	16
Sept.	3Ps(3Ps)	0	-	0	0	-	3	-
Oct.	3Ps(3Ps)	0	-	0	0	-	3	-
Nov.	3Ps(3Ps)	0	-	0	0	-	22	-
Dec.	3Ps(3Ps)	0	-	0	0	-	20	-
1984	3Ps	456.06	-	12.49	20.06	324.53	2277	2599

Table 4. Estimates of discarded yellowtail in Newfoundland fisheries in 1984.

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Stock 3LNO								
Jan.	3L	0	-	0	0	-	4	-
	3N	0	-	0	0	-	365	-
	3O	0	-	0	0	-	10	-
	3LNO	0	-	0	0	-	379	-
Feb.	3N	0.43	0.01	2.27	0.36	2.79	120	123
	3O	0	-	0	0	-	24	-
	3LNO	0.43	-	2.27	0.30	3.35	144	147
Mar.	3L	1.38	0.09	6.12	10.62	0.85	13	14
	3N	64.88	4.39	6.34	20.53	21.38	316	337
	3O	4.38	0.06	1.35	9.52	0.63	46	47
	3LNO	70.64	-	6.04	18.84	24.10	375	399
Apr.	3L	14.23	0.77	5.13	3.79	20.35	376	396
	3N	218.61	8.47	3.73	8.61	98.33	2538	2636
	3O	0.02	0.00	0.00	0.29	0.00	7	7
	3LNO	232.86	-	3.82	7.97	115.91	2921	3037
May	3L	64.60	2.88	4.27	3.10	92.95	2085	2178
	3N	107.46	5.12	4.55	5.70	89.86	1886	1976
	3O	3.80	0.05	1.30	6.67	0.75	57	58
	3LNO	175.86	-	4.38	4.37	184.38	4028	4212
June	3L	24.46	0.72	2.86	2.14	33.65	1143	1177
	3N	6.29	0.10	1.56	1.01	9.94	625	635
	3O	0	-	0	0	-	32	-
	3LNO	30.75	-	2.60	1.71	44.38	1800	1844
July	3L	50.41	2.86	5.37	4.38	65.24	1150	1215
	3N	23.98	5.06	17.42	3.84	131.67	624	756
	3O	4.02	0.43	9.66	7.18	5.99	56	62
	3LNO	78.41	-	9.62	4.28	194.88	1830	2025
Aug.	3L	0	-	0	0	-	245	-
	3N	0	-	0	0	-	179	-
	3O	0	-	0	0	-	6	-
	3LNO	0	-	0	0	-	430	-
Sept.	3L	2.22	0.15	6.33	24.67	0.61	9	10
	3N	1.16	0.04	3.33	29.00	0.14	4	4
	3LNO	3.38	-	5.32	26.00	0.73	13	14
Oct.	3L	0	-	0	0	-	2	-
	3N	0	-	0	0	-	3	-
	3O	3.31	0.10	2.93	22.07	0.45	15	15
	3LNO	3.31	-	2.93	16.55	0.60	20	21
Nov.	3L	8.09	0.34	4.03	38.52	0.88	21	22
	3N	16.65	0.38	2.23	42.69	0.89	39	40
	3O	4.92	0.14	2.77	21.39	0.65	23	24
	3LNO	29.66	-	2.82	35.73	2.41	83	85
Dec.	3L	0	-	0	0	-	6	-
	3N	0	-	0	0	-	6	-
	3O	0	-	0	0	-	7	-
	3LNO	0	-	0	0	-	19	-
1984	3LNO	625.30	-	4.84	5.19	612.88	12042	12655

Table 5. Estimates of discarded Greenland halibut in Newfoundland fisheries in 1984.

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Stock 2+3KL								
Jan.	3K	0.07	0.00	0.00	3.50	0.00	2	2
	3L	0.76	0.04	5.00	12.67	0.32	6	6
	2+3KL	0.83	-	4.60	10.37	0.38	8	8
Feb.	3L (2+3KL)	0	-	0	0	-	1	-
Mar.	3K (2+3KL)	0.24	0.34	58.62	24.00	1.42	1	2
Apr.	3K (2+3KL)	2.36	0.59	20.00	39.33	1.50	6	8
May	3K	57.97	3.76	6.09	14.64	25.69	396	422
	3L	0	-	0	0	-	1	-
	2+3KL	57.97	-	6.09	14.60	25.75	397	423
June	3K	0	-	0	0	-	965	-
	3L	0	-	0	0	-	3	-
	2+3KL	0	-	0	0	-	968	-
July	2H	0	-	0	0	-	14	-
	2J	0	-	0	0	-	41	-
	3K	63.50	2.68	4.05	10.36	25.87	613	639
	3L	0	-	0	0	-	1	-
	2+3KL	63.50	-	4.05	9.49	28.23	669	697
Aug.	2H	253.65	0.05	0.02	27.36	0.18	927	927
	2J	136.85	0.82	0.60	10.78	7.60	1269	1277
	3K	0	-	0	0	-	329	-
	2+3KL	390.50	-	0.22	15.47	8.95	2525	2534
Sept.	2H	97.65	1.80	1.81	13.91	12.94	702	715
	2J	1266.49	11.03	0.86	77.18	14.29	1641	1655
	3K	0.89	0.02	2.20	1.00	2.00	89	91
	3L	0.57	0.00	0.00	28.50	0.00	2	2
	2+3KL	1356.60	-	0.93	56.11	22.90	2434	2457
Oct.	2J	986.53	8.18	0.82	73.46	11.14	1343	1354
	3K	1.14	0.00	0.00	28.50	0.00	4	4
	3L	1.00	0.00	0.00	16.67	0.00	6	6
	2+3KL	988.67	-	0.82	73.07	11.19	1353	1364
Nov.	2J	109.99	4.60	4.01	44.53	10.33	247	257
	3K	0.10	0.00	0.00	5.00	0.00	2	2
	3L	1.35	0.11	7.53	33.75	0.33	4	4
	2+3KL	111.44	-	4.06	44.05	10.69	253	264
Dec.	2J	5.08	0.00	0.00	2.54	0.00	2	2
	3K	0.72	0.01	1.37	12.00	0.08	6	6
	3L	2.27	0.00	0.00	17.46	0.00	13	13
	2+3KL	8.07	-	0.12	38.43	0.03	21	21
1984	2+3KL	2989.18	-	1.43	34.61	125.07	8636	8761

Table 6. Estimates of discarded witch in Newfoundland fisheries in 1984.

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Stock 2+3KL								
Jan.	3K	0.17	0.29	63.04	0.94	30.71	18	49
	3L	0.05	0.03	37.50	0.10	31.20	52	83
	2+3KL	0.22	-	59.26	0.31	101.82	70	172
Feb.	3K	2.96	3.43	53.86	5.29	64.89	56	121
	3L	1.15	0.20	14.82	6.05	3.30	19	22
	2+3KL	4.11	-	46.90	5.48	66.24	75	141
Mar.	3K	0.35	0.48	57.83	5.83	8.23	6	14
	3L	0.28	0.02	6.67	2.80	0.71	10	11
	2+3KL	0.63	-	44.25	3.94	12.70	16	29
Apr.	2J	0	-	0	0	-	1	-
	3K	3.96	0.49	11.01	24.75	1.98	16	18
	3L	0.13	0.02	13.33	3.25	0.62	4	5
	2+3KL	4.09	-	11.09	19.48	2.73	21	24
May	3K	17.56	0.66	3.62	15.40	4.28	114	118
	3L	0.23	0	0	5.75	0	4	4
	2+3KL	17.79	-	3.58	15.08	4.38	118	122
June	2J	0	-	0	0	-	1	-
	3K	0	-	0	0	-	698	-
	3L	0	-	0	0	-	7	-
	2+3KL	0	-	0	0	-	706	-
July	2J	0	-	0	0	-	6	-
	3K	9.35	0	0	14.17	0	66	66
	3L	0.74	0.03	3.90	4.11	0.73	18	19
	2+3KL	10.09	-	0.30	11.21	0.78	90	91
Aug.	2J	5.99	0.34	5.37	100.00	0.34	3	6
	3K	0	-	0	0	-	3	-
	3L	0	-	0	0	-	5	-
	2+3KL	5.99	-	5.37	54.45	1.25	11	12
Sept.	2J	0.72	0.01	1.37	3.60	0.28	20	20
	3K	0.28	0.03	9.68	4.67	0.64	6	7
	3L	0	-	0	0	-	2	-
	2+3KL	1.00	-	3.85	3.57	0.99	28	29
Oct.	2J	0.29	0	0	29.00	0	1	1
	3K	0.32	0	0	2.91	0	11	11
	3L	0.85	0	0	10.63	0	8	8
	2+3KL	1.46	-	0	7.30	0	20	30
Nov.	3K	0.04	0.06	60.00	2.00	3.00	2	5
	3L	0.39	0.03	7.14	9.75	0.31	4	4
	2+3KL	0.43	-	17.31	7.17	1.26	6	7
Dec.	3K	0.75	0	0	8.33	0	9	9
	3L	0.87	0	0	14.50	0	6	6
	2+3KL	1.62	-	0	10.80	0	15	15
1984	2+3KL	47.43	-	29.02	4.03	480.78	1176	1657
Stock 3NO								
Jan.	3N	0	-	0	0	-	5	-
	3O	0	-	0	0	-	10	-
	3NO	0	-	0	0	-	15	-

Table 6 (Cont'd.)

Month	Area	Observed kept (MT)	Observed discards	% observed discards	% of landed weight observed	Est. discards	Landed weight	Estimated total removals
Feb.	3N	0	-	0	0	-	5	-
	3O	23.50	0.34	1.43	11.24	3.02	209	212
	3NO	23.50	-	1.43	10.98	3.09	214	217
Mar.	3N	1.23	0.00	0.00	2.67	0.00	46	46
	3O	39.05	0.65	1.64	11.19	5.81	349	355
	3NO	40.28	-	1.59	10.20	6.37	395	401
Apr.	3N	0.31	0	0	3.89	0	8	8
	3O	0	-	0	0	-	9	-
	3NO	0.31	-	0	1.82	0	17	17
May	3N(3NO)	0.34	0	0	34.00	0	1	1
June	3N(3NO)	0	-	0	0	-	1	-
July	3N	0.20	0.05	20.00	3.33	1.5	6	8
	3O	0.08	0	0	1.33	0	6	6
	3NO	0.28	-	15.15	2.33	2.14	12	14
Aug.	3N(3NO)	0	-	0	0	-	7	-
Sept.	3O(3NO)	0.01	0	0	0.14	0	7	7
Oct.	3N	0	-	0	0	-	1	-
	3O	13.94	0.33	2.31	100.00	0.44	3	14
	3NO	13.94	-	2.31	100.00	0.44	4	14
Nov.	3O(3NO)	9.02	0.25	2.70	100.00	0.25	1	9
1984	3NO	87.68	-	1.85	13.01	12.72	674	687
Stock 3Ps								
Jan.	3Ps(3Ps)	0.46	0	0	46.00	0	1	1
Feb.	3Ps(3Ps)	11.81	0.03	0.25	5.76	0.52	205	206
Mar.	3Ps(3Ps)	3.91	0.16	3.93	13.48	1.19	29	30
July	3Ps(3Ps)	1.86	0.15	7.46	100.00	0.15	1	2
Aug.	3Ps(3Ps)	0	-	0	0	-	1	-
Sept.	3Ps(3Ps)	0	-	0	0	-	1	-
Oct.	3Ps(3Ps)	0	-	0	0	-	1	-
Nov.	3Ps(3Ps)	0.28	0	0	1.08	0	26	26
Dec.	3Ps(3Ps)	0	-	0	0	-	3	-
1984	3Ps	18.32	-	0.70	6.84	1.90	268	270

Table 7. Patterns of discarding for semi or non-commercial speices.

Discarded by-catch species	Directed fishery	Major areas	Major seasons	Total estimated discards	Total estimated kept	% Discarded
Skate	Cod	2J3KLNO	All	680	69	91
	Redfish	3KL3Ps4R	All	118	0	100
	Plaice	3LNO3PS	All	1470	0	100
	Yellowtail	3LN	Spring/Summer	114	0	100
	Witch	3N	Fall	33	0	100
	G. halibut	2HJ3K	Summer/Fall	227	0	100
	All	2J-4R	All	2642	69	98
Wolffish	Cod	2J3KL	All	278	344	45
	Redfish	3K3Ps3R	All	44	38	54
	Plaice	3LNO3Ps	All	11	84	12
	Yellowtail	3N	Spring	1	1	50
	G. halibut	2HJ3K	Summer/Fall	50	21	70
	All	2H-4R	All	384	557	41
White hake	Cod	4R4Vn	Spring	8	0	100
	Redfish	3Ps	Spring/Summer	14	4	78
	Plaice	30	Spring	10	6	63
	All	30-4R	Spring/Summer	32	10	76
Halibut	Cod	2J3KL0 4R4Vn	All	1	79	1
	Redfish	3KLNO3Ps	Spring	0	25	0
	Yellowtail	3N4Vs	Spring	0	2	0
	G. halibut	2JH3K	Summer/Fall	0	3	0
	Witch	3N	Fall	0	10	
	All	2H-4R	All	1	126	1
Other	-	-	-	550	-	-
Total				3609		

Table 8. Patterns of discarding for Newfoundland offshore fisheries, 1981-84.

Species	Stock	1981		1982		1983		1984	
		% Observed discards	% of Landed weight observed	% Observed discards	% of Landed weight observed	% Observed discards	% of Landed weight observed	% Observed discards	% of Landed weight observed
Cod	2GH	5.9	97	1.1	6	-	-	4.6	16
	2J+3KL	1.5	12	2.2	8	3.7	12	3.8	13
	3NO	7.5	4	3.5	5	2.7	5	4.7	5
	3PS	0.4	3	0.4	9	1.9	6	1.5	19
	4RS+3PN	0.6	13	-	0	0.3	10	3.3	16.6
	4VN	0.6	6	-	0	1.4	11	8.2	6.5
	4VWX	0.1	4	0.4	7	1.1	16	2.1	2
Redfish	2+3K	1.4	8	2.6	14	10.4	26	6.0	13
	3LN	0.4	7	1.0	7	1.5	24	11.6	19
	3O	-	-	-	-	-	-	0	11
	3P	0.7	15	0.4	20	2.0	17	0.5	29
	4RST	0	69	-	0	0.3	8	0.0	33
	4VN	0.4	13	0.1	6	0.4	5	0.5	7
	4VsWx	-	-	-	-	-	-	0	29
White hake	3+4	14.1	5	-	-	-	-	-	-
Plaice	2+3K	0.9	3	12.6	14	11.8	20	25.0	16
	3LNO	4.6	11	4.1	8	6.1	12	5.6	5
	3PS	6.5	1	10.0	5	1.8	5	12.5	20
Yellowtail	3LNO	4.2	9	5.5	6	4.6	9	4.8	5
Turbot	2+3KL	2.3	6	7.8	7	2.8	34	1.4	35
Witch	2J+3KL	0.6	2	3.4	8	1.8	18	29.0	4
	4RS	0	1	-	-	0.5	3	-	-
	3PS	0	10	-	-	17.0	4	0.7	7
	4VWX	3.4	12	-	-	-	-	-	-
	3NO	0.7	9	3.70	3	2.6	22	1.9	13
Shrimp	2HJ	0.5	94	0.4	9	-	-	-	-
All	All	2.6	13	3.2	7	4.5	8	-	-

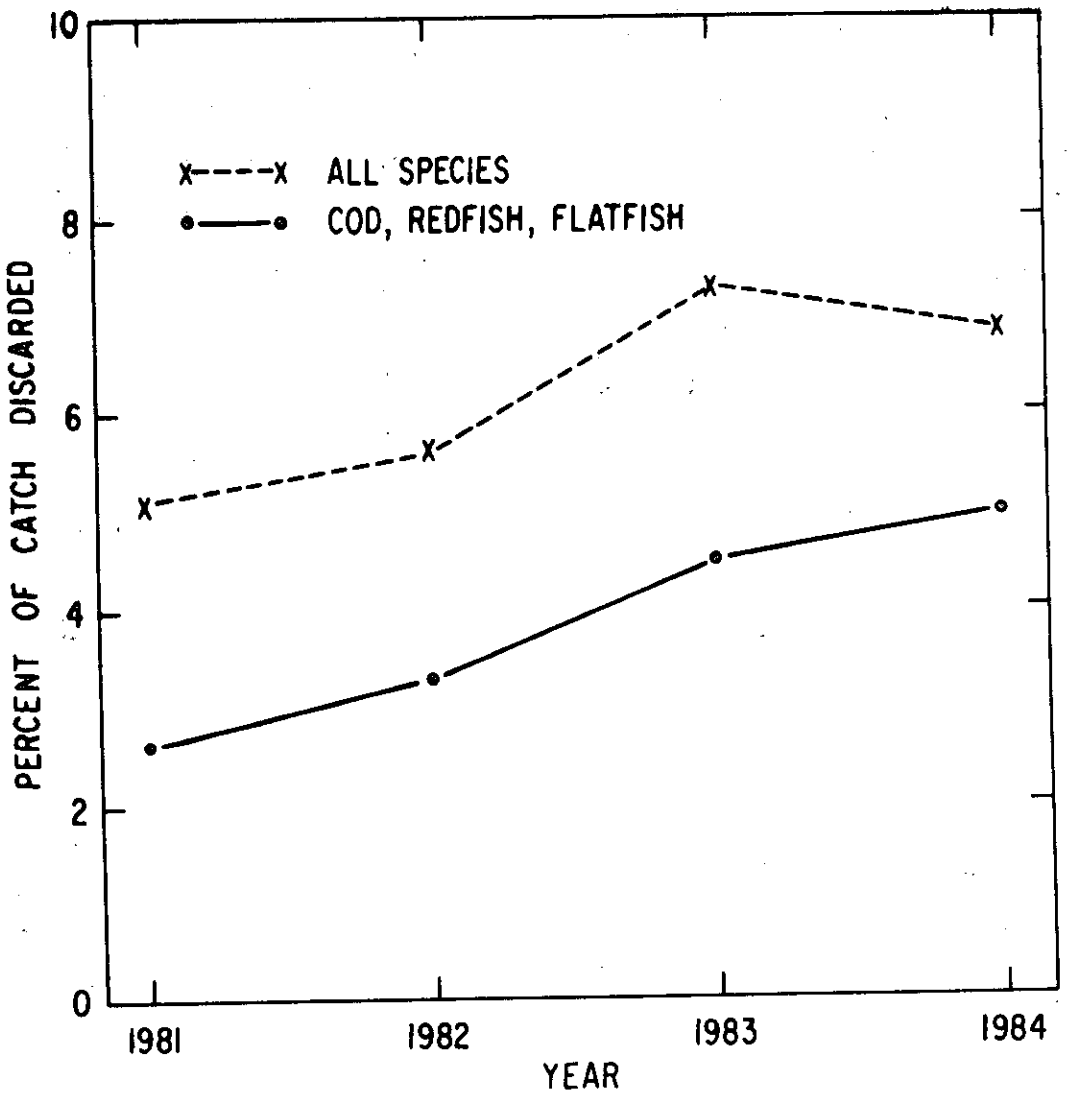

Fig. 1. Rate of discarding for the Newfoundland offshore fishery, 1981-84.