Northwest Atlantic Fisheries Organization

Serial No. N1033 NAFO SCR Doc. 85/75

SCIENTIFIC COUNCIL MEETING - JUNE 1985

Estimates of Discarding by the Newfoundland Offshore Fleet in 1983

by

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Abstract

Information collected by Canadian fisheries observers in 1983 from vessels of the Newfoundland offshore fleet (greater than 90'LOA) suggested that the overall rate of discarding had increased from the previous two years. While the total estimated discard weight of 13,000 t represented an absolute drop of 16% from 1982, the rate of discarding increased by 1.7% to 7.3% of total catch, given an 18% decrease in amount landed. Fifty-seven percent constituted the commercially important species cod, redfish, plaice, yellowtail, witch and turbot. This component of mortality was not recorded in the official landing statistics.

Samples in varying amounts for certain key stocks allowed for an estimation of numbers of removals attributable to discarding and an examination of the size relationship of discarded and landed fish. Given that Canadian Observers are charged with enforcement-related as well as biological duties the above values must be considered as minimum estimates only, due to a deterrent effect related to their presence. In the 87% of unobserved fishing activity there is evidence that the rate of discarding is likely higher.

Dumping or non-size selective discarding of both directed species and bycatch particularly in the 2J+3KL cod fishery was identified as an increasingly serious problem particularly for the small overlapping stocks of redfish and plaice. In general, the main problem fisheries, in terms of overall discarding remained 2J+3KL cod, 2+3K redfish (a significant increase from the previous year), 2+3K and 3LNO plaice, 3LNO yellowtail and 3PS witch. All other stocks had estimated discard rates of less than 3%. A seasonal examination of both directed species and bycatch assisted in defining patterns of discarding throughout the year. Also, as in previous years, skate and wolffish were identified as the major components of semi or non-commercial species which totaled over 5,400 t.

Introduction

In the Canadian Atlantic offshore fishery, non-marketability of certain species or sizes of fish has often resulted in a portion of the catches being returned to the sea. The procedure has been classified into the two categories, discarding and dumping. The former refers to selective removal of undersized, damaged or otherwise unmarketable individuals from the catch, and occurs when the gear does not avoid catching undesirable components of a species. The latter refers to non-selective removal of whole or partial catches which occurs when less desirable species are taken as bycatch or when catches taken near the trips completion exceed boat quotas or hold capacity, and whole catches are dumped. In either case, survival of these individuals is very limited or non existent. The problem is intensified by a general dominance of younger year-classes in the discarded component, leading to larger numbers of individuals lost to the population per unit of weight discarded. The loss consequently reduces the numbers of marketable fish in future years.

This element of mortality most often goes unrecorded in the nominal catch statistics because it is rarely recorded in the fishing record. Therefore it is not included as input in the assessment process. Prior to 1977 very little information was available regarding discard practices of the Canadian offshore fleet and therefore its effect on the various stocks was unknown. For the period following 1977, Kulka (1984) reviewed discard analyses pertaining to the Newfoundland fisheries, including a broad coverage study initiated in 1981 to monitor the discarding practices of the offshore fleet. The present paper sets forth the third year

analysis of the above mentioned study and is primarily designed to quantify temporal and areal patterns of discarding. It also provides a first look at recent trends, the relationship of discarding and dumping, including reasons for the latter, and a more detailed view of the discarding of semi or potentially commercial offshore species in the area mainly north of the Laurential Channel and outside the Gulf of St. Lawrence.

Methods

In 1983, 13% of the weight of fish caught offshore and landed in Newfoundland was observed by Canadian fisheries observers deployed to the fleet (vessels greater than 90' LOA). Collection of detailed catch, effort and discarding information using methods described in Kulka and Firth (1985) facilitated quantification of fleet discard practices. In addition, the length and age data collected from both landed and discarded components (including 42,700 discard measurements, mainly plaice and cod) permitted estimates of total numbers discarded in some cases and an examination of size structure of discards in relation to landings for selected fisheries.

The weight data were compiled by species, month and NAFO division, and the landing component of the observed catch was compared to total landed weights supplied by the regional Statistics Branch of Fisheries and Oceans in order to estimate total discards. The proportion of landed weight observed to total landed weight was applied to the corresponding observed discard weights in each area and month to derive discard estimates of 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 are presented in Tables 1 through 7 for 26 stocks of cod, redfish, American plaice, yellowtail, Greenland halibut, witch and semi-commercial species, respectively. The three columns to the right in each of Tables 1 through 6 presents landings and estimates of discards and removals, the latter two derived from observed data presented in column 3 and 4. Table 8 presents a 3 year summary of discarding patterns for the major commercial species.

The following sections set forth a discussion of observed discard patterns in order to define areal and temporal trends and delineate current dumping practices. Those fisheries exhibiting significant trends are highlighted.

Cod

Table 8 indicates relatively stable, trivial levels of discarding for 5 of 7 observed cod stocks. One of two trends of note was a nearly 3 fold drop in the observed discard rate for 3NO cod, 1981 to 1983. As in 1982, most of the estimated 400,000 fish were discarded in association with the directed fishery in the latter part of the year with little if any attributable to dumping. The other trend of significance was a 2.5 times increase over 3 years for 2J+3KL cod. An estimated 3036t or 5.06 M fish were dumped or discarded during the January to July 2J and 3K directed fishery and to increasingly lesser degrees in 3L summer cod and plaice, 3KL spring redfish and 2J, 3K and 3L fall Greenland halibut fisheries. Figure 1 illustrates the relative importance of the discarded component in relation to total removals for size classes where discarding occured. For discarded fish less than 45 cm, mainly 2 to 4 year olds, the ratio of discarded to dumped fish was about 1 to 1. For discards greater than 45 cm in length, an estimated 23% of the total, the principal part were dumped, a practice that has become increasingly more prevalent over the past 3 years as the abundance of this stock has climbed. Whole or parts of very large cathes were returned to the sea particularly near the end of the trip when holds were nearly full. Consistent observer narrative reports indicated that dumping and discarding of commercial size components was considerably more prevalent on unobserved vessels as indicated by hearsay evidence from radio messages and conversations with crew members. This suggests that the 3.71% discard rate for this stock is likely an underestimate. Regardless, it is improbable that discarding of this magnitude has more than a minor effect on this very substantial stock with an average annual recruitment in the range of 500 to 600 M fish.

Redfish

Two of 5 redfish fisheries showed significant trends over the past 3 years, the others stable at consistently low levels of less than 1.5%. An elevation in the rate for 3P redfish can be attributed to increased discarding of small size components in the directed fishery, however the discard rate is still small and the effect minor. A more significant increase to 10.4% in 1983 from 1.4% in 1981 for 2J+3K redfish is for the most part related to a substantial increase in dumping of bycatch in the 2J and 3K cod directed fisheries. This is a

case where discarding of bycatch in a much larger fishery could significantly increase levels of removals of the much smaller bycatch stock. Observer narrative reports indicate that the 615 t or 1.2 M commercial sized fish observed as discarded represented an underestimate given the reports of much greater dumping for unobserved vessels fishing the northern cod stock. A total of 4700 t of redfish taken as bycatch in this fishery may represent the upper limit of dumped 2+3K redfish.

American plaice/yellowtail

Table 8 indicates that after a jump in discarding in 1982 the rate for 2+3K plaice leveled off at 11.8% in 1983, equivalent to an estimated 102 t of discards. About 50% of the discards from this small stock are dumped bycatch from the larger cod directed fishery in 2J and 3K. As for redfish, this dumping activity was curtailed to an extent by the presence of observers (reference observers narrative reports), therefore the 102 t estimate of total observed discarded plaice is likely a minimum estimate as well. However a maximum estimate is probably considerably less than the 3700 t recorded kept plus discarded bycatch of plaice because of this species greater marketability than redfish, leading to a greater retainment rate. Regardless, discarded bycatch in the extensive northern cod fishery could result in a substantial removal of 2J+3K plaice which could have a significant effect on this much smaller stock.

In contrast, the 1972 t or 7.9 M 3LNO discarded plaice and 423 t or 1.7 M discarded yellowtail were mainly small, unmarketable sizes taken with the respective directed fisheries. Figure 2 illustrates the relationship of discards to total removals in the plaice fishery over the range of discarded sizes. Areal and temporal patterns as described by Kulka (1984) were similar to those in the current year for both of the above stocks.

Other flatfish

The discard rate for 2+3KL Greenland halibut dropped to 2.8% but this change may be related in part to greatly increased coverage over 1982 and also to a lack of observations for the shrimp fishery which in 1982 was a major contributor in terms of small sized bycatch discards of this species. In 1983, the estimated 238 t or 0.8 M fish, 3 times lower than the previous year, was centered mainly in the southern and more shallow areas. For witch, all but the 3Ps stock continued to have relatively low associated levels of discarding. The estimated 17% of discarded 3Ps witch however amounted to only 37 t.

Other species

Two species groups, skates and wolffish comprised 86% of the discarded non- or semi-commercial species in 1983. Table 7 indicates that skate, mainly thorny, was a significant bycatch in a wide range of fisheries south of 2 H of which 99% was discarded. It amounted to an average of about 2% of the total catch weight in the various fisheries but was highest in the plaice (5.7%) and yellowtail (3.6%) directed fisheries on the Grand Bank. Over a similar range of fisheries, 3 wolffish species were discarded in varying amounts, spotted usually retained, striped 50 to 60% discarded and northern mainly discarded according to marketability. Other bycatch species such as white hake, pollock (Table 7), grenadier, capelin, squid, crab, eelpouts and sculpins among others made up the other 14% of an estimated 5419 t of semi or non-commercial discards. This estimated tonnage represents an 11% increase over the 1982 level reported by Kulka (1984).

Conclusions

The total estimated weight of discarded species by the Newfoundland Offshore fleet in 1983 amounted to nearly 13,000 t, of which 57% constituted the major commercial species cod, redfish and flatfish. While in absolute terms this value of discarded weight is slightly lower than estimates for the previous two years (14,000 t in 1981 and 15,500 t in 1982), at 7.3% of total catch by weight, it represented a slight increase in terms of proportion of removals in all fisheries. However, the commercially important component of discards which amounted to 7,300 t or 4.5% of total caught weight showed an increase from the 2.6% level in 1981 and 3.2% in 1982. A substantial portion of this increase can be attributed to the increasing practise of dumping of both directed and bycatch species when catches are very large. This was particularly evident in the northern cod directed fishery where cod, redfish and plaice were dumped in substantial amounts. In this fishery and to a lesser extent in others, estimates of discards presented in this paper must be considered as minimum values because of deterrence brought about by the surveillance aspect of observer duties. Therefore, increased dumping was the most significant trend in 1983 with respect overall to discarding practises in the domestic fleet and may have had a more substantial effect on the relatively small redfish and plaice stocks overlapping with 2J+3KL cod than indicated by the data.

Table 1. Estimates of discarding in the offshore Newfoundland cod fisheries in 1983.

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Jan.	2J	1279.06	60.98	4.55	29.34	207.82	4359	4567
	3K	288.20	4.96	1.69	16.67	29.76	1729	1759
	3L	198.65	3.09	1.53	6.96	44.41	2855	2899
	2J+3KL	1765.91	69.03	3.76	19.75	349.58	8943	9293
Feb.	2J	1410.55	27.39	1.90	14.48	189.15	9741	9930
	3K	134.24	3.82	2.77	8.09	47.24	1660	1707
	3L	299.74	6.60	2.15	7.72	85.46	3881	3966
	2J+3KL	1844.53	37.81	2.01	12.07	313.26	15282	15595
March	2J	327.25	7.41	2.21	9.43	78.57	3470	3549
	3K	755.92	38.77	4.88	22.17	174.84	3409	3584
	3L	390.65	8.44	2.11	15.73	53.67	2484	2538
	2J+3KL	1473.82	54.62	3.57	15.74	346.99	9363	9710
April	2J	358.35	53.12	12.91	11.47	463.23	3125	3588
	3K	533.15	25.00	4.48	6.96	359.19	7660	8019
	3L	364.19	3.26	0.89	15.90	20.50	2290	2311
	2J+3KL	1255.69	81.38	6.09	9.60	847.38	13,075	13,922
May	2J	65.58	0.28	0.43	1.00	0.28	-	66
	3K	744.21	37.76	4.83	10.74	351.46	6927	7278
	3L	418.29	18.48	4.23	10.84	170.49	3859	4029
	2J+3KL	1228.08	56.52	4.40	11.39	522.23	10852	11374
June	2J	350.15	34.26	8.91	19.49	175.83	1797	1973
	3K	77.39	0	0	15.03	0	515	515
	3L	363.59	6.20	1.68	16.07	38.59	2263	2302
	2J+3KL	791.13	40.46	4.87	17.29	233.97	4575	4809
July	2J	44.55	2.48	5.27	9.22	26.89	483	510
	3K	26.95	0.12	0.44	5.67	2.12	475	477
	3L	45.25	1.42	3.04	3.92	36.21	1154	1190
	2J+3KL	116.75	4.02	3.33	5.53	72.72	2112	2185
Aug.	2J	37.81	2.60	6.43	17.26	15.06	219	234
	3K	0	-	-	0	-	15	-
	3L	74.09	3.97	5.09	5.40	73.46	1371	1444
	2J+3KL	111.90	-	5.27	6.97	89.36	1605	1694
Sept.	2J	66.05	1.00	1.49	47.18	2.12	140	142
	3K	0	-	-	0	-	4	-
	3L	202.91	.76	0.37	8.73	8.70	2323	2332
	2J+3KL	268.96		0.44	10.90	10.84	2467	2478
Oct.	2J	146.50	2.30	1.55	81.39	2.83	180	183
	3K	0	-	-	0	-	228	-
	3L	39.99	0.55	1.36	1.64	33.45	2432	2465
	2J+3KL	186.49	-	1.37	6.57	39.45	2840	2879
Nov.	2J	108.90	1.03	0.94	100	0.38	40	40
	3K	22.22	0.45	1.99	4.72	9.54	471	481
	3L	154.77	3.24	2.05	4.28	75.66	3614	3690
	2J+3KL	285.89	4.72	1.62	6.93	68.10	4125	4193
Dec.	2J	0	-	-	0	-	78	-
	3K	0	-	-	0	-	114	-
	3L	0	-	-	0	-	3492	-
	2J+3K	0	-	-	0	-	3684	-
1983		9329.15	-	3.71	11.83	3035.70	78,857	81,893
Jan.	3N	2.02	0	0	7.77	0	26	26
	3O	3.68	0	0	0.34	0	1076	1076
	3NO	5.70	0	0	0.52	0	1102	1102

Table 1. (Cont'd.)

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Feb.	3N	4.66	0.03	0.64	19.42	0.15	24	24
	3O	56.05	0.02	0.04	29.97	0.07	187	187
	3NO	60.71	0.05	0.08	28.77	0.17	211	211
March	3N	5.94	0	0	100	0	2	2
	3O	11.15	0	0	4.14	0	269	269
	3NO	17.09	0	0	6.31	0	271	271
April	3N	9.05	0	0	25.14	0	36	36
	3O	12.82	0	0	2.83	0	453	453
	3NO	21.87	0	0	4.47	0	489	489
May	3N	21.41	0.30	1.38	15.51	1.93	138	140
	3O	96.46	2.01	2.04	14.04	14.32	687	701
	3NO	117.87	2.31	1.92	14.29	16.17	825	841
June	3N	22.98	0.95	3.97	20.34	4.67	113	118
	3O	37.65	0.51	1.34	12.76	4.00	295	299
	3NO	60.63	1.46	2.35	14.86	9.82	408	418
July	3N	27.65	0.67	2.37	8.18	8.19	338	346
	3O	0.80	0	0	1.25	0	64	64
	3NO	28.45	0.67	2.30	7.08	8.19	402	410
Aug.	3N	58.21	14.79	20.26	9.28	159.31	627	786
	3O	0.95	0.15	13.64	1.76	8.53	54	63
	3NO	59.16	14.94	20.16	8.69	171.98	681	853
Sept.	3N	0	-	-	0	-	256	-
	3O	0	-	-	0	-	88	-
	3NO	0	-	-	0	-	344	-
Oct.	3N	0.10	0.02	16.67	0.03	73.40	367	440
	3O	25.99	0.23	0.88	3.79	6.07	686	692
	3NO	26.09	0.25	0.95	2.48	10.09	1053	1063
Nov.	3N	2.36	0	0	2.91	0	81	81
	3O	22.46	.06	0.27	0.95	6.29	2356	2362
	3NO	24.82	.06	0.24	1.02	5.89	2437	2443
Dec.	3N	0	-	-	0	-	29	-
	3O	0	-	-	0	-	353	-
	3NO	0	-	-	0	-	382	-
1983		422.39	-	2.74	4.91	242.79	8605	8848
Jan.	4R	0	-	-	0	-	283	-
	4S	0	-	-	0	-	2	-
	3Pn	1.05	0	0	100	0	0	1.05
	4RS+3Pn	1.05	0	0	0.37	0	285	285
Feb.	4R(4RS+3Pn)	6.40	0.12	1.84	3.12	3.84	205	209
March	3P	0	-	-	0	-	2	-
	4R	90.91	0.10	0.11	13.08	0.76	695	696
	4RS+3Pn	90.91	-	0.11	13.04	0.76	697	698
April	4R	132.40	0.66	0.50	19.27	3.42	687	690
	4S	0	-	-	0	-	3	-
	4RS+3Pn	132.40	-	0.49	19.19	3.43	690	693
May	4R(4RS+3Pn)	0	-	-	0	-	350	-
June	4R(4RS+3Pn)	0	-	-	0	-	90	-
Aug.	4R(4RS+3Pn)	0	-	-	0	-	7	-

Table 1. (Cont'd.)

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Sept.	3Pn	0.10	0	0	10.00	0	1	1
	4R	0.16	0	0	5.33	0	3	3
	4RS+3Pn	0.26	0	0	6.50	0	4	4
Nov.	3Pn(4RS+3Pn)	0	-	-	0	-	1	-
Dec.	3Pn	0	-	-	0	-	1	-
	4R	0	-	-	0	-	36	-
	4RS+3Pn	0	-	-	0	-	37	-
1983		231.02	-	0.34	9.76	8.03	2366	2374
Jan.	3Ps	39.91	0	0	11.06	0	361	361
Feb.	3Ps	0	-	-	0	-	50	-
March	3Ps	55.71	0	0	12.35	0	451	451
April	3Ps	0	-	-	0	-	62	-
May	3Ps	2.78	0.03	1.07	3.76	0.80	74	75
June	3Ps	0	-	-	0	-	11	-
July	3Ps	0	-	-	0	-	4	-
Aug.	3Ps	0	-	-	0	-	34	-
Sept.	3Ps	3.20	0	0	0.77	0	417	417
Oct.	3Ps	14.70	0	0	5.72	0	257	257
Nov.	3Ps	.11	0	0	0.01	0	175	175
Dec.	3Ps	0	-	-	0	-	10	-
1983		116.41	-	1.90	6.11	36.98	1906	1943
Jan.	4Vn	0	-	-	0	-	700	-
Feb.	4Vn	119.93	1.66	1.37	33.97	4.89	353	358
March	4Vn	0	-	-	0	-	100	-
April	4Vn	15.39	0.24	1.54	18.32	1.31	84	88
May	4Vn	0	-	-	0	-	1	-
Sept.	4Vn	0	-	-	0	-	1	-
Oct.	4Vn	0	-	-	0	-	2	-
Nov.	4Vn	0	-	-	0	-	1	-
Dec.	4Vn	0	-	-	0	-	1	-
1983		135.32	-	1.40	10.89	17.64	1243	1261
Feb.	4Vs	0	-	-	0	-	58	-
	4W	0	-	-	0	-	4	-
	4X	0	-	-	0	-	15	-
	4VsWX	0	-	-	0	-	77	-
March	4Vs	67.85	0.45	0.66	19.01	2.37	357	359
	4W	152.59	2.11	1.36	38.83	5.43	393	398
	4VsWX	220.44	2.56	1.15	29.39	8.71	750	759
April	4Vs(4VxWX)	14.99	0.25	1.64	39.45	0.63	38	39
May	4Vs	3.06	0.02	0.65	1.63	1.23	188	189
	4W	0	-	-	0	-	29	-
	4VsWX	3.06	-	0.65	1.41	1.42	217	218
June	4Vs(4VsWX)	0	-	-	0	-	78	-
July	4Vs(4VsWX)	0	-	-	0	-	35	-
Aug.	4Vs(4VsWX)	0	-	-	0	-	166	-
Oct.	4Vs(4VsWX)	0.41	0	0	13.67	0	3	3
Dec.	4Vs(4VsWX)	0	-	-	0	-	116	-
1983		238.90	-	1.06	16.14	15.80	1480	1496

Table 2. Estimates of discarding in the offshore Newfoundland redfish fisheries in 1983.

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Jan.	2J	5.26	4.52	46.22	87.67	5.16	6	11
	3K	28.97	9.58	24.85	6.75	141.86	429	571
	2+3K	34.23	14.10	29.17	7.87	179.18	435	614
Feb.	2J	32.04	5.96	15.68	29.13	20.46	110	130
	3K	277.21	2.51	0.90	38.39	6.54	722	729
	2+3K	309.25	8.47	2.67	37.17	22.79	832	855
March	2J	16.07	3.66	18.55	47.26	7.74	34	42
	3K	563.80	9.10	1.59	100	6.08	377	383
	2+3K	579.87	12.76	2.15	100	9.04	411	420
April	2J	11.24	4.45	28.36	15.19	29.30	74	103
	3K	73.44	12.97	15.01	6.84	189.68	1074	1264
	2+3K	84.68	17.42	17.06	7.38	236.16	1148	1384
	2J	0.20	0.80	80.00	100	0.80	0	1
May	3K	205.51	11.00	5.08	28.00	39.29	734	773
	2+3K	205.71	11.80	5.43	28.03	39.29	734	773
June	2J	4.72	0.27	5.41	26.22	1.03	18	19
	3K	106.26	5.51	4.93	19.46	28.31	546	574
	2+3K	110.98	5.78	4.95	19.68	29.37	564	593
July	2H	0	.01	100	0	-	27	-
	2J	54.27	0	0	43.77	0	124	124
	3K	1.97	0.12	5.74	0.41	28.99	476	505
	2+3K	56.24	0.13	4.61	8.97	30.29	627	657
August	2J	0	-	-	0	-	215	-
	3K	0	-	-	0	-	75	-
	2+3K	0	-	-	0	-	290	-
Sept.	2H	0	-	-	0	-	22	-
	2J	0	-	-	0	-	41	-
	3K	0	-	-	0	-	17	-
	2+3K	0	-	-	0	-	80	-
	2J	0	2.16	100.00	0	2.16	0	2.16
	3K	0	-	-	0	-	133	-
Oct.	2+3K	0	-	100.00	0	2.16	133	13.5
	2J	0	0.54	100.00	0	0.54	0	0.54
Nov.	3K	2.73	0.07	2.51	7.80	0.90	35	36
	2+3K	2.73	0.61	18.26	7.80	7.82	35	43
Dec.	3K(2+3K)	0	-	-	0	-	6	-
1983		1383.69	-	10.41	26.13	615.24	5295	5910
Jan.	3L(3LN)	122.14	5.94	4.64	16.35	36.33	747	783
Feb.	3L(3LN)	151.66	0	0	56.38	0	269	269
Mar.	3L(3LN)	115.31	1.11	0.95	100	0.06	6	6
Apr.	3L(3LN)	188.28	0.19	0.10	18.46	1.03	1020	1021
May	3L(3LN)	264.97	0.49	0.18	36.10	1.36	734	735
June	3L(3LN)	0	-	-	0	-	304	-
July	3L(3LN)	0	-	-	0	-	174	-
Aug.	3L(3LN)	0	-	-	0	-	7	-
Sept.	3L(3LN)	0	.01	100.00	0	0	148	148
Oct.	3L(3LN)	0	-	-	0	-	92	-
Nov.	3L	1.02	0.20	16.39	3.92	5.10	26	31
	3N	0	0.10	100.00	0	0	0	0
	3LN	1.02	0.30	22.73	3.92	5.10	26	31
Dec.	3L(3LN)	0	-	-	0	-	27	-
1983		843.38	-	1.47	23.73	52.86	3554	3607

Table 2. (Cont'd.)

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Jan.	3Ps(3P)	.26	0	0	100	0	0	0
Mar.	3Pn	0	-	-	0	-	1	-
	3Ps	0.28	0.17	37.78	14.00	1.21	2	3
	3P	0.28	-	37.76	9.33	1.82	3	5
Apr.	3Pn(3P)	0	-	-	0	-	3	-
May	3Ps(3P)	0	-	-	0	-	3	-
July	3Pn(3P)	0	-	-	0	-	37	-
Aug.	3Pn	0	-	-	0	-	11	-
	3Ps	0	-	-	0	-	138	-
	3P	0	-	-	0	-	149	-
Sept.	3Pn	62.35	0.05	0.08	14.47	0.35	431	431
	3Ps	295.42	11.68	3.80	87.40	13.36	338	351
	3P	357.77	11.73	3.17	46.52	25.21	769	794
Oct.	3Pn	0	-	-	0	-	22	-
	3Ps	56.41	0.81	1.42	6.47	12.52	872	885
	3P	56.41	-	1.42	6.31	12.84	894	907
Nov.	3Pn	42.24	0.38	0.89	13.80	2.75	306	309
	3Ps	40.84	0.14	0.34	26.18	0.53	156	157
	3P	83.08	.52	0.62	17.98	12.89	462	465
Dec.	3Pn	0	-	-	0	-	183	-
	3Ps	0	-	-	0	-	389	-
	3P	0	-	-	0	-	572	-
1983		497.80	-	1.97	17.22	58.19	2892	2950
Jan.	4R	0	-	-	0	-	65	-
	4S	0	-	-	0	-	6	-
	4RST	0	-	-	0	-	71	-
Feb.	4R(4RST)	0.31	0.07	18.42	10.33	0.68	3	4
Mar.	4R(4RST)	31.93	.30	0.93	61.40	0.49	52	52
Apr.	4R(4RST)	0.50	0.02	3.85	25.00	0.08	2	2
May	4R	0	-	-	0	-	120	-
	4S	0	-	-	0	-	1	-
	4RST	0	-	-	0	-	121	-
Jun.	4R(4RST)	0	-	-	0	-	97	-
Aug.	4R(4RST)	0	-	-	0	-	307	-
Sept.	4R	73.51	0	0	22.21	0	331	331
	4S	0	-	-	0	-	29	-
	4RST	73.51	-	0	20.42	0	360	360
Oct.	4R(4RST)	0	-	-	0	-	67	-
Nov.	4R(4RST)	20.96	0	0	34.36	0	61	61
Dec.	4R(4RST)	0	-	-	0	-	367	-
1983		127.21	-	0.26	8.44	3.94	1508	1512
Feb.	4X(4VWX)	0	-	-	0	-	2	-
Mar.	4VS(4VWX)	6.52	0.08	1.21	72.44	0.11	9	9
May	4VS(4VWX)	0	-	-	0	-	2	-
July	4VS(4VWX)	0	-	-	0	-	13	-
Aug.	4VS(4VWX)	0	-	-	0	-	2	-
Sept	4VS(4VWX)	6.66	.27	3.90	100	.27	0	7
Oct.	4VS(4VWX)	139.43	0	0	37.38	0	373	373
Dec.	4VS(4VWX)	0	-	-	0	-	139	-
1983		152.61	-	0.10	28.26	0.54	540	541

Table 2. (Cont'd.)

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Jan.	4Vn	0	-	-	0	-	56	-
Feb.	4Vn	0.30	0.12	28.57	30.00	0.40	1	1
Mar.	4Vn	0	-	-	0	-	1	-
July	4Vn	0	-	-	0	-	21	-
Sept.	4Vn	33.18	0	0	39.50	0	84	84
Oct.	4Vn	0	-	-	0	-	80	-
Nov.	4Vn	7.04	0.03	0.42	1.47	2.04	478	480
Dec.	4Vn	0	-	-	0	-	184	-
1983		40.52	-	0.43	4.48	3.92	905	909

Table 3. Estimates of discarding in the offshore Newfoundland plaice fisheries.

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Jan.	3K(2+3K)	81.63	3.19	3.76	38.87	8.21	210	218
Feb.	2J	0.31	0.47	60	100.00	0.47	0	1
	3K	0.41	0.07	14.58	13.67	0.51	3	4
	2+3K	0.72	0.54	42.86	24.00	2.25	3	4
Mar.	2J	0.53	1.16	68.64	53.00	2.19	1	3
	3K	6.92	0.29	4.02	46.13	0.63	15	16
	2+3K	7.45	1.45	16.29	46.56	3.11	16	19
Apr.	2J	0.14	1.08	88.52	14.00	7.71	1	9
	3K	0.44	0.36	45.00	3.67	9.82	12	22
	2+3K	0.58	1.44	71.29	4.46	32.28	13	45
May	3K	40.74	3.15	7.18	34.24	9.20	119	128
	2+3K	40.74	3.15	7.18	34.24	9.20	119	128
June	2J	6.24	1.26	16.80	41.60	3.03	15	18
	3K	2.12	0.18	7.83	5.73	3.14	37	40
	2+3K	8.36	1.44	14.69	16.08	8.96	52	61
July	2H	4.28	0	0	26.75	0	16	16
	2J	1.40	0	0	6.36	0	22	22
	3K	2.16	0.02	0.92	11.37	0.18	19	19
	2+3K	7.84	0.02	0.25	13.75	0.18	57	57
Aug.	2H	0	-	-	0	-	11	-
	2J	0.36	0	0	6.00	0	6	6
	3K	0	-	-	0	-	2	-
	2+3K	0.36	-	0	1.89	0	19	19
Sept.	2H	0.06	0	0	3.00	0	2	2
	2J	1.51	0.18	10.65	13.73	1.31	11	12
	3K	0	10.66	-	0	-	1	-
	2+3K	1.57	-	9.15	11.21	1.41	14	16
Oct.	2J	1.40	0.21	13.04	5.19	4.05	27	31
	3K	0	-	-	0	-	154	-
	2+3K	1.40	-	13.04	0.77	27.15	181	208
Nov.	2J	0.38	0	0	100	0	0	0
	3K	0.09	0.01	10.00	0.12	8.33	75	83
	2+3K	0.47	0.01	2.63	0.63	8.33	75	83
Dec.	3K(2+3K)	0	-	-	0	-	8	-

Table 3. (Cont'd.)

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
1983		151.12	-	11.75	19.70	102.15	767	869
Jan.	3L	52.54	1.26	2.34	10.01	12.59	525	538
	3N	31.02	1.43	4.41	10.31	13.88	301	315
	3O	58.75	1.74	2.88	7.92	21.98	742	764
	3LNO	142.31	4.43	3.02	9.08	48.81	1568	1617
Feb.	3L	28.65	0.36	1.24	17.69	2.04	162	164
	3N	71.21	2.03	2.77	29.92	6.78	238	245
	3O	62.33	5.34	7.89	42.40	12.59	147	160
	3LNO	162.19	7.73	4.55	29.65	26.07	547	573
Mar.	3L	10.47	0.01	0.10	7.07	0.14	148	148
	3N	120.21	9.22	7.12	52.72	17.49	228	245
	3O	168.53	4.63	2.67	42.56	10.88	396	407
	3LNO	599.21	13.86	2.26	77.62	17.86	772	790
Apr.	3L	450.46	28.32	5.92	31.09	91.10	1449	1540
	3N	59.40	4.75	7.40	17.47	27.19	340	367
	3O	24.66	1.34	5.15	5.49	24.40	440	473
	3LNO	534.52	34.41	6.05	23.88	144.07	2238	2382
May	3L	548.82	34.76	5.96	18.55	187.41	2959	3146
	3N	51.04	1.83	3.46	15.06	12.15	339	351
	3O	47.06	9.78	17.21	6.96	140.49	676	816
	3LNO	646.92	46.37	6.69	16.28	284.85	3974	4259
June	3L	614.84	32.19	4.98	18.41	174.81	3339	3514
	3N	99.62	6.38	6.02	26.85	23.76	371	395
	3O	157.98	6.40	3.89	31.98	20.01	494	514
	3LNO	872.44	44.97	4.90	20.75	216.70	4204	4421
July	3L	141.58	11.79	7.69	7.02	167.88	2016	2184
	3N	78.12	6.23	7.39	6.01	103.59	1299	1403
	3O	5.40	0.04	0.74	2.47	1.62	219	221
	3LNO	225.10	18.06	7.43	6.37	283.54	3534	3818
Aug.	3L	93.94	10.16	9.76	8.39	121.13	1120	1241
	3N	113.89	4.36	3.69	9.70	44.94	1174	1219
	3O	13.55	2.23	14.13	12.78	17.45	106	123
	3LNO	221.38	16.75	7.03	9.22	181.59	2400	2582
Sept.	3L	44.72	5.23	10.47	2.23	234.95	2009	2244
	3N	0	-	-	0	-	338	-
	3O	0	-	-	0	-	297	-
	3LNO	44.72	-	10.47	1.69	309.21	2644	2953
Oct.	3L	23.72	0.58	2.39	1.20	48.17	1970	2018
	3N	0.68	0.03	4.23	0.08	37.50	850	888
	3O	5.29	0.06	1.12	2.29	2.62	231	234
	3LNO	29.69	0.67	2.21	0.97	68.85	3051	3120
Nov.	3L	86.95	5.11	5.55	6.13	83.34	1418	1501
	3N	71.70	9.09	11.25	10.36	87.73	692	780
	3O	13.20	0.05	0.38	4.11	1.22	321	322
	3LNO	171.85	14.25	7.66	7.07	201.58	2431	2633
Dec.	3L	0	-	-	0	-	1116	-
	3N	0	-	-	0	-	1724	-
	3O	0	-	-	0	-	56	-
	3LNO	0	-	-	0	-	2896	-
1983		3650.33	-	6.12	12.06	1971.85	30259	32231

Table 3. (Cont'd.)

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Jan	3Ps	3.05	0	0	3.24	0	94	94
Feb.	3Ps	0	-	-	0	-	46	-
Mar.	3Ps	51.43	3.09	5.67	35.23	8.77	146	155
Apr.	3Ps	0	-	-	0	-	38	-
May	3Ps	0.11	0.01	8.33	100	0.01	0	0
June	3Ps	0	-	-	0	-	5	-
July	3Ps	0	-	-	0	-	98	-
Aug.	3Ps	0	-	-	0	-	40	-
Sept.	3Ps	1.14	0	0	0.42	0	273	273
Oct.	3Ps	0.49	0.01	2.00	0.21	4.71	231	236
Nov.	3Ps	0	-	-	0	-	91	-
Dec.	3Ps	0	-	-	0	-	2	-
1983		56.22	-	1.78	5.28	19.29	1064	1083

Table 4. Estimates of discarding in the offshore Newfoundland Yellowtail fisheries.

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Jan.	3L	6.3	0	0	100	0	0	
	3N	35.10	1.09	3.01	9.64	11.30	364	375
	3O	0.15	0	0	0.63	0	24	24
	3LNO	41.55	1.09	2.56	10.71	10.18	388	398
Feb.	3L	0	-	-	0	-	2	-
	3N	102.39	0.92	0.89	29.42	3.13	348	351
	3O	13.31	0.06	0.45	100	0.06	13	13
	*3LNO	115.70	0.98	0.84	31.87	3.21	363	366
Mar.	3N	0.75	0.04	5.06	18.75	0.21	4	4
	3O	0.48	0.05	9.43	9.60	0.52	5	6
	3LNO	1.23	0.09	6.82	13.67	0.66	9	10
Apr.	3L	1.31	0.16	10.88	4.23	3.79	31	35
	3N	99.42	4.49	4.32	23.50	19.10	423	442
	3O	5.78	0.16	2.69	15.62	1.02	37	38
	3LNO	106.51	4.81	4.32	21.69	22.17	491	513
May	3L	16.98	0.72	4.07	17.33	4.16	98	102
	3N	109.23	4.23	3.73	21.67	19.52	504	524
	3O	34.59	3.35	8.83	15.87	21.11	218	239
	3LNO	160.80	8.30	4.91	19.61	42.33	820	862
June	3L	61.42	1.20	1.92	10.89	11.02	564	575
	3N	40.50	2.34	5.46	16.20	14.44	250	264
	3O	10.44	0.44	4.04	25.46	1.73	41	43
	3LNO	112.36	3.98	3.42	13.14	30.29	855	885
July	3L	18.24	0.71	3.75	3.43	20.71	532	553
	3N	46.26	4.90	9.58	8.66	56.56	534	591
	3O	0	-	-	0	-	27	-
	3LNO	64.50	5.61	8.00	5.90	79.23	1093	1172
Aug.	3L	30.56	1.81	5.59	5.01	36.13	610	646
	3N	113.03	3.67	3.14	10.52	34.87	1074	1109
	3O	0.38	0.20	34.48	1.19	16.84	32	49
	3LNO	143.97	5.68	3.80	8.39	67.70	1716	1784

Table 4. (Cont'd.)

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Sept.	3L	0	-	-	0	-	251	-
	3N	0	-	-	0	-	697	-
	3O	0	-	-	0	-	29	-
	3LNO	0	-	-	0	-	977	-
Oct.	3L	0.80	0.06	6.98	0.35	17.03	227	244
	3N	0.68	0.04	5.56	0.17	24.00	408	432
	3O	5.08	0.20	3.79	8.47	2.36	60	62
	3LNO	6.56	0.30	4.37	0.94	31.78	695	727
Nov.	3L	8.30	0.74	8.19	5.68	13.02	146	159
	3N	0.67	0.01	1.47	0.15	6.66	446	453
	3O	1.68	0.08	4.55	0.90	8.86	186	195
	3LNO	10.65	0.83	7.23	1.37	60.63	778	839
Dec.	3L	0	-	-	0	-	61	-
	3N	0	-	-	0	-	486	-
	3O	0	-	-	0	-	16	-
	3LNO	0	-	-	0	-	563	-
1983		763.88	-	4.61	8.73	422.57	8748	9171

Table 5. Estimates of discarding in the offshore Newfoundland turbot fisheries.

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Jan.	2J	0.17	0	0	17.00	0	1	1
	3K	31.82	1.22	3.69	31.50	3.87	101	105
	3L	0.78	0.27	25.71	4.11	6.58	19	26
	2+3KL	32.77	1.49	4.35	27.08	5.50	121	127
Feb.	2J	0.28	0.38	57.58	14.00	2.71	2	5
	3K	0.12	0	0	1.50	0	8	8
	3L	0.67	0.08	10.67	16.75	0.48	4	4
	2+3KL	1.07	0.46	30.07	7.64	32.57	14	47
Mar.	2J	0.23	0.10	30.30	100	0.10	0	0
	3K	0.47	0.49	51.04	23.50	2.09	2	4
	3L	0.16	0.19	54.29	100	0.19	0	0
	2+3KL	0.86	1.08	55.67	43.00	1.59	2	4
Apr.	3K	0.75	0.12	13.79	6.82	1.76	11	13
	3L	0.48	0.35	42.17	12.00	2.92	4	7
	2+3KL	1.23	0.47	27.65	8.20	4.68	15	20
May	3K	179.95	4.41	2.39	76.90	5.73	234	240
	3L	2.35	0.19	7.48	11.19	1.70	21	23
	2+3KL	182.30	4.60	2.46	71.49	7.43	255	262
June	2J	1.39	0.04	2.80	17.38	0.23	8	8
	3K	180.24	2.38	1.30	24.42	9.75	738	748
	3L	0.39	0.02	4.88	2.79	0.72	14	15
	2+3KL	182.02	2.44	1.32	23.95	10.19	760	770
July	2H	89.97	0	0	48.11	0	187	187
	2J	23.17	0	0	10.03	0	231	231
	3K	64.10	0.60	0.93	8.47	7.09	757	764
	3L	0	-	-	0	-	5	-
	2+3KL	177.24	-	0.60	15.02	7.12	1180	1187

Table 5. (Cont'd.)

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Aug.	2H	48.06	3.60	6.97	4.98	72.36	966	1038
	2J	240.70	5.95	2.41	15.64	38.04	1539	1577
	3K	0	-	-	0	-	66	-
	3L	0	-	-	0	-	1	-
	2+3KL	288.76	-	4.22	11.23	113.35	2572	2685
Sept.	2H	70.18	5.70	7.51	5.67	100.55	1238	1339
	2J	596.70	5.00	0.83	87.11	5.74	685	686
	3L	0.67	0	0	1.68	0	40	40
	2+3KL	667.55	10.70	1.58	34.01	31.46	1963	1994
Oct.	2J	971.29	14.90	1.51	108.52	13.73	895	909
	3K	0	-	-	0	-	3	-
	3L	0.55	0.04	6.78	2.12	1.89	26	28
	2+3KL	971.84	-	1.67	105.18	15.67	924	940
Nov.	2J	238.50	4.85	1.99	83.10	5.84	287	293
	3K	0	-	-	0	-	2	-
	3L	0.75	0.07	8.54	5.36	1.31	14	15
	2+3KL	239.25	-	2.32	78.96	7.20	303	310
Dec.	3K	0	-	-	0	-	25	-
	3L	0	-	-	0	-	9	-
	2+3KL	0	-	-	0	-	34	-
1983		2744.89	-	2.84	33.71	237.75	8143	8381

Table 6. Estimates of discarding in the offshore Newfoundland witch fisheries.

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Jan.	2J	0	-	-	0	-	1	-
	3K	10.61	0.26	2.39	7.52	3.46	141	144
	3L	3.26	0.20	5.78	12.07	1.66	27	29
	2J+3KL	13.87	-	2.96	8.21	5.15	169	175
Feb.	2J	0	-	-	0	-	2	-
	3K	11.46	0.02	0.17	5.46	0.37	210	210
	3L	0.31	0.03	8.82	1.41	2.13	22	24
	2J+3KL	11.77	-	1.07	5.03	2.52	234	237
Mar.	3K	0.55	0.40	42.11	13.75	2.91	4	7
	3L	0.56	0.05	8.20	56.00	0.09	1	1
	2J+3KL	1.11	0.47	29.75	22.20	2.12	5	7
Apr.	2J	0	-	-	0	-	1	-
	3K	0.70	0.04	5.41	8.75	0.46	8	8
	3L	0.79	0	0	5.27	0	15	15
	2J+3KL	1.49	-	1.96	6.21	0.48	24	24
May	3K	88.98	0.95	1.06	60.53	1.57	147	149
	3L	4.41	0.04	0.90	16.96	0.24	26	26
	2J+3KL	93.39	0.99	1.05	53.98	1.83	173	175
June	2J	0.44	0	0	14.67	0	3	3
	3K	23.43	0.39	1.64	17.23	2.26	136	138
	3L	2.99	0	0	18.69	0	16	16
	2J+3KL	26.86	0.39	1.43	17.33	2.25	155	157

Table 6. (Cont'd.)

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
July	2J	1.21	0	0	9.31	0	13	13
	3K	2.12	0.06	2.75	3.03	1.98	70	72
	3L	1.50	0	0	15.00	0	10	10
	2J+3KL	4.83	0.06	1.23	5.19	1.16	93	94
Aug.	2J	0.22	0.01	4.35	3.67	0.27	6	6
	3K	0	-	-	0	-	1	-
	3L	0.61	0.02	3.17	12.20	0.16	5	5
	2J+3KL	0.83	-	3.77	6.92	0.47	12	12
Sept.	3L	1.02	0	0	4.25	0	24	24
	2J+3KL	1.02	0	0	4.25	0	24	24
Oct.	2J	0	-	-	0	-	1	-
	3K	0	-	-	0	-	5	-
	3L	0	-	-	0	-	27	-
	2J+3KL	0	-	0	-	-	33	-
Nov.	3K	0	-	-	0	-	4	-
	3L	1.97	0.11	5.29	21.89	0.50	9	10
	2J+3KL	1.97	-	5.26	15.15	0.72	13	14
Dec.	3K	0	-	-	0	-	18	-
	3L	0	-	-	0	-	5	-
	2J+3KL	0	-	-	0	-	23	-
1983		157.14	-	1.82	16.40	17.74	958	976
Jan.	3N	1.56	0	0	4.22	0	37	37
	30	15.94	0.41	2.51	9.32	4.40	171	175
	3NO	17.50	0.41	2.29	8.41	4.87	208	213
Feb.	3N	1.80	0	0	4.19	0	43	43
	30	58.35	3.95	6.34	129.67	3.05	45	48
	3NO	60.15	3.95	6.16	68.35	5.78	88	94
Mar.	3N	71.68	1.66	2.26	41.20	4.03	174	178
	30	150.87	2.57	1.67	31.04	8.28	486	494
	3NO	222.55	4.23	1.87	33.72	12.54	660	673
Apr.	3N	19.94	0.46	2.25	10.23	4.50	195	200
	30	13.41	0.22	1.61	4.99	4.41	269	273
	3NO	33.35	0.68	2.00	7.19	9.46	464	473
MAY	3N	0.51	0.04	7.27	10.20	0.39	5	5
	30	13.63	0.96	6.58	17.25	5.56	79	85
	3NO	14.14	1.00	6.61	16.83	5.94	84	90
June	3N	0	-	-	0	-	1	-
	30	1.16	0	0	16.57	0	7	7
	3NO	1.16	-	0	0.15	0	8	8
July	3N	0	-	-	0	-	2	-
	30	0	-	-	0	-	6	-
	3NO	0	-	-	0	-	8	-
Aug.	3N	0.09	0	0	4.50	0	2	2
	30	0.15	0	0	15.00	0	1	1
	3NO	0.24	0	0	8.00	0	3	3
Sept.	3N	0	-	-	0	-	4	-
	30	0	-	-	0	-	2	-
	3NO	0	-	-	0	-	6	-
Oct.	3N	0	-	-	0	-	23	-
	30	0.18	0.01	5.26	1.64	0.61	11	12
	3NO	0.18	-	5.27	0.53	1.89	34	36

Table 6. (Cont'd.)

Month	Area	Observed kept(MT)	Observed discards	% Observed discards	% of Landed wt. observed	Est. discards	Landed weight	Estimated total removals
Nov.	3N	0	-	-	0	-	11	-
	3O	0	-	-	0	-	7	-
	3NO	0	-	-	0	-	18	-
Dec.	3N(3NO)	0	-	-	0	-	4	-
1983		349.27	-	2.55	22.04	41.42	1585	1626
Jan.	3Ps	1.07	0	0	11.89	0	9	9
Feb.	3Ps	0	-	-	0	-	2	-
Mar.	3Ps	1.57	0.06	3.68	11.21	0.54	14	15
Apr.	3Ps	0	-	-	0	-	7	-
May	3Ps	2.24	0.03	1.32	100	0.03	0	2
July	3Ps	0	-	-	0	-	1	-
Aug.	3Ps	0	-	-	0	-	1	-
Sept.	3Ps	1.04	0.33	24.09	4.73	6.98	22	29
Oct.	3Ps	0.80	0.18	18.37	0.70	25.88	115	141
Nov.	3Ps	0.49	0.04	7.55	9.80	0.41	5	5
Dec.	3Ps	0	-	-	0	-	4	-
1983		7.21	-	17.02	4.01	36.92	180	217

Table 7. Patterns of discarding for non and semi-commercial bycatch

Discarded bycatch species	Directed fishery	Major areas	Major season	Total estimated discards(t)	Total estimated kept(t)	Percent discarded
Skate	Cod	2J,3KL,30 3Ps,4VN	ALL	1368	15	99
	REDFISH	3KL,3P	ALL	122	0	100
	PLAICE	3LNO	ALL	1818	1	100
	YELLOWTAIL	3LNO		318	2	99
	WITCH	30	SPRING	9	0	100
	TURBOT	2HJ,3K	SUM,FALL	156	4	98
	ALL	2J-3P	-	3791	22	99
WOLFFISH	COD	2J3KL	ALL	640	1429	31
	REDFISH	3KL,3P	ALL	32	14	70
	PLAICE	3KLN	ALL	59	168	26
	YELLOWTAIL	3N	SPRING,SUM	2	23	8
	WITCH	3K	SPRING	1	0	100
	TURBOT	2HJ	ALL	133	47	74
	ALL	2J-3P	-	867	1681	34
WHITE HAKE	COD	30	SPRING	4	160	2
	REDFISH	3P	FALL	8	46	15
	PLAICE	3NOP	WINTER,SPRING	22	62	26
	ALL	3NOP	-	34	268	11
HALIBUT	COD	3KLP	ALL	0	124	0
	REDFISH	3LP,4V	ALL	0	34	0
	PLAICE	3NO	SPRING,SUM	0	75	0
	YELLOWTAIL		SPRING,SUM	0	2	0
	TURBOT	2HJ3K	SUM,FALL	0	4	0
	ALL	3KLP	-	0	239	0
POLLOCK	COD	3PS,4V	ALL	2	158	1
	REDFISH	3P,4V	FALL	0	6	0
	PLAICE	30	SPRING	0	3	0
	ALL	3P,4V	-	2	167	1
OTHER	-	-	-	400	-	-
TOTAL	-	-	-	5419	-	-

Table 8. Discard patterns for commercial species, 1981-1983

Species	Stock	1981		1982		1983	
		% Observed discards	% of Landed wt. observed	% Observed discards	% of Landed wt. observed	% Observed discards	% of Landed wt. observed
COD	2GH	5.9	97	1.1	6	-	-
	2J+3KL	1.5	12	2.2	8	3.71	11.83
	3NO	7.5	4	3.5	5	2.74	4.91
	3Ps	0.4	3	0.4	9	1.90	6.11
	4RS+3Pn	0.6	13	-	0	0.34	9.76
	4VN	0.6	6	-	0	1.40	10.89
	4VWX	0.1	4	0.4	7	1.06	16.14
REDFISH	2+3K	1.4	8	2.6	14	10.41	26.13
	3LN	0.4	7	1.0	7	1.47	23.73
	3P	0.7	15	0.4	20	1.97	17.22
	4RST	0	69	-	0	0.26	8.44
	4VN	0.4	13	0.1	6	0.43	4.48
WHITE HAKE	3+4	14.1	5	-	-	-	-
PLAICE	2+3K	0.9	3	12.6	14	11.75	19.70
	3LNO	4.6	11	4.1	8	6.12	12.06
	3Ps	6.5	1	10.0	5	1.78	5.28
YELLOWTAIL	3LNO	4.2	9	5.5	6	4.61	8.73
TURBOT	2+3KL	2.3	6	7.8	7	2.84	33.71
WITCH	2J+3KL	0.6	2	3.4	8	1.82	17.74
	4RS	0	1	-	-	0.52	2.89
	3Ps	0	10	-	-	17.02	4.01
	4VWX	3.4	12	-	-	-	-
	3NO	0.7	9	3.70	3	2.55	22.04
SHRIMP	2HJ	0.5	94	0.4	9	-	-
ALL	ALL	2.6	13	3.2	7	4.5	8

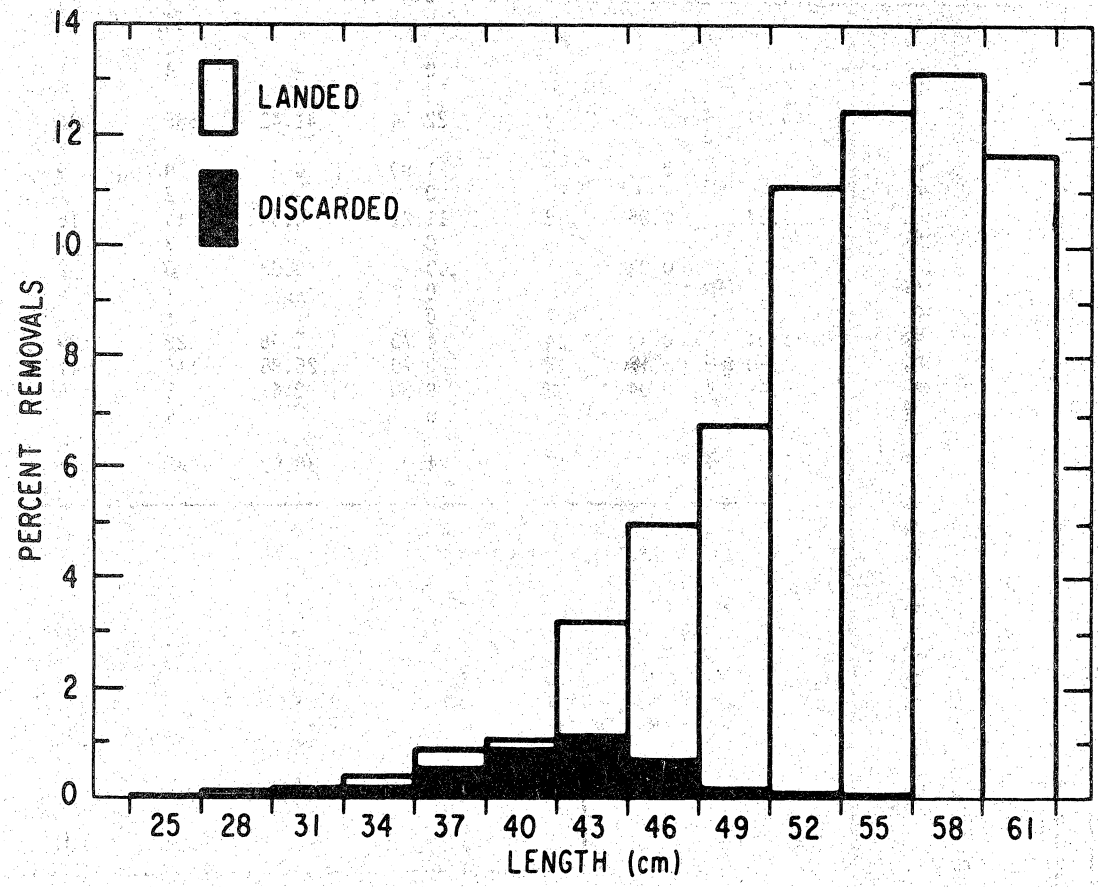

Fig. 1. Estimated discarded and landed removals of 2J3KL cod for 1983, within the range of discarding.

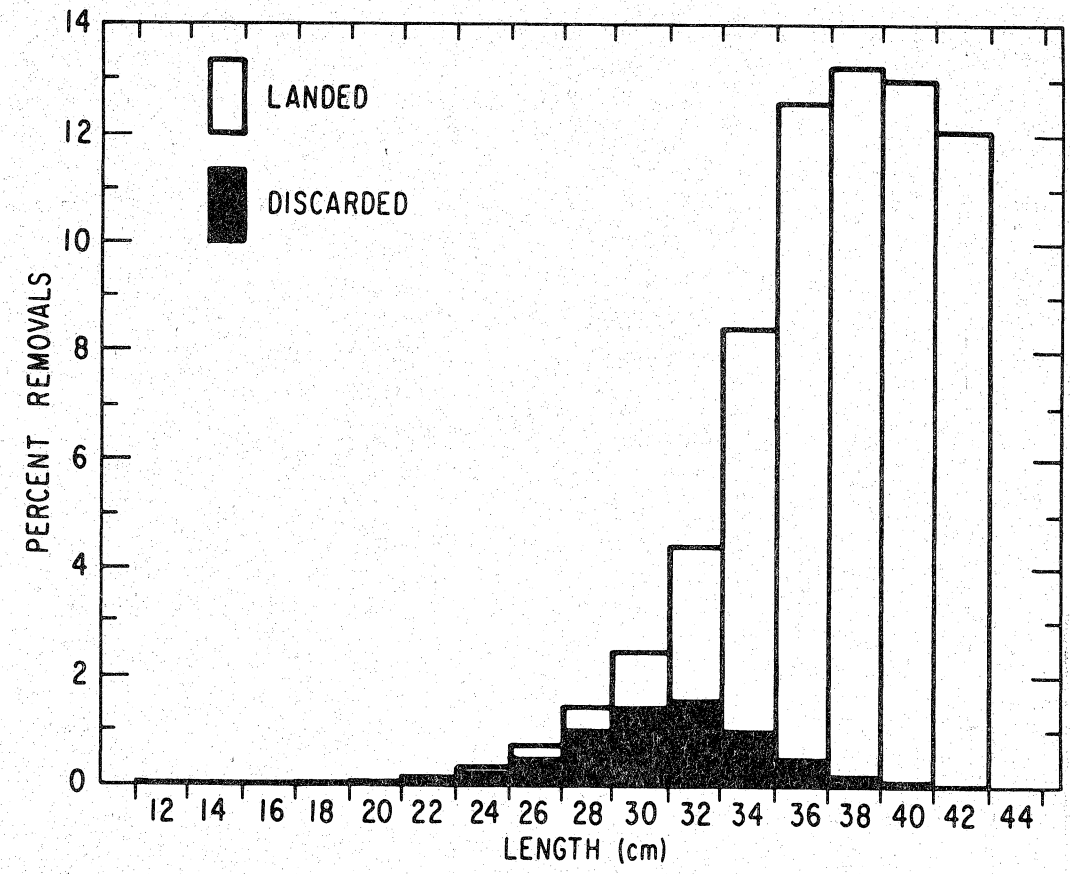

Fig. 2. Estimated discarded and landed removals of 3LNO plaice for 1983, within the range of discarding.