

## Assessment of the 1997 Newfoundland and Labrador Snow Crab Fishery

D. M. Taylor and P. G. O'Keefe

Science Branch  
Department of Fisheries and Oceans  
P. O. Box 5667  
St. John's NF A1C 5X1

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### Abstract

Summaries of fishery performance in the Newfoundland and Labrador snow crab, *Chionoecetes opilio*, fishery are provided for 34 management areas within five NAFO Divisions. Comparative data are provided on yearly landings, effort and CPUE's for individual management areas and fleet components. In 1997 landings reached a record level of 45,901 t, a 20.8% increase over those achieved in 1996. This increase in landings is due to continuing high levels of abundance of commercial-sized animals in most snow crab management areas. In addition to fishery performance statistics, figures illustrating fishing positions reported from 1994, 1995, 1996, and 1997 logbooks are presented.

### Résumé

Des sommaires du rendement de la pêche du crabe des neiges, *Chionoecetes opilio*, de Terre-Neuve et du Labrador sont présentés pour 34 zones de gestion de cinq divisions de l'OPANO. On trouve aussi des données comparatives pour les débarquements, l'effort et les PUE annuels pour chacune des zones de pêche et composantes de la flottille. En 1997, les débarquements ont atteint le niveau record de 45 901 t, soit une augmentation de 20,8 % par rapport à 1996. Cette augmentation s'explique par le maintien d'une grande abondance d'animaux de taille commerciale dans la plupart des zones de gestion. Le lecteur trouvera aussi, en plus de statistiques sur le rendement, des figures illustrant les positions des lieux de pêche signalées dans les registres de bord de 1994, 1995, 1996 et 1997.

## Introduction

The Newfoundland snow crab (*Chionoecetes opilio*) fishery began in Trinity Bay in 1968. Initially, the catch consisted solely of crabs caught as groundfish gillnet bycatch but within several years there was a directed trap fishery in most inshore areas along the northeast coast of the Island. After this initial areal expansion, the fishery remained relatively stable until the early 1980's when the collapse of the Alaskan king crab fishery triggered a rapid expansion of the fishery both in terms of effort and landings but also in terms of fishing grounds. During this time the fishery was prosecuted by approximately 50 vessels which were restricted to using 800 traps each. In 1981 Zonal Management was introduced which essentially restricted vessels to exclusively fishing the NAFO Division where licence holders resided.

The mid 1980's represent a turning point for the fishery with a depletion of the crab resource in most areas of NAFO Divisions 3K and 3L and the commencement of fisheries in 2J and 3Ps. In 1985 a supplementary fishery prosecuted by enterprises needing to supplement their income from a failing groundfish fishery was started in 3K. Vessels prosecuting this fishery were restricted to 150 traps and fished the same grounds as the fulltime vessels. A supplementary fishery in 3L commenced in 1987 with the same regulatory regime as that for 3K supplementary fishermen.

In 1987 quota management was initiated in all areas of 3L accompanied by a redefinition of fishing seasons for both fleet sectors. Quota management was initiated in 3K in 1988. Depending on the area, fishing by supplementary vessels was restricted to specified seasons in the spring or fall or, in some cases, the quota was split between a fall and a spring season. With the introduction of quota management, areas were redefined and quotas allocated to individual management areas (Fig. 1) by fleet sector. There is no biological basis for the current definition of management areas but rather, they are an attempt to allocate effort proportionally to resource availability. This strategy is an attempt to prevent over exploitation of near-shore areas. In 1989 fulltime vessels were restricted to offshore fishing grounds, and bays, (except Bonavista Bay), were reserved for the supplementary fleet.

The fishery in Labrador began in 1985 and expanded significantly in 1991 with the commencement of fishing activity north of 53:30 Latitude. This fishery, centered in Cartwright, is fished exclusively by supplementary vessels and they, like their southern Labrador counterparts, are permitted to fish 300 traps.

In 1994 there were several important changes in the snow crab fishery. In 3K, a dockside monitoring program run by fishers was instituted with a great deal of success. Access to the fishery for supplementary vessels was expanded in 1994. There were now 3 fleet sectors; fulltime, supplementary larger than 40 gross tons in weight and supplementary less than 40 gross tons in weight but having an overall length greater than 35 ft. All three fleet components have designated trap limits, quotas and fishing areas. In order to avoid "gluts" trip limits and/or weekly harvest limits were introduced.

In 1995 dockside monitoring was extended to all NAFO divisions thereby providing reasonable assurance that data on vessel landings was accurate. Monitors were required to initial fishers logbook entries in order to validate them. Also in 1995, an additional fleet of fishers gained access to the snow crab resource. Vessels under 35 ft. LOA were issued temporary seasonal permits and permitted access to the fishery. 360 permits were issued with an allocation of 1800 t and each bay was allocated a quota and number of permits reflective of resource availability. Where too many fishers applied for the number of permits available, a draw system was implemented. Fishing grounds in all NAFO Divisions were extended offshore (outside of 200 n. miles in NAFO Division 3LNO).

The 1996 Newfoundland and Labrador snow crab fishery expanded in several ways from the level of activity experienced in 1995. Landings (Table 6) increased to 38,007 t (quota 38,905 t), an 18.8% increase over 1995 landings (31,986 t). Areally, several new fishing areas were occupied in 1996 with excellent results overall in terms of catch rates and quality. Many new participants fished snow crab for the first time as additional temporary permits were issued to fishers using vessels under 35 ft. LOA.

Enterprise allocations have been adopted by almost all fleet sectors, either partially (3Ps supplementary) or in full (2J, 3K and 3LNO fulltime). In 1996 there were over 2600 enterprises licensed to participate in the snow crab fishery (Table 1).

1996 saw the introduction of a two-tiered pricing structure for snow crab, as well as the implementation of enterprise allocations, (EA's) for almost every harvesting sector. These changes, in tandem with trip limits and weekly catch limits, resulted in a much more regulated and directed fishery than in past years. The two-tiered pricing system was designed to encourage fishers to harvest selectively, crab in excess of 102 mm (4 inches) carapace width (CW). This new pricing structure may have contributed to increased discard mortality in that observers reported that fishers were retaining legal-sized crab under 102 mm CW until they had caught their assigned trip limit of crabs over 102 mm CW. Then, unwanted legal-sized crabs were returned to the water after up to several hours on board the vessel undoubtedly increasing the frequency of discard mortality. The absence of a competitive fishery with the introduction of individual quotas allowed fishers to take their time and high-grade large crab but at a cost of increased discard mortality.

In 1997 there was a protracted price dispute between the fishers and processors. This resulted in a significant delay in opening the fishery. A further difficulty in terms of a timely opening was the issue of how to continue the system of two-tiered pricing without the negative effects in term of discard mortality experienced during high-grading by the fleet in 1996. Processors stated that the only way to have a financially viable fishery in 1997 was the maintenance of a two-tiered pricing structure. Analysis of data provided by fishery officers and at-sea observers indicated that the potential discard mortality resulting from high-grading practices was alarmingly high in some areas. Resource Management Branch insisted that unless provisions were made to minimize high-grading and attendant discard mortality there would be no 1997 commercial fishery that included a two-tiered pricing policy. In mid-July, a compromise was reached which allowed for a two-tiered pricing system but disallowed deliberately culling legal-sized under 103 mm CW crabs from the catch. An agreement to this effect was signed by processing and harvesting representatives and the fishery opened, albeit at a much later date than normal.

In terms of fishing activity the fishery continued to expand in terms of licencees, landings and in terms of the area of the commercial grounds prosecuted. The number of licences issued for the Newfoundland and Labrador region in 1997 increased to 3087, up from 2624 in 1996. The number of licences increased in all NAFO Divisions with the exception of 2J where a disappointing 1996 season for the under 35 ft. temporary permit component of the fleet appears to have caused a reduction in licence applications for the 1997 fishery. Landings increased to 45,903 t (quota 44,915t), an increase of 20.8% over 1996. Areally, the fishery expanded modestly in 1997 with exploratory fisheries attempting to determine the northern extent of commercial fishing grounds in Labrador (2J) and whether fishing was feasible at depths greater than 550 m on the continental slope of NAFO Division 3K. In both areas special quotas were assigned in order to induce vessels to explore for crabs.

## Methods

### Fishery Performance - Logbook Data

Raw data on fishers catches, effort (trap hauls) and fishing positions were extracted from logbooks, analysed and summarized by the Informatics and Statistics Branch of the Newfoundland Region of Fisheries and Oceans. While not all logbook entries were usable due to errors or omissions on the part of the fisher, most were at least superficially suitable for generating estimates of CPUE for each management area and for use in plotting distribution of fishing activity.

Figures 3a, b, c and d illustrate the distribution of fishing effort for 1997 in relation to that for 1994-96. It may be that potential for areal expansion in this fishery is limited to modest northward and continued offshore expansion in NAFO Division 2J and continuing exploratory efforts downslope in all other NAFO Divisions.

## Observer Data

Data on catches, size-frequency and shell condition were collected by observers from Seawatch Inc. and analysed to determine the degree of comparability between commercial logbook data and research cruise data. CPUE was determined by utilizing the width-weight regression defined by Taylor and Warren (1990) and applying it to observer-supplied and research-cruise measurements of legal-sized crabs.

## Results

### Fishery Performance

Landings increased in all NAFO Divisions from 1996 levels (Fig. 2). A summary of fishery data by NAFO Division from 1979 to 1997 is presented in Table 2. An overview of CPUE's as determined by logbook analyses are presented in Table 3 for each management area and can be summarized as follows:

#### **2J**

CPUE's decreased in the north and south by 24% by 49% respectively. This increase is principally due to the discovery of new fishing grounds in the offshore areas. Inshore, particularly in the northern zone, soft-shelled crab was a serious problem early in the fishing season but became less of a problem as fishers searched out areas with crab of more acceptable quality. In the north in particular, there is less fishing pressure on the fishing grounds where the fishery initially developed. In fact, many fishers reported that they had virtually abandoned these grounds in favour of more productive offshore areas.

#### **3K**

Catch rates (CPUE) in Canada Bay (3A) increased by 19% over 1996 levels while those for White Bay (3B), Green Bay (3C) and Fogo-Twillingate (3D) were reduced by 20%, 39% and 7% respectively. These reductions in catch rates can be attributed to three factors; a general decline in resource availability, an increase in the incidence of soft-shelled crabs, and an increase in the incidence of Bitter Crab Disease (BCD). Although the CPUE reported for Offshore 3K (4) reflect little change in catch rates (+6%) it should be noted that this is a very large area and anecdotal information from fishers indicates that the nearshore fishing grounds had lower catch rates than in 1996. Several fishers reported that areas where CPUE was most drastically reduced were areas where they had encountered large numbers of BCD-infected crabs in 1996. Most of the management areas outside of Area 4 have been amalgamated into area 3KS for analysis of the 1997 fishery data. The areas represent a relatively homogeneous population of crab and are fished by the same vessels. Area 3KN has been analysed separately for 1997 due to the fact that this area was allotted a special quota in order to test the commercial feasibility of fishing deeper than 550m. Yearly comparisons for area 3KS are based on a summary of data for all years. CPUE for 3KS in 1997 was virtually unchanged from 1996. In fact catch rates have been relatively stable for the past 5 years.

The incidence of BCD infected crabs was extremely high in some parts of areas 4 and 3KS. Despite culling of infected crabs conducted by fishers, infected crabs were frequently landed at port as part of the catch. For example, DFO inspectors inspected the catches of 8 vessels landing at Twillingate on October 6, 1997. They found that in samples representing 22,600 lbs of crab, 678 lbs (3%) were infected. The incidence of infected crabs ranged from less than 1% to 18%. Similarly, between October 7-15 dockside graders (Tavel Ltd.) examined the catches of 20 vessels landing at Twillingate and determined that all had diseased crabs on board. One vessel landed a catch that had 22% diseased crabs. Many fishers admitted to dumping diseased crabs at sea in addition to those they landed indicating that the at-sea incidence may be significantly higher than port sampling would indicate.

### 3L

Trends in CPUE for this NAFO Division were highly variable in 1997. Although it might be reasonable to assume that CPUE's would decline during a second year of high-grading and a switch to larger-meshed traps by a large portion of the fleet, catch rates actually rose in several areas. In general it would seem that inshore areas experienced a stable or slightly declining CPUE while offshore areas experienced an increase in CPUE.

### 3Ps

CPUE's remained relatively stable in all areas of 3Ps with the exception of Area 11X, the "Mossy Hole" where the catch rate approximately doubled over the 1996 level. In addition to the reported catches from the Newfoundland fleet in 3Ps, vessels fishing out of St. Pierre are reported to have landed 190 t from grounds adjacent to the Halibut Channel.

### 4R

Catch rates for most areas were reduced from 1996 levels and remain relatively low compared to the rest of the Island and Labrador.

Detailed information on the fishery performance in individual management areas is presented in Tables 4 through 37.

### Observer Data

Comparative CPUE data for log and observer-supplied commercial catches are presented in Table 38. For most management areas the number of traps sampled by observers was too small for meaningful comparisons of CPUE. However, in most areas where more than 1 or 2 traps were measured CPUE's were quite comparable. Efforts to obtain measurements of at-sea commercial catches will be intensified in 1998.

## Discussion

### Prognosis

Immediate prospects for the Newfoundland and Labrador snow crab fishery are that for the short-term, abundance and catch rates will remain at relatively high levels in most areas. However, the concerns expressed previously (Taylor and O'Keefe, 1997) for the resource prospects in inshore areas, particularly those in NAFO Division 3K must be reiterated. A combination of soft-shelled abundance, a high incidence of BCD and high-grading with possible detrimental culling practices may be placing the long-term sustainability of the resource in these management areas at risk. Declining recruitment identified as a potential problem previously may have "bottomed out" as indicated by widespread reports of a high abundance of soft-shelled crabs in several inshore areas.

### Uncertainties

The impact of culling practices in response to a two-tiered pricing system makes direct comparison of CPUE's from 1996 and 1997 with previous years difficult to interpret. Although fishers and processors formally agreed that high-grading would not be practised despite a two-tiered price structure there is ample evidence that high-grading continued unabated in 1997. Whether culling practices improved over 1996 is uncertain. In addition, the continuing switch to larger meshed traps by offshore fishers in 3L and 3K further compromises the validity of year-to-year comparison.

Another uncertainty that has recently become prominent is the reported increase in the incidence of crabs infected with Bitter Crab Disease (BCD)(Taylor and Khan, 1995). Until 1997 this disease appears to be largely restricted to certain areas of NAFO Division 3K but appears to have spread throughout this area over the last year. Logbook reports and inshore time-series cruise catches indicate that the disease has become evident in Trinity and Conception Bays as well. This condition is caused by a parasitic dinoflagellate (Hematodinium sp.) and is fatal to crabs but harmless to humans. An unfortunate symptom of this disease is that infected crabs are unpalatable and may contaminate the meat of non-infected crabs that happen to be cooked with them in a batch cooker. The only practical means of dealing with this disease is education. Fishers have been asked to land all infected crabs and dispose of them at landfill sites. Discarding infected individuals at sea will undoubtedly contribute to the spread of the disease since many fishers cull and discard crab while steaming from one site to the next. A continuing program of educating the industry about all aspects of this disease is in place.

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#### Literature Cited

- Taylor, D.M., and P.G. O'Keefe. 1997. Summary of Performance of the 1996 Newfoundland and Labrador snow crab fishery. DFO CSAS Res. Doc. 97/08.
- Taylor, D.M., and P.G. O'Keefe. 1997. Summary of Performance of the 1995 Newfoundland and Labrador snow crab fishery. DFO CSAS Res. Doc. 97/59.
- Taylor, D.M., and W.G. Warren. 1991. Male snow crab, Chionoecetes opilio (Fabricius, 1788), weight-width relationships: an exercise in multi-source regression. J. Shell. Res. 10(1): 165-168.
- Taylor, D.M., and R.A. Khan. 1995. Observations on the occurrence of Hematodinium sp. (Dinoflagellata: Syndinidae), the causative agent of bitter crab disease in Newfoundland snow crab (Chionoecetes opilio). J. Invert. Path. 65: 283-288.

**Table 1.** Summary of licences by area for the Newfoundland and Labrador 1996 snow crab fishery.

Licence type	NAFO Division										Total	
	2J		3K		3LNO		3Ps		4R			
	96	97	96	97	96	97	96	97	96	97	96	97
Fulltime	4	4	29	29	42	42	-	-	3	3	78	78
Supp.	31	31	230	230	323	323	92	92	-	-	676	676
Explor.	-	-	-	-	4	4	-	-	56	61	60	65
Temp.	46	35	640	743	578	787	358	509	188	270	1810	2344
<b>Total</b>	<b>81</b>	<b>70</b>	<b>899</b>	<b>1002</b>	<b>947</b>	<b>1156</b>	<b>450</b>	<b>601</b>	<b>247</b>	<b>334</b>	<b>2624</b>	<b>3163</b>



Table 2. Summary of performance of the Newfoundland snow crab fishery, 1979-97.

Year	Div. 2J		Div. 3K		Div. 3LMNO		Div. 3Ps		Div. 4R		Total Newfoundland	
	Catch (t)	('000 trap hauls)	Catch (t)	('000 trap hauls)	Catch (t)	('000 trap hauls)	Catch (t)	('000 trap hauls)	Catch (t)	('000 trap hauls)	Catch (t)	('000 trap hauls)
1979	-	-	788	79	9,426	666	-	-	-	-	10,214	745
1980	-	-	628	58	8,190	527	-	-	-	-	8,818	585
1981	-	-	1,202	94	12,636	808	-	-	-	-	13,838	902
1982	-	-	2,505	215	10,673	762	-	-	-	-	13,178	977
1983	-	-	4,868	520	6,188	745	-	-	-	-	11,056	1,265
1984	-	-	5,080	606	4,476	679	-	-	-	-	9,556	1,285
1985	311	20	3,953	670	2,605	496	602	-	-	-	7,471	1,186
1986	467	40	3,958	917	3,467	490	651	-	-	-	8,543	1,447
1987	256	30	2,656	730	3,083	552	596	199	-	-	6,591	1,511
1988	451	48	2,565	656	5,903	641	856	231	-	-	9,775	1,576
1989	523	50	2,359	477	4,985	653	529	113	-	-	8,396	1,293
1990	645	51	4,253	334	5,211	608	596	119	-	-	10,705	1,112
1991	989	66	7,675	523	6,394	688	176	31	-	-	15,234	1,308
1992	1,529	110	7,295	551	6,652	519	121	10	-	-	15,597	1,190
1993	2,275	161	9,760	595	8,979	554	704	61	-	-	21,718	1,371
1994	2,978	295	11,039	869	12,237	847	1,590	96	655	119	28,499	2,226
1995	3,178	402	12,245	1,065	13,790	806	1,853	185	920	159	31,986	2,617
1996	3,090	303	14,185	1,163	16,847	1,110	3,052	184	833	141	38,007*	2,909
1997	3,166	266	14,830	1,257	22,185	1,499	4,753	250	967	269	45,901**	3,541

\* In addition to the total catch of 38,007 t, a catch of 1,032 t was caught in 4R by Quebec-based fishers.

\*\* In addition to the total catch of 45,901 t, a catch of 708 t was caught in 4R by Quebec-based fishers.

**Table 3.** Summary by management area of the comparison of 1995-96 and 1996-97 snow crab fishery data. Numbers represent the percentage change.

Area	Landings		Effort		CPUE	
	1997 vs 1996	1996 vs 1995	1997 vs 1996	1996 vs 1995	1997 vs 1996	1996 vs 1995
2J						
North	-15	+18	-32	+3	+24	+14
South	+18	-20	-18	-26	+49	+9
3K						
3A	+69	+3	+60	-22	+6	+33
3B	+40	+63	+77	+43	-21	+14
3C	-36	+43	+6	+137	-39	-40
3D	-11	+4	-8	+30	-3	-20
3Ks	+11	+5	+7	+3	+4	+2
3Kn	-27	-	-29	-	+3	-
4	+4	-5	-2	+3	+6	-7
3L						
5A	+10	-9	+25	+25	-12	-26
5B	-8	+33	+16	+58	-21	-15
5Bx	+81	+40	+57	+70	+15	-18
6A	0	+18	-8	+90	+8	-38
6B	+52	+15	+68	+28	-10	-10
6C	+25	+14	+27	+29	-2	-11
7A	+21	-6	+28	+16	-6	-19
7B	+7	+5	+8	+17	-1	-9
7C	-4	-3	+4	-16	-8	-13
7BC	+62	+13	+9	+116	+49	-47
8A	+153	-8	+182	-16	-10	+11
9A	-45	+3	-48	+66	+7	-38
3Ps						
10A	+53	+48	+42	+20	+8	+23
10C	+50	-9	+36	-7	+10	-2
11	+138	-13	+129	-65	+4	+146

This table was constructed from fishery performance information collated from vessel logbooks in each of the management areas. The comparisons made based on CPUE may not accurately reflect abundance.

**Table 4.** Area 2J - Southern Labrador.

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1985	311		20.5		15.2			
1986	467		39.6		11.8			
1987	256		30.1		8.5			
1988	451		48.5		9.3		926	
1989	523		50.3		10.4		920	
1990	645		51.2		12.6		920	
1991	917		59.2		15.5		920	
1992	1077	(317)	76.0	(22.5)	14.2	(14.4)	720	(300)
1993	1331	(455)	91.6	(31.6)	14.7	(14.4)	860	(440)
1994	1466	(491)	130.2	(54.6)	12.9	(9.0)	860	(440)
1995	1384	(779)	175.2	(111.3)	10.0	(7.0)	600	(760)
1996	1043	(503)	129.3	(59.2)	11.9	(8.5)	500	(600)
1997	1439	(867)	111.6	(77.4)	14.8	(11.2)	500	(825)

**Table 5.** Area 2JS extended (east of 53°30'W).

Year	Total landings		Effort		CPUE (kg/trap)		Quota (t)	
	(t)	(supp)	('000s)	(supp)	Full	(Supp.)	Full	(Supp.)
1994	330		25.8		12.8		300	
1995	334		40.7		8.2		300	
1996	331		28.1		11.8		300	
1997	178	(123)	13.3	(10.0)	15.5	(12.3)	0	(0)

An area south of 54°40'N and >100 n mi offshore was fished in 1996 resulting in a catch of 91 t (CPUE 12.2) by fulltime fishers and a catch of 261 t (CPUE 9.0) by supplementary fishers.

**Table 6.** Area 2J - Northern Labrador.

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1991	72	6.6	10.9	500
1992	452	45.7	9.9	400
1993	984	80.0	11.8	1000
1994	1182	168.9	7.0	1300
1995	931	143.2	6.5	1040
1996	833	128.2	6.5	900
1997*	1459	148.9	9.8	1325

\* The line separating 2JN and 2JNX was removed. Most of the landings were taken offshore.

An experimental quota of 100 t was allocated to Torngat Fish Processors Co-op in an area N of 50°40' latitude which resulted in a catch of 90 t (CPUE = 12.2 kg/trap).

**Table 7.** Area 2JN extended (east of 53°30'W).

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1995	529	60.1	8.8	500
1996	531	44.2	12.0	575

**Table 8.** Area 3A - Canada Bay.

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1992	82	8.2	10.0	50
1993	104	10.0	10.4	75
1994	112	19.6	5.7	100
1995	136	34.0	4.0	150
1996	140	26.4	5.3	200
1997*	237	42.3	5.6	250

\*Line of latitude changed from 50°30'N to 50°22'N.

**Table 9.** Area 3B - White Bay.

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1979	297	33.0	9.0	
1980	254	24.7	10.3	
1981	552	39.1	14.1	
1982	1153	84.2	13.7	
1983	2474	240.2	10.3	
1984	3048	354.4	8.6	
1985	1336	262.0	5.1	
1986	1353	397.9	3.4	
1987	418	154.8	2.7	
1988	387	184.3	2.1	750
1989	206	98.1	2.1	250
1990	182	41.4	4.4	150
1991	-	5.0	-	200
1992	209	26.1	8.0	200
1993	377	44.4	8.5	300
1994	476	58.8	8.1	400
1995	408	48.0	8.5	400
1996	667	68.8	9.7	700
1997	937	121.7	7.7	900

**Table 10. Area 3C - Green Bay.**

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1979	491	46.3	10.6	
1980	374	37.8	9.9	
1981	650	54.6	11.9	
1982	1352	130.0	10.4	
1983	537	88.0	6.1	
1984	502	76.1	6.6	
1985	476	80.7	5.9	
1986	938	246.8	3.8	
1987	303	112.2	2.7	
1988	255	127.5	2.0	400
1989	243	69.4	3.5	180
1990	260	47.3	5.5	280
1991	407	59.9	6.8	400
1992	416	47.8	8.7	400
1993	606	60.0	10.1	500
1994	611	67.9	9.0	600
1995	689	74.1	9.3	750
1996	984	175.7	5.6	1000
1997	634	186.5	3.4	750

**Table 11. Area 3D - Fogo-Twillingate.**

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1983	1857	191.4	9.7	
1984	1463	164.4	8.9	
1985	1063	141.7	7.5	
1986	895	165.7	5.4	
1987	424	83.1	5.1	
1988	800	163.3	4.9	300
1989	410	75.9	5.4	400
1990	709	77.1	9.2	600
1991	1593	156.2	10.2	1300
1992	1183	113.8	10.4	1200
1993	1297	107.2	12.1	1200
1994	1169	111.3	10.5	1200
1995	1419	168.9	8.4	1400
1996	1476	220.3	6.7	1550
1997	1314	202.2	6.5	1550

**Table 12. Area 4 - 3K offshore.**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1984	67		11.0		6.1			
1985	225		40.2		5.6			
1986	772		108.7		7.1			
1987	594		108.0		5.5			
1988	1123		184.1		6.1		1900	
1989	1534		229.0		6.7		1600	
1990	3102		168.6		18.4		3300	
1991	5579	(1060)	378.4	(90.6)	15.7	(11.7)	4300	(1400)
1992	5405	(2030)	407.8	(175.0)	14.5	(11.6)	3100	(1700)
1993	5772	(2154)	351.0	(137.0)	16.9	(15.7)	3200	(1800)
1994	5662	(2269)	363.8	(173.2)	17.8	(13.1)	3200	(1800)
1995	5805	(3515)	432.2	(283.5)	15.4	(12.4)	2300	(3200)
1996	5506	(3197)	443.5	(290.6)	15.1	(11.0)	2300	(3200)
1997	5709	(3345)	435.8	(290.6)	13.6	(12.2)	2200	(3500)

**Table 13. Area 3Ks.**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1993	868	-	51.4	-	16.9	-	750	-
1994	3009	(2002)	218.0	(144.0)	13.7	(13.9)	835	(1665)
1995	3788	(2485)	264.9	(172.6)	14.2	(14.4)	1400	(2600)
1996	3981	(2598)	272.7	(183.0)	15.3	(14.2)	1400	(2600)
1997	4432	(2890)	291.6	(190.1)	15.4	(15.2)	1550	(2900)

**Table 14. Area 3KN, North of. 50°40' in 3KBC (supp.).**

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1996	1431	126.6	11.3	700
1997*	1041	89.7	11.6	700

\*Permits were issued to both fulltime and supplementary crab fishers to fish in outer northern 3K at depths >300 fms, resulting in additional catches of 128 t and 398 t respectively.

**Table 15. Area 5A - Bonavista Bay.**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1979	1586		172.4		9.2			
1980	1905		192.4		9.9			
1981	1376		172.0		8.0			
1982	905		96.3		9.4			
1983	1101		203.9		5.4			
1984	1327		250.4		5.3			
1985	728		251.0		2.9			
1986	648		140.9		4.6		500	
1987	602		84.8		7.1		500	
1988	844	(109)	89.6		8.2		600	(100)
1989	959	(320)	75.2		8.5		600	(300)
1990	1072	(416)	91.1	(37.8)	12.3	(11.0)	600	(300)
1991	1102	(479)	102.8	(41.7)	10.2	(11.5)	650	(350)
1992	1160	(468)	82.6	(35.2)	14.6	(13.3)	650	(350)
1993	1431	(526)	99.1	(41.1)	15.6	(12.8)	700	(400)
1994	1550	(984)	101.2	(70.3)	18.3	(14.0)	500	(600)
1995	1106	(736)	78.4	(52.9)	14.5	(13.9)	375	(725)
1996*	-	(1006)	-	(97.7)	-	(10.3)	-	(1000)
1997	-	(1111)	-	(122.1)	-	(9.1)	-	(1000)

\* Beginning in 1996 fulltime vessels were excluded from fishing in this area.

**Table 16. Area 5B - Outer Bonavista Bay.**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1990	161	(161)	36.6	(36.6)	-	(4.4)	200	(200)
1991	479	(479)	41.6	(41.6)	-	(11.5)	350	(350)
1992	769	(433)	48.6	(27.9)	16.2	(15.5)	400	(400)
1993	1277	(826)	78.6	(47.5)	14.5	(17.4)	500	(500)
1994	1562	(868)	105.0	(57.5)	14.6	(15.1)	700	(600)
1995	1445	(881)	89.2	(56.8)	17.5	(15.5)	500	(800)
1996	1923	(1275)	141.0	(96.6)	14.6	(13.2)	600	(1200)
1997*	-	(1773)	-	(164.2)	-	(10.8)	-	(1700)

\* In 1977 fulltime vessels and large supplementary vessels were excluded from fishing in this area.

Table 17. Area 5B - extended.

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1994	697	(431)	72.5	(49.0)	11.3	(8.8)	200	(400)
1995	592	(237)	31.5	(12.5)	18.7	(19.0)	400	(400)
1996	827	(388)	53.5	(24.6)	15.2	(15.8)	500	(500)
1997	1500	(779)	83.8	(41.4)	17.2	(18.8)	750	(750)

Table 18. Area 6A - Inner Trinity Bay.

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1979	67	4.2	16.0	
1980	59	4.6	12.9	
1981	110	14.9	7.4	
1982	65	10.7	6.1	
1983	72	12.0	6.0	
1984	17	2.5	6.9	
1985	19	5.0	3.8	
1986	18	3.5	5.1	
1987	44	9.0	4.9	100
1988	98	22.8	4.3	75
1989	180	35.3	5.1	200
1990	232	38.0	6.1	200
1991	259	46.3	5.6	200
1992	177	21.6	8.2	200
1993	380	43.2	8.8	275
1994	490	48.0	10.2	400
1995	583	43.8	13.3	525
1996	689	83.0	8.3	700
1997	690	76.7	9.0	600



**Table 19. Area 6B - Conception Bay.**

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1979	464	28.8	16.1	
1980	869	56.4	15.4	
1981	502	43.7	11.5	
1982	694	60.9	11.4	
1983	564	64.1	8.8	
1984	333	52.0	6.4	
1985	139	26.2	5.3	
1986	193	32.7	5.9	
1987	227	24.7	9.2	
1988	499	45.0	11.1	
1989	476	78.0	6.1	500
1990	314	62.8	5.0	500
1991	383	100.8	3.8	400
1992	304	49.8	6.1	300
1993	309	44.1	7.0	300
1994	416	33.5	12.4	300
1995	516	37.1	13.9	525
1996	595	47.6	12.5	650
1997	904	80.0	11.3	800

**Table 20. Area 6C - Eastern Avalon**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1979	7632		436.1		17.5			
1980	5065		242.3		20.9			
1981	7607		484.5		15.7			
1982	3368		253.2		13.3			
1983	801		108.2		7.4			
1984	312		55.7		5.6			
1985	113		24.6		4.6			
1986	144		26.7		5.4			
1987	172		29.7		5.8			
1988	751		72.2		10.4		300	(300)
1989	661		68.1		9.7		400	(300)
1990	850	(231)	102.0	(36.1)	9.4	(6.4)	600	(400)
1991	1090	(391)	134.7	(61.1)	9.5	(6.4)	600	(400)
1992	1078	(428)	102.2	(47.6)	11.9	(9.0)	600	(400)
1993	1541	(839)	88.5	(55.2)	21.1	(15.2)	700	(500)
1994	2024	(1391)	110.5	(79.9)	20.7	(17.4)	700	(900)
1995	2128	(1658)	120.9	(97.0)	19.7	(17.1)	425	(1512)
1996*	2432	(2152)	155.9	(141.6)	19.6	(15.2)	300	(1600)
1997**	-	(3028)	-	(197.9)	-	(15.3)	-	(2600)

\* A quota of 300 t was allocated to the temporary seasonal fishers for Eastern/Southern Avalon in 1996 which resulted in a catch of 291 t (CPUE 15.2)

\*\* In 1997 fulltime vessels were excluded from fishing in this area.

**Table 21. Area 7A - Outer Trinity Bay.**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1979	569		57.5		9.9			
1980	494		58.1		8.5			
1981	178		24.7		7.2			
1982	95		13.8		6.9			
1983	107		20.2		5.3			
1984	202		38.1		5.3			
1985	113		27.6		4.1			
1986	165		56.9		2.9			
1987	140		36.8		3.8			
1988	200		39.2		5.1			
1989	251		51.2		4.9		300	
1990	245		40.2		6.1		400	
1991	397		60.2		6.6		400	
1992	497	(176)	40.5	(13.1)	11.7	(13.4)	250	(150)
1993	751	(350)	52.5	(26.3)	15.3	(13.3)	300	(200)
1994	1066	(800)	68.0	(50.0)	14.8	(16.0)	300	(500)
1995	1060	(905)	70.7	(60.7)	15.5	(14.9)	200	(700)
1996	994	(814)	81.8	(69.0)	14.1	(11.8)	150	(800)
1997*	-	(1202)	-	(104.5)	-	(11.5)	-	(1200)

\* In 1997 fulltime vessels were excluded from fishing in this area.

**Table 22. Area 7B - Offshore Avalon (Shoal Patch).**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1981	1840		65.7		28.0			
1982	4194		218.4		19.2			
1983	1662		151.1		11.0			
1984	431		47.9		9.0			
1985	31		6.0		5.2			
1986	-		-		-			
1987	-		-		-			
1988	298		39.7		7.5			
1989	519		68.3		7.6			
1990	701		60.4		11.6		500	
1991	1371		114.3		12.0		1300	
1992	1758		102.2		17.2		1300	
1993	1730		82.8		20.9		1500	
1994	2383	(544)	118.1	(28.8)	20.6	(18.9)	1800	(200)
1995	2514	(841)	129.0	(47.8)	20.6	(17.6)	1700	(800)
1996	2638	(960)	151.4	(58.2)	18.0	(16.5)	1700	(800)
1997	2825	(1015)	164.2	(62.3)	17.7	(16.3)	1800	(1000)

**Table 23. Area 7C - Downing Basin.**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1982	114		7.3		15.6			
1983	733		61.1		12.0			
1984	397		40.9		9.7			
1985	-		-		-			
1986	-		-		-			
1987	-		-		-			
1988	-		-		-			
1989	-		-		-			
1990	-		-		-			
1991	-		-		-			
1992	147		13.7		10.7		200	
1993	264		14.4		18.3		300	
1994	746		46.6		16.0		400	
1995	855	(374)	43.3	(20.4)	21.0	(18.3)	400	(300)
1996	833	(350)	49.8	(22.2)	17.5	(15.8)	450	(300)
1997	796	(290)	51.7	(19.7)	15.9	(14.7)	500	(300)

**Table 24. Area 7Bc - Shoal Patch/Downing Basin extended.**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1995	539	(367)	29.8	(20.4)	18.2	(18.0)	175	(325)
1996	1237	(700)	69.6	(37.8)	16.9	(18.5)	550	(850)
1997	1581	(917)	79.4	(44.7)	19.1	(20.5)	650	(950)

**Table 25. Area 3LNO - Outside 200 miles.**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1995	1370	(934)	69.2	(47.4)	19.9	(19.7)	450	(1050)
1996	1552	(1232)	149.2	(116.2)	9.7	(10.6)	300	(1200)
1997*	2509	(1917)	161.9	(122.1)	15.1	(15.7)	550	(1150)

**Table 26. Area 3L - Outside 170 and inside 200 n miles.**

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1996	502	(353)	28.2	(19.7)	17.5	(17.9)	200	(400)
1997	1407	(865)	105.0	(44.4)	9.1	(19.5)	600	(900)

**Table 27.** Area 8A - Southern Avalon (inside 50 miles).

Year	Total landings		Total effort		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	('000s)	(Supp.)	Full	(Supp.)	Full	(Supp.)
1980	292		13.8		21.1			
1981	854		45.2		18.9			
1982	732		49.8		14.7			
1983	955		99.5		9.6			
1984	1068		135.2		7.9			
1985	627		87.1		7.2			
1986	1267		117.3		10.8			
1987	1129		92.5		12.2			
1988	2347		223.5		10.5		2300	
1989	1640		197.6		8.3		2400	
1990	448		65.9		6.8		2000	
1991	624		115.6		5.4		800	
1992	456	(276)	45.3	(25.1)	8.9	(11.0)	200	(200)
1993	855	(412)	85.1	(38.5)	9.5	(10.7)	400	(300)
1994	819	(303)	55.2	(20.3)	14.8	(14.9)	400	(800)
1995	-	(502)	-	(30.4)	-	(16.5)	-	(563)
1996	-	(464)	-	(25.4)	-	(18.3)	-	(700)
1997		(1174)	-	(71.6)	-	(16.4)	-	(1000)

**Table 28.** Area 8B - Southern Avalon (outside 50 miles).

Year	Total landings		Effort ('000s)		CPUE (kg/trap)		Quota (t)	
	(t)	(Supp.)	Total	(Supp.)	Full	(Supp.)	Full	(Supp.)...
1995	26		1.9		13.4		200	
1996	295		18.0		16.4		300	
1997	948	(551)	52.1	(29.9)	17.9	(18.4)	400	(600)

**Table 29. Area 9A - St. Mary's Bay.**

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1979	8	1.2	6.7	
1980	-	-	-	
1981	168	11.2	15.0	
1982	506	48.2	10.5	
1983	274	37.5	7.3	
1984	264	35.2	7.5	
1985	164	23.1	7.1	
1986	102	21.3	4.8	
1987	4	0.7	5.8	
1988	266	36.9	7.2	
1989	217	29.7	7.3	200
1990	267	31.0	8.6	200
1991	317	27.8	11.4	300
1992	306	27.1	11.3	300
1993	441	36.8	12.0	300
1994	484	29.7	16.3	400
1995	515	35.0	14.7	525
1996	530	58.2	9.1	525
1997	294	30.3	9.7	425

**Table 30. Area 9B - St. Mary's Bay (west of Cape Pine).**

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1995	39	-	-	200
1996	39	3.6	10.8	200
1997	443	23.1	19.2	400

**Table 31. Area 10A - Placentia Bay.**

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1983	43	3.1	13.9	
1984	175	18.6	9.4	
1985	385	44.8	8.6	
1986	930	91.2	10.2	
1987	596	198.7	3.0	600
1988	856	231.4	3.7	600
1989	529	112.6	4.7	600
1990	596	119.2	5.0	600
1991	176	31.4	5.6	600
1992	121	11.4	10.6	400
1993	603	55.3	10.9	400
1994	895	57.7	15.5	400
1995	700	44.3	15.8	625
1996	1039	53.3	19.5	1000
1997	1591	78.8	20.2	1500

**Table 32. Area 10B - Outer Placentia Bay (between 46°N and 46°30'N).**

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1996	759	37.4	20.3	750
1997	1011	48.6	20.8	1000

**Table 33. Area 10C - Halibut Channel (south of 46°).**

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1994	289	14.0	20.6	250
1995	818	44.2	18.5	800
1996	747	41.0	18.2	750
1997	1124	58.5	19.2	1000

**Table 34.** Area 11 - Fortune Bay.

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1993	101	10.9	93	100
1994	406	35.0	11.6	200
1995	335	59.8	5.6	575
1996	292	21.2	13.8	350
1997*	694	48.5	14.3	700

\* A quota of 200 t was allocated to fishers in Area 11 west of Pass Is. resulting in a catch of 61 t (CPUE = 4.0).

**Table 35.** Area 11X - South of 46°15'N.

Year	Total landings (t)	Effort ('000s)	CPUE (kg/trap)	Quota (t)
1996	215	34.1	6.3	200
1997	272	20.0	13.6	200

**Table 36.** Area 4R/3Pn west/south coast (fulltime).

Area	Year	Quota (t)	Landings (t)	Effort ('000 tr. h)	CPUE (kg/tr. h)
Area 13	1994	889	870 (334) <sup>1</sup>	61.9 <sup>2</sup>	5.4 <sup>2</sup>
	1995	889	883 (198)	29.6	6.7
	1996	1111	1071 (39)	7.4	5.3
	1997	931	895 (187)	39.8	4.7
South of Table Point + 3Pn	1994	-	157	-	3.8
	1995	225	205	-	2.6
	1996	645	454 <sup>3</sup>	126.1	3.6
	1997	645	314	108.3	2.9
Bay of Islands	1994	110	106	16.6	6.3
	1995	110	110	16.9	6.5
	1996	80	57	13.9	4.1
	1997	80	29	11.6	2.5
St. George's Bay	1994	65	58	8.4	7.1
	1995	65	64	7.9	8.1
	1996	50	45	5.6	8.1
	1997	45	44	6.7	6.6

<sup>1</sup> Both Quebec and Newfoundland vessels landed in the other Province and the incidence varies. Landings in Newfoundland in brackets ( ).

<sup>2</sup> Effort and CPUE are for Newfoundland vessels only.

<sup>3</sup> 1984 t landed in Quebec

Table 37. Area 4R/3Pn - west/south coast (temporary).

Area	Year	Quota (t)	Landings (t)	Effort ('000 tr. h)	CPUE (kg/tr. h)
A. Lapoile Bay	1995	15	13	-	-
	1996	39	8	3.1	2.6
	1997	40	0	-	-
B. Cape Ray-Johnsons Cove	1995	10	2	-	-
	1996	20	4	0.9	4.4
	1997	20	7	1.3	5.4
C. Johnsons Cove-Cape St. George	1995	25	24	-	-
	1996	66	63	9.4	6.7
	1997	170	128	27.8	4.6
D. Cape St. George-Bear Head	1995	25	25	-	-
	1996	69	62	10.8	5.7
	1997	70	31	5.5	5.6
E. Bear Head-Cape St. Gregory	1995	50	50	-	-
	1996	81	31	11.0	2.8
	1997	80	16	5.0	3.2
F. Inside Bay of Islands	1995	-	-	-	-
	1996	30	24	7.5	3.2
	1997	30	5	2.8	1.8
G. Cape St. Gregory-Broom Point	1995	60	59	-	-
	1996	140	140	15.2	9.0
	1997	140	158	16.8	9.4
H. Broom Point-Table Point	1995	50	27	-	-
	1996	69	36	5.1	7.0
	1997	70	48	12.4	3.9
Area 13 (West Nfid. vessels)	1995	-	-	-	-
	1996	60	37	7.7	4.8
	1997	0	0	-	-
TOTALS	1995	235	200		
	1996	574	405		
	1997	620	393		



Table 38. Comparison of observer and logbook data for the snow crab fishery, 1995-97.

Area	CPUE 1995			CUPE 1996			CPUE 1997		
	Logbook	Observer	# traps sampled	Logbook	Observer	# traps sampled	Logbook	Observer	# traps sampled
2JS	11.3	10.0	12	5.2	11.9	1	-	-	-
2JSX	-	-	-	20.0	11.8	4	13.4	14.6	1
2JN	-	-	-	10.2	6.5	6	-	-	-
3A	3.3	4.0	1	-	-	-	-	-	-
3B	14.0	8.5	3	-	-	-	7.7	9.9	1
3C	18.2	9.3	1	-	-	-	-	-	-
3D	-	-	-	-	-	-	6.5	7.4	11
4	21.2	15.4	68	2.9	15.1	1	13.1	13.8	12
3Kb	19.1	14.0	5	10.3	16.4	1	-	-	-
3Kc	18.1	12.2	7	34.9	16.1	1	15.2	11.7	22
3Kg	30.9	17.7	6	-	-	-	-	-	-
3KN	-	-	-	-	-	-	11.6	13.9	3
5A	-	-	-	-	-	-	9.1	9.6	18
5B	19.1	17.5	6	6.8	14.6	1	-	-	-
5BX	19.3	18.7	6	-	-	-	17.9	27.3	2
6C	11.2	19.7	3	-	-	-	15.3	16.4	1
7A	19.7	15.5	4	-	-	-	11.5	26.8	2
7B	22.4	20.6	55	27.8	18.0	1	-	-	-
8A	-	-	-	-	-	-	16.4	26.4	2
8B	-	-	-	-	-	-	-	-	-
9A	-	-	-	-	-	-	9.7	17.3	1
9B	-	-	-	-	-	-	19.2	25.1	2



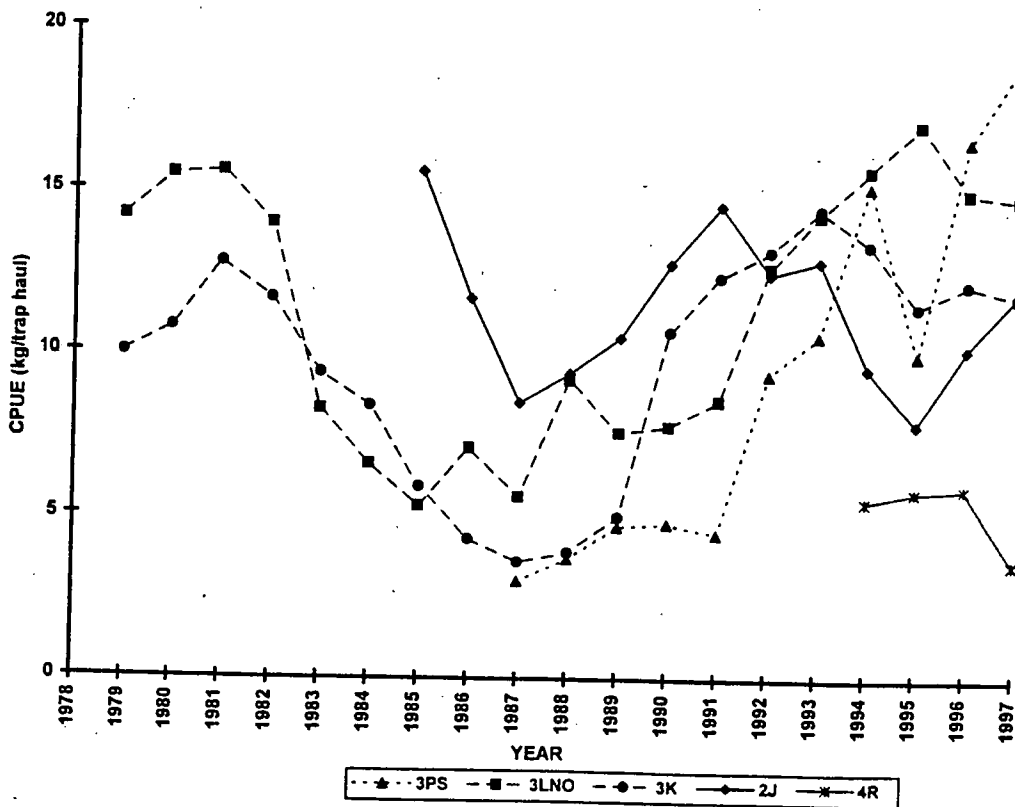
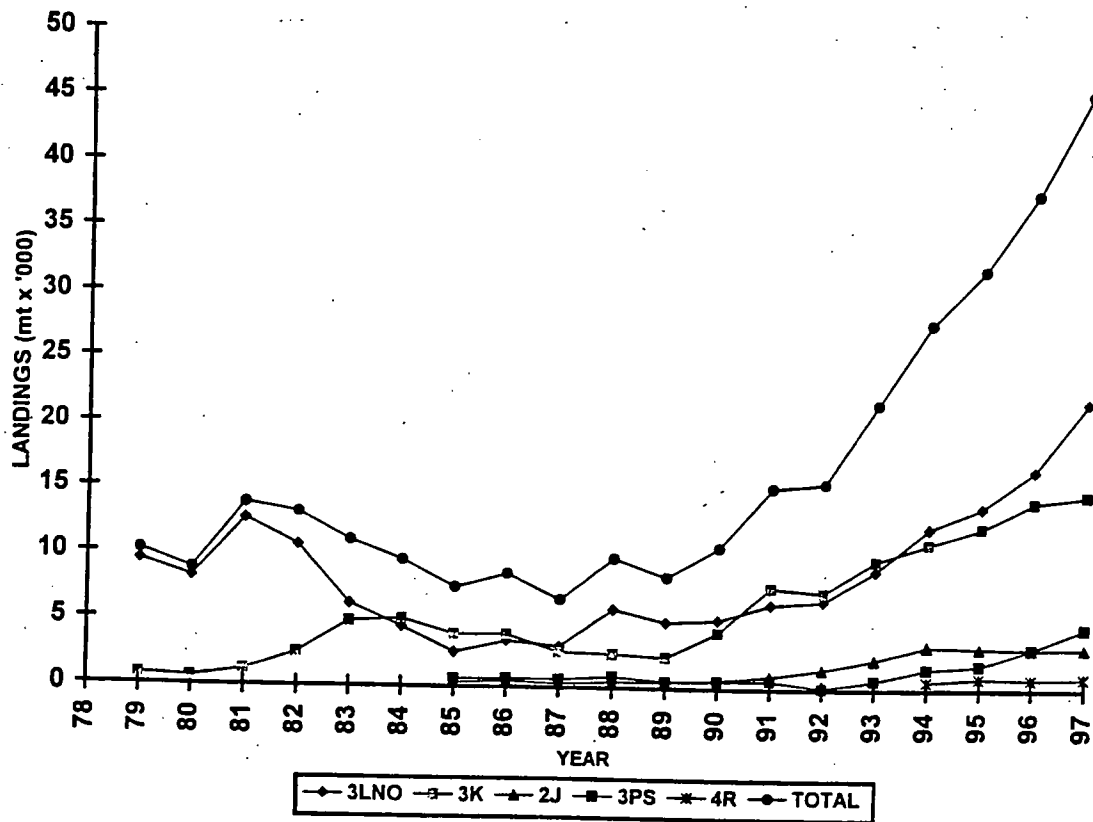


Figure 2. Summary of landings and CPUE (kg./trap haul) by NAFO division, 1979-1997.

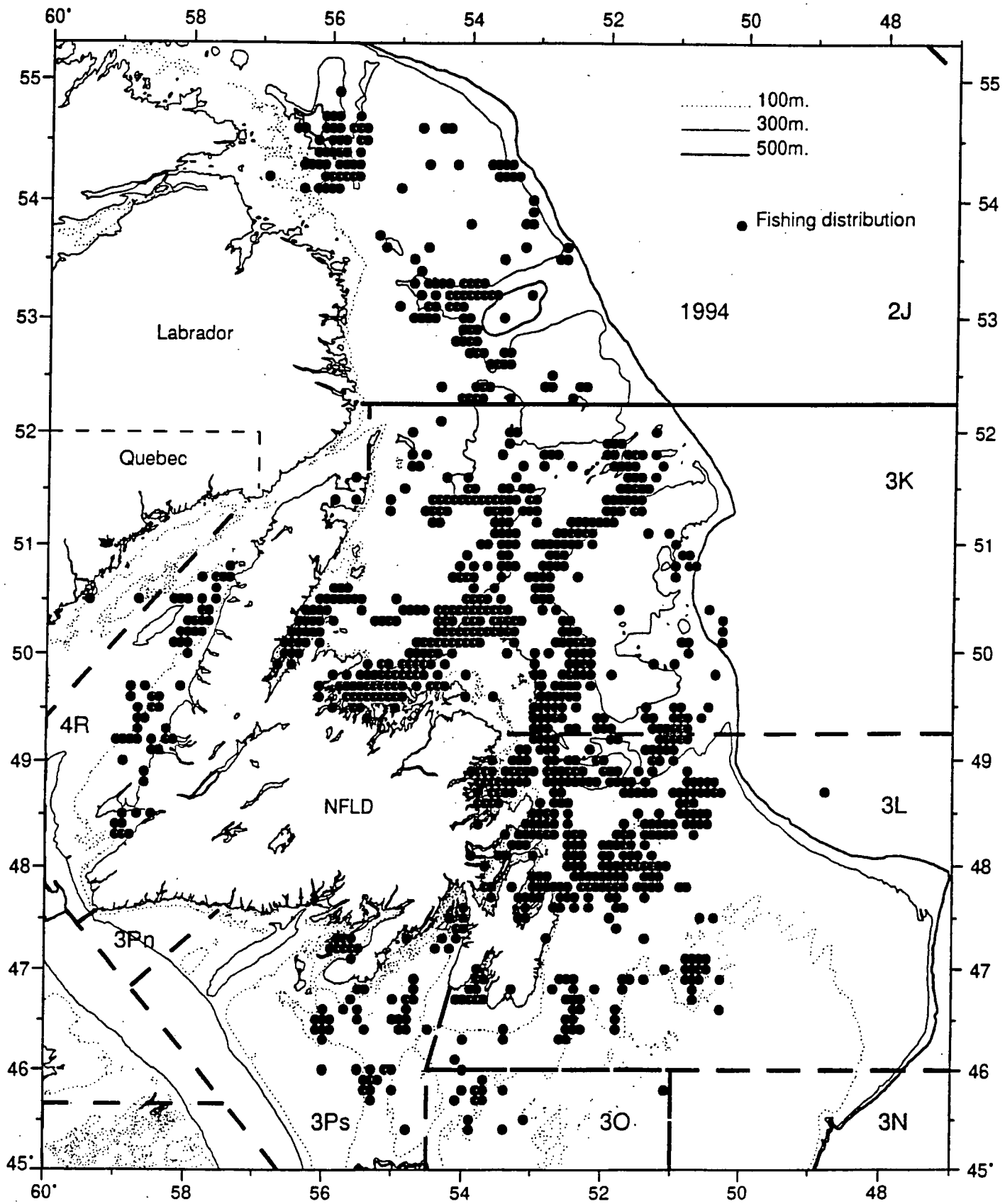


Figure 3a. Distribution of crab fishing effort, 1994.

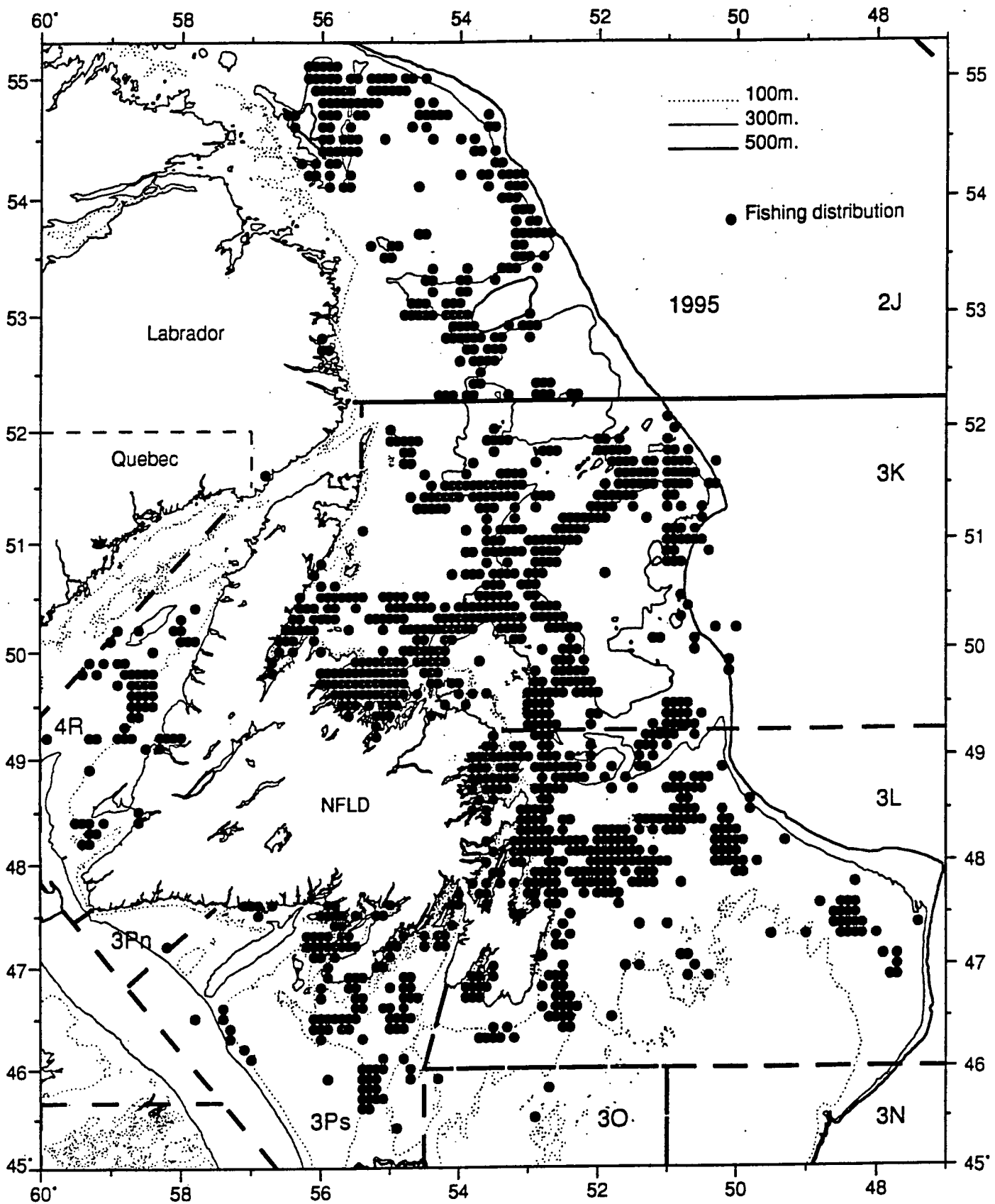


Figure 3b. Distribution of crab fishing effort, 1995.

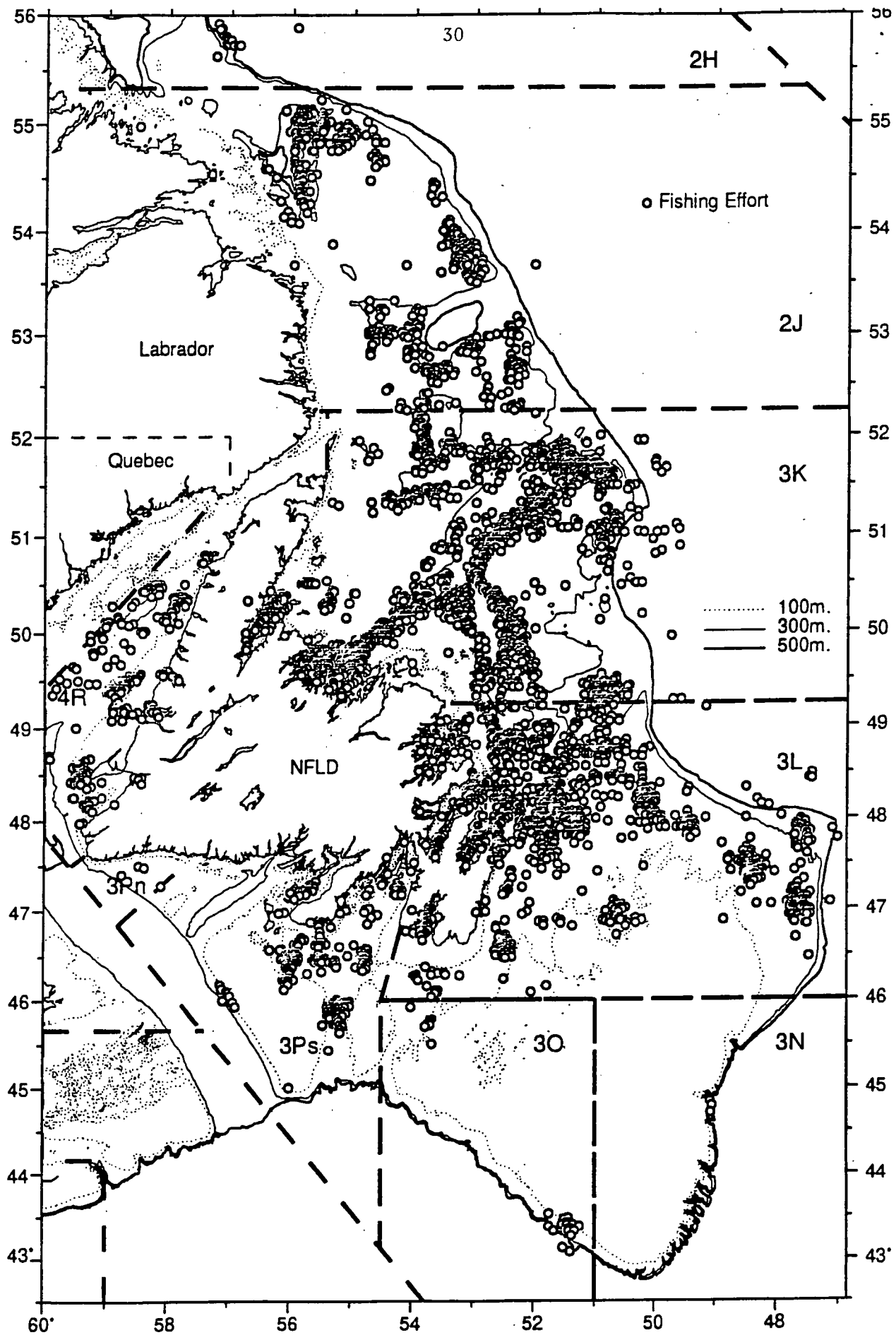


Figure 3c. Distribution of crab fishing effort, 1996.

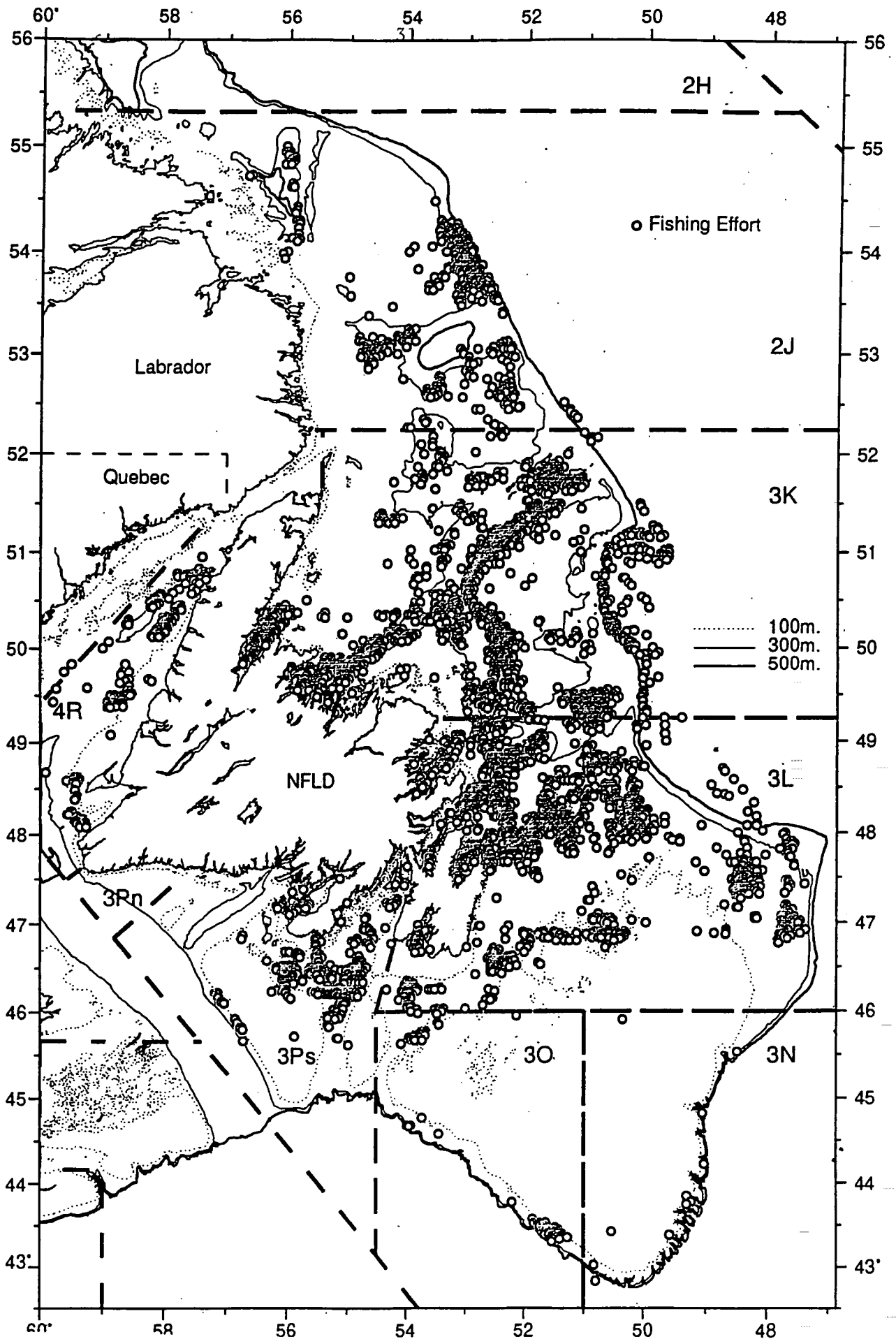


Figure 3d. Distribution of fishing effort, 1997.