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Information Pertaining to the Distribution of Northern Shrimp (*Pandalus borealis*, Kroyer) in NAFO Divisions 3LNO

by:

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Abstract

Since 1995, Canadian multi-species stratified random surveys have been used to estimate northern shrimp (*Pandalus borealis*, Kroyer) biomass and abundance indices within NAFO Divisions 3LNO. The geographic distribution of this resource including the relative and seasonal distribution inside and outside the NAFO Regulatory Area (NRA) by both Division and age group are described within this report. Biomass increased from 5,921 tons in autumn 1995 to 121,815 tons in spring 2000 then decreased to 103,451 tons in spring 2001. At least 90% of the resource was found within NAFO Div. 3L. Tighter confidence limits around the point estimates were usually obtained from autumn rather than spring surveys. Autumn estimates indicated that between 12 and 24% of the resource was found in the NRA. Whereas between 18 and 32% of the biomass, estimated from spring survey data, were found in the NRA. Within NRA demographics were similar to those from their respective divisions.

The abundance and seasonal distribution of the resource is then described in relation to a proposed Southeast Shoal (Div. 3N) closed area. Northern shrimp were found in the proposed area on only two occasions.

Introduction

The northern shrimp (*Pandalus borealis*) stock, in Div. 3LNO, extends beyond Canada's 200 Nmi limit, therefore, it is a NAFO regulated stock. The Faroese began fishing shrimp in the NAFO Regulatory Area (NRA) during 1993. In 1999, a 6,000-ton quota was established for 2000 and 2001, and fishing was restricted to Div.3L, at depths greater than 200 m. The 6,000-quota was established as 15% of the lower confidence limit around the autumn 1998 3L biomass estimate. It was recommended that this harvest level be maintained for the time necessary to determine its impact upon shrimp resources. The average percent biomass contributed to the 3LNO stock by the Div. 3L NRA, over the period 1995-1998, was 17.10%. Therefore, a 1,000-ton quota was established in the NRA while a 5,000-ton quota was established in the Exclusive Economic Zone (EEZ).

This report describes the geographic distribution of this resource including the relative and seasonal distribution inside and outside the NAFO Regulatory Area (NRA) by both Division and age group. The abundance and seasonal distribution of the resource is then described in relation to a proposed Southeast Shoal (Div. 3N) closed area (NAFO FC Working Paper 02/10). This work was requested in NAFO SC-02/22.

Methods and Materials

Data used in describing the resource were obtained from the Canadian autumn and spring multi-species research surveys. Shrimp abundance, biomass, maturity and carapace length data have been collected since autumn 1995, as part of the Canadian multi-species surveys conducted using the CCG *Wilfred Templeman*, CCG *Alfred Needler* and

CCG *Teleost*. Fishing sets of 15 minute duration and a towing speed of 3 knots were randomly allocated to strata covering the Grand Banks and slope waters to a depth of 1500 m (Fig. 1-3). All vessels used a Campelen 1800 shrimp trawl with a codend mesh size of 40 mm and a 12.7-mm liner. SCANMAR sensors estimated that the mean wingspread was 16.8 m. Details of the survey design and fishing protocols are outlined in (Brodie, 1996; McCallum and Walsh, 1996).

Shrimp were frozen and returned to the Northwest Atlantic Fisheries Centre where identification to species and maturity stage was made. The maturity of the shrimp was defined by four stages:

males;
transitionals;
primiparous females;
and multiparous females

as defined by Ramussen (1953), Allen (1959) and McCrary (1971).

Oblique carapace lengths (0.1 mm) were recorded while number and weight per set were estimated. Stratified abundance and biomass indices were estimated via areal expansion using programs based upon Cochran (1997) and written in SAS (D. Orr, unpublished). Inshore strata were not sampled during 1999, therefore, the analysis was restricted to data collected from offshore strata only (numbered <784). Comparisons between biomass within an entire division and the relative amount within it's respective NRA were made using raw percent, running average percent, running weighted average percent and running geometric mean percent as described in Zar (1999).

Length frequencies were separated by maturity stage and the following depth strata:

<=183 m
184 – 274 m
275 – 366 m
367 – 549 m
=>550 m

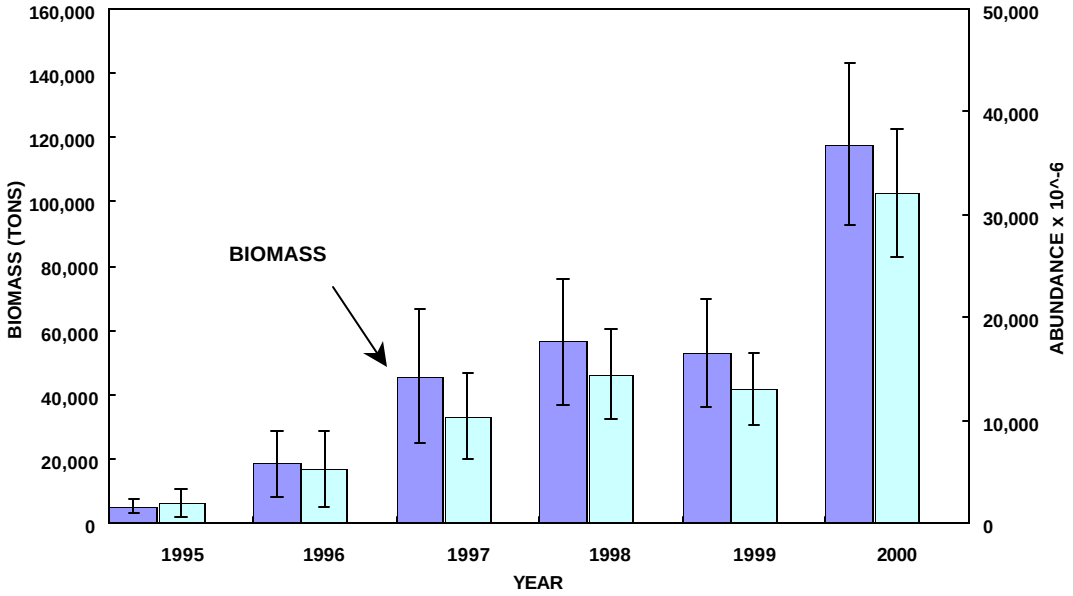
in an attempt to gain better modal separation when aging. Wherever possible, modal analysis was conducted using MIX 3.1A (MacDonald and Pitcher, 1979). In certain cases, small sample sizes resulted in length frequencies that could not validly be aged using Mix. In these cases, it was necessary to create the following age length key:

Age (years)	Carapace length
0	<8.5 mm
1	8.5 – 12.0 mm
2	12.5 – 17 mm
3	17.5 – 20.0 mm
4	20.5 – 22.5 mm
5	23.0 – 24.5 mm
6	25.0 – 27.0 mm
7+	>27.0 mm

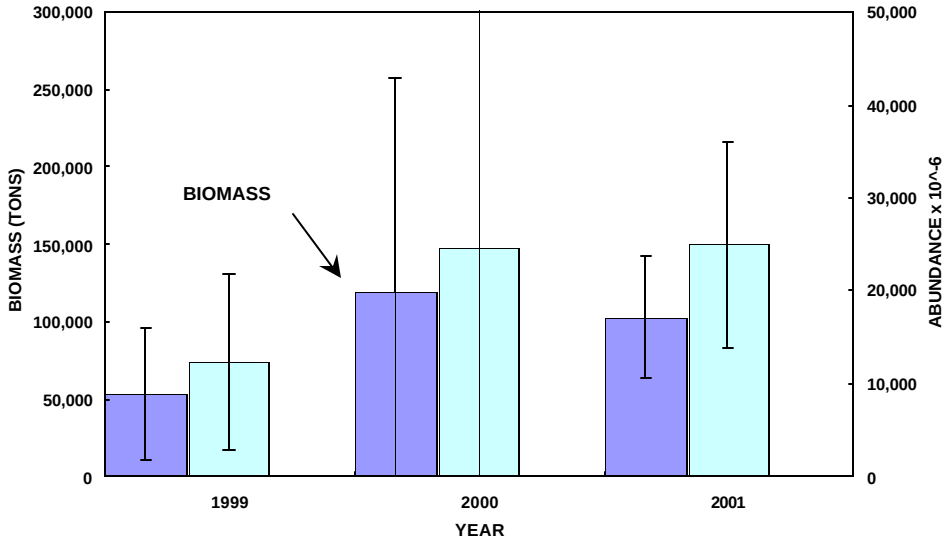
The age length key was developed through analysis of well-developed modes and observations made in adjacent waters (Orr *et al*., 2002; Nicolajsen, 2001; Skuladóttir, 2001; Skuladóttir and Diaz, 2001).

Results and Discussion

Results of the autumn 1995-spring 2001 Canadian multi-species surveys (Fig. 1-3; Tables 1-11) indicate that shrimp have been widely distributed along the edge of the Grand Banks. However, the preponderance of shrimp was in found in Div. 3L. The biomass index increased from 5,921 tons in autumn of 1995 to 59,914 tons during autumn of 1998, remained stable until spring of 2000, at which time it increased to 121,815 tons but then decreased to 103,451 tons during spring 2001.



Autumn multispecies survey biomass and abundances of 3LNO *P. borealis*



Spring multispecies survey biomass and abundances of 3LNO *P. borealis*

These charts indicate that the biomass and abundance estimates for the autumn surveys have tight confidence limits relative to spring survey results. The lower confidence limits for the spring of 2000 are negative. Differences between spring and autumn confidence limits indicate that there may be a seasonal influence upon shrimp catchability and/ or distribution patterns. For this reason, data from the autumn surveys are treated separately from the spring survey data.

The breadth of the autumnal confidence limits appear inversely proportional to the point estimates indicating that catches (weight and count) are less variable when population size is high.

Distribution of shrimp in Divisions 3LNO

Over the study period, the area outside 200 Nmi accounted for between 12 and 31% of the Div. 3LNO biomass estimates (Tables 7 - 11; Fig. 1-3).

More than 90% of the biomass was found within Div. 3L, mostly within depths from 185 to 550 m. Over the six autumn surveys, the biomass within the NRA ranged between 11 and 24% of the total Div. 3L biomass. Various means of obtaining running percent averages indicate that shrimp within the NRA contribute between 15.3 and 23% percent of the Div. 3L biomass. During spring, the NRA contribution between 18 and 30% of the total 3L biomass. The various formulations of percent averages indicated that the NRA contributed ranged between 24.63-29.32 % of the total Div. 3L spring biomass. However, one must use caution when interpreting the latter range, because as mentioned above, confidence limits for the spring are broad, often extending into negative values (Table 4).

Division 3N accounted for less than 10% of the total Div. 3LNO biomass. More than 80% of the Div. 3N biomass was found outside the 200 Nmi limit. Division 3O accounted for less than 1% of the Div. 3LNO biomass. The area outside the 200 Nmi limit contributed between 0-34% of the Div. 3O biomass (Tables 7 -10, Fig. 1-3).

Table 11 indicates the 1999 and 2000 annual comparisons between the entire and the NRA biomasses. Between 22 and 27 percent of the Div. 3L biomass was found in the Div. 3L NRA. Ninety six percent of the Div. 3N biomass was found in the Div. 3N NRA. While between 5 and 85% of the Div. 3O biomass was found in the Div. 3O NRA. When all divisions are combined, the NRA contributed between 23 and 27 % of the biomass. These comparisons should be viewed with caution because only two data points were used in the calculations.

Stock composition

Detailed length frequency distributions for each maturity stage, division, NRA and season are presented in Tables 11-46. There is consistency between demographics within entire divisions and their respective NRA (Fig. 4-8). Comparisons of y-axis scales along these plots clearly indicate differences in population size between divisions. The y-axis scales for Div. 3L is approximately two orders of magnitude greater than it is for Div. 3N and three orders of magnitude greater than it is for Div. 3O. Because shrimp were abundant in Div. 3L, the length frequencies had well developed modes making it possible to identify 0-group to 7+ year old shrimp (Fig. 9).

Males with a modal length of 18.0-mm CL, believed to have been the 1997 year-class (age 3) dominated abundances within the autumn 2000 survey data. The 1998 year-class was evident near 15 mm while the 1999 year-class had a mode between 9 and 11.5 mm. The largest males (>19 mm) and smallest females (< 22 mm) are thought to belong to the 1996 year-class. The weaker 1996 year-class appears to be followed by relatively strong 1997 and 1998 year-classes. The broad female distribution suggests that it consists of several year-classes (Fig. 4).

It is predicted that the residual female biomass as well as the stronger 1997 and 1998 year-classes will moderate the affects of the weaker 1996 year-class.

Low numbers of shrimp in Div. 3N and 3O resulted in length frequencies that did not have well defined modes (Fig. 6-9), therefore the respective age frequencies may not be representative of the population (Fig. 11 and 12).

Relative abundance and biomass in the proposed closed area

The proposed closed area is referenced in NAFO FC Working Paper 02/10 and is illustrated in Fig. 16 of this document. Tables 47 and 48 (Fig. 17-19) indicate that shrimp were rarely found in the proposed closed area. However, small patches of northern shrimp were present in the deeper waters along the Div. 3N shelf slope.

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Table 1. Total abundance (X 1000), biomass (Kg. X1000) of northern shrimp (*Pandalus borealis*) collected during the autumn 1995 - 2000 Canadian research surveys into NAFO Div. 3L. (All tows were standardized to 15 minutes; . means not sampled.). Data were taken from strata < 784 so that all years would be comparable.

Depth	Area	Autumn 95		Autumn 96		Autumn 97		Autumn 98		Autumn 99		Autumn 2000	
Range in m	in Nmi2	WT 176, 178, 179 WT 181, Tel 22 & Tel 23		WT 196 - 198, Tel 41		WT 213-217 Tel 57 & 58		WT 230 - 233 Tel 75 & 76		WT 246 - 248		WT 321 - 323 Tel 339, 342 & 343	
		abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)
30 - 56	9285	.	.	0	0	0	0	97	0	.	.	393	0
57 - 92	18957	0	0	1,591	6	3,558	16	3,273	13	1,532	5	7,880	34
93 - 183	7170	26,803	41	66,329	176	448,482	1,849	485,811	1,237	597,044	1,855	962,240	3,313
184 - 274	399	254,635	787	989,385	3,518	5,284,488	25,015	8,806,344	32,516	9,312,284	36,423	22,399,779	73,001
275 - 366	4030	1,659,530	4,374	4,271,393	14,647	4,624,501	18,515	5,186,605	22,691	3,056,209	14,390	8,585,977	41,292
367 - 549	1192	12,073	142	15,004	218	50,610	353	5,649	25	32,400	187	45,685	232
550 - 731	804	2,256	13	197	1	1,982	9	632	2	547	3	7,494	27
732 - 914	957	0	0	0	0	86	1	13	0	0	0	265	2
915 -1097	945	0	0	0	0	0	0	0	0	0	0	79	1
1098 -1280	1745	.	0	35	0	0	0	0	0	0	0	0	0
1281 -1463	773	.	0	0	0	0	0	0	0	0	0	0	0
Total (000's)		1,957,945	5,358	5,346,560	18,566	10,419,805	45,758	14,471,183	56,485	13,013,407	52,863	32,019,951	117,902
Upper 95% limit		3,335,665	7,397	9,051,691	28,893	14,661,173	66,426	18,820,969	76,064	16,485,962	69,804	38,245,868	142,949
Lower 95% limit		580,225	3,318	1,641,430	8,238	6,178,437	25,090	10,121,396	36,905	9,540,852	35,923	25,794,034	92,855
%<184m		1	1	1	1	4	4	3	2	5	4	3	3
%184 - 549 m		98	99	99	99	96	96	97	98	95	96	97	97
%>549 m		0	0	0	0	0	0	0	0	0	0	0	0
						Outside 200 Nmi limit							
93 - 183	933	24	0	110	0	18,480	79	6,906	14	20,967	70	48,171	187
184 - 274	791	8,806	26	429,678	1,635	290,656	1,246	1,005,018	4,454	1,346,964	6,486	4,405,969	19,197
275 - 366	758	162,699	997	433,908	2,759	643,252	3,685	558,307	4,222	306,325	2,079	1,519,770	8,949
367 - 549	636	275	4	7,328	110	11,499	102	3,954	17	13,288	98	18,808	113
550 - 731	554	1,935	12	197	1	186	1	10	0	90	1	0	0
732 - 914	607	0 .		0	0	86	1	13	0	0	0	119	1
915 -1097	582 .	.		0	0	0	0	0	0	0	0	46	0
1098 -1280	1,331 .	.		35	0	0	0	0	0	0	0	0	0
1281 -1463	295 .	.		0	0	0	0	0	0 .	.		0	0
Total (000's)		173,738	1,039	871,256	4,506	964,158	5,115	1,574,208	8,707	1,691,507	8,734	5,990,885	28,447
Upper 95% limit		440,468	4,853	2,035,525	25,676	2,533,454	13,242	4,705,895	25,437	3,907,713	19,432	10,973,587	49,256
Lower 95% limit		-92,992	-2,774	-293,013	-16,664	-605,137	-3,013	-1,557,479	-8,022	-524,699	-1,964	1,008,184	7,638
%<184m		0	0	0	0	2	2	0	0	1	1	1	1
%184 - 549 m		99	99	100	100	98	98	100	100	99	99	99	99
%>549 m		1	1	0	0	0	0	0	0	0	0	0	0

Table 2 Total abundance (X 1000), biomass (Kg. X1000) of northern shrimp (*Pandalus borealis*) collected during the autumn 1995 - 2000 Canadian research surveys into NAFO Div. 3N. (All tows were standardized to 15 minutes; . means not sampled.) Data were taken from strata < 784 so that all years would be comparable.

Depth Range in m	Area in Nmi2	Autumn 95 WT 176 & 177		Autumn 96 Tel 41, 42 & AN 253		Autumn 97 WT 212 - 214		Autumn 98 WT 229, 230, WT 233 & Tel 76		Autumn 99 WT 245 - 247		Autumn 2000 WT 320, 322, WT 323, Tel 338 & 339	
		abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)
<=56	3,092	0	0	0	0	63	1	0	0	175	1	0	0
57 - 92	11,490	7,903	36	3,507	13	1,661	6	2,042	13	1,291	4	3,664	14
93 - 183	1,168	0	0	1,107	2	17,302	44	43,866	119	55	1	2,368	10
184 - 274	546	18,053	45	377,532	776	73,069	318	769,586	3,023	22,871	104	13,223	65
275 - 366	386	191	2	46,636	144	3,689	40	8,846	82	11,758	90	9,806	57
367 - 549	420	65,926	450	89,437	578	1,620	17	3,286	25	6,638	61	11,859	88
550 - 731	352	0	0	139	1	183	1	10,473	97	1,241	12	1,971	17
732 - 914	394	.	.	.	.	.	.	0	0	.	.	1,834	17
915 -1097	411	.	.	.	.	.	.	0	0	.	.	102	1
1098 -1280	491	.	.	.	.	.	.	0	0	.	.	7	0
1281 -1463	773	.	.	.	.	.	.	0	0	.	.	13	0
Total (000's)		92,073	533	518,358	1,514	97,588	427	838,098	3,360	44,030	272	44,847	270
Upper 95% limit		952,009	6,272	5,139,701	13,314	692,829	2,694	9,394,044	36,474	108,302	731	90,560	1,175
Lower 95% limit		-767,863	-5,206	-4,102,986	-10,285	-497,654	-1,840	-7,717,847	-29,754	-20,243	-188	-865	-635
%<184m		9	7	1	1	19	12	5	4	3	2	13	9
%184 - 549 m		91	93	99	99	80	88	93	93	94	94	78	78
%>549 m		0	0	0	0	0	0	1	3	3	4	9	13
						Outside 200 Nmi limit							
<=56	1,605	0	0	0	0	11	0	0	0	30	0	0	0
57 - 92	2,996	1,732	7	3,029	11	658	2	20	0	51	1	48	0
93 - 183	864	0	0	1,107	2	17,235	44	43,866	119	33	0	1,887	8
184 - 274	508	15,225	38	304,211	626	68,154	292	629,225	2,474	18,870	84	11,846	56
275 - 366	366	191	2	44,894	138	3,143	34	7,560	70	9,764	74	8,694	51
367 - 549	420	65,926	450	89,437	578	1,620	17	3,286	25	6,638	61	11,859	88
550 - 731	352	0	0	139	1	183	1	10,473	97	1,241	12	1,971	17
732 - 914	394	.	.	.	.	.	.	0	0	.	.	1,834	17
915 -1097	411	.	.	.	.	.	.	0	0	.	.	102	1
1098 -1280	491	.	.	.	.	.	.	0	0	.	.	7	0
1281 -1463	773	.	.	.	.	.	.	0	0	.	.	13	0
Total (000's)		83,073	497	442,817	1,356	91,005	391	694,430	2,786	36,627	232	38,262	240
Upper 95% limit		931,482	6,216	4,176,800	4,875	685,509	2,645	7,507,801	29,156	90,987	629	82,410	1,118
Lower 95% limit		-765,336	-5,222	-3,291,167	-2,164	-503,500	-1,863	-6,118,942	-23,585	-17,732	-164	-5,886	-638
%<184m		2	2	1	1	20	12	6	4	0	0	5	3
%184 - 549 m		98	98	99	99	80	88	92	92	96	95	85	82
%>549 m		0	0	0	0	0	0	2	3	3	5	10	15

Table 3 Total abundance (X 1000), biomass (Kg. X1000) of northern shrimp (*Pandalus borealis*) collected during autumn 1995 - 2000 Canadian research surveys into NAFO Div. 3O. (All tows were standardized to 15 minutes; . means not sampled.) Data were taken from strata < 784 so that all years would be comparable.

Depth	Area	Autumn 95		Autumn 96		Autumn 97		Autumn 98		Autumn 99		Autumn 2000	
Range in m	in Nmi2	WT 176 & 177		WT 200, Tel 42 & AN 253		WT 212, 213		WT 229, 230, WT 233 & Tel 76		WT 244 - 246		WT 319, 320 WT 322 & Tel 338	
		abundance	biomass	abundance	biomass	abundance	biomass	abundance	biomass	abundance	biomass	abundance	biomass
		(x 1000)	(Kg X 1000)	(x 1000)	(Kg X 1000)	(x 1000)	(Kg X 1000)	(x 1000)	(Kg X 1000)	(x 1000)	(Kg X 1000)	(x 1000)	(Kg X 1000)
57 - 92	12541	0	0	674.76	5.77	727.19	3.65	6847.29	18.52	1083.42	2.73	643.79	3.47
93 - 183	4775	2488.01	10.44	1128.85	2.13	4305.34	9.05	5586.12	14.19	1358.62	2.87	0	0
184 - 274	371	1874.57	20	80.75	0.74	705.04	3.68	4626.47	35.5	143.13	1.08	459.78	3.63
275 - 366	215	0	0	0	0	27.29	0.27	46.22	0.53	23.69	0.12	0	0
367 - 549	318	0	0	15.68	0.21	12.18	0.12	22.63	0.17	44.2	0.5	28.43	0.1
550 - 731	332	6.82	0.07	6.42	0.06	11.71	0.12	9.22	0.09	184.22	1.77	34.12	0.41
732 - 914	339	.	.	.	.	.	.	7.22	0.07	.	.	15.41	0.08
915 -1097	390	.	.	.	.	.	.	0	0	.	.	0	0
1098 -1280	407	.	.	.	.	.	.	.	.	.	.	0	0
1281 -1463	488	.	.	.	.	.	.	.	.	.	.	0	0
Total (000's)		4,369	31	1,906	9	5,789	17	17,145	69	2,837	9	1,182	8
Upper 95% limit		28,725	280	14,756	15	38,940	86	26,763	301	5,351	17	3,239	51
Lower 95% limit		-19,986	-219	-10,943	3	-27,362	-52	7,527	-163	325	1	-876	-36
%<184m		57	34	95	89	87	75	73	47	86	62	54	45
%184 - 549 m		43	66	5	11	13	24	27	52	7	19	41	49
%>549 m		0	0	0	1	0	1	0	0	6	20	4	6
						Outside 200 Nmi limit							
57 - 92	269	0	0	20	0	20	0	458	1	37	0	0	0
93 - 183	246	34	0	506	1	1,318	3	680	2	235	1	0	0
184 - 274	74	34	0	10	0	342	1	1,659	11	81	1	56	0
275 - 366	47	0	0	0	0	0	0	0	0	18	0	0	0
367 - 549	58	0	0	12	0	0	0	8	0	18	0	22	0
550 - 731	71	5	0	0	0	9	0	0	0	141	1	26	0
732 - 914	105	.	.	.	.	.	.	7	0	.	.	15	0
915 -1097	126	.	.	.	.	.	.	0	0	.	.	0	0
1098 -1280	147	.	.	.	.	.	.	.	.	.	.	0	0
1281 -1463	180	.	.	.	.	.	.	.	.	.	.	0	0
Total (000's)		73	1	548	1	1,688	4	2,813	15	530	3	119	1
Upper 95% limit		279	5	6,987	11	18,447	36	25,261	162	4,137	23.340.77	292	5
Lower 95% limit		-134	-4	-5,891	-8	-15,071	-28	-19,635	-133	-3,077	-17	-53	-4
%<184m		47	31	96	82	79	65	40	22	51	27	0	0
%184 - 549 m		46	61	4	19	20	32	59	78	22	29	65	36
%>549 m		7	9	0	0	1	2	0	0	27	44	35	63

Table 4. Total abundance (X 1000), biomass (Kg. X1000) of northern shrimp (*Pandalus borealis*) collected during spring 1999 - 2001 Canadian research surveys into NAFO Div. 3L. (All tows were standardized to 15 minutes; . means not sampled.) Data were taken from strata < 784 so that all years would be comparable.

Depth	Area	Spring 99		Spring 2000		Spring 2001	
Range in m	in Nmi2	WT 240 & 241		WT 317 & 318		WT 368 - 370	
		abundance	biomass	abundance	biomass	abundance	biomass
		(x 1000)	(Kg X 1000)	(x 1000)	(Kg X 1000)	(x 1000)	(Kg X 1000)
30 - 56	9285	0	0	.	.	0	0
57 - 92	18957	123	1	40	0	45	0
93 - 183	7170	6,004	29	25,633	54	9,883	33
184 - 274	399	3,197,714	13,247	14,036,717	63,616	9,707,932	49,384
275 - 366	4030	9,158,773	40,320	10,359,484	54,779	17,057,342	70,669
367 - 549	1192	27,134	248	110,186	1,023	98,522	910
550 - 731	804	15,963	88	5,539	50	5,958	55
732 - 914	957	.	.	.	.	.	.
915 -1097	945	.	.	.	.	.	.
1098 -1280	1745	.	.	.	.	.	.
1281 -1463	773	.	.	.	.	.	.
Total (000's)		12,405,970	53,934	24,535,333	119,521	24,975,809	103,378
Upper 95% limit		21,924,774	96,644	104,192,465	257005.238.03	35,965,001	142,843
Lower 95% limit		2,887,166	11,223	-55,121,800	-17,963	13,986,617	63,913
%<184m		0	0	0	0	0	0
%184 - 549 m		100	100	100	100	108	117
%>549 m		0	0	0	0	0	0
				Outside 200 Nmi limit			
93 - 183	933	491	1	279	1	155	1
184 - 274	791	1,160,062	6,284	3,980,018	21,186	133,867	722
275 - 366	758	1,588,698	8,192	2,424,460	14,212	3,895,114	17,131
367 - 549	636	19,408	170	73,282	681	90,285	796
550 - 731	554	15,374	83	5,137	48	8,465	65
732 - 914	607	.	.	.	.	.	.
915 -1097	582	.	.	.	.	.	.
1098 -1280	1331	.	.	.	.	.	.
1281 -1463	295	.	.	.	.	.	.
Total (000's)		2,780,533	14,731	6,488,871	36,127	4,123,688	18,714
Upper 95% limit		7,145,264	37,178	57,253,651	301,999	31,466,669	125,743
Lower 95% limit		-1,584,198	-7,717	-44,275,909	-229,746	-23,219,293	-88,315
%<184m		0	0	0	0	0	0
%184 - 549 m		100	99	100	100	100	100
%>549 m		1	1	0	0	0	0

Table 5. Total abundance (X 1000), biomass (Kg. X1000) of northern shrimp (*Pandalus borealis*) collected during spring 1999 - 2001 Canadian research surveys into NAFO Div. 3N. (All tows were standardized to 15 minutes; . means not sampled.) Data were taken from strata < 784 so that all years would be comparable.

Depth	Area	Spring 99		Spring 2000		Spring 2001	
Range in m	in Nmi2	WT 238 - 240		WT 316 & 317		WT 367 - 369	
		abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)
<=56	3,092	0	0	0	0	0	0
57 - 92	11,490	804	3	45	0	176	2
93 - 183	1,168	87,864	101	142	1	347	1
184 - 274	546	67,373	231	158,291	319	2,341	5
275 - 366	386	117,656	940	305,982	1,886	7,742	43
367 - 549	420	10,200	74	4,678	40	474	3
550 - 731	352	47	0	114	1	0	0
732 - 914	394	.	.	.	.	.	
915 -1097	411	.	.	.	.	.	
1098 -1280	491	.	.	.	.	.	
1281 -1463	773	.	.	.	.	.	
Total (000's)		283,943	1,349	469,254	2,248	11,081	53
Upper 95% limit		862,737	11,209	4,430,958	24,096	47,633	278
Lower 95% limit		-294,852	-8,511	-3,492,450	-19,601	-25,471	-171
%<184m		31	8	0	0	5	4
%184 - 549 m		69	92	100	100	95	96
%>549 m		0	0	0	0	0	0
				Outside 200 Nmi limit			
<=56	1605	0	0	0	0	0	0
57 - 92	2996	10	0	0	0	0	0
93 - 183	864	87,864	101	75	1	347	1
184 - 274	508	63,910	220	128,087	260	1,981	4
275 - 366	366	116,431	932	303,944	1,876	6,545	37
367 - 549	420	10,200	74	4,678	40	474	3
550 - 731	352	47	.	114	1	0	0
732 - 914	394	.		0	0	0	0
915 -1097	411	.		0	0	0	0
1098 -1280	491	.		0	0	0	0
1281 -1463	773	.		0	0	0	0
Total (000's)		278,461	1,327	436,899	2,178	9,347	45
Upper 95% limit		856,035	11,176	4,236,408	23,915	39,743	232
Lower 95% limit		-299,112	-8,523	-3,362,610	-19,559	-21,049	-143
%<184m		32	8	0	0	4	1
%184 - 549 m		68	92	100	100	96	99
%>549 m		0	0	0	0	0	0

Table 6. Total abundance (X 1000), biomass (Kg. X1000) of northern shrimp (*Pandalus borealis*) collected during spring 1999 - 2001 Canadian research surveys into NAFO Div. 3O. (All tows were standardized to 15 minutes; . means not sampled.) Data were taken from strata < 784 so that all years would be comparable.

Depth	Area	Spring 99		Spring 2000		Spring 2001	
Range in m	in Nmi2	WT 238 &239		WT 315 - 317		Wt 365 - 368	
		abundance	biomass	abundance	biomass	abundance	biomass
		(x 1000)	(Kg X 1000)	(x 1000)	(Kg X 1000)	(x 1000)	(Kg X 1000)
57 - 92	12541	126	0	0	0	1,037	3
93 - 183	4775	8,592	12	508	1	3,540	13
184 - 274	371	2,528	11	2,269	7	486	2
275 - 366	215	1,097	8	3,983	29	7	0
367 - 549	318	298	3	264	2	263	2
550 - 731	332	0	0	797	7	0	0
732 - 914	339	.	.	.	.	.	.
915 -1097	390	.	.	.	.	.	.
1098 -1280	407	.	.	.	.	.	.
1281 -1463	488	.	.	.	.	.	.
Total (000's)		12,642	34	7,823	46	5,332	20
Upper 95% limit		35,594	63	61,843	399	27,536	99
Lower 95% limit		-10,311	5	-46,198	-307	-16,872	-60
%<184m		69	37	6	3	86	81
%184 - 549 m		31	63	83	83	14	19
%>549 m		0	0	10	14	0	0
				Outside 200 Nmi limit			
57 - 92	269	0	0	0	0	0	0
93 - 183	246	0	0	0	0	0	0
184 - 274	74	0	0	29	0	54	0
275 - 366	47	0	0	0	0	0	0
367 - 549	58	0	0	133	1	201	1
550 - 731	71	0	0	603	5	0	0
732 - 914	105	.	.	.	.	.	.
915 -1097	124	.	.	.	.	.	.
1098 -1280	147	.	.	.	.	.	.
1281 -1463	180	.	.	.	.	.	.
Total (000's)		0	0	764	6	255	2
Upper 95% limit		0	0	8,498	69	2,582	17
Lower 95% limit		0	0	-6,970	-58	-2,073	-14
%<184m		0	0	0	0	0	0
%184 - 549 m		0	0	21	15	100	100
%>549 m		0	0	79	85	0	0

Table 7 NAFO divisions 3LNO *Pandalus borealis* biomass estimates for entire divisions and outside the 200 Nmi limit.
Shrimp were collected during the autumn Canadian multi-species surveys using a Campelen 1800 shrimp trawl.
(Data were standardized to 15 minute tows.)

Season	Year	Division	Entire Division biomass estimate (Kg x 1000)	Percent by division	Outside 200 Nmi limit Biomass estimate (Kg x 1000)	Percent biomass by division	Percent of biomass
fall	1995	3L	5,358	90.49	1,039	67.63	19.40
fall	1996	3L	18,566	92.42	4,506	76.86	24.27
fall	1997	3L	45,758	99.04	5,115	92.83	11.18
fall	1998	3L	56,485	94.28	8,707	75.66	15.42
fall	1999	3L	52,863	99.47	8,734	97.38	16.52
fall	2000	3L	117,902	99.77	28,447	99.16	24.13
fall	1995	3N	533	9.00	497	32.34	93.29
fall	1996	3N	1,514	7.54	1,356	23.12	89.52
fall	1997	3N	427	0.92	391	7.09	91.52
fall	1998	3N	3,360	5.61	2,786	24.21	82.91
fall	1999	3N	272	0.51	232	2.59	85.57
fall	2000	3N	270	0.23	240	0.84	88.80
fall	1995	3O	31	0.52	1	0.04	1.82
fall	1996	3O	9	0.04	1	0.02	12.50
fall	1997	3O	17	0.04	4	0.07	23.79
fall	1998	3O	69	0.12	15	0.13	21.23
fall	1999	3O	9	0.02	3	0.03	33.59
fall	2000	3O	8	0.01	1	0.00	8.02
	all divisions						
fall	1995		5,921		1,537		25.96
fall	1996		20,089		5,862		29.18
fall	1997		46,202		5,509		11.92
fall	1998		59,914		11,508		19.21
fall	1999		53,144		8,969		16.88
fall	2000		118,180		28,687		24.27

Table 8 NAFO divisions 3LNO *Pandalus borealis* biomass estimates for entire divisions and outside the 200 Nmi limit. Shrimp were collected during the spring Canadian multi-species surveys using a Campelen 1800 shrimp trawl. (Data were standardized to 15 minute tows.)

					Outside 200 Nmi limit		
Season	Year	Division	Entire Division biomass estimate (Kg x 1000)	Percent by division	Biomass estimate (Kg x 1000)	Percent biomass by division	Percent of biomass
spring	1999	3L	53,934	97.50	14,731	91.74	27.31
spring	2000	3L	119,521	98.12	36,127	94.30	30.23
spring	2001	3L	103,378	99.93	18,714	99.75	18.10
spring	1999	3N	1,349	2.44	1,327	8.26	98.34
spring	2000	3N	2,248	1.85	2,178	5.68	96.88
spring	2001	3N	53	0.05	45	0.24	83.89
spring	1999	3O	34	0.06	0	0.00	0.00
spring	2000	3O	46	0.04	6	0.02	12.77
spring	2001	3O	20	0.02	2	0.01	7.84
	all divisions						
spring	1999		55,317		16,057		29.03
spring	2000		121,815		38,310		31.45
spring	2001		103,451		18,761		18.13

Table 9 Various formulations of the average percent of the total Pandalus borealis biomass within the 3LNO NRA. Shrimp were collected during the autumn Canadian multi-species surveys using a Campelen 1800 shrimp trawl. (Data were standardized to 15 minute tows.)

Season	Year	Division	Entire Division biomass estimate (Kg x 1000)	Biomass estimate within NRA (Kg x 1000)	Percent of biomass within the NRA			
					raw percent	running average	running weighted average	running geometric mean
fall	1995	3L	5,358	1,039	19.40	19.40	19.40	19.40
fall	1996	3L	18,566	4,506	24.27	21.83	23.18	21.70
fall	1997	3L	45,758	5,115	11.18	18.28	15.30	17.39
fall	1998	3L	56,485	8,707	15.42	17.57	15.35	16.88
fall	1999	3L	52,863	8,734	16.52	17.36	15.70	16.81
fall	2000	3L	117,902	28,447	24.13	18.49	19.04	17.85
fall	1995	3N	533	497	93.29	93.29	93.29	93.29
fall	1996	3N	1,514	1,356	89.52	91.40	90.50	91.38
fall	1997	3N	427	391	91.52	91.44	90.67	91.43
fall	1998	3N	3,360	2,786	82.91	89.31	86.20	89.22
fall	1999	3N	272	232	85.57	88.56	86.18	88.48
fall	2000	3N	270	240	88.80	88.60	86.29	88.53
fall	1995	3O	31	1	1.82	1.82	1.82	1.82
fall	1996	3O	9	1	12.50	7.16	4.24	4.78
fall	1997	3O	17	4	23.79	12.70	10.10	8.16
fall	1998	3O	69	15	21.23	14.84	16.24	10.36
fall	1999	3O	9	3	33.59	18.59	17.41	13.11
fall	2000	3O	8	1	8.02	16.83	16.90	12.08
	all divisions							
fall	1995		5,921	1,537	25.96	25.96	25.96	25.96
fall	1996		20,089	5,862	29.18	27.57	28.45	27.52
fall	1997		46,202	5,509	11.92	22.35	17.88	20.83
fall	1998		59,914	11,508	19.21	21.57	18.48	20.41
fall	1999		53,144	8,969	16.88	20.63	18.02	19.65
fall	2000		118,180	28,687	24.27	21.24	20.46	20.35

Table 10 Various formulations of the percent of the total *Pandalus borealis* biomass within the 3LNO 200 Nmi limit. Shrimp were collected during the spring Canadian multi-species surveys using a Campelen 1800 shrimp trawl. (Data were standardized to 15 minute tows.)

Season	Year	Division	Entire Division biomass estimate (Kg x 1000)	Biomass estimate within NRA (Kg x 1000)	Percent of biomass within the NRA			
					raw percent	running average	running weighted average	running geometric mean
spring	1999	3L	53,934	14,731	27.31	27.31	27.31	27.31
spring	2000	3L	119,521	36,127	30.23	28.77	29.32	28.73
spring	2001	3L	103,378	18,714	18.10	25.21	25.13	24.63
spring	1999	3N	1,349	1,327	98.34	98.34	98.34	98.34
spring	2000	3N	2,248	2,178	96.88	97.61	97.43	97.61
spring	2001	3N	53	45	83.89	93.04	97.23	92.80
spring	1999	3O	34	0	0.00	0.00	0.00	0.00
spring	2000	3O	46	6	12.77	6.39	7.34	.
spring	2001	3O	20	2	7.84	6.87	7.44	.
	all divisions							
spring	1999		55,317	16,057	29.03	29.03	29.03	29.03
spring	2000		121,815	38,310	31.45	30.24	30.69	30.21
spring	2001		103,451	18,761	18.13	26.20	26.06	25.49

Table 11 Various formulations of the average percent of the total *Pandalus borealis* biomass within the 3LNO NRA. Shrimp were collected during the autumn Canadian multi-species surveys using a Campelen 1800 shrimp trawl. Biomass estimates are the average between the spring and autumn for the period fall 1999 - spring 2000.

Year	Division	Entire Division biomass estimate (Kg x 1000)	Biomass estimate within NRA (Kg x 1000)	Percent of biomass within the NRA			
				raw percent	running average	running weighted average	running geometric mean
1999	3L	53,399	11,732	21.97	21.97	21.97	21.97
2000	3L	118,711	32,287	27.20	24.58	25.58	24.45
1999	3N	810	779	96.20	96.20	96.20	96.20
2000	3N	1,259	1,209	96.01	96.11	96.09	96.11
1999	3O	31	2	4.87	4.87	4.87	4.87
2000	3O	4	3	84.53	44.70	13.58	20.30
	all divisions						
1999		54,240	12,513	23.07	23.07	23.07	23.07
2000		119,974	33,499	27.92	25.50	26.41	25.38

Table 12. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3L during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176, 178, 179 WT 181, Tel 22 & Tel 23	Autumn 1996 WT 196 - 198 & Tel 41	Autumn 1997 WT 213 - 217, Tel 57 & 58	Autumn 1998 WT 230 - 233 Tel 75 & 76	Autumn 1999 WT 246 - 248	Autumn 2000 WT 321- 323, Tel 339, 342 & Tel 343
6.5	0	0	0	0	0	0
7	0	0	0	47	1,276	0
7.5	3,346	85	3,176	71	4,290	18,215
8	0	393	1,542	804	5,566	5,696
8.5	3,527	1,114	6,875	57,794	20,487	91,288
9	26,153	7,641	21,185	153,439	15,564	149,707
9.5	61,406	30,261	61,605	291,309	30,055	229,705
10	133,857	33,314	67,970	607,274	65,812	421,097
10.5	164,996	25,249	104,823	789,351	78,145	432,327
11	204,525	18,891	96,965	678,255	76,358	303,905
11.5	124,270	15,975	69,478	462,649	75,244	176,011
12	72,289	34,228	39,150	166,126	34,068	93,654
12.5	29,907	29,769	32,546	114,667	47,839	128,176
13	17,329	46,359	25,479	57,974	70,336	343,141
13.5	19,376	94,855	36,701	87,264	133,549	788,132
14	18,875	209,566	75,608	117,077	241,706	1,201,378
14.5	12,976	347,634	188,795	245,707	395,192	1,705,207
15	20,820	601,934	399,864	423,740	779,381	1,753,981
15.5	29,417	711,683	628,744	432,380	1,221,610	1,687,366
16	40,909	637,895	736,401	423,551	1,325,026	1,326,045
16.5	35,060	420,630	486,370	360,497	965,504	1,397,629
17	37,294	267,629	462,353	397,472	490,892	1,907,001
17.5	25,762	160,945	471,564	551,305	305,261	2,899,278
18	13,901	198,883	569,753	792,032	344,196	3,397,982
18.5	10,903	201,241	783,555	946,830	466,687	2,257,132
19	19,504	247,241	714,381	1,002,804	484,359	1,614,856
19.5	13,516	240,576	652,110	918,141	488,535	1,029,486
20	14,032	143,069	376,335	822,249	516,721	692,579
20.5	11,106	73,869	251,648	716,012	510,689	553,791
21	8,536	76,525	113,321	472,760	491,782	396,433
21.5	7,263	37,762	60,918	318,834	328,824	402,556
22	3,897	31,463	14,206	118,468	192,027	209,904
22.5	2,165	26,928	8,141	16,149	119,197	100,787
23	1,057	15,594	323	8,518	34,608	56,288
23.5	248	10,842	234	1,209	25,367	12,770
24	104	3,422	56	0	3,516	4,781
24.5	54	1,427	0	0	1,820	0
25	54	0	0	0	0	0
25.5	0	0	0	0	0	0
26	0	0	0	0	0	0
26.5	0	0	0	0	0	0
27	0	0	0	0	0	0
27.5	0	0	0	0	0	0
28	0	0	0	0	0	0
28.5	0	0	0	0	0	0
Total (000's)	1,188,435	5,004,892	7,563,026	12,552,756	10,391,487	27,788,282
Upper 95% li	2,309,698	8,492,782	10,297,608	16,565,508	13,205,559	33,568,292
Lower 95% li	67,172	1,517,002	4,828,444	8,540,004	7,577,415	22,008,271

Table 13. Abundance (000's) of transitional and primiparous female northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3L during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176, 178, 179 WT 181, Tel 22 & Tel 23	Autumn 1996 WT 196 - 198 & Tel 41	Autumn 1997 WT 213 - 217, Tel 57 & 58	Autumn 1998 WT 230 - 233 Tel 75 & 76	Autumn 1999 WT 246 - 248	Autumn 2000 WT 321- 323, Tel 339, 342 & Tel 343
8.5	0	0	0	0	0	0
9	0	0	0	0	0	0
9.5	0	0	0	0	0	0
10	0	0	0	0	0	0
10.5	0	0	0	0	0	0
11	0	0	0	0	0	0
11.5	0	0	0	0	0	0
12	0	0	0	0	638	0
12.5	959	0	0	0	0	0
13	0	0	0	0	0	0
13.5	3,989	0	0	0	0	0
14	15,348	0	0	0	0	0
14.5	9,708	0	0	0	0	0
15	48,864	0	0	0	0	0
15.5	126,767	0	0	0	0	0
16	116,811	0	245	0	0	0
16.5	92,772	2,510	71	0	0	0
17	63,648	0	4,611	0	0	0
17.5	43,865	5,883	593	47	0	21
18	16,738	3,310	13,738	0	184	35,572
18.5	13,954	7,207	32,009	9,642	3,945	62,928
19	16,792	11,805	68,940	9,266	16,718	96,414
19.5	18,622	18,542	192,530	47,657	35,375	94,795
20	19,354	25,620	221,139	55,044	70,595	248,313
20.5	17,089	20,782	382,095	86,450	139,652	220,283
21	16,499	6,361	407,000	104,436	267,353	325,940
21.5	20,380	13,192	360,278	79,288	374,280	275,601
22	22,051	5,713	201,627	45,695	316,725	171,821
22.5	17,315	7,161	107,292	20,647	210,851	178,493
23	13,263	0	55,436	4,119	87,798	111,325
23.5	8,503	0	25,598	0	46,917	26,681
24	2,988	0	6,807	0	44,066	9,966
24.5	3,020	0	4,102	0	3,151	6,210
25	402	0	40	0	0	1,707
25.5	119	0	23	0	0	0
26	0	0	0	0	0	0
26.5	0	0	0	0	0	0
27	0	0	0	0	0	0
27.5	50	0	0	0	0	0
28	0	0	0	0	0	0
28.5	0	0	0	0	0	0
29	0	0	0	0	0	0
29.5	0	0	0	0	0	0
30	0	0	0	0	0	0
Total (000's)	729,866	128,086	2,084,175	462,291	1,618,247	1,866,071
Upper 95% limit	1,087,560	386,121	3,537,467	651,113	2,168,692	3,038,157
Lower 95% limit	372,171	-129,950	630,883	273,468	1,067,803	693,984

Table 14. Abundance (000's) of multiparous + ovigerous northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3L during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176, 178, 179 WT 181, Tel 22 & Tel 23	Autumn 1996 WT 196 - 198 & Tel 41	Autumn 1997 WT 213 - 217, Tel 57 & 58	Autumn 1998 WT 230 - 233 Tel 75 & 76	Autumn 1999 WT 246 - 248	Autumn 2000 WT 321- 323, Tel 339, 342 & Tel 343
10.5	0	0	0	0	0	0
11	0	0	0	0	0	0
11.5	0	0	0	0	0	0
12	0	0	0	0	0	0
12.5	0	0	0	0	0	0
13	0	0	0	0	0	0
13.5	0	0	0	0	1,792	0
14	0	0	523	0	0	0
14.5	0	0	0	0	0	0
15	755	0	0	0	0	0
15.5	0	0	0	406	0	0
16	0	0	3,135	4,834	0	0
16.5	0	0	1,305	4,760	3,918	9,912
17	0	0	1,305	7,548	8,841	56
17.5	0	290	2,673	6,860	7,583	3,125
18	298	0	1,194	9,586	7,744	17,122
18.5	0	965	3,401	1,833	6,374	7,538
19	724	6,076	3,195	1,055	14,008	9,610
19.5	506	0	4,004	4,934	4,277	11,738
20	438	386	7,978	9,140	10,035	5,495
20.5	50	828	8,799	23,873	7,380	27,098
21	279	1,190	21,839	54,158	17,656	58,573
21.5	1,414	3,949	48,101	113,972	38,777	118,267
22	1,516	2,754	66,609	179,638	78,406	152,701
22.5	1,377	11,990	82,875	246,395	102,230	292,157
23	3,098	20,451	94,787	226,999	148,068	289,033
23.5	4,030	21,358	98,493	174,312	146,837	392,654
24	5,284	17,111	77,621	156,256	150,574	405,051
24.5	9,999	25,912	81,801	89,088	82,294	282,919
25	6,793	28,052	71,519	60,273	73,959	184,453
25.5	6,078	22,493	40,006	33,844	42,264	90,937
26	6,096	17,689	23,248	16,725	23,229	40,564
26.5	5,226	9,729	4,805	9,911	10,970	36,913
27	3,024	5,919	5,676	9,838	7,297	5,021
27.5	1,966	3,027	10,737	3,481	4,518	5,808
28	1,997	2,376	2,146	5,780	2,959	1,897
28.5	445	2,292	1,624	1,775	654	113
29	183	2,198	1,598	295	1,268	79
29.5	288	1,635	356	0	197	2,262
30	79	1,227	226	0	67	0
30.5	50	1,138	104	20	79	0
31	0	110	99	0	0	869
31.5	0	135	0	20	14	0
32	0	0	0	0	0	0
Total (000's)	61,991	211,276	771,780	1,457,607	1,004,269	2,451,963
Upper 95% limit	96,586	1,019,620	1,548,843	2,113,480	1,510,036	3,758,328
Lower 95% limit	27,397	-597,068	-5,284	801,734	498,501	1,145,597

Table 15. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3N during autumn Canadian research surveys in 1995 - 2000. The data were taken from strata<784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 Tel 41, 42 & AN 253	Autumn 1997 WT 212 - 214	Autumn 1998 WT 229, 230, 233 & Tel 76	Autumn 1999 WT 245 - 247	Autumn 2000 WT 320, 322, 323, Tel 338 & 339
5.5	0	0	0	0	0	0
6	0	0	0	0	0	0
6.5	0	111	0	0	0	0
7	382	55	0	0	0	0
7.5	1,146	463	166	0	0	0
8	200	1,785	0	0	15	0
8.5	1,252	5,395	0	2,807	0	69
9	1,242	2,269	0	8,894	36	391
9.5	609	847	651	37,963	159	170
10	209	3,124	0	33,235	110	459
10.5	78	1,875	25	13,624	284	115
11	287	9,481	114	8,877	51	156
11.5	993	31,256	516	3,399	82	17
12	3,398	41,873	899	5,153	46	125
12.5	3,705	56,783	1,592	5,531	253	169
13	5,086	51,888	2,042	5,766	546	112
13.5	5,296	31,781	1,342	4,789	440	420
14	1,912	25,074	1,095	17,839	487	348
14.5	3,132	20,664	1,821	24,608	712	520
15	2,135	17,580	3,625	19,551	644	544
15.5	3,323	16,194	4,392	38,582	898	1,118
16	3,613	14,058	7,116	35,717	1,621	870
16.5	3,245	25,129	9,588	54,601	1,282	981
17	4,367	13,121	9,918	39,101	1,289	1,431
17.5	3,468	23,048	5,158	27,648	1,005	2,349
18	2,253	12,061	6,088	49,571	1,709	2,796
18.5	1,916	11,629	6,363	49,764	1,249	2,458
19	1,537	9,301	5,612	57,673	1,612	2,115
19.5	2,492	10,679	3,864	56,250	1,839	1,941
20	2,684	7,112	4,599	52,246	2,332	1,959
20.5	2,113	6,672	4,139	16,324	2,014	1,903
21	1,910	1,297	2,889	27,778	2,083	2,021
21.5	955	570	1,986	26,638	2,572	1,622
22	955	1,651	915	11,871	1,290	1,457
22.5	382	17	325	11,477	921	890
23	191	1,424	269	6,693	270	513
23.5	0	0	182	11	101	83
24	0	6	14	23	12	76
24.5	0	0	0	0	0	20
25	0	0	0	0	0	0
25.5	0	0	0	0	0	0
26	0	0	0	0	0	0
26.5	0	0	0	0	0	0
27	0	0	0	0	0	0
27.5	0	0	0	0	0	0
28	0	0	0	0	0	0
28.5	0	0	0	0	0	0
Total (000's)	66,465	456,272	87,303	754,003	27,962	30,217
Upper 95% limit	623,567	4,834,624	652,980	8,601,999	68,051	49,954
Lower 95% limit	-490,637	-3,922,079	-478,375	-7,093,992	-12,127	10,480

Table 16. Abundance (000's) of transitional and primiparous female northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3N during autumn Canadian research surveys in 1995 - 2000. The data were taken from strata<784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 Tel 41, 42 & AN 253	Autumn 1997 WT 212 - 214	Autumn 1998 WT 229, 230, 233 & Tel 76	Autumn 1999 WT 245 - 247	Autumn 2000 WT 320, 322, 323, Tel 338 & 339
14	0	0	0	0	0	0
14.5	0	0	0	0	0	0
15	0	0	0	0	0	0
15.5	0	0	0	0	0	0
16	0	0	0	0	0	0
16.5	0	64	0	0	0	0
17	0	58	0	0	0	0
17.5	0	0	0	0	0	5
18	0	428	0	0	0	0
18.5	0	40	0	31	0	0
19	0	2,121	0	124	0	46
19.5	0	3,669	662	93	0	0
20	0	5,222	237	31	36	149
20.5	0	6,094	311	155	129	128
21	0	3,570	291	0	188	192
21.5	191	6,460	522	124	347	307
22	191	1,095	74	0	363	185
22.5	0	1,681	72	0	168	107
23	0	430	60	0	62	19
23.5	0	41	12	0	0	21
24	0	25	14	0	0	0
24.5	0	16	0	0	0	0
25	0	7	0	0	0	0
25.5	0	0	0	0	0	0
26	0	0	0	0	0	0
26.5	0	0	0	0	0	0
27	0	0	0	0	0	0
27.5	0	0	0	0	0	0
28	0	0	0	0	0	0
28.5	0	0	0	0	0	0
29	0	0	0	0	0	0
29.5	0	0	0	0	0	0
30	0	0	0	0	0	0
30.5	0	0	0	0	0	0
31	0	0	0	0	0	0
Total (000's)	382	31,020	2,254	557	1,291	1,158
Upper 95% limit	5,234	318,213	22,826	7,636	5,398	6,363
Lower 95% limit	-4,471	-256,172	-18,319	-6,521	-2,816	-4,047

Table 17. Abundance (000's) of multiparous and ovigerous female northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3N during autumn Canadian research surveys in 1995 - 2000. The data were taken from strata<784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 Tel 41, 42 & AN 253	Autumn 1997 WT 212 - 214	Autumn 1998 WT 229, 230, 233 & Tel 76	Autumn 1999 WT 245 - 247	Autumn 2000 WT 320, 322, 323, Tel 338 & 339
11	0	0	0	0	0	0
11.5	0	58	0	0	0	0
12	0	0	0	0	0	0
12.5	0	58	0	0	0	0
13	0	0	0	0	0	0
13.5	0	0	0	0	0	0
14	0	0	0	0	0	0
14.5	0	289	0	0	0	0
15	0	457	0	0	0	0
15.5	0	58	0	0	0	0
16	0	231	0	0	0	0
16.5	0	231	0	0	0	0
17	0	0	0	0	0	0
17.5	0	1,372	0	0	0	0
18	0	284	176	0	0	0
18.5	0	58	0	0	0	0
19	0	0	0	14	0	0
19.5	0	6	0	79	0	0
20	0	6	0	23	122	0
20.5	0	19	14	356	47	20
21	382	0	22	993	89	148
21.5	764	413	145	1,867	409	285
22	805	1,354	210	6,578	664	656
22.5	2,493	2,577	962	4,743	1,183	1,118
23	2,924	4,341	819	21,432	1,943	1,667
23.5	1,939	4,370	1,387	14,035	2,854	2,602
24	2,525	3,169	1,244	5,156	2,510	1,771
24.5	2,121	4,444	1,027	8,776	1,803	2,064
25	1,540	2,892	840	6,318	1,466	1,620
25.5	2,885	1,344	642	8,093	884	944
26	1,538	22	573	3,299	746	540
26.5	1,337	1,755	526	923	365	208
27	1,528	826	234	718	167	211
27.5	382	820	207	282	150	78
28	573	0	125	105	111	97
28.5	382	524	134	48	12	106
29	191	0	52	14	32	0
29.5	382	0	0	0	0	0
30	0	0	13	17	0	0
30.5	0	0	6	0	0	0
31	0	0	6	0	0	0
Total (000's)	24,688	31,973	9,362	83,868	15,556	14,133
Upper 95% limit	335,252	360,837	46,480	805,797	107,263	32,201
Lower 95% limit	-285,876	-296,891	-27,757	-638,061	-76,152	-3,935

Table 18. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3O during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 WT 200, Tel 42 & AN 253	Autumn 1997 WT 212 & 213	Autumn 1998 WT 229, 230, 233 & Tel 76	Autumn 1999 WT 244 - 246	Autumn 2000 WT 319, 320, WT 322 & Tel 338
6	0	0	0	0	0	0
6.5	0	0	0	0	0	0
7	0	0	0	0	0	0
7.5	0	0	0	0	0	0
8	70	0	0	0	0	0
8.5	70	0	0	0	0	0
9	0	0	0	137	44	0
9.5	0	195	0	156	0	0
10	0	0	60	196	0	0
10.5	0	0	60	372	394	0
11	70	195	235	897	322	0
11.5	70	390	1,030	1,552	325	0
12	70	0	698	978	233	0
12.5	70	352	536	1,616	272	0
13	70	1,461	243	240	972	0
13.5	241	731	417	551	322	0
14	70	527	411	514	7	16
14.5	139	405	536	113	172	0
15	317	0	180	230	172	23
15.5	149	0	338	581	0	0
16	53	395	447	647	38	137
16.5	96	0	267	430	128	0
17	20	0	569	377	0	11
17.5	75	11	251	411	133	27
18	10	0	327	683	121	179
18.5	20	0	226	620	198	224
19	63	0	111	544	15	100
19.5	47	0	86	947	149	22
20	40	0	20	832	77	11
20.5	75	0	0	881	84	240
21	30	0	8	429	7	149
21.5	20	0	8	197	23	5
22	10	0	0	165	8	18
22.5	0	0	0	47	0	7
23	0	0	0	41	0	0
23.5	0	0	0	16	0	0
24	0	0	0	0	0	0
24.5	0	0	0	0	0	0
25	0	0	0	0	0	0
25.5	0	0	0	0	0	0
26	0	0	0	0	0	0
26.5	0	0	0	0	0	0
27	0	0	0	0	0	0
27.5	0	0	0	0	0	0
28	0	0	0	0	0	0
28.5	0	0	0	0	0	0
29	0	0	0	0	0	0
29.5	0	0	0	0	0	0
30	0	0	0	0	0	0
Total (000's)	1,964	4,663	7,066	15,401	4,215	1,168
Upper 95% limit	16,022	9,345	39,959	22,928	6,441	1,864
Lower 95% limit	-12,093	-19	-25,827	7,874	1,989	473

Table 19. Abundance (000's) of transitional and primiparous female northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3O during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 WT 200, Tel 42 & AN 253	Autumn 1997 WT 212 & 213	Autumn 1998 WT 229, 230, 233 & Tel 76	Autumn 1999 WT 244 - 246	Autumn 2000 WT 319, 320, WT 322 & Tel 338
10.5	0	0	0	0	0	0
11.0	0	0	0	0	0	0
11.5	0	0	0	0	0	0
12.0	0	0	0	0	0	0
12.5	0	0	0	0	0	0
13.0	0	0	0	0	0	0
13.5	0	0	0	0	0	0
14.0	0	0	0	0	0	0
14.5	0	0	0	0	0	0
15.0	0	0	0	0	0	0
15.5	0	0	0	0	0	0
16.0	0	0	0	0	0	0
16.5	0	0	0	0	0	0
17.0	0	0	0	0	0	0
17.5	0	0	0	0	0	0
18.0	0	0	0	0	0	0
18.5	0	0	0	8	0	0
19.0	0	0	0	0	0	0
19.5	0	0	12	8	0	0
20.0	0	0	0	23	0	0
20.5	0	0	0	32	0	0
21.0	0	0	0	67	0	0
21.5	7	0	0	16	0	0
22.0	0	0	0	0	0	0
22.5	0	0	0	16	21	0
23.0	0	0	0	8	0	33
23.5	0	0	0	0	13	0
24.0	0	17	0	0	0	22
24.5	20	0	0	11	0	11
25.0	30	0	0	0	0	0
25.5	10	0	0	0	0	0
26.0	10	0	0	0	0	0
26.5	0	0	0	0	0	0
27.0	10	0	0	0	0	0
27.5	10	0	0	0	0	0
28.0	0	0	0	0	0	0
28.5	0	0	0	0	0	0
29.0	0	0	0	0	0	0
29.5	0	0	0	0	0	0
30.0	0	0	0	0	0	0
Total (000's)	98	17	12	187	34	67
Upper 95% limit	1,257	236	158	2,019	384	915
Lower 95% limit	-1,062	-202	-135	-1,645	-315	-781

Table 20. Abundance (000's) of female northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3O during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 WT 200, Tel 42 & AN 253	Autumn 1997 WT 212 & 213	Autumn 1998 WT 229, 230, 233 & Tel 76	Autumn 1999 WT 244 - 246	Autumn 2000 WT 319, 320, WT 322 & Tel 338
13	0	0	0	0	0	0
13.5	0	0	0	0	0	0
14	0	0	0	0	0	0
14.5	0	0	0	0	0	0
15	0	0	0	0	0	0
15.5	0	0	0	0	0	0
16	0	0	0	0	0	0
16.5	0	0	0	0	0	0
17	0	0	12	0	0	0
17.5	0	0	0	0	0	0
18	0	0	0	0	0	0
18.5	0	0	0	0	0	0
19	0	11	0	0	0	0
19.5	0	0	0	0	0	0
20	0	0	8	0	0	0
20.5	10	0	20	0	28	0
21	85	0	0	88	0	0
21.5	112	0	0	24	0	7
22	445	11	11	148	29	11
22.5	197	11	19	160	30	11
23	189	11	22	246	52	11
23.5	312	0	46	315	44	33
24	350	0	22	285	39	56
24.5	121	11	11	258	15	18
25	101	0	0	162	0	33
25.5	131	11	19	168	15	11
26	40	0	0	101	0	29
26.5	20	0	0	78	0	0
27	10	0	0	15	7	0
27.5	0	0	19	33	0	0
28	0	0	0	31	0	0
28.5	0	0	0	0	8	7
29	0	0	0	0	0	0
29.5	0	0	0	0	0	0
30	0	0	0	0	0	0
Total (000's)	2,125	65	208	2,111	266	227
Upper 95% limit	21,520	890	2,019	10,759	2,491	2,795
Lower 95% limit	-17,269	-760	-1,603	-6,538	-1,959	-2,340

Table 21. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3L during spring Ca research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 240 & 241	Spring 2000 WT 317 & 318	Spring 2001 WT 368 - 370
5.5	0	0	0
6	0	0	0
6.5	0	0	2,826
7	6,330	14,157	7,037
7.5	179	46,063	36,593
8	20,517	94,150	36,551
8.5	25,450	135,174	11,447
9	12,794	73,405	54
9.5	23,682	39,125	9,711
10	4,446	30,686	20,553
10.5	1,563	57,830	36,011
11	10,181	45,392	184,641
11.5	16,504	157,694	201,162
12	38,517	262,995	312,276
12.5	129,204	451,017	614,171
13	262,788	884,564	689,435
13.5	701,358	982,209	744,196
14	800,045	1,011,198	680,982
14.5	836,198	696,342	508,452
15	735,604	720,602	484,069
15.5	428,769	602,876	794,779
16	187,846	601,313	879,234
16.5	115,905	765,920	1,350,607
17	277,182	1,350,106	1,287,583
17.5	333,896	1,637,703	1,539,283
18	511,943	1,621,003	1,574,510
18.5	473,160	1,223,271	1,786,227
19	487,048	609,824	1,900,986
19.5	590,346	658,256	1,646,234
20	737,652	410,935	1,006,786
20.5	686,513	520,016	451,546
21	481,486	391,160	232,393
21.5	411,989	235,661	87,663
22	114,854	172,677	52,024
22.5	54,750	114,017	13,830
23	23,711	13,037	8,690
23.5	6,770	8,333	15,237
24	1,080	189	20
24.5	0	0	0
25	0	0	0
25.5	0	0	4,183
26	0	0	0
26.5	0	0	0
27	0	0	0
27.5	0	0	0
28	0	0	0
28.5	0	0	0
29	0	0	0
Total (000's)	9,550,256	16,638,899	19,211,978
Upper 95% limit	17,903,122	35,889,286	29,362,181
Lower 95% limit	1,197,389	-2,611,488	9,061,776

Table 22. Abundance (000's) of transitional and primiparous female northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3L during Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 240 & 241	Spring 2000 WT 317 & 318	Spring 2001 WT 368 - 370
13.5	0	0	0
14	0	0	0
14.5	0	0	0
15	0	0	24
15.5	0	0	48
16	0	0	18,876
16.5	0	0	72
17	0	3,153	11,856
17.5	2,745	5,615	7,865
18	0	13,755	72
18.5	5,932	0	9,462
19	2,151	14,987	27,453
19.5	21,067	60,691	127,445
20	12,931	117,463	240,062
20.5	45,989	251,042	430,082
21	93,388	326,247	440,586
21.5	176,089	587,523	427,927
22	379,890	611,861	376,577
22.5	484,980	789,512	352,710
23	392,406	841,610	299,767
23.5	343,073	831,354	136,457
24	182,096	366,971	105,833
24.5	86,913	243,309	42,601
25	38,703	146,337	34,653
25.5	7,643	43,759	1,052
26	1,582	19,777	855
26.5	46	1,107	233
27	0	230	166
27.5	0	0	0
28	0	0	0
28.5	0	0	0
29	0	0	0
29.5	0	0	0
30	0	0	0
Total (000's)	2,277,621	5,276,301	3,092,732
Upper 95% limit	4,162,792	11,688,803	4,676,353
Lower 95% limit	392,449	1,956,532	1,509,110

Table 23. Abundance (000's) of multiparous and ovigerous northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3L during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 240 & 241	Spring 2000 WT 317 & 318	Spring 2001 WT 368 - 370
12	0	0	0
12.5	0	0	0
13	0	0	0
13.5	0	0	7,841
14	0	0	0
14.5	0	0	0
15	0	3,153	0
15.5	0	0	0
16	0	0	0
16.5	0	0	2,651
17	0	0	14,678
17.5	4,301	0	12,677
18	6,357	24,194	2,789
18.5	6,452	19,307	15,383
19	10,509	18,868	18,738
19.5	2,079	14,304	24,397
20	2,723	22,916	36,402
20.5	2,185	36,235	13,971
21	10,009	36,091	33,853
21.5	5,726	151,782	76,698
22	32,744	216,718	198,782
22.5	40,301	284,599	208,624
23	56,504	309,179	355,762
23.5	81,128	380,574	394,111
24	101,118	403,701	385,111
24.5	69,412	313,973	317,480
25	50,605	156,955	205,852
25.5	53,463	89,855	155,864
26	19,167	57,035	91,206
26.5	8,409	47,917	57,043
27	3,722	19,465	21,631
27.5	5,807	5,486	4,161
28	1,593	3,296	13,606
28.5	2,810	2,938	1,304
29	829	1,658	1,022
29.5	581	254	437
30	327	363	0
30.5	52	36	0
31	212	57	0
31.5	0	62	0
32	0	36	0
Total (000's)	579,123	2,621,004	2,672,075
Upper 95% limit	806,374	9,081,544	3,515,298
Lower 95% limit	351,871	-3,839,535	1,828,852

Table 24. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3N during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 238 - 240	Spring 2000 WT 316 & 317	Spring 2001 WT 367 - 369
5.5	0	0	0
6	0	0	0
6.5	629	0	83
7	4,621	230	181
7.5	4,326	806	198
8	1,283	1,152	280
8.5	1,263	667	406
9	2,864	775	83
9.5	4,229	705	0
10	9,528	3,613	17
10.5	13,229	2,713	10
11	12,833	5,535	20
11.5	11,910	11,936	49
12	9,277	10,865	288
12.5	4,964	4,463	104
13	3,556	7,173	253
13.5	2,558	12,340	76
14	3,618	17,078	74
14.5	4,441	20,497	109
15	5,538	21,781	191
15.5	6,284	11,140	195
16	4,756	11,568	190
16.5	5,700	5,644	231
17	6,365	8,441	185
17.5	6,002	9,684	317
18	6,319	12,138	495
18.5	6,093	17,522	680
19	3,210	7,175	712
19.5	3,327	28,669	642
20	4,463	23,864	449
20.5	4,016	27,768	434
21	2,978	18,715	234
21.5	1,094	11,739	199
22	778	6,941	48
22.5	32	2,059	14
23	75	145	19
23.5	24	0	0
24	0	0	0
24.5	0	0	0
25	0	0	0
25.5	0	0	0
26	0	0	0
26.5	0	0	0
27	0	0	0
27.5	0	0	0
Total (000's)	162,183	325,542	7,465
Upper 95% limit	1,357,874	3,029,217	14,743
Lower 95% limit	-1,033,509	-2,378,134	188

Table 25. Abundance (000's) of transitional and primiparous female northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3N during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 238 - 240	Spring 2000 WT 316 & 317	Spring 2001 WT 367 - 369
15	0	0	0
15.5	0	0	0
16	0	0	0
16.5	0	0	0
17	156	0	0
17.5	0	0	0
18	0	0	0
18.5	101	0	46
19	156	938	54
19.5	0	0	0
20	299	0	0
20.5	1,893	2,884	27
21	2,794	1,726	130
21.5	6,467	13,414	263
22	9,949	24,280	354
22.5	13,190	21,393	424
23	11,299	19,797	529
23.5	6,413	12,293	320
24	4,125	9,870	346
24.5	2,037	2,929	112
25	723	1,238	119
25.5	125	994	38
26	0	42	0
26.5	0	14	0
27	0	0	0
27.5	0	0	0
28	0	0	0
28.5	0	0	0
29	0	0	0
29.5	0	0	0
30	0	0	0
Total (000's)	59,729	111,812	2,762
Upper 95% limit	488,947	1,307,905	19,303
Lower 95% limit	-369,490	-1,084,282	-13,778

Table 26. Abundance (000's) of female northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3N during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 238 - 240	Spring 2000 WT 316 & 317	Spring 2001 WT 367 - 369
14	0	0	0
14.5	0	0	0
15	0	0	0
15.5	0	0	0
16	0	0	0
16.5	0	0	0
17	257	0	0
17.5	0	0	0
18	0	0	0
18.5	0	0	0
19	0	0	0
19.5	125	0	0
20	0	0	8
20.5	101	58	0
21	156	102	18
21.5	341	128	0
22	321	995	21
22.5	1,869	4,141	83
23	4,567	6,429	72
23.5	6,509	3,401	48
24	9,561	3,048	152
24.5	8,948	3,182	215
25	10,150	3,406	66
25.5	6,953	4,255	100
26	4,177	1,272	56
26.5	2,760	159	25
27	1,258	40	38
27.5	2,232	91	0
28	1,375	42	0
28.5	420	9	0
29	319	946	0
29.5	0	0	0
30	0	0	0
Total (000's)	62,396	31,703	902
Upper 95% limit	684,860	334,402	1,904
Lower 95% limit	-560,068	-270,997	-100

Table 27. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3O during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 99 WT 238 & 239	Spring 2000 WT 316 - 317	Spring 2001 WT 365 - 368
7.5	0	0	0
8	26	0	0
8.5	102	0	0
9	127	0	0
9.5	265	0	0
10	393	0	260
10.5	331	44	107
11	1,828	66	107
11.5	1,167	0	45
12	1,413	387	382
12.5	1,430	88	28
13	1,285	117	79
13.5	791	110	124
14	365	165	66
14.5	291	88	240
15	116	261	81
15.5	154	278	94
16	143	329	188
16.5	65	271	387
17	15	239	629
17.5	25	149	683
18	122	247	425
18.5	50	427	298
19	99	209	31
19.5	30	237	155
20	59	303	237
20.5	101	134	186
21	31	20	19
21.5	19	62	26
22	14	69	0
22.5	0	0	0
23	0	0	6
23.5	0	33	0
24	10	0	0
24.5	0	0	0
25	0	0	0
25.5	0	0	0
26	0	0	0
26.5	0	0	0
27	0	0	0
27.5	0	0	0
28	0	0	0
28.5	0	0	0
29	0	0	0
29.5	0	0	0
30	0	0	0
Total (000's)	10,863	4,330	4,883
Upper 95% limit	33,649	33,098	24,897
Lower 95% limit	-11,923	-24,437	-15,132

Table 28. Abundance (000's) of transitional and primiparous northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3O during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 99 WT 238 & 239	Spring 2000 WT 316 - 317	Spring 2001 WT 365 - 368
15.5	0	0	0
16	0	0	0
16.5	0	0	0
17	0	0	0
17.5	8	0	0
18	4	0	0
18.5	8	11	0
19	8	23	0
19.5	104	22	0
20	205	136	21
20.5	189	102	16
21	177	148	15
21.5	199	145	120
22	274	178	56
22.5	236	201	68
23	208	137	29
23.5	95	126	26
24	91	50	0
24.5	74	34	0
25	37	34	0
25.5	14	11	0
26	0	0	0
26.5	0	0	0
27	0	0	0
27.5	0	0	0
28	0	0	0
28.5	0	0	0
29	0	0	0
29.5	0	0	0
30	0	0	0
Total (000's)	1,928	1,359	351
Upper 95% limit	5,484	14,913	826
Lower 95% limit	-1,627	-12,195	-124

Table 29. Abundance (000's) of multiparous and ovigerous northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3O during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 99 WT 238 & 239	Spring 2000 WT 316 - 317	Spring 2001 WT 365 - 368
9.5	0	0	0
10	0	0	0
10.5	0	0	0
11	0	0	0
11.5	0	0	0
12	0	0	0
12.5	0	0	0
13	0	0	0
13.5	0	0	0
14	0	0	0
14.5	0	0	0
15	0	0	0
15.5	0	0	0
16	0	0	0
16.5	0	0	0
17	0	0	0
17.5	8	22	0
18	0	0	0
18.5	0	0	0
19	0	16	0
19.5	0	11	0
20	0	23	0
20.5	10	56	0
21	0	30	0
21.5	0	174	0
22	8	99	19
22.5	10	202	6
23	31	323	0
23.5	65	263	13
24	88	258	34
24.5	138	103	13
25	89	393	0
25.5	76	46	6
26	0	68	0
26.5	15	34	0
27	0	23	0
27.5	6	11	0
28	0	19	0
28.5	0	131	0
29	0	0	0
29.5	0	0	0
30	0	0	0
Total (000's)	544	2,307	92
Upper 95% limit	4,066	21,887	1,085
Lower 95% limit	-2,979	-17,274	-902

Table 30. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3L NRA during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176, 178, 179 WT 181, Tel 22 & Tel 23	Autumn 1996 WT 196 - 198 & Tel 41	Autumn 1997 WT 213 - 217, Tel 57 & 58	Autumn 1998 WT 230 - 233, Tel 75 & 76	Autumn 1999 WT 246 - 248	Autumn 2000 WT 321 - 323, Tel 339, 342 & Tel 343
7.5	0	0	0	0	0	0
8	0	0	702	438	0	0
8.5	165	0	0	5,035	9	0
9	138	1,053	3,566	3,498	29	2,522
9.5	895	3,438	4,339	13,127	108	5,684
10	1,788	6,311	7,057	35,731	204	16,407
10.5	1,590	9,797	10,646	54,062	4,662	13,482
11	3,202	5,527	7,564	41,717	5,950	30,658
11.5	4,300	1,692	4,382	21,074	6,193	5,169
12	3,846	504	1,368	3,082	3,256	8,811
12.5	1,544	504	3,774	5,655	36	5,365
13	802	968	0	2,369	571	2,559
13.5	809	2,566	796	7,993	29	12,941
14	662	7,508	7,245	6,557	4,598	41,359
14.5	905	23,072	6,221	12,551	6,414	55,911
15	4,081	33,456	15,476	22,999	32,733	101,495
15.5	8,169	46,769	41,347	7,591	65,244	124,135
16	9,495	63,619	52,759	31,786	92,618	129,890
16.5	6,699	55,535	35,026	22,747	82,964	182,005
17	6,593	35,037	30,727	37,229	37,768	295,257
17.5	4,589	26,803	23,924	51,842	44,340	469,891
18	1,882	33,946	34,982	57,906	40,132	617,179
18.5	1,664	51,651	48,772	91,358	87,601	679,658
19	2,365	74,379	66,844	100,055	105,522	472,123
19.5	3,003	81,897	85,399	91,047	116,148	347,833
20	2,607	54,824	53,423	107,637	97,550	240,746
20.5	2,178	25,412	40,685	118,772	132,239	206,082
21	1,440	28,473	20,862	85,127	111,304	162,785
21.5	1,703	20,946	11,196	91,755	64,472	184,657
22	1,184	21,599	4,885	42,248	56,727	112,214
22.5	857	19,277	2,605	5,423	35,746	59,280
23	50	9,886	185	2,124	11,407	36,270
23.5	248	9,968	0	537	9,340	7,901
24	50	1,940	56	0	1,261	1,922
24.5	0	1,015	0	0	625	0
25	0	0	0	0	0	0
25.5	0	0	0	0	0	0
26	0	0	0	0	0	0
26.5	0	0	0	0	0	0
27	0	0	0	0	0	0
27.5	0	0	0	0	0	0
28	0	0	0	0	0	0
28.5	0	0	0	0	0	0
29	0	0	0	0	0	0
29.5	0	0	0	0	0	0
30	0	0	0	0	0	0
Total (000's)	79,500	759,369	626,810	1,181,069	1,257,800	4,632,189
Upper 95% limit	196,314	1,745,981	1,706,398	3,852,446	3,102,467	8,750,863
Lower 95% limit	-37,313	-227,244	-452,778	-1,490,307	-586,867	513,516

Table 31. Abundance (000's) of transitional and primiparous female northern shrimp (*Pandalus borealis)* collected in the Div 3L NRA during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176, 178, 179 WT 181, Tel 22 & Tel 23	Autumn 1996 WT 196 - 198 & Tel 41	Autumn 1997 WT 213 - 217, Tel 57 & 58	Autumn 1998 WT 230 - 233, Tel 75 & 76	Autumn 1999 WT 246 - 248	Autumn 2000 WT 321 - 323, Tel 339, 342 & Tel 343
11	0	0	0	0	0	0
11.5	0	0	0	0	0	0
12	0	0	0	0	0	0
12.5	0	0	0	0	0	0
13	0	0	0	0	0	0
13.5	331	0	0	0	0	0
14	0	0	0	0	0	0
14.5	496	0	0	0	0	0
15	2,514	0	0	0	0	0
15.5	8,260	0	0	0	0	0
16	5,726	0	131	0	0	0
16.5	6,705	0	0	0	0	0
17	4,301	0	913	0	0	0
17.5	3,848	0	131	0	0	0
18	2,047	0	100	0	92	0
18.5	2,129	0	2,339	0	0	2,986
19	2,714	0	3,047	0	0	3,106
19.5	2,219	0	12,570	0	245	24,976
20	4,872	0	15,140	0	7,454	47,236
20.5	4,380	0	19,424	2,073	18,037	68,181
21	6,043	0	29,024	1,562	37,959	110,794
21.5	8,973	0	30,895	1,028	53,616	111,662
22	9,392	0	40,489	2,055	63,237	100,657
22.5	9,831	0	21,753	1,073	47,509	89,664
23	6,905	0	17,911	0	21,393	67,286
23.5	4,648	0	6,218	0	11,860	12,249
24	1,338	0	3,237	0	12,091	8,488
24.5	1,253	0	3,641	0	1,349	4,275
25	143	0	40	0	0	0
25.5	42	0	23	0	0	0
26	0	0	0	0	0	0
26.5	0	0	0	0	0	0
27	0	0	0	0	0	0
27.5	50	0	0	0	0	0
28	0	0	0	0	0	0
28.5	0	0	0	0	0	0
29	0	0	0	0	0	0
29.5	0	0	0	0	0	0
30	0	0	0	0	0	0
Total (000's)	99,157	0	207,028	7,790	274,841	651,558
Upper 95% limit	250,145	0	478,790	99,427	526,144	1,559,129
Lower 95% limit	-51,831	0	-64,734	-83,846	23,537	-256,014

Table 32. Abundance (000's) of multiparous and ovigerous northern shrimp (*Pandalus borealis)* collected in NAFO Div. 3L NRA during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176, 178, 179 WT 181, Tel 22 & Tel 23	Autumn 1996 WT 196 - 198 & Tel 41	Autumn 1997 WT 213 - 217, Tel 57 & 58	Autumn 1998 WT 230 - 233, Tel 75 & 76	Autumn 1999 WT 246 - 248	Autumn 2000 WT 321 - 323, Tel 339, 342 & Tel 343
11.5	0	0	0	0	0	0
12	0	0	0	0	0	0
12.5	0	0	0	0	0	0
13	0	0	0	0	0	0
13.5	0	0	0	0	0	0
14	0	0	26	0	0	0
14.5	0	0	0	0	0	0
15	18	0	0	0	0	0
15.5	0	0	0	20	0	0
16	0	0	0	2,997	0	0
16.5	0	0	0	0	0	1,563
17	0	0	0	26	0	0
17.5	0	180	1,025	46	2,632	0
18	295	0	0	46	0	6,283
18.5	0	617	791	555	625	1,563
19	423	0	60	46	3,086	2,517
19.5	193	0	859	2,997	0	6,287
20	180	0	1,690	0	83	30
20.5	50	188	1,873	1,052	2,667	5,764
21	276	149	742	6,039	143	4,629
21.5	0	791	6,265	8,380	286	16,596
22	222	1,477	5,488	24,507	10,183	31,754
22.5	364	1,664	11,083	61,216	6,295	48,894
23	326	8,100	14,331	58,282	15,319	78,664
23.5	1,569	9,278	16,131	56,717	24,210	125,352
24	2,172	10,614	15,712	55,301	26,026	127,641
24.5	4,026	15,488	13,287	35,242	16,971	109,775
25	2,976	18,972	12,622	30,254	18,641	65,824
25.5	2,889	14,263	7,209	15,804	14,080	31,072
26	2,991	11,697	8,341	10,301	8,308	16,926
26.5	2,336	7,457	3,083	5,781	2,893	15,544
27	903	4,020	2,738	4,157	2,559	4,269
27.5	1,045	2,333	2,700	1,997	1,871	2,668
28	1,041	1,213	1,529	1,805	1,305	1,877
28.5	154	1,377	1,255	932	262	90
29	74	1,325	1,248	94	428	79
29.5	87	931	197	0	130	858
30	25	759	104	0	0	0
30.5	49	642	64	20	12	0
31	0	79	40	0	0	859
31.5	0	104	0	20	14	0
32	0	0	0	0	0	0
Total (000's)	24,683	113,719	130,493	384,632	159,026	707,375
Upper 95% limit	38,854	850,899	423,961	1,068,675	387,902	1,026,353
Lower 95% limit	10,511	-623,460	-162,976	-299,411	-69,851	388,397

Table 33. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3N NRA during autumn Canadian research surveys in 1995 - 2000. The data were taken from strata<784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 Tel 41, 42 & AN 253	Autumn 1997 WT 212 - 214	Autumn 1998 WT 229, 230, WT 233 & Tel 76	Autumn 1999 WT 245 - 247	Autumn 2000 WT 320, 322, 323, Tel 338 & Tel 339
5.5	0	0	0	0	0	0
6	0	0	0	0	0	0
6.5	0	111	0	0	0	0
7	382	55	0	0	0	0
7.5	1,146	463	166	0	0	0
8	200	1,511	0	0	15	0
8.5	1,205	4,572	0	2,345	0	0
9	1,196	1,994	0	7,039	29	322
9.5	609	836	126	30,098	29	33
10	209	2,574	0	26,296	29	47
10.5	32	1,595	20	10,845	142	47
11	241	7,808	114	7,023	44	15
11.5	825	25,187	516	2,936	74	17
12	2,898	33,716	888	4,227	46	125
12.5	3,239	46,253	1,522	4,606	238	165
13	4,458	42,294	1,501	4,841	494	112
13.5	4,476	26,072	1,251	4,327	418	272
14	1,406	20,851	928	15,002	454	334
14.5	2,619	17,020	1,706	20,779	605	441
15	1,600	14,744	3,436	17,078	461	485
15.5	2,456	13,476	4,181	32,556	691	896
16	2,658	12,226	6,850	30,626	1,053	747
16.5	2,471	21,063	9,318	45,646	953	902
17	3,413	11,123	9,609	32,614	939	1,222
17.5	3,120	19,646	4,875	23,485	875	1,811
18	1,916	11,186	5,629	40,066	1,345	2,208
18.5	1,887	10,776	5,848	41,414	1,032	2,029
19	1,537	9,008	5,183	48,674	1,310	1,813
19.5	2,492	10,086	3,413	46,199	1,426	1,529
20	2,684	6,277	4,199	43,817	1,866	1,658
20.5	2,113	5,840	3,684	13,751	1,678	1,534
21	1,910	1,290	2,620	22,491	1,721	1,875
21.5	955	567	1,741	21,197	2,049	1,545
22	955	1,376	833	9,535	1,072	1,214
22.5	382	14	297	9,157	768	805
23	191	1,150	247	5,305	234	490
23.5	0	0	182	11	87	76
24	0	5	11	19	12	76
24.5	0	0	0	0	0	17
25	0	0	0	0	0	0
25.5	0	0	0	0	0	0
Total (000's)	57,878	382,763	80,893	624,002	22,185	24,861
Upper 95% limit	597,327	3,874,410	646,237	6,876,977	55,181	46,640
Lower 95% limit	-481,572	-3,108,883	-484,451	-5,628,973	-10,812	3,082

Table 34. Abundance (000's) of transitional and primiparous northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3N NRA during autumn Canadian research surveys in 1995 - 2000. The data were taken from strata<784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 Tel 41, 42 & AN 253	Autumn 1997 WT 212 - 214	Autumn 1998 WT 229, 230, WT 233 & Tel 76	Autumn 1999 WT 245 - 247	Autumn 2000 WT 320, 322, 323, Tel 338 & Tel 339
10	0	0	0	0	0	0
10.5	0	0	0	0	0	0
11	0	0	0	0	0	0
11.5	0	0	0	0	0	0
12	0	0	0	0	0	0
12.5	0	0	0	0	0	0
13	0	0	0	0	0	0
13.5	0	0	0	0	0	0
14	0	0	0	0	0	0
14.5	0	0	0	0	0	0
15	0	0	0	0	0	0
15.5	0	0	0	0	0	0
16	0	0	0	0	0	0
16.5	0	59	0	0	0	0
17	0	54	0	0	0	0
17.5	0	0	0	0	0	5
18	0	428	0	0	0	0
18.5	0	33	0	31	0	0
19	0	2,119	0	124	0	39
19.5	0	3,364	662	93	0	0
20	0	4,925	225	31	29	143
20.5	0	5,799	284	155	103	116
21	0	3,552	276	0	165	146
21.5	191	5,624	520	124	293	298
22	191	1,086	59	0	307	179
22.5	0	1,672	59	0	138	107
23	0	426	48	0	55	15
23.5	0	34	12	0	0	21
24	0	22	11	0	0	0
24.5	0	15	0	0	0	0
25	0	7	0	0	0	0
25.5	0	0	0	0	0	0
26	0	0	0	0	0	0
26.5	0	0	0	0	0	0
27	0	0	0	0	0	0
27.5	0	0	0	0	0	0
28	0	0	0	0	0	0
28.5	0	0	0	0	0	0
29	0	0	0	0	0	0
29.5	0	0	0	0	0	0
Total (000's)	382	29,220	2,154	557	1,089	1,069
Upper 95% limit	5,234	309,792	22,460	7,636	4,457	6,091
Lower 95% limit	-4,471	-251,353	-18,151	-6,521	-2,278	-3,954

Table 35. Abundance (000's) of multiparous and ovigerous northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3N NRA during autumn Canadian research surveys in 1995 - 2000. The data were taken from strata<784 so that all years would be comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 Tel 41, 42 & AN 253	Autumn 1997 WT 212 - 214	Autumn 1998 WT 229, 230, WT 233 & Tel 76	Autumn 1999 WT 245 - 247	Autumn 2000 WT 320, 322, 323, Tel 338 & Tel 339
10.5	0	0	0	0	0	0
11	0	0	0	0	0	0
11.5	0	54	0	0	0	0
12	0	0	0	0	0	0
12.5	0	54	0	0	0	0
13	0	0	0	0	0	0
13.5	0	0	0	0	0	0
14	0	0	0	0	0	0
14.5	0	269	0	0	0	0
15	0	433	0	0	0	0
15.5	0	54	0	0	0	0
16	0	215	0	0	0	0
16.5	0	215	0	0	0	0
17	0	0	0	0	0	0
17.5	0	1,093	0	0	0	0
18	0	272	176	0	0	0
18.5	0	54	0	0	0	0
19	0	0	0	11	0	0
19.5	0	5	0	79	0	0
20	0	5	0	19	100	0
20.5	0	19	11	356	47	20
21	382	0	17	977	76	136
21.5	764	412	118	1,825	348	266
22	805	1,337	174	5,543	574	613
22.5	2,493	2,573	785	4,008	1,017	1,011
23	2,924	4,334	673	17,486	1,707	1,553
23.5	1,939	4,084	1,223	11,515	2,516	2,031
24	2,525	3,157	1,080	4,289	2,252	1,686
24.5	2,121	4,437	894	7,219	1,603	1,978
25	1,540	2,888	732	5,225	1,336	1,526
25.5	2,880	1,342	563	6,539	826	879
26	1,538	20	530	2,703	697	516
26.5	1,337	1,754	459	881	350	191
27	1,528	824	211	702	166	203
27.5	382	819	191	274	150	78
28	573	0	115	94	109	95
28.5	382	523	118	41	12	104
29	191	0	49	11	32	0
29.5	382	0	0	0	0	0
30	0	0	13	17	0	0
30.5	0	0	6	0	0	0
31	0	0	6	0	0	0
Total (000's)	24,684	31,240	8,144	69,812	13,916	12,886
Upper 95% limit	335,248	359,382	39,954	646,345	41,649	30,091
Lower 95% limit	-285,880	-296,902	-23,667	-506,720	-13,816	-4,320

Table 36. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3O NRA during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so comparable. that all years would be comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 WT 200, Tel 42 & AN 253	Autumn 1997 WT 212 & 213	Autumn 1998 WT 229, 230, 233 & Tel 76	Autumn 1999 WT 244 - 246	Autumn 2000 WT 319, 320, 322 & Tel 338
8.5	0	0	0	0	0	0
9	0	0	0	0	9	0
9.5	0	101	0	30	0	0
10	0	0	0	11	0	0
10.5	0	0	0	11	0	0
11	0	101	49	33	0	0
11.5	0	203	85	31	0	0
12	0	0	223	51	20	0
12.5	0	13	133	33	0	0
13	0	0	126	9	0	0
13.5	17	111	187	0	20	0
14	0	0	144	37	6	11
14.5	0	101	96	17	0	0
15	0	0	42	30	0	17
15.5	0	0	64	56	0	0
16	0	0	92	59	20	17
16.5	17	0	121	89	55	0
17	0	0	68	106	0	0
17.5	0	0	68	82	6	4
18	0	0	122	125	49	11
18.5	0	0	32	201	60	4
19	0	0	0	281	11	28
19.5	5	0	48	210	18	0
20	0	0	15	190	11	0
20.5	0	0	0	141	45	4
21	0	0	6	123	6	0
21.5	0	0	6	50	17	4
22	0	0	0	63	6	17
22.5	0	0	0	18	0	5
23	0	0	0	6	0	0
23.5	0	0	0	11	0	0
24	0	0	0	0	0	0
24.5	0	0	0	0	0	0
25	0	0	0	0	0	0
Total (000's)	39	630	1,728	2,101	357	120
Upper 95% limit	473	7,190	17,615	17,983	3,272	216
Lower 95% limit	-396	-5,930	-14,160	-13,781	-2,558	25

Table 37. Abundance (000's) of transitional and primiparous female northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3O NRA during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 WT 200, Tel 42 & AN 253	Autumn 1997 WT 212 & 213	Autumn 1998 WT 229, 230, 233 & Tel 76	Autumn 1999 WT 244 - 246	Autumn 2000 WT 319, 320, 322 & Tel 338
17.5	0	0	0	0	0	0
18	0	0	0	0	0	0
18.5	0	0	0	6	0	0
19	0	0	0	0	0	0
19.5	0	0	0	6	0	0
20	0	0	0	17	0	0
20.5	0	0	0	17	0	0
21	0	0	0	28	0	0
21.5	5	0	0	11	0	0
22	0	0	0	0	0	0
22.5	0	0	0	11	6	0
23	0	0	0	6	0	0
23.5	0	0	0	0	0	0
24	0	13	0	0	0	0
24.5	0	0	0	0	0	0
25	0	0	0	0	0	0
25.5	0	0	0	0	0	0
26	0	0	0	0	0	0
26.5	0	0	0	0	0	0
27	0	0	0	0	0	0
27.5	0	0	0	0	0	0
28	0	0	0	0	0	0
28.5	0	0	0	0	0	0
29	0	0	0	0	0	0
29.5	0	0	0	0	0	0
30	0	0	0	0	0	0
30.5	0	0	0	0	0	0
Total (000's)	5	13	0	101	6	0
Upper 95% limit	66	180	0	1,381	77	0
Lower 95% limit	-56	-154	0	-1,180	-66	0

Table 38. Abundance (000's) of multiparous and ovigerous northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3O NRA during autumn Canadian research surveys during 1995 - 2000. The data were taken from strata <784 so comparable.

Length in mm	Autumn 1995 WT 176 & 177	Autumn 1996 WT 200, Tel 42 & AN 253	Autumn 1997 WT 212 & 213	Autumn 1998 WT 229, 230, 233 & Tel 76	Autumn 1999 WT 244 - 246	Autumn 2000 WT 319, 320, 322 & Tel 338
18.5	0	0	0	0	0	0
19	0	0	0	0	0	0
19.5	0	0	0	0	0	0
20	0	0	6	0	0	0
20.5	0	0	7	0	0	0
21	0	0	0	6	0	0
21.5	5	0	0	11	0	5
22	10	0	0	22	12	0
22.5	0	0	0	34	23	0
23	5	0	0	67	39	0
23.5	0	0	0	73	34	0
24	5	0	0	22	29	0
24.5	0	0	0	45	11	5
25	0	0	0	45	0	0
25.5	0	0	6	39	12	0
26	0	0	0	45	0	5
26.5	0	0	0	34	0	0
27	0	0	0	6	5	0
27.5	0	0	0	0	0	0
28	0	0	0	0	0	0
28.5	0	0	0	0	6	5
29	0	0	0	0	0	0
29.5	0	0	0	0	0	0
30	0	0	0	0	0	0
30.5	0	0	0	0	0	0
Total (000's)	24	0	18	448	170	21
Upper 95% lim	328	0	87	6,138	1,865	286
Lower 95% lim	-280	0	-51	-5,243	-1,524	-244

Table 39. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3L NRA during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 240 & 241	Spring 2000 WT 317 & 318	Spring 2001 WT 368 - 370
5.5	0	0	0
6	0	0	0
6.5	0	0	175
7	0	0	175
7.5	0	0	549
8	0	0	9,074
8.5	0	0	663
9	0	0	0
9.5	0	0	87
10	0	12,712	87
10.5	0	0	4,109
11	0	40	16,121
11.5	0	0	16,298
12	0	40	25,071
12.5	0	0	37,537
13	72	90,272	37,579
13.5	40,777	76,311	87,382
14	53,077	88,983	87,248
14.5	79,930	83,664	63,891
15	81,294	104,693	49,988
15.5	68,170	79,440	93,853
16	28,204	33,300	77,117
16.5	36,424	44,290	301,567
17	49,453	183,000	155,082
17.5	76,404	364,020	219,856
18	125,098	563,113	322,822
18.5	148,907	527,328	390,389
19	151,206	266,297	389,816
19.5	195,369	332,616	410,685
20	243,482	216,761	194,398
20.5	218,530	330,094	145,663
21	164,017	256,791	68,572
21.5	157,961	167,313	36,135
22	45,978	106,177	20,889
22.5	20,201	73,470	5,465
23	15,088	10,393	3,044
23.5	3,999	8,066	5,445
24	421	100	20
24.5	0	0	0
25	0	0	0
25.5	0	0	1,491
26	0	0	0
26.5	0	0	0
27	0	0	0
27.5	0	0	0
28	0	0	0
Total (000's)	2,004,062	4,019,281	3,278,342
Upper 95% limit	5,310,743	38,128,473	28,505,882
Lower 95% limit	-1,302,619	-30,090,000	-21,950,000

Table 40. Abundance (000's) of transitional and primiparous northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3L NRA during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 240 & 241	Spring 2000 WT 317 & 318	Spring 2001 WT 368 - 370
9	0	0	0
9.5	0	0	0
10	0	0	0
10.5	0	0	0
11	0	0	0
11.5	0	0	0
12	0	0	0
12.5	0	0	0
13	0	0	0
13.5	0	0	0
14	0	0	0
14.5	0	0	0
15	0	0	0
15.5	0	0	0
16	0	0	11,689
16.5	0	0	0
17	0	0	0
17.5	2,149	0	7,754
18	0	0	0
18.5	3,671	0	209
19	0	204	404
19.5	4,297	0	16,210
20	0	12,805	1,054
20.5	72	46,054	13,925
21	7,207	51,657	33,031
21.5	26,179	132,587	69,519
22	72,817	131,664	68,137
22.5	119,986	214,354	65,786
23	127,438	400,576	91,529
23.5	150,508	373,700	45,901
24	89,864	180,541	46,591
24.5	40,205	145,108	18,180
25	17,864	107,552	15,456
25.5	1,209	31,278	952
26	655	18,245	794
26.5	46	820	218
27	0	0	166
27.5	0	0	0
28	0	0	0
28.5	0	0	0
29	0	0	0
Total (000's)	664,166	1,847,144	507,505
Upper 95% limit	1,908,590	14,451,086	2,097,345
Lower 95% limit	-580,259	-10,760,000	-1,082,336

Table 41. Abundance (000's) of multiparous and ovigerous northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3L NRA during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 240 & 241	Spring 2000 WT 317 & 318	Spring 2001 WT 368 - 370
9.5	0	0	0
10	0	0	0
10.5	0	0	0
11	0	0	0
11.5	0	0	0
12	0	0	0
12.5	0	0	0
13	0	0	0
13.5	0	0	7,754
14	0	0	0
14.5	0	0	0
15	0	0	0
15.5	0	0	0
16	0	0	0
16.5	0	0	0
17	0	0	87
17.5	0	0	7,754
18	3,646	7,826	87
18.5	3,646	0	4,022
19	0	93	0
19.5	0	0	8,413
20	0	0	0
20.5	0	0	0
21	0	169	0
21.5	120	12,916	122
22	2,649	1,756	6,843
22.5	9,210	53,734	11,841
23	9,753	53,310	25,861
23.5	8,768	98,105	47,084
24	23,689	104,431	46,084
24.5	16,190	139,107	43,529
25	16,463	51,346	37,526
25.5	8,814	42,638	43,622
26	3,493	19,878	20,622
26.5	2,165	27,790	11,073
27	1,247	3,464	7,140
27.5	1,540	2,901	1,895
28	664	1,742	4,814
28.5	256	913	699
29	417	579	659
29.5	238	219	312
30	178	62	0
30.5	26	0	0
31	161	0	0
31.5	0	62	0
Total (000's)	113,332	623,041	337,842
Upper 95% limit	252,197	4,828,133	992,886
Lower 95% limit	-25,534	-3,582,051	-317,201

Table 42. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3N NRA during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 238 - 240	Spring 2000 WT 316 & 317	Spring 2001 WT 367 - 369
6	0	0	0
6.5	629	0	83
7	4,621	230	181
7.5	4,312	806	198
8	1,250	1,152	280
8.5	1,253	667	406
9	2,860	649	83
9.5	4,229	534	0
10	9,528	2,859	17
10.5	13,190	2,210	10
11	12,823	4,638	20
11.5	11,864	9,542	49
12	9,165	8,698	288
12.5	4,855	3,763	104
13	3,451	5,816	253
13.5	2,482	9,902	76
14	3,575	13,775	74
14.5	4,299	16,309	109
15	5,317	17,690	191
15.5	6,092	9,146	195
16	4,526	9,957	190
16.5	5,224	4,997	231
17	5,595	7,212	185
17.5	5,550	8,931	317
18	5,802	11,311	495
18.5	5,737	17,242	680
19	3,085	7,131	712
19.5	3,202	28,505	642
20	4,416	23,694	449
20.5	3,936	27,581	434
21	2,922	18,625	234
21.5	1,035	11,719	199
22	770	6,925	48
22.5	27	2,037	14
23	75	135	19
23.5	20	0	0
24	0	0	0
24.5	0	0	0
25	0	0	0
Total (000's)	157,715	294,385	7,465
Upper 95% limit	1,349,397	2,762,675	14,743
Lower 95% limit	-1,033,967	-2,173,906	188

Table 43. Abundance (000's) of transitional and primiparous female northern shrimp (*Pandalus borealis)* collected during in the NAFO Div. 3N NRA spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 238 - 240	Spring 2000 WT 316 & 317	Spring 2001 WT 367 - 369
15.5	0	0	0
16	0	0	0
16.5	0	0	0
17	156	0	0
17.5	0	0	0
18	0	0	0
18.5	101	0	46
19	156	938	54
19.5	0	0	0
20	239	0	0
20.5	1,855	2,884	27
21	2,789	1,600	130
21.5	6,420	13,244	263
22	9,894	24,128	354
22.5	13,043	21,297	424
23	11,148	19,717	529
23.5	6,335	12,251	320
24	4,061	9,801	346
24.5	2,011	2,887	112
25	694	1,238	119
25.5	110	994	38
26	0	42	0
26.5	0	14	0
27	0	0	0
27.5	0	0	0
28	0	0	0
28.5	0	0	0
29	0	0	0
29.5	0	0	0
30	0	0	0
Total (000's)	59,013	111,034	2,762
Upper 95% limit	487,777	1,307,035	19,303
Lower 95% limit	-369,751	-1,084,967	-13,778

Table 44. Abundance (000's) of multiparous and ovigerous female northern shrimp (*Pandalus borealis)* collected during in the NAFO Div. 3N NRA spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 1999 WT 238 - 240	Spring 2000 WT 316 & 317	Spring 2001 WT 367 - 369
9	0	0	0
9.5	0	0	0
10	0	0	0
10.5	0	0	0
11	0	0	0
11.5	0	0	0
12	0	0	0
12.5	0	0	0
13	0	0	0
13.5	0	0	0
14	0	0	0
14.5	0	0	0
15	0	0	0
15.5	0	0	0
16	0	0	0
16.5	0	0	0
17	257	0	0
17.5	0	0	0
18	0	0	0
18.5	0	0	0
19	0	0	0
19.5	121	0	0
20	0	0	8
20.5	101	58	0
21	156	96	18
21.5	341	112	0
22	319	995	21
22.5	1,856	4,141	83
23	4,543	6,406	72
23.5	6,391	3,358	48
24	9,509	2,968	152
24.5	8,906	3,024	215
25	10,120	3,368	66
25.5	6,938	4,228	100
26	4,168	1,262	56
26.5	2,754	148	25
27	1,254	40	38
27.5	2,228	91	0
28	1,370	42	0
28.5	420	9	0
29	319	946	0
29.5	0	0	0
30	0	0	0
Total (000's)	62,070	31,290	902
Upper 95% limit	684,455	333,955	1,904
Lower 95% limit	-560,316	-271,375	-100

Table 45. Abundance (000's) of male northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3O NRA during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 99 WT 238 & 239	Spring 2000 WT 315 - 317	Spring 2001 WT 365 - 368
8	0	0	0
8.5	0	0	0
9	0	0	0
9.5	0	0	0
10	0	0	0
10.5	0	0	0
11	0	0	0
11.5	0	0	0
12	0	0	0
12.5	0	0	9
13	0	6	0
13.5	0	33	9
14	0	0	0
14.5	0	0	0
15	0	5	0
15.5	0	11	14
16	0	106	0
16.5	0	0	5
17	0	0	0
17.5	0	12	0
18	0	0	28
18.5	0	100	10
19	0	12	0
19.5	0	6	15
20	0	106	10
20.5	0	12	10
21	0	0	15
21.5	0	0	19
22	0	0	0
22.5	0	0	0
23	0	0	5
23.5	0	0	0
24	0	0	0
24.5	0	0	0
25	0	0	0
25.5	0	0	0
26	0	0	0
26.5	0	0	0
27	0	0	0
27.5	0	0	0
28	0	0	0
28.5	0	0	0
29	0	0	0
29.5	0	0	0
30	0	0	0
Total (000's)	0	407	148
Upper 95% limit	0	4,295	1,254
Lower 95% limit	0	-3,481	-958

Table 46. Abundance (000's) of transitional and primiparous female northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3O NRA during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 99 WT 238 & 239	Spring 2000 WT 315 - 317	Spring 2001 WT 365 - 368
17.5	0	0	0
18	0	0	0
18.5	0	0	0
19	0	0	0
19.5	0	0	0
20	0	0	5
20.5	0	0	0
21	0	0	0
21.5	0	6	9
22	0	6	0
22.5	0	6	10
23	0	0	10
23.5	0	0	20
24	0	12	0
24.5	0	0	0
25	0	0	0
25.5	0	0	0
26	0	0	0
26.5	0	0	0
27	0	0	0
27.5	0	0	0
28	0	0	0
28.5	0	0	0
29	0	0	0
29.5	0	0	0
30	0	0	0
Total (000's)	0	29	53
Upper 95% limit	0	255	623
Lower 95% limit	0	-197	-517

Table 47. Abundance (000's) of multiparous and ovigerous northern shrimp (*Pandalus borealis)* collected in the NAFO Div. 3O NRA during spring Canadian research surveys in 1999 - 2001. The data were taken from strata <784 so that all years would be comparable.

Length in mm	Spring 99 WT 238 & 239	Spring 2000 WT 315 - 317	Spring 2001 WT 365 - 368
18	0	0	0
18.5	0	0	0
19	0	0	0
19.5	0	0	0
20	0	0	0
20.5	0	0	0
21	0	6	0
21.5	0	0	0
22	0	6	15
22.5	0	6	5
23	0	100	0
23.5	0	0	10
24	0	6	15
24.5	0	0	10
25	0	100	0
25.5	0	0	5
26	0	0	0
26.5	0	0	0
27	0	0	0
27.5	0	0	0
28	0	6	0
28.5	0	100	0
29	0	0	0
29.5	0	0	0
30	0	0	0
Total (000's)	0	329	59
Upper 95% limit	0	4,143	803
Lower 95% limit	0	-3,486	-686

Table 48. Total abundance (X 1000), biomass (Kg. X1000) of northern shrimp (*Pandalus borealis*) collected during autumn 1995 - 2000 Canadian research surveys into the Southeast Shoal (NAFO Div. 3N). (Data were standardized to 15 minute tows; . means not sampled.).

	Autumn 95 WT 176, 177		Autumn 96 Tel 41, 42 & AN 253		Autumn 97 WT 212-214		Autumn 98 WT 229, 230, WT 233, Tel 76		Autumn 99 WT 245 - 247		Autumn 2000 WT 320, 322 WT 323, Tel 338 & 339	
	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)
Total (000's)	0	0	0	0	54.01	0.54	0	0	170.14	0.57	0	0
pper 95% limit	0	0	0	0	178.56	1.79	0	0	572.50	1.91	0	0
ower 95% limit	0	0	0	0	-70.54	-0.71	0	0	-232.23	-0.77	0	0

Table 49. Total abundance (X 1000), biomass (Kg. X1000) of northern shrimp (*Pandalus borealis*) collected during spring 1999 - 2001 Canadian research surveys into the Southeast Shoal (NAFO Div. 3N). (Data were standardized to 15 minute tows; . means not sampled.).

	Spring 99 WT 238 - 240		Spring 2000 WT 316 & 317		Spring 2001 WT 367 - 369	
	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)	abundance (x 1000)	biomass (Kg X 1000)
Total (000's)	0	0	0	0	0	0
pper 95% limit	0	0	0	0	0	0
ower 95% limit	0	0	0	0	0	0

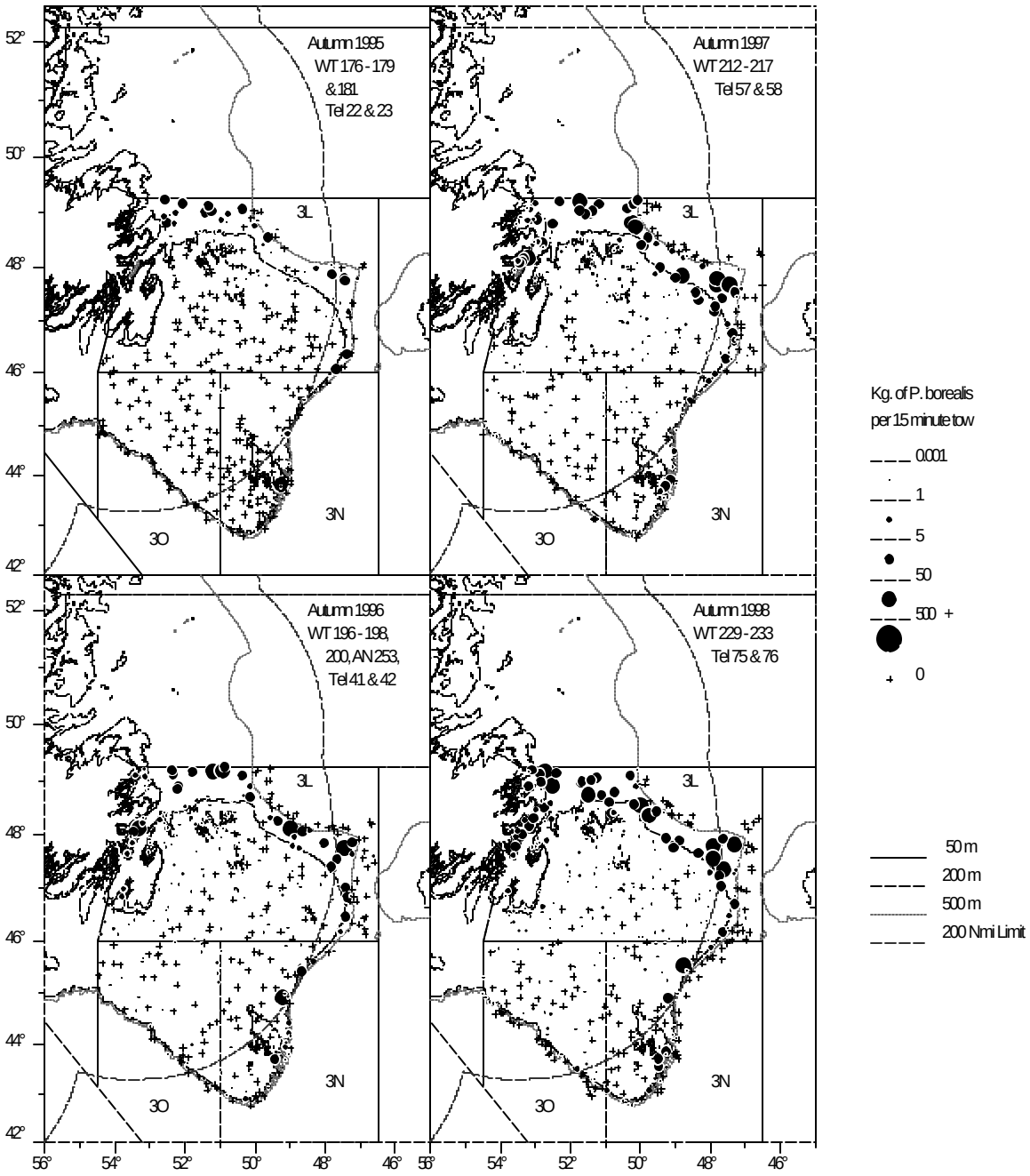


Fig. 1 Distribution of Pandalus borealis collected during Canadian 1995 - 98 autumn multi-species research surveys. (Catches were made with a Campelen 1800 shrimp trawl).

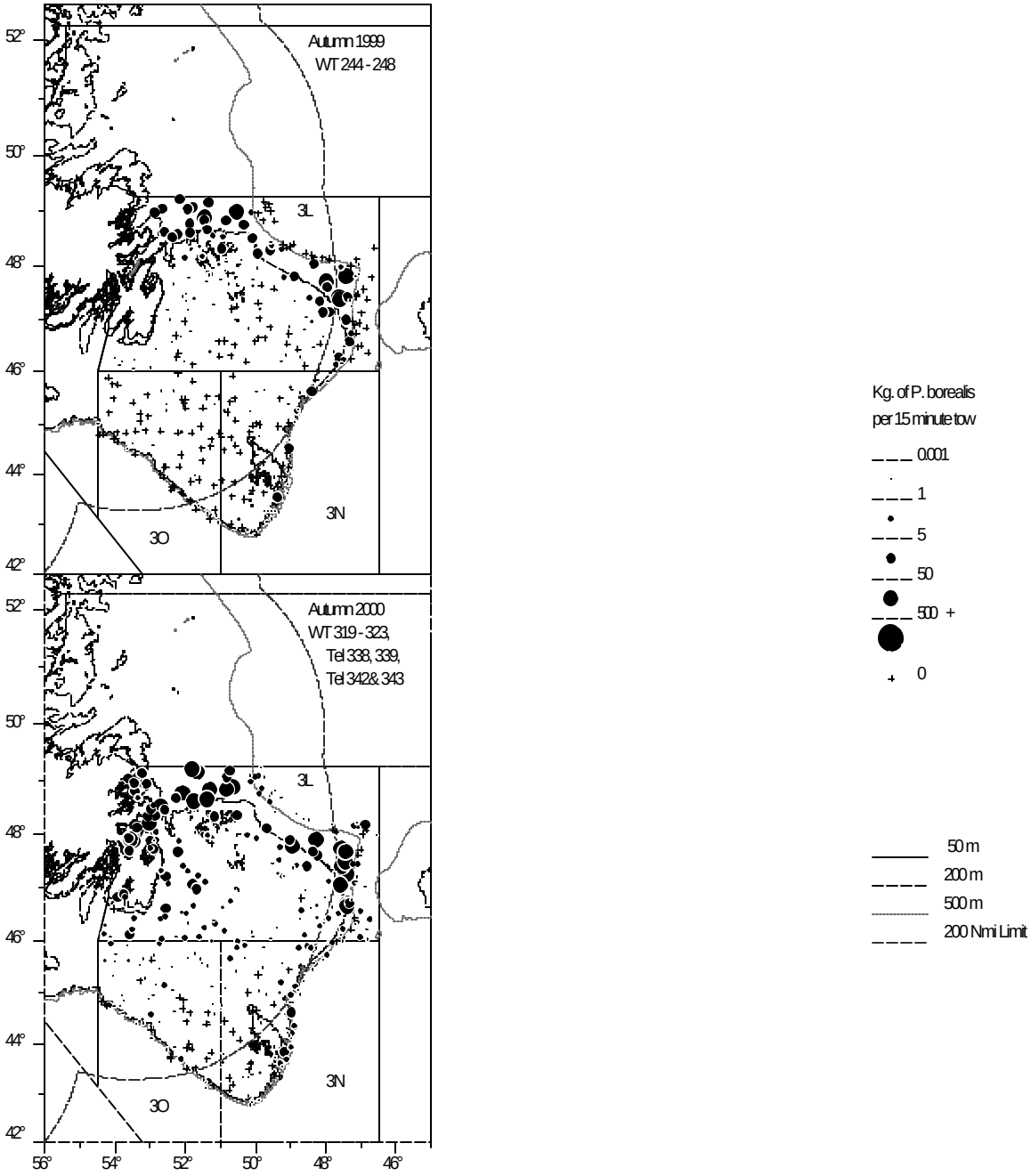


Fig. 2 Distribution of Pandalus borealis collected during Canadian 1999 - 2000 autumn multi-species research surveys. (Catches were made with a Campelen 1800 shrimp trawl).

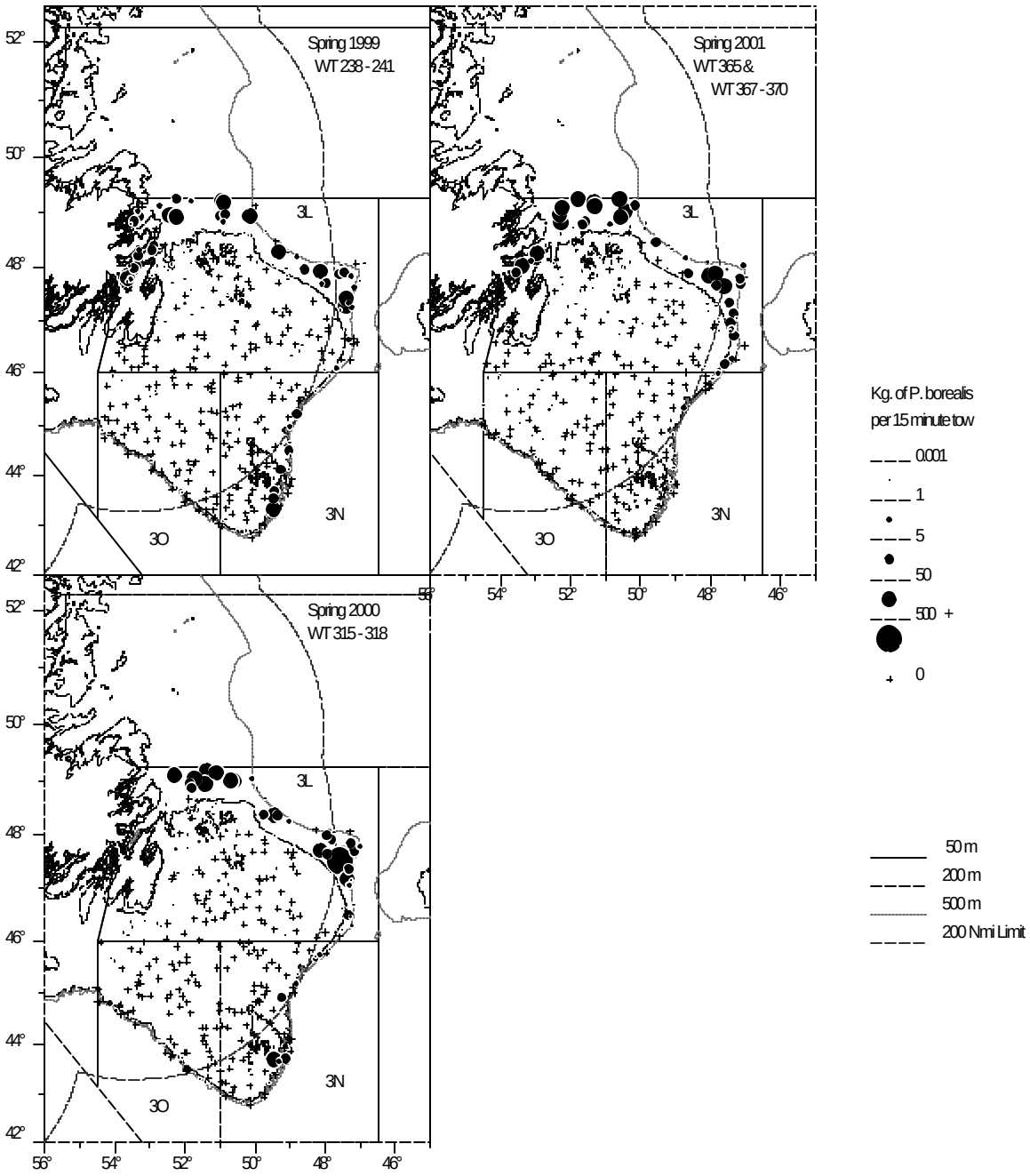


Fig. 3 Distribution of Pandalus borealis collected during Canadian 1999 - 2001 spring multi-species research surveys. (Catches were made with a Campelen 1800 shrimp trawl).

Fig. 4 Pandalus borealis within NAFO Division 3L from autumn Canadian 1995 - 2000 research survey data. (Standardized 15 min tows, abundances X10^6)

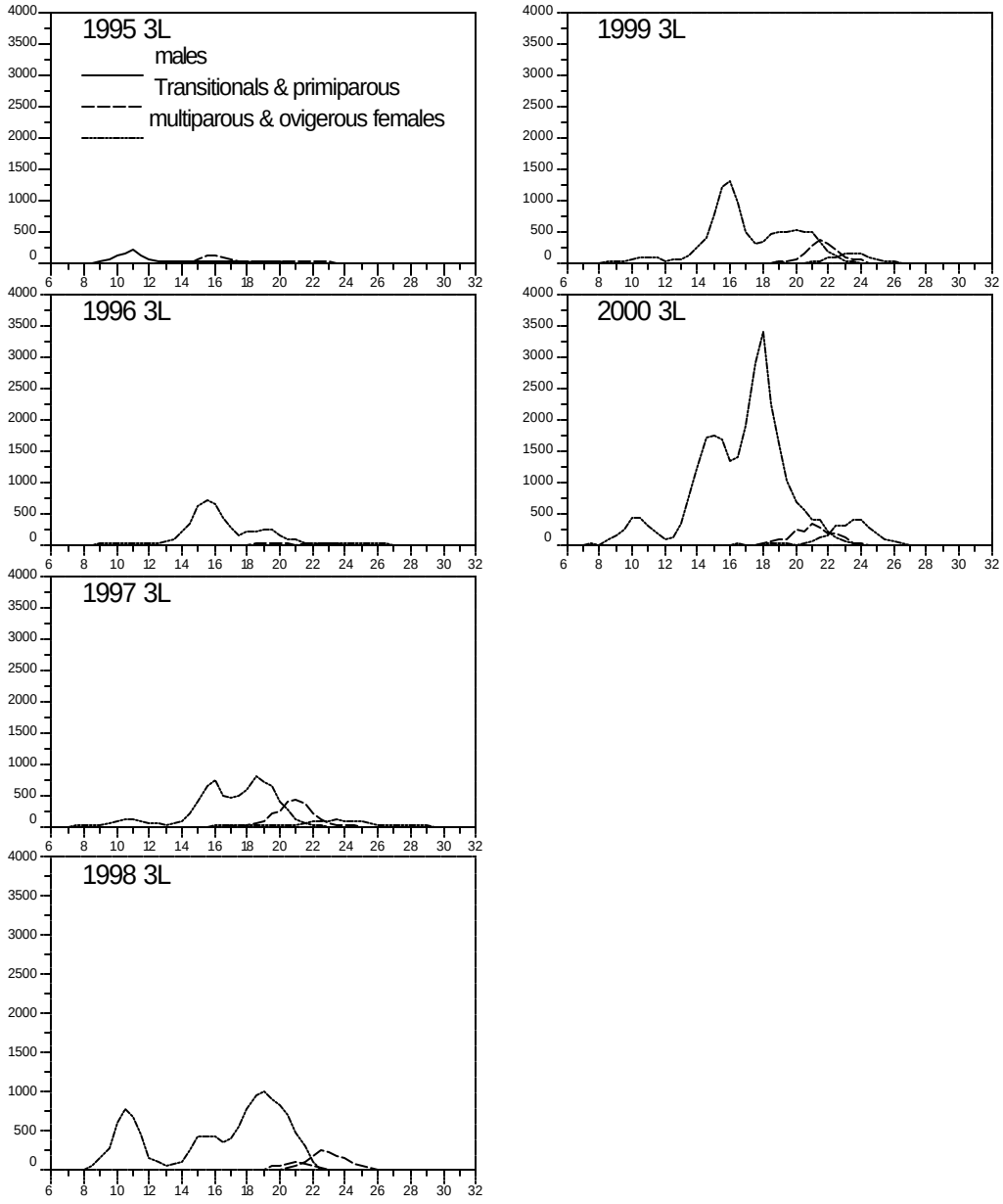


Fig. 5 Pandalus borealis within the NAFO Division 3L NRA from autumn Canadian 1995 - 2000 research survey data. (Standardized 15 min tows, abundances X10^6)

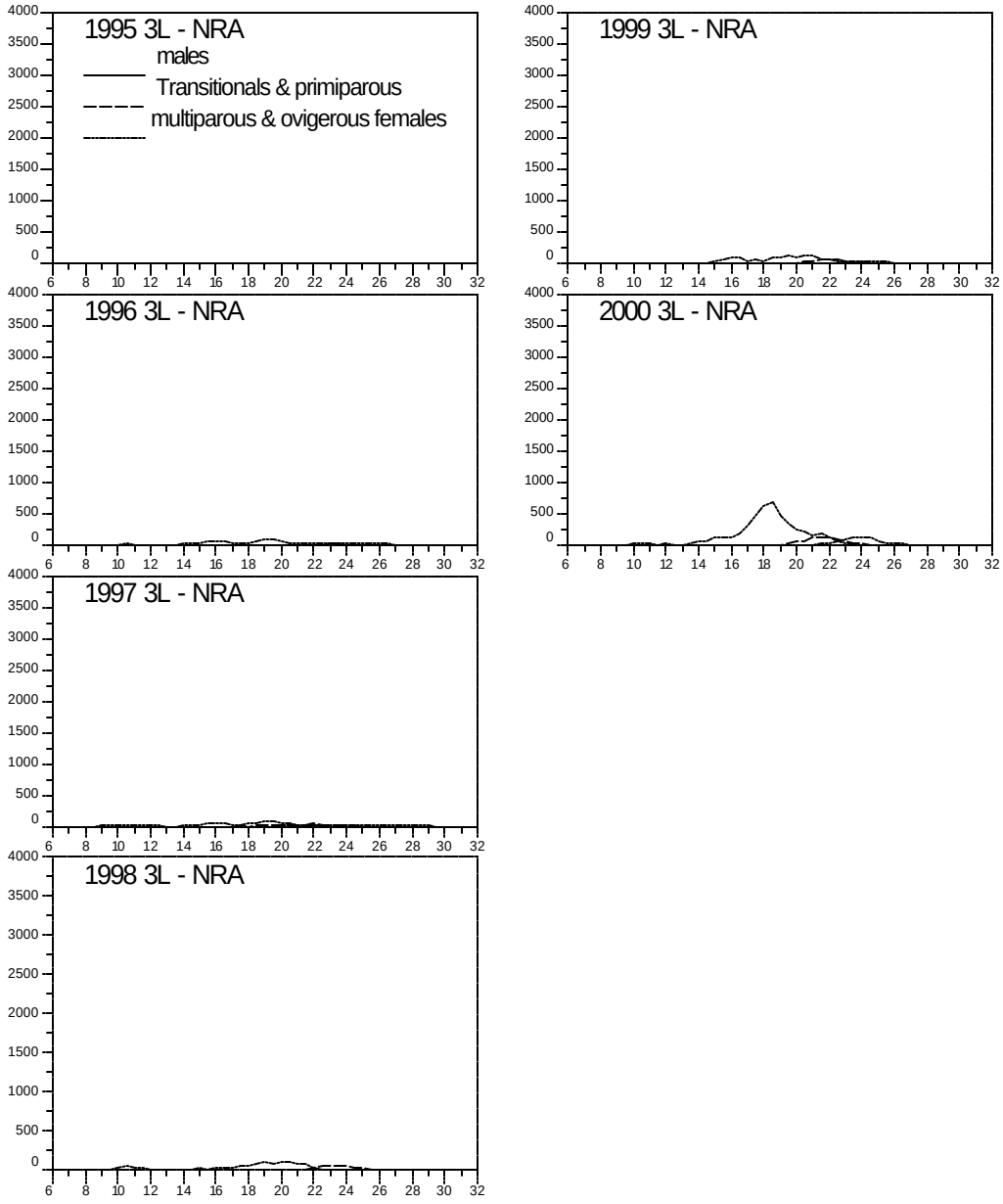


Fig. 6 Pandalus borealis within NAFO Division 3N from autumn Canadian 1995 - 2000 research survey data. (Standardized 15 min tows, abundances X10^6)

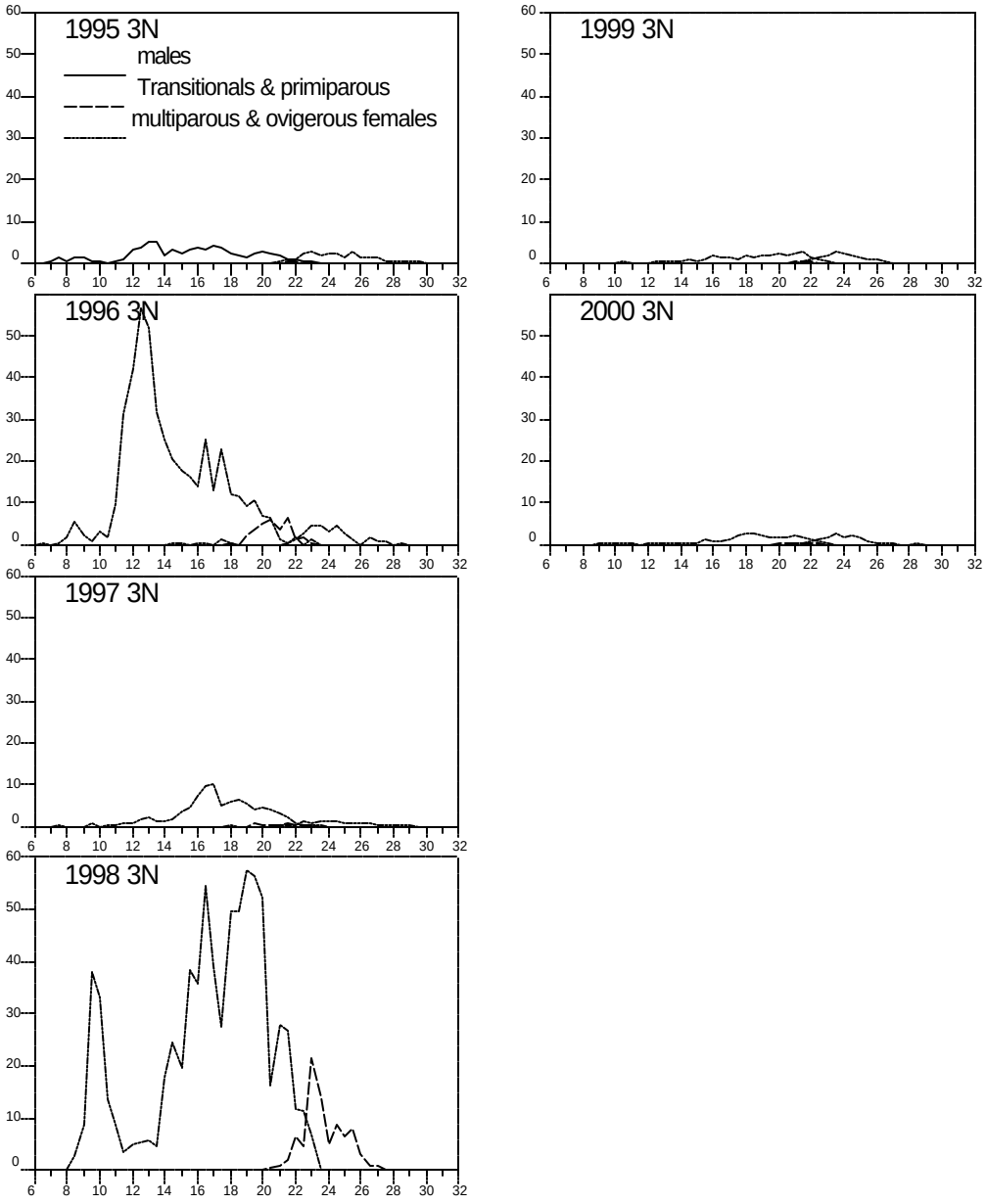


Fig. 7 Pandalus borealis within the NAFO Division 3N NRA from autumn Canadian 1995 - 2000 research survey data. (Standardized 15 min tows, abundances X10^6)

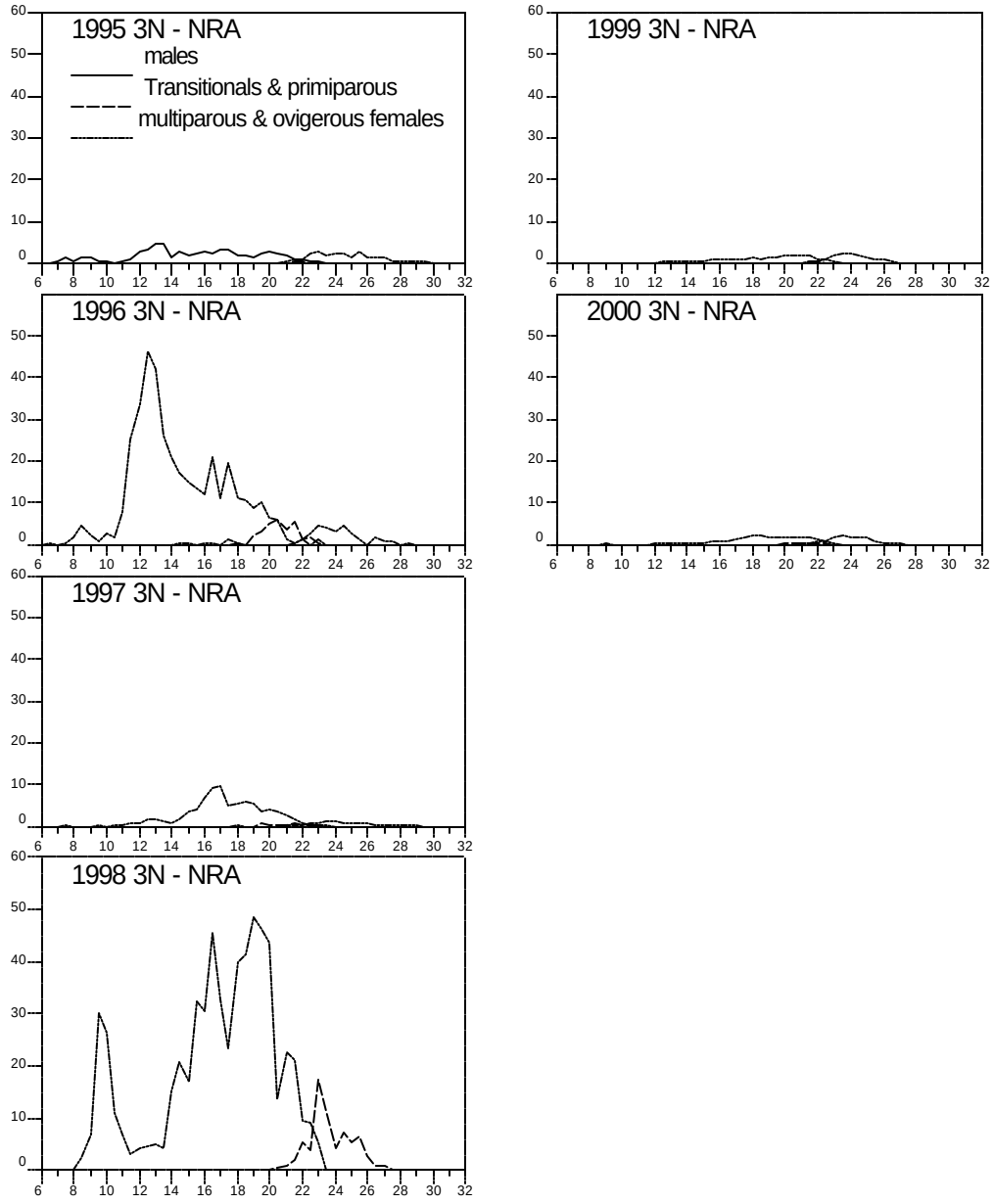


Fig. 8 Pandalus borealis within NAFO Division 3O from autumn Canadian 1995 - 2000 research survey data. (Standardized 15 min tows, abundances X10^6)

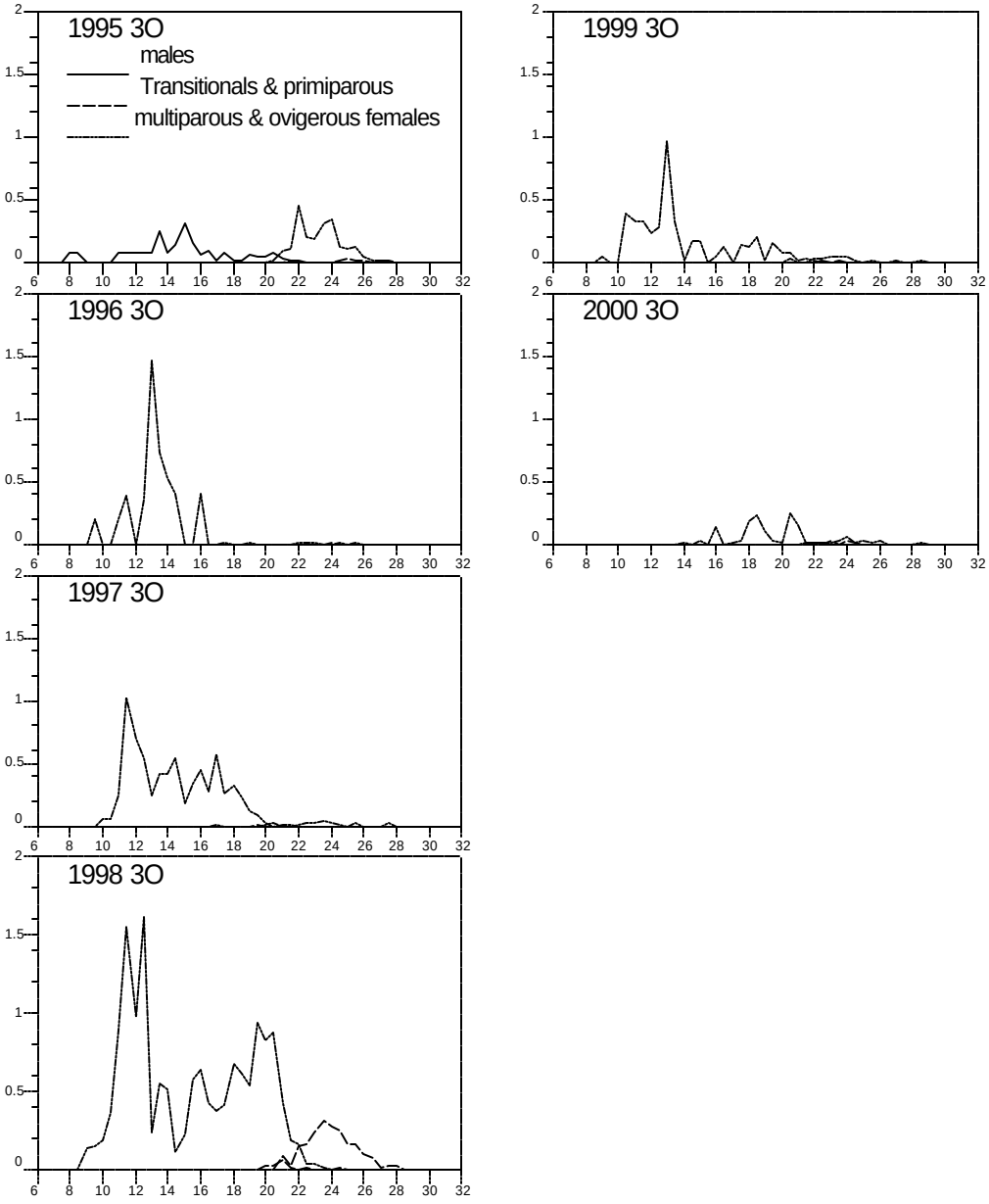


Fig. 9 Pandalus borealis within the NAFO Division 3O NRA from autumn Canadian 1995 - 2000 research survey data. (Standardized 15 min tows, abundances X10^6)

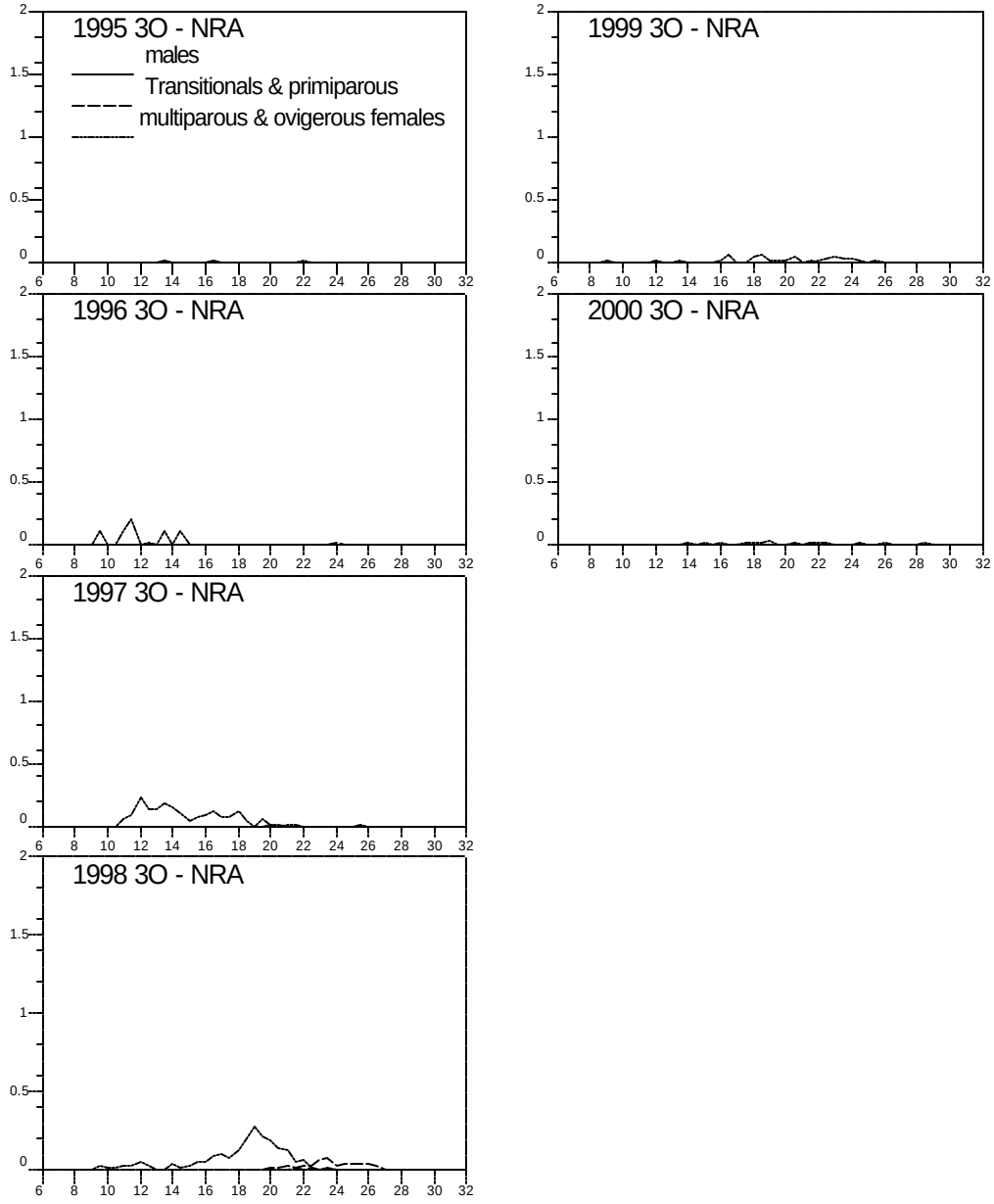


Fig. 10 Pandalus borealis population at age within NAFO Division 3L from autumn Canadian 1995 - 2000 research survey data. (Standardized 15 min tows, abundances X 10^6)

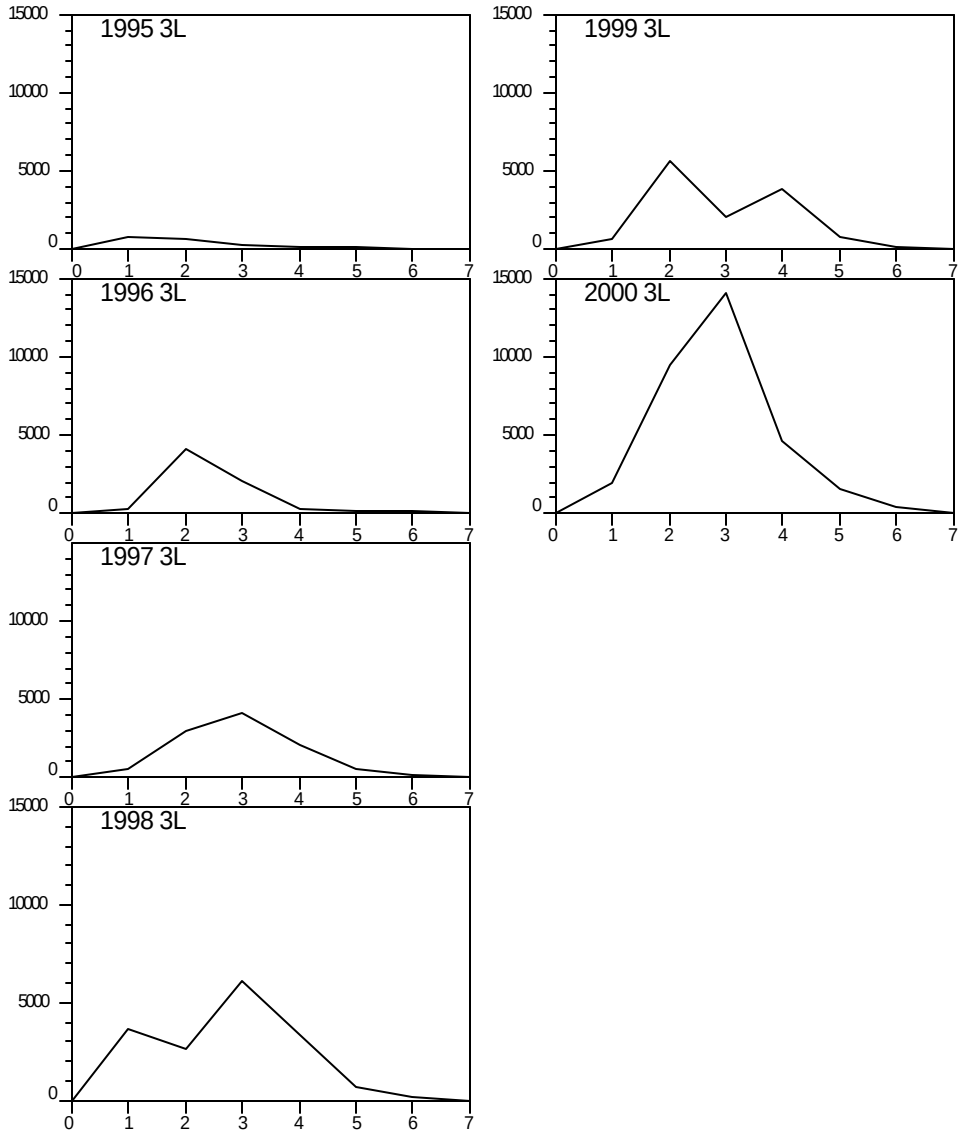


Fig. 11 Pandalus borealis population at age within NAFO Division 3N from autumn Canadian 1995 - 2000 research survey data. (Standardized 15 min tows, abundances X 10^6)

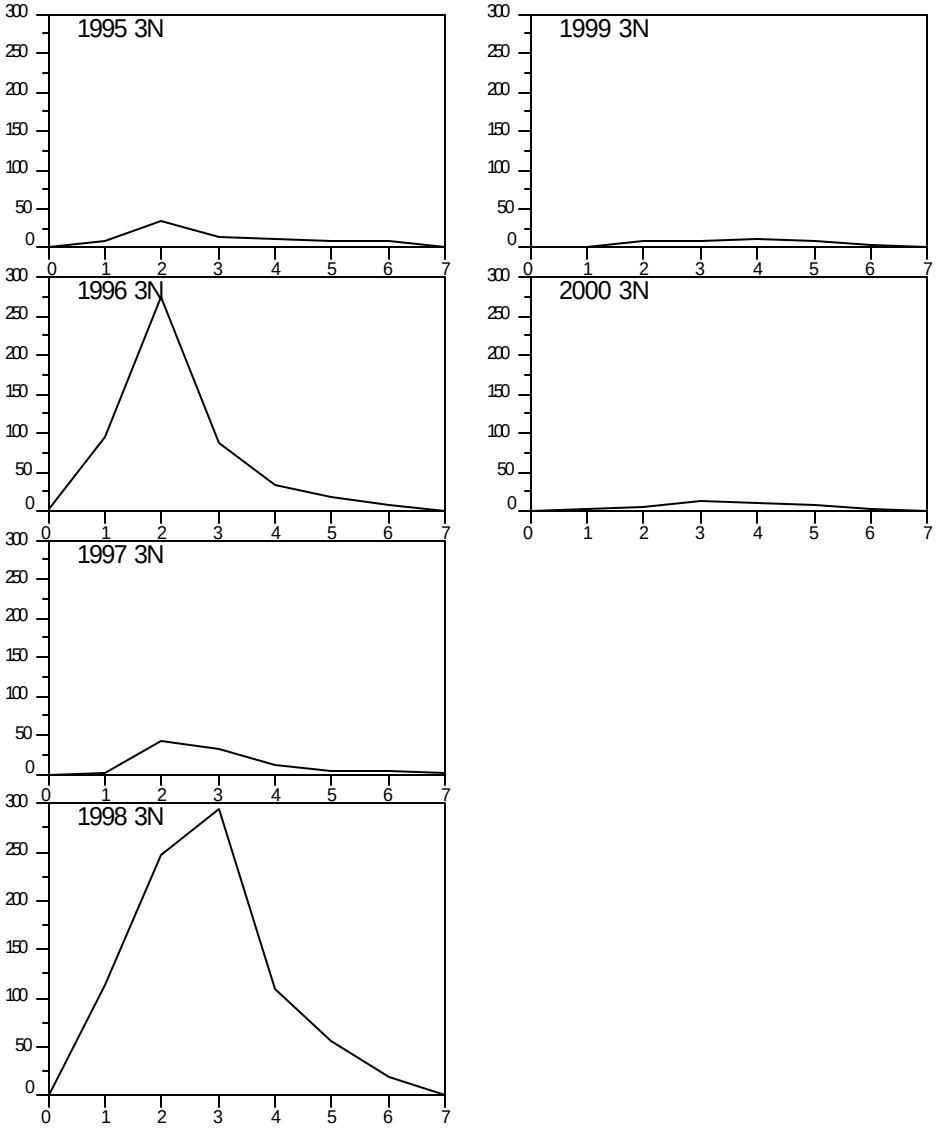
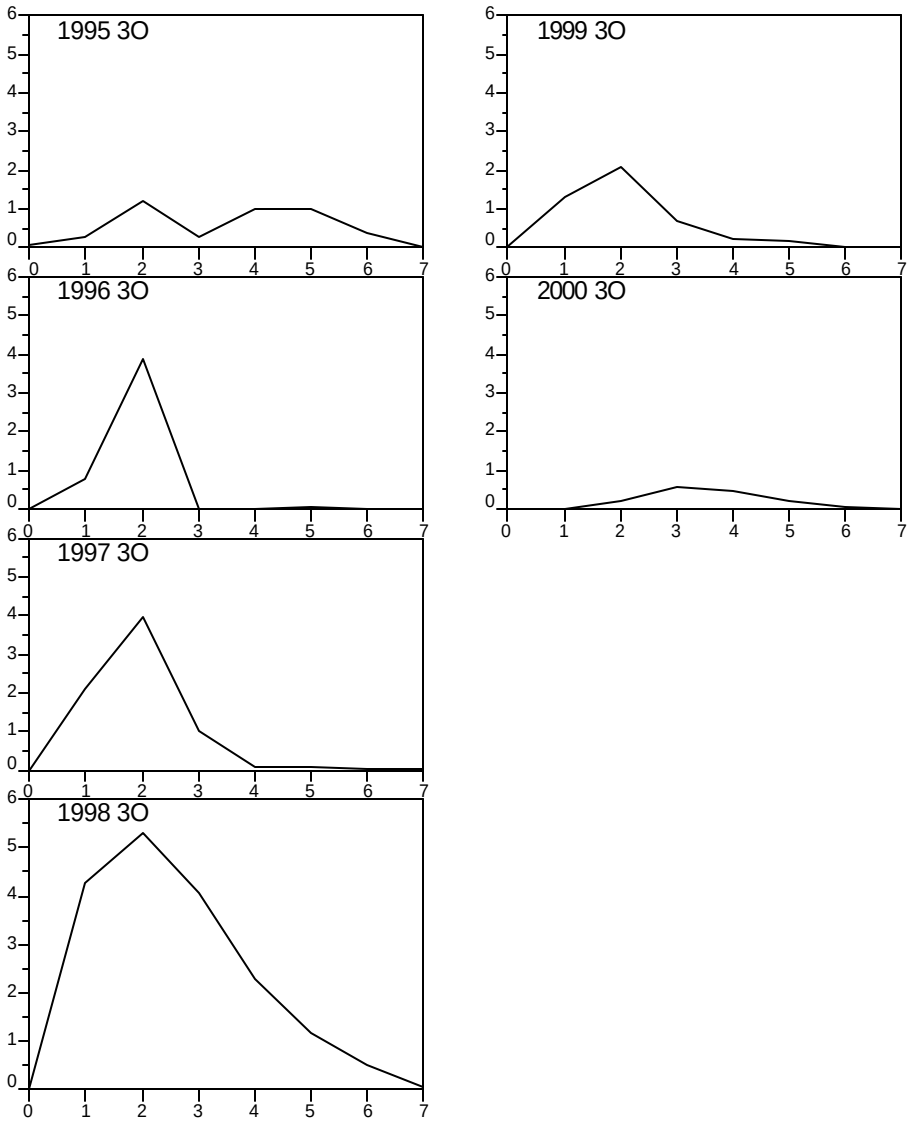


Fig. 12 Pandalus borealis population at age within NAFO Division 3O from autumn Canadian 1995 - 2000 research survey data. (Standardized 15 min tows, abundances X 10^6)



Age in years

Fig. 13 Pandalus borealis within NAFO Division 3L from spring Canadian 1999 - 2001 research survey data. (Standardized 15 min tows, abundances X10^6)

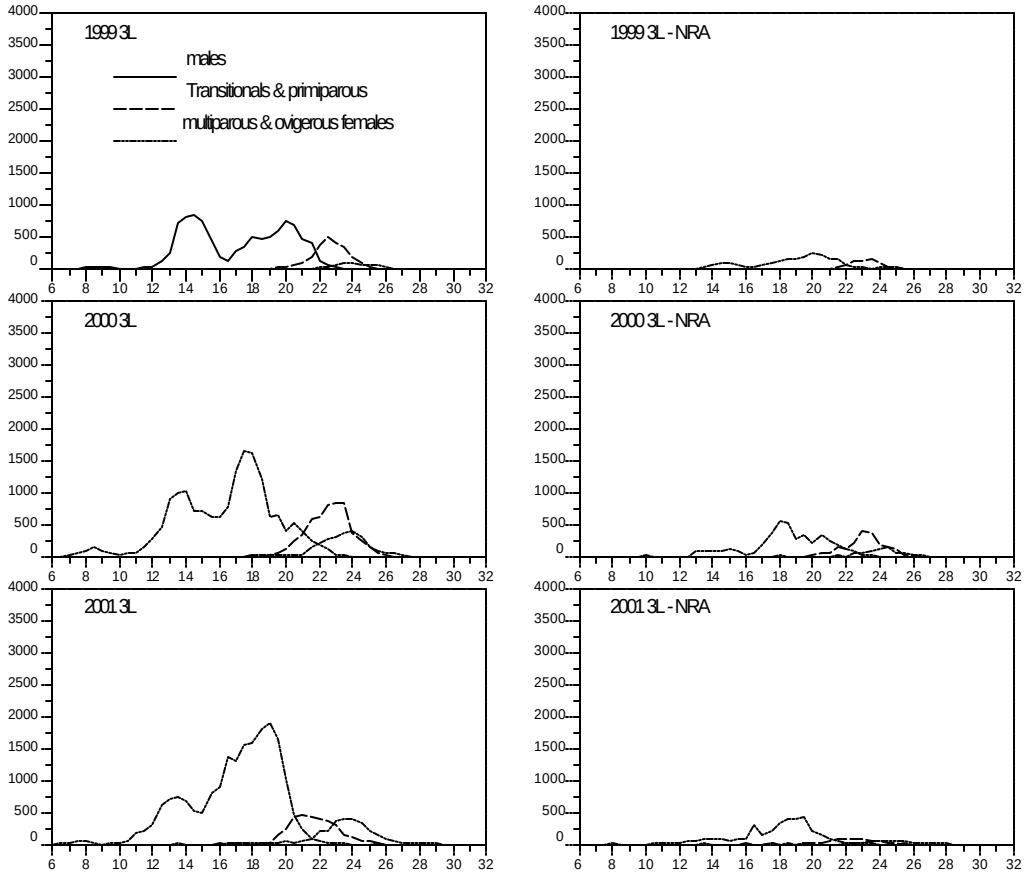


Fig. 14 Pandalus borealis within NAFO Division 3N from spring Canadian 1999 - 2001 research survey data. (Standardized 15 min tows, abundances X10^6)

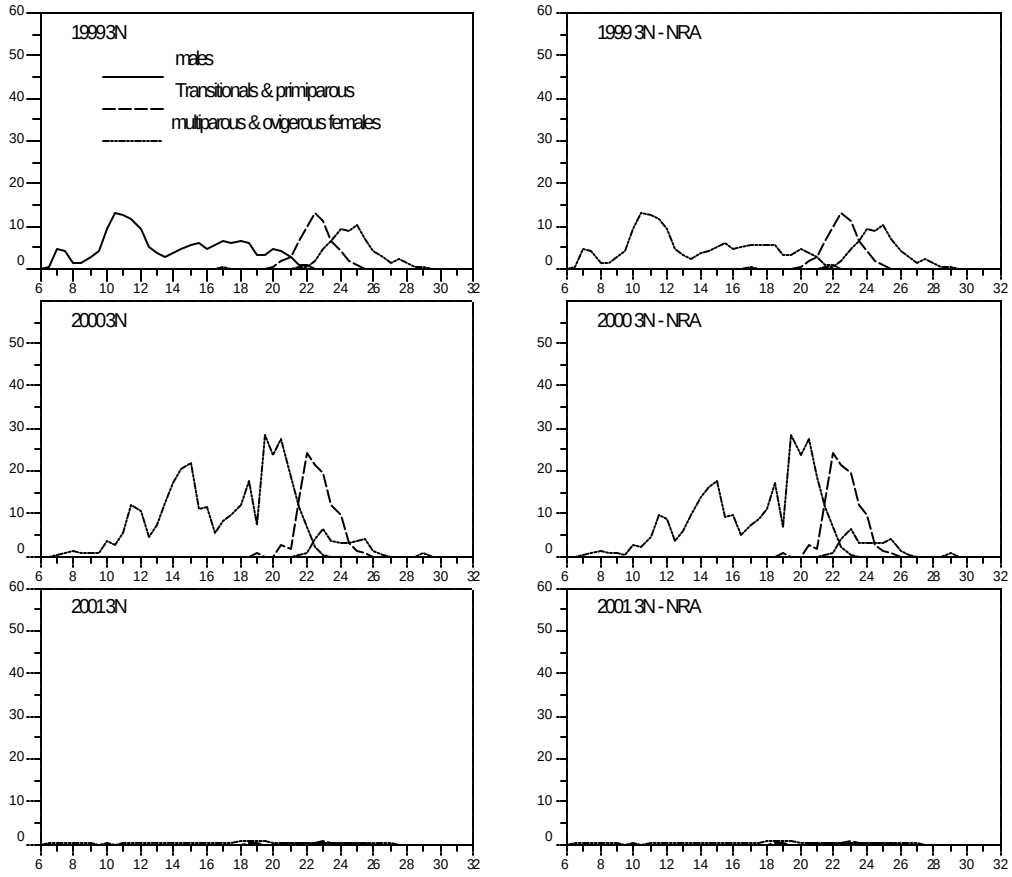
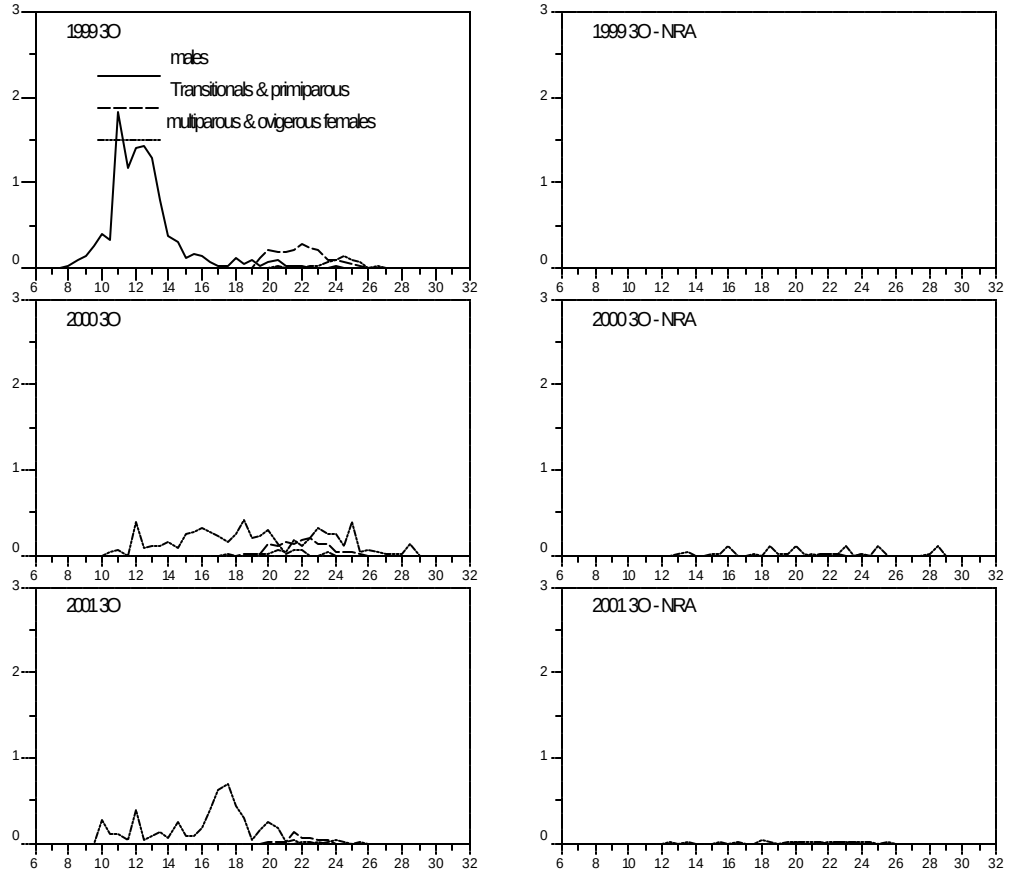


Fig. 15 Pandalus borealis within NAFO Division 3O from spring Canadian 1999 - 2001 research survey data. (Standardized 15 min tows, abundances X10^6)



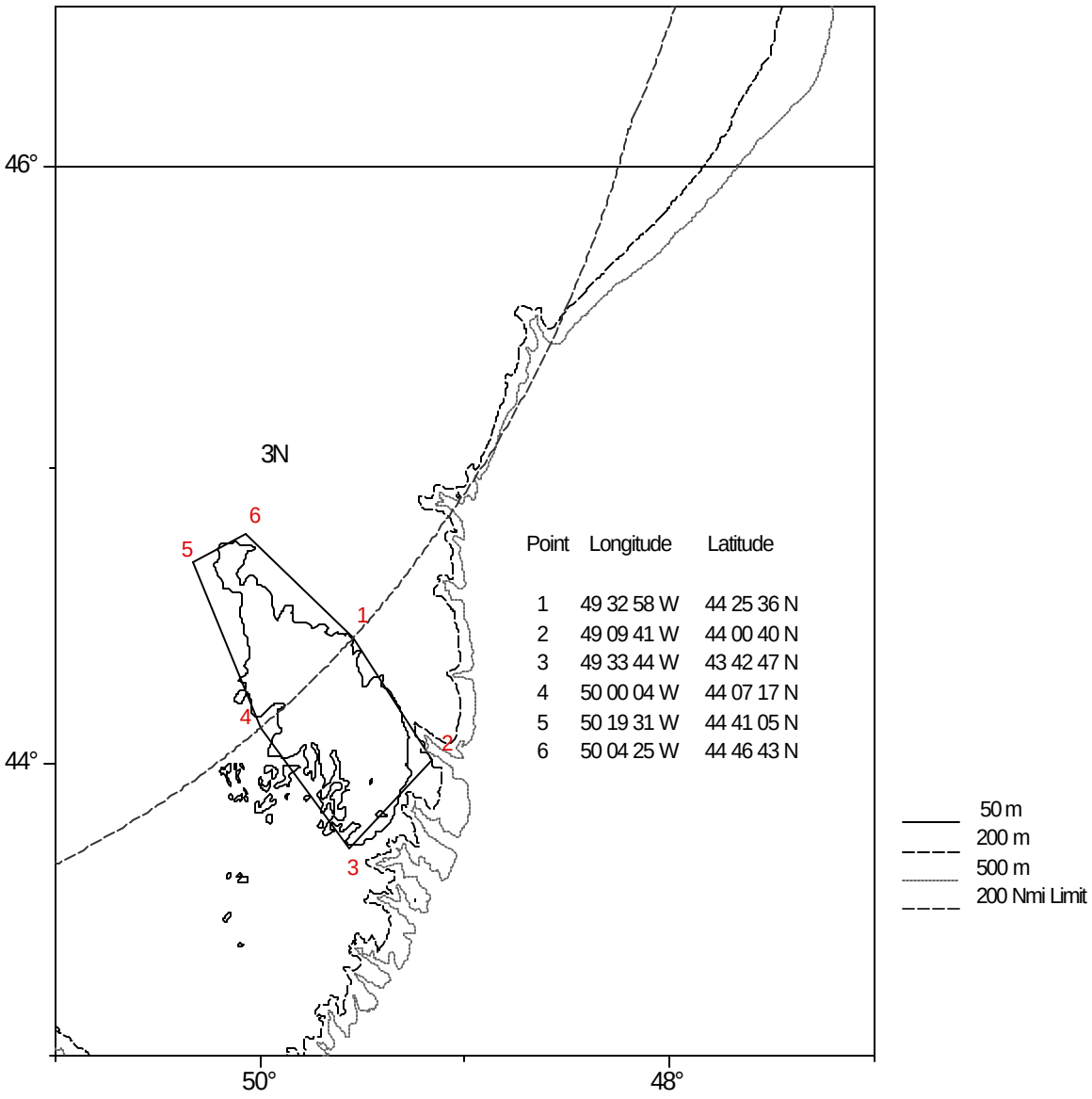


Fig. 16 Closed nursery area for groundfish in Division 3N(Southeast Shoal).

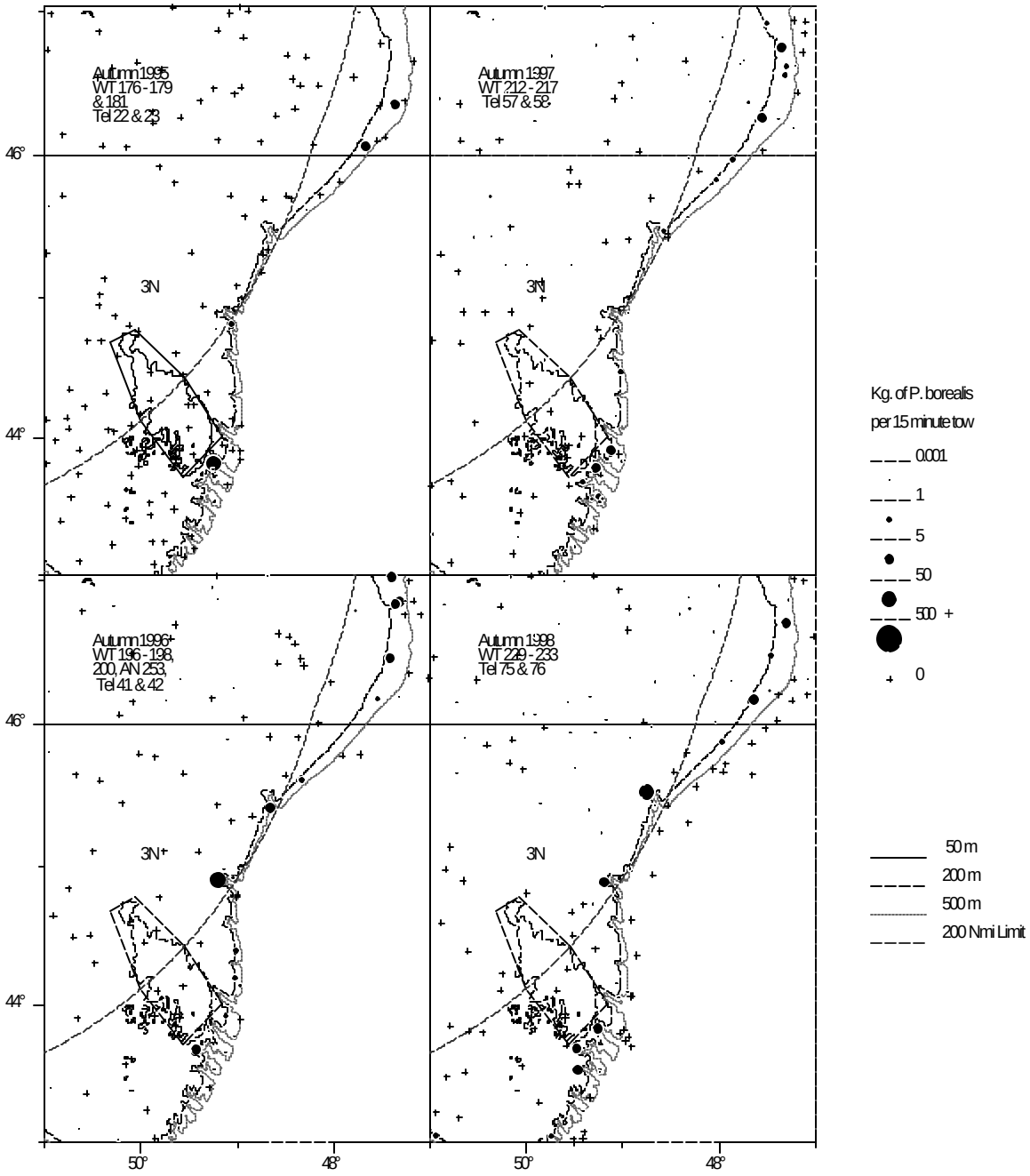


Fig. 17 Distribution of Pandalus borealis collected during Canadian 1995 - 98 autumn multi-species research surveys in relation to the closed nursery area for groundfish in Div. 3N (Southeast Shoal). (Catches were made with a Campelen 1800 shrimp trawl).

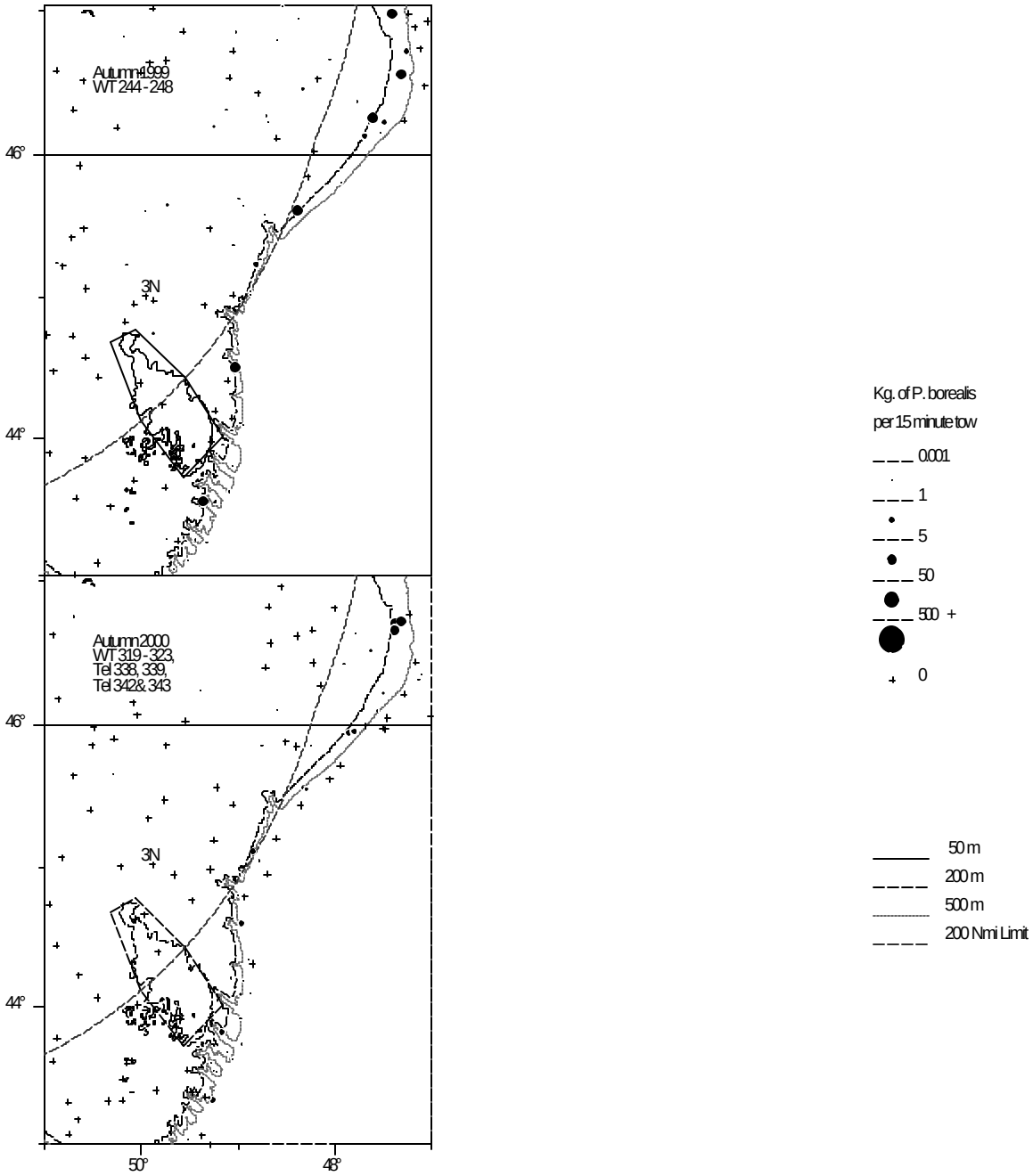


Fig. 18 Distribution of Pandalus borealis collected during Canadian 1999 - 2000 autumn multi-species research surveys in relation to the closed nursery area for groundfish in Div. 3N (Southeast Shoal). (Catches were made with a Campelen 1800 shrimp trawl).

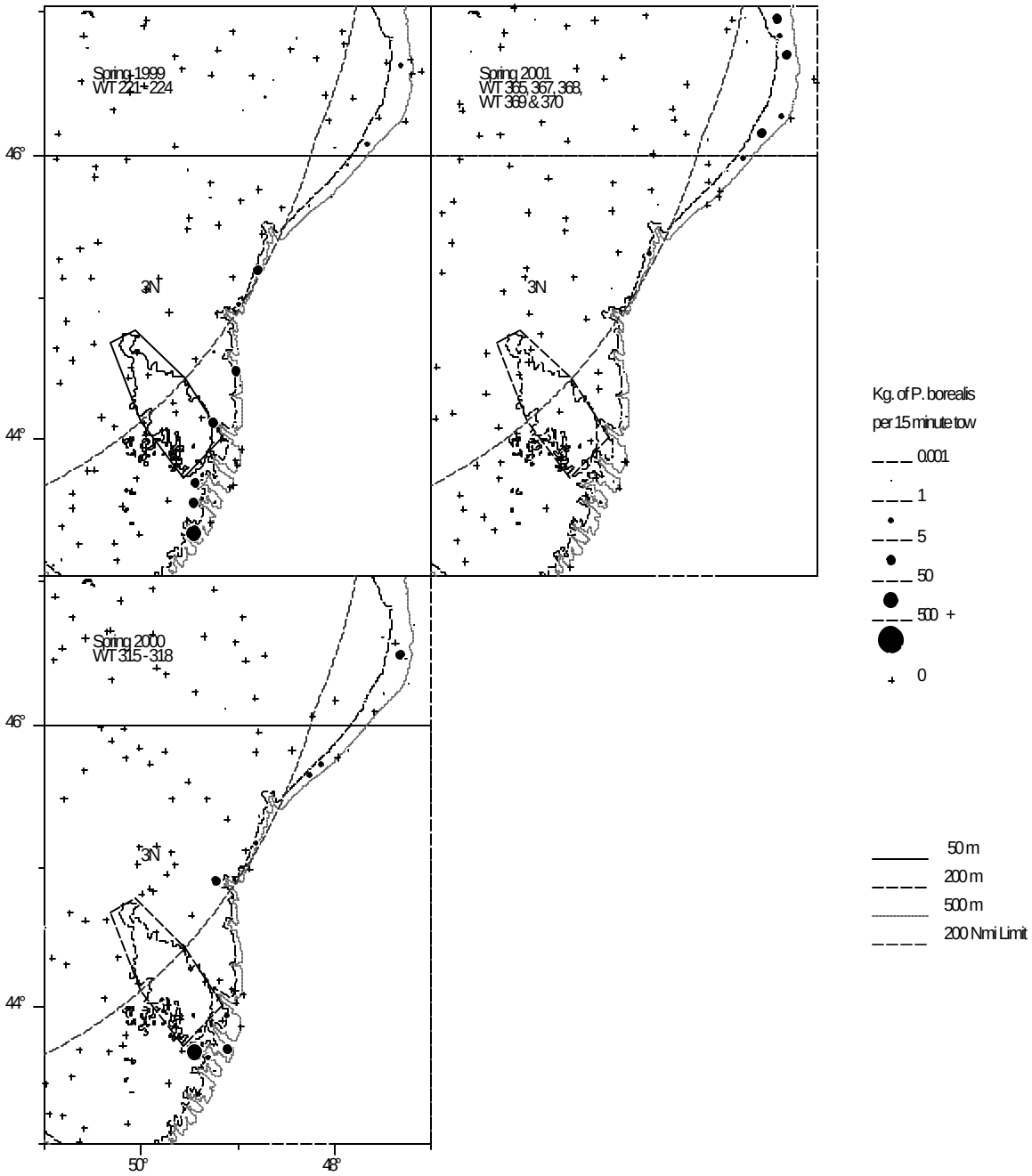


Fig. 19 Distribution of Pandalus borealis collected during Canadian 1999 - 2001 spring multi-species research surveys in relation to the closed nursery area for groundfish in Div. 3N (Southeast Shoal). (Catches were made with a Campelen 1800 shrimp trawl).