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Canadian Science Advisory Secretariat (CSAS)

Research Document 2013/003

Quebec Region

Update of the northern shrimp *Pandalus borealis* commercial fishery indices in the Estuary and the northern Gulf of St. Lawrence in 2012

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June 2013

Canada

Foreword

This series documents the scientific basis for the evaluation of aquatic resources and ecosystems in Canada. As such, it addresses the issues of the day in the time frames required and the documents it contains are not intended as definitive statements on the subjects addressed but rather as progress reports on ongoing investigations.

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Published by:

Fisheries and Oceans Canada
Canadian Science Advisory Secretariat
200 Kent Street
Ottawa ON K1A 0E6

http://www.dfo-mpo.gc.ca/csas-sccs/
csas-sccs@dfo-mpo.gc.ca

ISSN 1919-5044

Correct citation for this publication:

Savard, L. 2013. Update of the northern shrimp *Pandalus borealis* commercial fishery indices in the Estuary and the northern Gulf of St. Lawrence in 2012. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/003. iv + 48 p.

Aussi disponible en français :

Savard, L. 2013. Mise à jour des indicateurs de la pêche commerciale à la crevette nordique Pandalus borealis de l'estuaire et du nord du golfe du Saint-Laurent en 2012. Secr. can. de consult. sci. du MPO. Doc. de rech. 2013/003. iv + 48 p.

ABSTRACT

The Estuary and Gulf of St. Lawrence northern shrimp (*Pandalus borealis*) stock status is determined every year by examining a main indicator from the commercial fishery and the research survey. This document presents the data and methods that are used to produce the commercial fishery statistics (catches, effort, catch rates, number at length) from 1982 to 2012 for each of the four fishing areas.

SOMMAIRE

L’état des stocks de crevette nordique (*Pandalus borealis*) de l’estuaire et du golfe du Saint-Laurent est déterminé chaque année par l’examen par l’examen d’un indicateur principal provenant de la pêche commerciale et du relevé de recherche. Ce document présente les données et méthodes utilisées pour produire les statistiques de la pêche commerciale (captures, effort, taux de capture, nombres à la longueur) de1982 à 2012 pour chacune des quatre zones de pêche.

INTRODUCTION

The northern shrimp (*Pandalus borealis*) fishery began in the Gulf of St. Lawrence in 1965 (Table 1). The exploitation is conducted by trawlers in four shrimp fishing areas (SFA): Estuary (SFA 12), Sept-Iles (SFA 10), Anticosti (SFA 9) and Esquiman (SFA 8) (Figure 1). Fishing is regulated by several management measures, including the setting of total allowable catches (TAC) for each of the four areas. The TAC is set each year from the main stock status indicator. The main indicator of stock status is calculated from the male (recruitment to the female component) and female indices (spawning stock) obtained from the summer fishery (number per unit effort) and research survey (abundance) (DFO 2012, Savard 2012a).

This document presents the data and methods that are used to produce the 2012 commercial fishery statistics for each of the four fishing areas and to complete the 1982-2011 series (Savard 2012b).

FISHERY STATISTICS

The shrimp fishing licence holders have to describe their fishing operations in a logbook (Savard 2012b). Information on the estimated catch, the number of hours of trawling, and the location of the fishing tows are noted for each day at sea. The catch data are validated with the processing plant purchase slips or with the dock side monitoring program. The dock side monitoring program has been running since 1991; all fishermen have to have their landings weighted by observers who are based in designated ports.

The resolution of the information noted in the logbook and recorded in the zone file (ZIFF, Zonal Interchange File Format) corresponds to one fishing day at a given location. Every day, the fisherman has to note the total of the estimated catches and the total of hours of trawling for each location. The official landing (coming from the dock side weighting) that happens often after many days at sea, is then attributed proportionally to the daily catches.

The fishing location that is noted by the fisherman in his logbook is used to identify the shrimp fishing area in which the fishing operations took place. The location is expressed in latitude and longitude or with the identification of the fishing square (10 minutes by ten minutes) according to the form that is available to the fleet to which the fisherman belongs. It could happen that the fishing location is missing; in such cases, it is possible to identify the shrimp fishing area with the NAFO sub-division which the fisherman should also note in his logbook.

COMMERCIAL CATCH SAMPLING

Samples from commercial catches have been collected at landing since 1982 (Savard 2012b). The samples are brought back to the laboratory where the individuals are sexed and measured (cephalothorax length, CL) to the closest 0.1 mm. The individuals are sexed according to the characteristic of the endopod of the first pleopod (Rasmussen 1953) and the maturity stage is determined by the presence or absence of sternal spines (McCrary 1971) and by the presence or absence of eggs. The number of samples collected by fishing area since 2007 is presented in Table 2.

CATCH AND FISHING EFFORT COMPILATION

An observation corresponds to a catch and an effort realised by a vessel for a fishing day in a given location. A first validation of the observations is done in eliminating missing or improbable data for essential variables (fishing vessel, catch, effort, date of the catch, shrimp fishing area).

Table 3 presents the catches and effort corresponding to the validated observations, by fishing area and by year. An annual catch per unit of effort is estimated from these data for each fishing area.

The sum of catches does not represent the total of the landings given that some observations had to be removed from the analyses because they were missing or incomplete. The sum of the effort corresponding to the same observations neither represents the total effort put by the fleets to catch the total landing. However, it is possible to estimate the total fishing effort as well as the effort by statistical square corresponding to the total landing by using the catch per unit of effort estimated from the validated observation subset (Savard 2012c) (Table 3). Similarly, it is possible to estimate the monthly catch and effort by fishing area and by year (Tables 4 and 5). The spatial distribution of the nominal fishing effort and the catch rates by statistical square is presented for the last three years in Figures 2 and 3.

NUMBERS AT LENGTH COMPILATION

Commercial catch samples are combined by area and by month. The monthly length frequency distributions are weighted by the month landing (Tables 6 to 9) and the numbers at length are calculated by applying the weight-length relationships estimated from the survey (Savard and Bourdages 2013). The annual commercial catches are estimated by summing the monthly numbers at length (Table 10). The numbers per unit of effort are calculated by dividing the numbers at length by the fishing effort (Table 11 and Figure 4).

CATCH PER UNIT OF EFFORT STADARDIZATION

The annual catches per unit of effort (CPUE) are standardized to take into account the changes in the fishing capacity and in the seasonal fishing patterns (Gavaris 1980). Multiple linear regressions were performed between the logarithm of CPUE and the variables vessel length and propulsion power (to reflect changes in fishing power), month (to take account changes in the fishing season) and year (to isolate the annual effect without any effect from the other variables). The analyses were performed with the GLM procedure of the SAS software (SAS 1996). The analyses were done separately for each fishing area.

The length and the propulsion power of the vessels were grouped into classes. The lengths were grouped into 6 classes of 10 feet, from 30 to 89 feet, identified by the middle of the class. The powers were grouped into 9 classes of 100 hp, from 100 to 999 hp, identified also by the middle of the class. Given that one observation corresponds to one (or less) fishing day, it is considered that the fishing effort in a given category is representative when many observations (and thus many fishing days) are associated with it.

The conditions for which the fishing effort is considered representative have already been presented in Savard (2011) (Table 12). They are the following:

- a vessel had to be active during at least 3 years and had to have at least 7 observations per year;
- a length or power class had to be present during at least 3 years and had to have at least 7 observations per year;
- months that were kept were those during which there were activities for at least 3 years and for which there are at least 7 observations (5 observations for the Estuary area) per year and per fishing area;
- an observation would be considered as significant if it corresponds to an effort greater than one hour and a catch greater than 50 kg;
- sub-categories representing less than 1% of the total observations were not used in the analyses because it was considered that they were little representative of the behaviour of the fleets.Les analyses de variance sont toutes significatives (p<0,0001) de même que la contribution de chaque catégorie à la régression multiple (p<0,0001) sauf pour la catégorie longueur (p=0,0091) dans la zone Estuaire (Tableaux 13 à 16). Le modèle explique 61 % de la variance pour la zone Esquiman, 59 % pour Anticosti, 52 % pour Sept-Îles et 57 % pour Estuaire.

The analyses of variance are all significant (p<0.0001) as well as the contribution of the categories to the regression (p<0.0001) except for the length category (p=0.0875) in the Estuary area (Tables 13 to 16). The model explains 60 % of the variance for Esquiman area, 59 % for Anticosti, 52 % for Sept-Îles and 58 % for Estuaire.

In general, the models are well fitted and the residuals of the regression are distributed on both sides of the zero value (Figure 5).

The standardized catch rates are shown in table 17 and figure 6. The CPUEs correspond to a standard vessel with a length class of 60-69 ft and a propulsion power class of 500-599 hp. The standard month is June.

ACKNOWLEDGEMENTS

Sincere thanks to the numerous technicians who have collected and analysed the samples of the commercial fishery as well as to the shrimp fishermen who filled the log-books.

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Table 1. Landing (L) and total of allowable catch (TAC) by shrimp fishing areas (SFA) : Estuary, SFA 12; Sept-Iles, SFA 10; Anticosti, SFA 9; Esquiman, SFA 8.

Year	SFA 12		SFA 10		SFA 9		SFA 8		TOTAL	
	L	*TAC*	**L**	*TAC*	**L**	*TAC*	**L**	*TAC*	**L**	*TAC*
1965			**11**						**11**	
1966			**95**						**95**	
1967			**278**						**278**	
1968			**271**						**271**	
1969			**273**						**273**	
1970			**413**				**159**		**572**	
1971			**393**				**691**		**1084**	
1972			**481**				**184**		**665**	
1973			**1273**				**520**		**1793**	
1974			**1743**		**980**		**594**		**3317**	
1975			**2135**		**1025**		**1368**		**4528**	
1976			**1841**		**1310**		**1494**		**4645**	
1977			**2746**		**1185**		**1249**		**5180**	
1978			**2526**		**1460**		**2166**		**6152**	
1979			**3207**		**1108**		**3226**		**7541**	
1980	**539**		**2978**		**1454**		**2441**		**7412**	
1981	**27**		**3680**		**1385**		**3014**		**8106**	
1982	**152**	*500*	**3774**	*3800*	**2464**	*4400*	**2111**	*4200*	**8501**	*12900*
1983	**158**	*500*	**3647**	*3800*	**2925**	*5000*	**2242**	*6000*	**8972**	*15300*
1984	**248**	*500*	**4383**	*4800*	**1336**	*5000*	**1578**	*6000*	**7545**	*16300*
1985	**164**	*500*	**4399**	*4600*	**2786**	*3400*	**1421**	*6000*	**8770**	*14500*
1986	**262**	*500*	**4216**	*4600*	**3340**	*3500*	**1592**	*3500*	**9410**	*12100*
1987	**523**	*500*	**5411**	*5600*	**3422**	*3500*	**2685**	*3500*	**12041**	*13100*
1988	**551**	*500*	**6047**	*5600*	**2844**	*3500*	**4335**	*3500*	**13777**	*13100*
1989	**629**	*500*	**6254**	*5700*	**4253**	*4200*	**4614**	*4500*	**15750**	*14900*
1990	**507**	*500*	**6839**	*6400*	**4723**	*4200*	**3303**	*4700*	**15372**	*15800*
1991	**505**	*500*	**6411**	*6400*	**4590**	*5000*	**4773**	*4700*	**16279**	*16600*
1992	**489**	*500*	**4957**	*6400*	**4162**	*5000*	**3149**	*4700*	**12757**	*16600*
1993	**496**	*500*	**5485**	*6400*	**4791**	*5000*	**4683**	*4700*	**15455**	*16600*
1994	**502**	*500*	**6165**	*6400*	**4854**	*5000*	**4689**	*4700*	**16210**	*16600*
1995	**486**	*500*	**6386**	*6400*	**4962**	*5000*	**4800**	*4700*	**16634**	*16600*
1996	**505**	*500*	**7014**	*7040*	**5469**	*5500*	**5123**	*5170*	**18111**	*18210*
1997	**549**	*550*	**7737**	*7744*	**6058**	*6050*	**5957**	*5687*	**20301**	*20031*
1998	**634**	*633*	**8981**	*8966*	**6932**	*7004*	**6554**	*6584*	**23101**	*23187*
1999	**646**	*633*	**9239**	*8966*	**7022**	*7004*	**6732**	*6584*	**23639**	*23187*
2000	**739**	*709*	**10160**	*10042*	**7941**	*7844*	**7396**	*7374*	**26236**	*25969*
2001	**832**	*786*	**10965**	*11136*	**5399**	*8700*	**7815**	*8178*	**25011**	*28800*
2002	**799**	*786*	**11493**	*11136*	**8638**	*8700*	**8250**	*8178*	**29180**	*28800*
2003	**796**	*802*	**11357**	*11360*	**8742**	*8874*	**6773**	*6674*	**27668**	*27710*
2004	**1033**	*995*	**15932**	*15611*	**10429**	*10226*	**8593**	*8502*	**35987**	*35334*
2005	**1001**	*995*	**12793**	*15611*	**8047**	*10226*	**8867**	*9351*	**30708**	*36183*
2006	**1029**	*995*	**15312**	*15611*	**8754**	*10226*	**8957**	*9351*	**34052**	*36183*
2007	**1022**	*995*	**15645**	*15611*	**10180**	*10226*	**9208**	*9352*	**36055**	*36184*
2008	**1017**	*1020*	**15972**	*15995*	**9635**	*10478*	**9110**	*9409*	**35734**	*36902*
2009	**993**	*1018*	**15873**	*15970*	**9644**	*10461*	**9473**	*9567*	**35983**	*37016*
2010	**906**	*917*	**15756**	*15969*	**10099**	*10461*	**9541**	*9567*	**36302**	*36914*
2011	**880**	*916*	**14376**	*15172*	**9831**	*9938*	**9177**	*9091*	**34264**	*35117*
2012	**956**	*1053*	**12482**	*12896*	**8273**	*8447*	**10271**	*10452*	**31982**	*32848*

2012: as in December 14, 2012

Table 2a. Number of samples of the commercial catches, by fishing area (SFA) and by year.

SFA	2007	2008	2009	2010	2011	2012
8	56	50	26	37	40	37
9	36	27	33	32	33	38
10	64	65	56	67	61	57
12	23	22	22	17	21	17
Total	179	164	137	153	155	149

Table 2b. Number of samples per 1,000 tons of landing, by fishing area (SFA) and by year.

SFA	2007	2008	2009	2010	2011	2012
8	6.1	5.5	2.7	3.9	4.4	3.6
9	3.5	2.8	3.4	3.2	3.4	4.6
10	4.1	4.1	3.5	4.3	4.2	4.6
12	22.5	21.6	22.2	18.8	23.9	17.8

Table 3. Number of observations, catch (kg), effort (h), catch per unit of effort (kg/h) and its standard error, percentage (%) of the landing corresponding to the observations, landing (t) and nominal effort (h) by fishing area (SFA) and by year.

SFA	*Year*	n obs	*Σ Catch*	Σ Effort	CPUE	SE CPUE	%	*Landing*	*Nominal effort*
8	1982	1281	1617217	13095	123.5	1.93	76.6%	2111	17093
8	1983	2038	1928751	20289	95.1	1.64	86.0%	2242	23584
8	1984	742	846375	7902	107.1	3.14	53.6%	1578	14733
8	1985	164	231139	2796	82.7	1.78	16.3%	1421	17191
8	1986	952	1059604	10412	101.8	2.04	66.6%	1592	15644
8	1987	948	1139041	11312	100.7	1.41	42.4%	2685	26666
8	1988	1029	1655517	13405	123.5	2.04	38.2%	4335	35102
8	1989	1468	2658524	16708	159.1	2.52	57.6%	4614	28998
8	1990	1913	3462732	22197	156.0	2.40	104.8%	3303	21173
8	1991	2434	4622662	29203	158.3	1.84	96.9%	4773	30152
8	1992	1770	3050726	24549	124.3	1.36	96.9%	3149	25339
8	1993	2308	4259605	31089	137.0	1.19	91.0%	4683	34179
8	1994	1759	4255546	26873	158.4	1.77	90.8%	4689	29610
8	1995	2191	4533581	30350	149.4	1.43	94.4%	4800	32133
8	1996	1642	4953833	22238	222.8	2.93	96.7%	5123	22997
8	1997	1556	5268261	20968	251.2	3.02	88.4%	5957	23710
8	1998	2087	6343591	25377	250.0	2.55	96.8%	6554	26219
8	1999	2102	6235218	24765	251.8	2.80	92.6%	6732	26738
8	2000	2188	6978227	23684	294.6	3.62	94.4%	7396	25102
8	2001	1933	6873173	23926	287.3	2.95	87.9%	7815	27204
8	2002	2329	7604268	26945	282.2	2.34	92.2%	8250	29233
8	2003	1815	6017310	18108	332.3	3.32	88.8%	6773	20382
8	2004	1857	7806027	17228	453.1	4.63	90.8%	8593	18965
8	2005	1681	7829711	17152	456.5	5.38	88.3%	8867	19424
8	2006	1605	8132496	17018	477.9	6.18	90.8%	8957	18744
8	2007	2080	8095434	22113	366.1	3.94	87.9%	9208	25152
8	2008	1717	7903806	19915	396.9	5.00	86.8%	9110	22954
8	2009	3261	9013066	20319	443.6	4.35	95.1%	9473	21356
8	2010	2947	8703093	17853	487.5	5.15	91.2%	9541	19572
8	2011	2945	8804867	16114	546.4	5.85	95.9%	9177	16795
8	2012	2770	8669928	15463	560.7	6.12	84.4%	10271	18318

Table 3 continued. Number of observations, catch (kg), effort (h), catch per unit of effort (kg/h) and its standard error, percentage (%) of the landing corresponding to the observations, landing (t) and nominal effort (h) by fishing area (SFA) and by year.

SFA	*Year*	n obs	*Σ Catch*	Σ Effort	CPUE	SE CPUE	%	*Landing*	*Nominal effort*
9	1982	1725	2259241	24987	90.4	0.95	91.7%	2464	27252
9	1983	1890	2252446	25894	87.0	1.06	77.0%	2925	33626
9	1984	1482	1243427	20206	61.5	0.85	93.1%	1336	21710
9	1985	2292	2569955	30665	83.8	0.76	92.2%	2786	33243
9	1986	2980	3181005	40802	78.0	0.70	95.2%	3340	42841
9	1987	2354	3050610	36176	84.3	0.85	89.1%	3422	40580
9	1988	1624	2367216	24137	98.1	1.14	83.2%	2844	28998
9	1989	1901	3661947	27630	132.5	1.51	86.1%	4253	32090
9	1990	1981	4243630	30459	139.3	1.81	89.9%	4723	33899
9	1991	2280	4611183	37598	122.6	1.09	100.5%	4590	37425
9	1992	2416	4113157	40742	101.0	0.79	98.8%	4162	41226
9	1993	2460	4553535	44786	101.7	0.63	95.0%	4791	47122
9	1994	2295	4897378	41169	119.0	0.88	100.9%	4854	40804
9	1995	1874	5024280	34810	144.3	1.08	101.3%	4962	34379
9	1996	2039	5480466	38038	144.1	1.32	100.2%	5469	37958
9	1997	1923	6052173	37455	161.6	1.55	99.9%	6058	37491
9	1998	2128	6991025	40955	170.7	1.26	100.9%	6932	40609
9	1999	2355	6880013	44971	153.0	1.19	98.0%	7022	45899
9	2000	2183	7681422	41184	186.5	1.40	96.7%	7941	42576
9	2001	1578	5151170	30707	167.8	1.89	95.4%	5399	32184
9	2002	2129	8475748	40843	207.5	1.89	98.1%	8638	41624
9	2003	1693	8441930	32173	262.4	2.53	96.6%	8742	33317
9	2004	2077	10058162	39541	254.4	2.27	96.4%	10429	40998
9	2005	1277	7550761	23618	319.7	4.69	93.8%	8047	25170
9	2006	1377	7830008	24554	318.9	4.67	89.4%	8754	27452
9	2007	1712	9426945	31971	294.9	2.94	92.6%	10180	34525
9	2008	1473	9017822	27673	325.9	3.31	93.6%	9635	29567
9	2009	1529	9591408	28114	341.2	3.73	99.5%	9644	28269
9	2010	1713	9720068	32106	302.8	3.09	96.2%	10099	33357
9	2011	1575	9602668	29598	324.4	3.37	97.7%	9831	30301
9	2012	1510	8114725	28341	286.3	3.12	98.1%	8273	28894

Table 3 continued. Number of observations, catch (kg), effort (h), catch per unit of effort (kg/h) and its standard error, percentage (%) of the landing corresponding to the observations, landing (t) and nominal effort (h) by fishing area (SFA) and by year.

SFA	*Year*	n obs	*Σ Catch*	Σ Effort	CPUE	SE CPUE	%	*Landing*	*Nominal effort*
10	1982	2247	2553557	31755	80.4	1.50	67.7%	3774	46933
10	1983	1532	2058040	21767	94.5	1.73	56.4%	3647	38573
10	1984	3593	4010611	51114	78.5	1.12	91.5%	4383	55860
10	1985	3297	4304857	50343	85.5	0.99	97.9%	4399	51444
10	1986	2888	4178501	43386	96.3	1.43	99.1%	4216	43776
10	1987	3540	5150568	56227	91.6	1.09	95.2%	5411	59070
10	1988	4079	5401173	65130	82.9	0.95	89.3%	6047	72918
10	1989	3477	5326254	55785	95.5	1.05	85.2%	6254	65502
10	1990	2783	6042829	45937	131.5	1.62	88.4%	6839	51989
10	1991	3336	6205506	53084	116.9	1.46	96.8%	6411	54842
10	1992	3921	4923073	65510	75.2	0.96	99.3%	4957	65961
10	1993	4066	5294796	72394	73.1	0.81	96.5%	5485	74994
10	1994	3841	6212447	73030	85.1	0.92	100.8%	6165	72472
10	1995	2303	6456768	44583	144.8	2.11	101.1%	6386	44094
10	1996	2120	7104522	40423	175.8	2.51	101.3%	7014	39908
10	1997	2272	7804687	41417	188.4	2.56	100.9%	7737	41058
10	1998	2427	9101709	43620	208.7	2.76	101.3%	8981	43042
10	1999	2589	9227579	46399	198.9	2.50	99.9%	9239	46456
10	2000	2817	10073652	51670	195.0	2.06	99.2%	10160	52112
10	2001	3486	10829084	66553	162.7	1.75	98.8%	10965	67388
10	2002	3068	11432992	57315	199.5	1.86	99.5%	11493	57616
10	2003	2156	11226104	37844	296.6	3.84	98.8%	11357	38285
10	2004	2928	15803486	51634	306.1	3.11	99.2%	15932	52054
10	2005	2352	12604659	40787	309.0	2.92	98.5%	12793	41396
10	2006	2951	15575716	50950	305.7	2.79	101.7%	15312	50087
10	2007	2239	14241237	39784	358.0	3.76	91.0%	15645	43706
10	2008	2543	15685023	44761	350.4	4.11	98.2%	15972	45580
10	2009	2785	15539625	48891	317.8	3.28	97.9%	15873	49940
10	2010	2932	15662346	54879	285.4	2.65	99.4%	15756	55207
10	2011	2964	14919638	54696	272.8	2.60	103.8%	14376	52703
10	2012	2446	12380998	43871	282.2	2.92	99.2%	12482	44230

Table 3 continued. Number of observations, catch (kg), effort (h), catch per unit of effort (kg/h) and its standard error, percentage (%) of the landing corresponding to the observations, landing (t) and nominal effort (h) by fishing area (SFA) and by year.

SFA	*Year*	n obs	*Σ Catch*	Σ Effort	CPUE	SE CPUE	%	*Landing*	*Nominal effort*
12	1982	108	120267	1628	73.9	4.34	79.1%	152	2057
12	1983	59	56827	1093	52.0	4.18	36.0%	158	3039
12	1984	217	207207	3254	63.7	3.75	83.6%	248	3895
12	1985	46	51468	705	73.0	6.35	31.4%	164	2247
12	1986	182	154399	3058	50.5	2.43	58.9%	262	5189
12	1987	268	318526	5097	62.5	2.42	60.9%	523	8368
12	1988	264	456580	4327	105.5	6.49	82.9%	551	5222
12	1989	314	506166	5576	90.8	3.27	80.5%	629	6929
12	1990	229	449916	3592	125.3	5.88	88.7%	507	4048
12	1991	161	494978	2144	230.9	23.31	98.0%	505	2187
12	1992	300	485908	4463	108.9	7.41	99.4%	489	4492
12	1993	183	485623	3092	157.1	9.47	97.9%	496	3158
12	1994	166	489712	2247	217.9	21.10	97.6%	502	2304
12	1995	144	477718	1718	278.1	20.39	98.3%	486	1747
12	1996	129	490021	1528	320.7	26.38	97.0%	505	1575
12	1997	163	534562	1903	280.9	13.90	97.4%	549	1954
12	1998	164	645551	1760	366.8	22.24	101.8%	634	1729
12	1999	143	646527	1708	378.6	25.63	100.1%	646	1707
12	2000	188	728266	2022	360.2	18.90	98.5%	739	2051
12	2001	245	821585	3251	252.7	9.41	98.7%	832	3292
12	2002	258	803416	3655	219.8	8.23	100.6%	799	3635
12	2003	197	797473	1939	411.3	20.65	100.2%	796	1935
12	2004	212	1032861	2614	395.2	15.72	100.0%	1033	2614
12	2005	225	1009218	2498	403.9	13.15	100.8%	1001	2478
12	2006	209	1035663	2293	451.6	17.40	100.6%	1029	2279
12	2007	232	1021777	2745	372.2	13.43	100.0%	1022	2746
12	2008	209	1016124	2826	359.6	12.71	99.9%	1017	2828
12	2009	257	994221	3485	285.3	10.81	100.1%	993	3480
12	2010	255	913836	3563	256.5	9.34	100.9%	906	3533
12	2011	277	879329	4405	199.6	4.76	99.9%	880	4408
12	2012	253	955615	4240	225.4	6.40	100.0%	956	4240

Table 4. Catch (t) per month by fishing area (SFA) and by year.

SFA	Year	J	F	M	A	M	J	J	A	S	O	N	D
8	1982	0	0	0	242	832	138	193	277	129	299	0	0
8	1983	0	142	345	696	187	382	159	111	149	59	12	0
8	1984	0	8	9	572	273	244	84	122	101	140	23	0
8	1985	0	0	0	5	236	378	176	419	208	0	0	0
8	1986	0	0	0	527	203	97	296	215	146	98	9	0
8	1987	0	0	78	213	344	753	219	539	204	238	76	22
8	1988	0	0	0	379	1203	960	881	445	0	300	123	45
8	1989	0	0	0	121	1292	1178	376	624	424	253	331	14
8	1990	0	0	0	0	860	532	1047	339	309	215	0	0
8	1991	0	0	0	716	1499	1285	876	240	100	28	29	0
8	1992	0	0	0	0	637	1613	685	72	102	40	1	0
8	1993	0	0	0	2	1337	1175	1333	621	171	36	10	0
8	1994	0	0	0	0	451	1660	1898	412	200	68	0	0
8	1995	4	0	0	9	2656	1453	38	114	317	207	2	0
8	1996	0	0	0	0	1832	2074	814	263	91	48	0	0
8	1997	0	0	0	3	1447	2598	1131	322	171	204	64	17
8	1998	0	0	0	1024	2432	1080	567	204	548	360	201	137
8	1999	0	0	0	1753	2394	1582	413	99	213	82	131	64
8	2000	0	0	0	2425	1875	1136	816	891	199	53	1	0
8	2001	0	0	0	1813	1633	1832	836	218	587	896	0	0
8	2002	0	0	0	1598	1478	2643	1771	479	182	68	31	0
8	2003	0	0	0	6	2494	2807	441	534	218	83	182	7
8	2004	0	0	6	39	2398	4296	1050	348	285	171	0	0
8	2005	0	0	0	1	2289	2608	639	1534	1113	675	8	0
8	2006	0	0	0	506	2351	1925	947	1264	1251	649	65	0
8	2007	0	0	3	880	4287	1028	848	592	892	431	223	22
8	2008	0	0	0	1149	3593	1739	2147	400	22	7	53	0
8	2009	0	0	0	875	3729	1345	2604	419	403	88	10	0
8	2010	0	0	0	304	4427	3545	558	535	106	18	48	0
8	2011	0	0	0	125	6672	1989	172	113	7	58	40	0
8	2012	0	0	0	137	5647	2947	766	378	326	71	0	0

Table 4 continued. Catch (t) per month by fishing area (SFA) and by year.

SFA	Year	J	F	M	A	M	J	J	A	S	O	N	D
9	1982	0	0	0	14	185	680	524	504	469	84	5	0
9	1983	0	0	0	45	108	912	592	365	543	327	33	0
9	1984	0	0	0	14	283	249	307	99	179	185	19	0
9	1985	0	0	0	15	100	490	791	577	607	206	0	0
9	1986	0	0	0	8	101	800	770	1027	418	216	0	0
9	1987	0	0	0	13	584	602	1047	827	236	113	0	0
9	1988	0	0	0	27	83	484	393	1065	354	425	12	0
9	1989	0	0	0	1	187	1173	826	544	380	1083	59	0
9	1990	0	0	0	6	22	965	1372	1919	439	0	0	0
9	1991	0	0	0	24	373	1055	1537	762	495	306	39	1
9	1992	0	0	0	1	151	1336	1375	777	479	41	3	0
9	1993	0	0	0	0	269	1908	1676	689	189	45	14	0
9	1994	0	0	0	12	95	891	2305	1141	305	99	5	0
9	1995	0	0	0	4	310	1085	2514	841	165	41	1	0
9	1996	0	0	0	30	349	1933	1902	773	348	98	37	0
9	1997	0	0	0	309	560	2007	2659	419	104	0	0	0
9	1998	0	0	0	153	1141	2494	1867	1052	181	43	0	0
9	1999	0	0	0	42	540	1545	3117	1206	396	74	62	40
9	2000	0	0	0	12	647	2546	3217	1081	369	50	19	0
9	2001	0	0	0	2	215	738	1449	2019	870	75	29	2
9	2002	0	0	0	15	891	1590	3344	2154	540	88	0	15
9	2003	0	0	0	368	834	2351	3669	1165	235	73	44	3
9	2004	0	0	0	94	699	2121	4824	1865	683	128	14	0
9	2005	0	0	0	120	1427	3486	1704	420	647	236	7	0
9	2006	0	0	0	40	1119	2348	2483	1536	925	274	30	0
9	2007	0	0	0	0	1162	1893	3278	2309	1318	109	47	64
9	2008	0	0	0	0	1231	2730	3234	1863	497	80	0	0
9	2009	0	0	0	68	1378	4463	2552	823	133	84	143	0
9	2010	0	0	0	1	930	4748	3329	1019	47	24	0	0
9	2011	0	0	0	22	1240	5359	2474	549	162	22	5	0
9	2012	0	0	0	23	1833	3908	1678	497	188	70	77	0

Table 4 continued. Catch (t) per month by fishing area (SFA) and by year.

SFA	Year	J	F	M	A	M	J	J	A	S	O	N	D
10	1982	0	0	87	834	1015	422	451	433	209	250	73	0
10	1983	0	0	0	697	1484	536	60	595	237	37	0	0
10	1984	0	0	17	776	1040	760	232	886	431	129	93	19
10	1985	0	0	143	1174	671	865	829	642	45	24	3	2
10	1986	0	0	91	1588	1093	633	684	22	85	20	0	0
10	1987	0	0	93	1329	1342	1028	25	54	1085	456	0	1
10	1988	0	0	78	999	1404	968	1321	349	728	199	0	0
10	1989	0	0	221	1555	1541	935	899	0	1103	0	0	0
10	1990	0	0	0	1310	1881	1676	1023	0	949	0	0	0
10	1991	0	0	0	1651	1435	891	655	771	595	373	40	1
10	1992	0	0	0	902	771	460	400	625	890	718	175	16
10	1993	0	0	0	931	963	283	733	844	1063	452	179	38
10	1994	0	0	181	888	1346	891	520	757	1036	392	113	41
10	1995	0	0	0	2018	1806	1216	324	650	269	84	16	2
10	1996	0	0	0	3151	2160	814	310	428	112	26	9	4
10	1997	0	0	0	3103	1900	1313	752	589	71	6	0	4
10	1998	0	0	0	2797	2242	677	1229	984	756	244	51	1
10	1999	0	0	0	3641	2175	1671	666	603	359	74	31	19
10	2000	0	0	0	2969	2410	1282	1103	1483	437	348	127	1
10	2001	0	0	0	3513	1182	395	277	1141	1913	1214	1163	167
10	2002	0	0	0	2047	2759	2979	1170	1042	1011	268	178	39
10	2003	0	0	0	4076	2828	1154	830	1450	864	92	39	25
10	2004	0	0	0	5375	3595	1784	896	2254	1735	275	19	0
10	2005	0	0	0	4760	3508	1439	1305	504	449	721	107	0
10	2006	0	0	0	1967	3665	2700	1300	1138	2745	1301	362	134
10	2007	0	0	0	2196	4532	4045	2521	781	476	546	473	75
10	2008	0	0	25	4717	3958	2954	1462	1233	1034	303	204	82
10	2009	0	0	0	4021	3868	1211	1002	2569	2755	438	8	0
10	2010	0	0	0	4405	4052	762	1516	2081	1783	899	257	2
10	2011	0	0	0	4151	3167	618	1810	2194	1531	737	167	0
10	2012	0	0	0	4523	2270	652	2085	1690	993	269	0	0

Table 4 continued. Catch (t) per month by fishing area (SFA) and by year.

SFA	Year	J	F	M	A	M	J	J	A	S	O	N	D
12	1982	0	0	0	50	19	3	24	3	51	2	0	0
12	1983	0	0	0	14	7	45	85	7	0	0	0	0
12	1984	0	0	0	18	36	47	51	5	20	58	10	3
12	1985	0	0	0	50	21	0	5	18	42	28	0	0
12	1986	0	0	18	17	18	5	28	62	70	45	0	0
12	1987	0	0	0	14	80	58	189	181	0	0	0	0
12	1988	0	0	0	347	80	86	39	0	0	0	0	0
12	1989	0	0	205	133	35	49	141	66	0	0	0	0
12	1990	0	0	212	125	171	0	0	0	0	0	0	0
12	1991	0	0	0	386	45	3	5	13	40	11	1	0
12	1992	0	0	0	314	99	17	7	15	13	10	14	0
12	1993	0	0	0	264	146	2	2	3	2	69	7	0
12	1994	0	0	50	390	34	2	2	3	6	8	7	0
12	1995	0	0	0	340	40	6	7	71	11	0	11	0
12	1996	0	0	0	404	20	6	6	15	40	11	3	0
12	1997	0	0	0	333	95	4	30	73	6	3	5	2
12	1998	0	0	0	265	151	23	72	40	38	43	2	0
12	1999	0	0	0	373	77	3	41	105	41	5	1	0
12	2000	0	0	0	448	79	6	1	77	71	54	3	0
12	2001	0	0	0	220	377	0	3	5	46	126	54	0
12	2002	0	0	0	188	278	0	1	86	208	26	11	0
12	2003	0	0	0	314	138	44	0	93	168	31	8	0
12	2004	0	0	0	213	299	52	0	90	237	129	13	0
12	2005	0	0	0	363	240	168	48	85	13	67	18	0
12	2006	0	0	0	418	128	209	12	49	150	18	46	0
12	2007	0	0	0	261	100	79	0	270	265	19	29	0
12	2008	0	0	0	106	475	57	100	100	114	30	37	0
12	2009	0	0	0	322	199	0	0	182	221	51	16	0
12	2010	0	0	0	497	118	0	0	78	117	80	16	0
12	2011	0	0	0	107	96	0	0	263	314	81	20	0
12	2011	0	0	0	15	304	61	214	79	160	103	18	0

Table 5. Effort (h) per month by fishing area (SFA) and by year.

SFA	Year	J	F	M	A	M	J	J	A	S	O	N	D
8	1982	0	0	0	1509	5781	1487	1557	2608	1382	2767	0	0
8	1983	0	835	2236	6240	1664	4107	2065	2124	2762	1277	272	0
8	1984	0	60	52	3558	2651	2386	781	1334	1455	2097	359	0
8	1985	0	0	0	105	2976	4583	2007	5140	2380	0	0	0
8	1986	0	0	0	2981	2307	1060	3368	2702	1901	1184	141	0
8	1987	0	0	685	2324	2926	6898	2671	5273	2413	2557	668	253
8	1988	0	0	0	2323	9413	8124	7428	3639	0	2831	914	429
8	1989	0	0	0	350	7698	6783	2616	3968	3185	1910	2392	96
8	1990	0	0	0	0	5307	2844	5383	2818	2842	1978	0	0
8	1991	0	0	0	2636	9841	7479	7033	1805	894	241	223	0
8	1992	0	0	0	0	4667	11786	6304	888	1197	490	8	0
8	1993	0	0	0	13	10049	7564	8832	5483	1745	358	134	0
8	1994	0	0	0	0	3578	9775	11522	2397	1702	636	0	0
8	1995	29	0	0	34	17022	9231	241	824	2581	2139	33	0
8	1996	0	0	0	0	6933	9014	4501	1834	428	289	0	0
8	1997	0	0	0	10	5991	9930	4071	1410	708	1119	404	67
8	1998	0	0	0	3811	9681	3552	2228	697	2287	1942	1371	650
8	1999	0	0	0	5985	10602	5355	1280	432	1265	512	912	395
8	2000	0	0	0	7606	7401	2701	2581	3578	986	239	11	0
8	2001	0	0	0	5724	6228	4744	2625	1011	2575	4298	0	0
8	2002	0	0	0	5098	5342	8022	7236	2197	794	434	111	0
8	2003	0	0	0	7	6959	8459	1439	1870	718	297	615	19
8	2004	0	0	15	159	5437	9412	1996	896	693	357	0	0
8	2005	0	0	0	1	4327	4641	1767	3549	3007	2111	22	0
8	2006	0	0	0	868	4397	2872	1655	3177	3705	1886	184	0
8	2007	0	0	3	1802	11965	2415	1567	1520	3084	1579	1039	179
8	2008	0	0	0	3335	10130	2917	4891	1270	120	37	254	0
8	2009	0	0	0	1801	8213	2764	5872	1203	1174	295	34	0
8	2010	0	0	0	907	8725	6422	1336	1625	419	42	97	0
8	2011	0	0	0	408	12461	2753	509	366	44	144	110	0
8	2012	0	0	0	409	9681	5029	1578	892	587	142	0	0

Table 5 continued. Effort (h) per month by fishing area (SFA) and by year.

SFA	Year	J	F	M	A	M	J	J	A	S	O	N	D
9	1982	0	0	0	96	1712	7053	5827	5324	5852	1333	56	0
9	1983	0	0	0	297	854	8374	7357	4696	6462	4874	712	0
9	1984	0	0	0	114	3096	3198	5188	1913	3276	4403	523	0
9	1985	0	0	0	178	1543	5685	8043	6771	7752	3272	0	0
9	1986	0	0	0	43	788	8150	8962	12658	7032	5209	0	0
9	1987	0	0	0	237	5778	6675	13167	10103	3135	1485	0	0
9	1988	0	0	0	247	969	4755	3665	11186	3662	4294	218	0
9	1989	0	0	0	43	1364	7771	5939	4734	3180	8490	570	0
9	1990	0	0	0	3	162	4114	10263	15492	3865	0	0	0
9	1991	0	0	0	97	2417	7393	12883	7208	4184	2857	379	7
9	1992	0	0	0	11	1645	12063	13909	8080	4909	565	44	0
9	1993	0	0	0	0	2605	17805	16191	7780	1918	643	179	0
9	1994	0	0	0	158	1081	7464	18731	9976	2393	921	79	0
9	1995	0	0	0	34	2753	7377	16147	6459	1141	444	22	0
9	1996	0	0	0	170	2794	10794	13540	6447	3043	811	358	0
9	1997	0	0	0	1612	4761	12891	14924	2516	786	0	0	0
9	1998	0	0	0	818	5801	13953	11332	6822	1386	497	0	0
9	1999	0	0	0	236	3748	9160	18387	8630	3998	737	705	298
9	2000	0	0	0	75	3794	13627	16297	5938	2342	371	132	0
9	2001	0	0	0	17	1446	3345	6299	12695	7476	674	216	16
9	2002	0	0	0	90	4110	6259	14975	11610	3862	597	0	121
9	2003	0	0	0	1467	2766	10081	13890	3868	734	319	168	25
9	2004	0	0	0	434	2370	7929	18566	7808	3170	630	91	0
9	2005	0	0	0	295	3826	9264	6440	1554	2771	999	21	0
9	2006	0	0	0	141	3701	5063	6956	5535	4631	1221	204	0
9	2007	0	0	0	0	3366	5210	11754	9162	4209	479	148	197
9	2008	0	0	0	0	3370	6482	9565	7488	2174	489	0	0
9	2009	0	0	0	282	3843	11510	9008	2964	295	218	150	0
9	2010	0	0	0	7	2083	14995	11976	3962	220	114	0	0
9	2011	0	0	0	97	3003	14947	9773	2025	281	107	68	0
9	2012	0	0	0	99	5572	12949	6393	2112	854	351	563	0

Table 5 continued. Effort (h) per month by fishing area (SFA) and by year.

SFA	Year	J	F	M	A	M	J	J	A	S	O	N	D
10	1982	0	0	286	4462	11798	6931	6455	7815	3712	4036	1437	0
10	1983	0	0	0	4232	13263	6619	1331	7963	4290	875	0	0
10	1984	0	0	20	4796	10256	10622	4614	13360	7420	2845	1579	348
10	1985	0	0	675	8552	11779	11199	10197	7432	920	577	101	12
10	1986	0	0	496	9100	13371	8793	9394	481	1639	502	0	0
10	1987	0	0	1098	11281	13818	11302	760	940	12941	6919	0	11
10	1988	0	0	709	8988	16241	13148	15584	4829	10116	3302	0	0
10	1989	0	0	1480	13855	16688	12003	10585	0	10892	0	0	0
10	1990	0	0	0	7845	14371	14732	6620	0	8420	0	0	0
10	1991	0	0	0	8627	14533	9253	6294	6367	5495	3852	407	14
10	1992	0	0	0	5533	10946	6752	5598	9830	12584	10535	3907	277
10	1993	0	0	0	7117	14800	3907	8837	11330	14415	10305	3869	415
10	1994	0	0	338	9482	18330	11207	5914	9101	10538	5276	1820	466
10	1995	0	0	0	10587	16141	9248	2146	3618	1694	514	126	21
10	1996	0	0	0	16102	13612	4582	1795	2587	769	193	138	131
10	1997	0	0	0	13670	12601	7994	3515	2790	386	81	0	22
10	1998	0	0	0	10287	9397	3430	6796	6367	4644	1795	316	10
10	1999	0	0	0	13598	13069	9021	2907	3734	3072	640	246	170
10	2000	0	0	0	12731	13638	7110	4735	7519	2798	2621	951	9
10	2001	0	0	0	13816	7547	2586	1259	6058	14404	11011	9742	964
10	2002	0	0	0	10989	15878	14503	4502	5187	4455	1187	740	175
10	2003	0	0	0	10113	9973	5174	3183	5459	3669	438	178	99
10	2004	0	0	0	12923	14212	7215	3163	7167	6375	919	81	0
10	2005	0	0	0	13924	12540	4536	3944	1758	1373	2876	445	0
10	2006	0	0	0	4822	12427	9411	4070	3310	9136	5315	1324	273
10	2007	0	0	0	4135	13433	12285	6180	1961	1700	2342	1537	132
10	2008	0	0	73	7116	13030	9706	5012	4448	4237	1336	455	167
10	2009	0	0	0	7524	14878	5097	2991	8968	9026	1417	37	0
10	2010	0	0	0	11974	13988	2975	5276	7808	7714	4371	1086	17
10	2011	0	0	0	12017	12519	2464	7249	9010	6360	2641	443	0
10	2012	0	0	0	13817	9482	2368	7248	5724	4210	1382	0	0

Table 5 continued. Effort (h) per month by fishing area (SFA) and by year.

SFA	Year	J	F	M	A	M	J	J	A	S	O	N	D
12	1982	0	0	0	423	284	54	334	39	876	47	0	0
12	1983	0	0	0	200	78	473	2010	278	0	0	0	0
12	1984	0	0	0	57	266	598	1036	117	430	1064	279	48
12	1985	0	0	0	331	323	0	67	341	672	512	0	0
12	1986	0	0	239	149	188	48	507	1051	1339	1668	0	0
12	1987	0	0	0	188	919	663	3290	3309	0	0	0	0
12	1988	0	0	5	2631	957	943	687	0	0	0	0	0
12	1989	0	0	1982	1669	587	512	1420	761	0	0	0	0
12	1990	0	0	1640	715	1693	0	0	0	0	0	0	0
12	1991	0	0	0	1097	262	51	124	173	308	157	14	0
12	1992	0	0	0	1716	1015	333	202	224	349	329	322	0
12	1993	0	0	0	1086	1110	14	29	86	47	691	94	0
12	1994	0	0	492	1035	364	57	50	110	42	93	60	0
12	1995	0	0	0	875	286	69	53	351	71	0	42	0
12	1996	0	0	0	959	80	69	63	127	222	45	10	0
12	1997	0	0	0	1056	317	42	114	348	43	11	16	6
12	1998	0	0	0	485	370	105	265	175	140	170	20	0
12	1999	0	0	0	604	269	32	227	360	180	26	9	0
12	2000	0	0	0	875	336	43	7	295	282	183	30	0
12	2001	0	0	0	731	1523	0	31	22	181	529	274	0
12	2002	0	0	0	880	1587	22	8	319	708	75	36	0
12	2003	0	0	0	524	319	146	0	308	497	120	21	0
12	2004	0	0	0	327	749	306	8	233	627	330	33	0
12	2005	0	0	0	819	547	334	158	273	51	243	54	0
12	2006	0	0	0	632	310	548	48	130	446	49	115	0
12	2007	0	0	0	371	290	248	0	757	889	103	88	0
12	2008	0	0	0	218	1299	109	227	335	465	88	88	0
12	2009	0	0	0	591	684	8	0	817	1062	259	59	0
12	2010	0	0	0	1500	686	0	0	274	640	358	73	0
12	2011	0	0	0	483	497	0	0	1321	1505	458	143	0
12	2012	0	0	0	74	1173	168	671	387	933	679	154	0

Table 6. Weighting cells used to estimate the numbers at length for Esquiman area (SFA=8), by year and by month.

The catch corresponds to the landing that is adjusted for the proportion (ratio) of P. borealis in the samples. The origin (month, year) of the samples used for the estimates is also indicated.

SFA	Year	Month	Landing (t)	Samples		Catch estimate (t)	From :	
				N individuals	Ratio *Pandalus borealis*		Month	Year
8	2007	1	0.0					
		2	0.0					
		3	3.2			3.2	4	2007
		4	880.1	3109	0.997	877.4	4	2007
		5	4287.3	4821	0.992	4252.0	5	2007
		6	1028.4	1387	0.991	1019.1	6	2007
		7	848.5	1087	0.995	844.1	7	2007
		8	592.5	1107	0.995	589.5	8	2007
		9	892.2	838	0.999	891.5	9	2007
		10	430.7	1113	1.000	430.7	10	2007
		11	223.2	2171	0.995	222.2	11	2007
		12	21.8			21.7	11	2007
8	2008	1	0.0					
		2	0.0					
		3	0.0					
		4	1148.8	1901	0.998	1146.2	4	2008
		5	3592.7	2890	0.991	3560.7	5	2008
		6	1738.6	4002	0.989	1719.8	6	2008
		7	2147.1	2435	0.989	2123.2	7	2008
		8	400.2	525	0.998	399.6	8	2008
		9	22.3	502	0.964	21.5	9	2008
		10	7.4			7.2	9	2008
		11	52.9	1080	0.993	52.5	11	2008
		12	0.0					
8	2009	1	0.0					
		2	0.0					
		3	0.0					
		4	874.7			872.7	4	2008
		5	3729.0			3695.8	5	2008
		6	1345.1	268	0.952	1281.1	6	2009
		7	2604.2	2719	0.996	2595.0	7	2009
		8	418.7	268	1.000	418.7	8	2009
		9	402.8	2235	0.997	401.4	9	2009
		10	88.4	1504	0.989	87.5	10	2009
		11	10.2	255	0.988	10.1	11	2009
		12	0.0					
8	2010	1	0.0					
		2	0.0					
		3	0.0					
		4	304.5	525	0.982	299.0	4	2010
		5	4428.0	2916	0.964	4270.3	5	2010
		6	3543.9	2699	0.990	3508.7	6	2010
		7	557.6	3263	0.994	554.3	7	2010
		8	535.5	267	0.994	532.5	8	2010
		9	105.7			105.7	11	2010
		10	18.3			18.3	11	2010
		11	47.5	265	1.000	47.5	11	2010
		12	0.0					
8	2011	1	0.0					
		2	0.0					
		3	0.0					
		4	125.2	268	0.994	124.5	4	2011
		5	6672.1	4665	0.995	6639.7	5	2011
		6	1989.0	4187	0.993	1975.0	6	2011
		7	172.4	260	0.995	171.5	7	2011
		8	113.1			112.5	7	2011
		9	6.7			6.7	10	2011
		10	58.1	536	0.995	57.8	10	2011
		11	40.3	571	0.999	40.3	11	2011
		12	0.0					
8	2012	1	0.0					
		2	0.0					
		3	0.0					
		4	136.6	555	0.938	128.2	4	2012
		5	5646.8	5165	0.984	5559.1	5	2012
		6	2946.6	2970	0.985	2901.5	6	2012
		7	765.9	1101	0.997	763.6	7	2012
		8	378.4	263	1.000	378.4	8	2012
		9	325.6			325.6	8	2012
		10	70.7			70.7	8	2012
		11	0.0					
		12	0.0					

Table 7. Weighting cells used to estimate the numbers at length for Anticosti area (SFA=9), by year and by month.

The catch corresponds to the landing that is adjusted for the proportion (ratio) of P. borealis in the samples. The origin (month, year) of the samples used for the estimates is also indicated.

SFA	Year	Month	Landing (t)	Samples		Catch estimate (t)	From :	
				N individuals	Ratio *Pandalus borealis*		Month	Year
9	2007	1	0.0					
		2	0.0					
		3	0.0					
		4	0.0					
		5	1162.0	1885	0.976	1134.2	5	2007
		6	1892.8	1881	0.989	1872.0	6	2007
		7	3278.1	2542	0.996	3264.8	7	2007
		8	2309.3	2086	0.985	2274.9	8	2007
		9	1318.4	1367	0.995	1311.5	9	2007
		10	108.8	309	1.000	108.8	10	2007
		11	46.9			46.9	10	2007
		12	63.8			63.8	10	2007
9	2008	1	0.0					
		2	0.0					
		3	0.0					
		4	0.0					
		5	1231.4	1054	0.972	1196.7	5	2008
		6	2730.2	2121	0.964	2631.3	6	2008
		7	3234.1	1842	0.982	3174.9	7	2008
		8	1863.0	1116	0.922	1718.5	8	2008
		9	496.8	536	0.999	496.5	9	2008
		10	79.5	505	0.990	78.7	10	2008
		11	0.0					
		12	0.0					
9	2009	1	0.0					
		2	0.0					
		3	0.0					
		4	68.5	259	0.974	66.7	4	2009
		5	1378.2	1333	0.959	1321.4	5	2009
		6	4462.6	2959	0.914	4080.1	6	2009
		7	2552.1	2457	0.981	2504.5	7	2009
		8	823.5	1375	0.995	819.7	8	2009
		9	132.7	276	0.996	132.3	9	2009
		10	83.6	273	1.000	83.6	10	2009
		11	143.0			143.0	10	2009
		12	0.0					
9	2010	1	0.0					
		2	0.0					
		3	0.0					
		4	1.2			1.0	5	2010
		5	930.4	1062	0.906	843.0	5	2010
		6	4747.8	2883	0.976	4635.3	6	2010
		7	3329.4	2365	0.993	3307.5	7	2010
		8	1019.0	1590	0.997	1015.5	8	2010
		9	47.4	260	0.992	47.0	9	2010
		10	23.8	268	0.993	23.7	10	2010
		11	0.0					
		12	0.0					
9	2011	1	0.0					
		2	0.0					
		3	0.0					
		4	21.9			21.8	5	2011
		5	1239.6	1290	0.996	1235.0	5	2011
		6	5358.8	2856	0.972	5209.0	6	2011
		7	2473.6	2626	0.986	2440.0	7	2011
		8	548.6	1320	0.983	539.4	8	2011
		9	161.5	513	0.992	160.2	9	2011
		10	22.3			22.1	9	2011
		11	4.6			4.6	9	2011
		12	0.0					
9	2012	1	0.0					
		2	0.0					
		3	0.0					
		4	22.5	269	0.972	21.9	4	2012
		5	1833.0	2733	0.970	1777.9	5	2012
		6	3907.8	2179	0.988	3860.3	6	2012
		7	1677.6	2240	0.994	1667.5	7	2012
		8	496.8	1622	0.999	496.2	8	2012
		9	188.3	541	0.994	187.3	9	2012
		10	69.8	807	0.997	69.6	10	2012
		11	77.2			77.0	10	2012
		12	0.0					

Table 8. Weighting cells used to estimate the numbers at length for Sept-Iles area (SFA=10), by year and by month.

The catch corresponds to the landing that is adjusted for the proportion (ratio) of P. borealis in the samples. The origin (month, year) of the samples used for the estimates is also indicated.

SFA	Year	Month	Landing (t)	Samples		Estimation de capture Catch estimate (t)	From :	
				N individuals	Ratio *Pandalus borealis*		Month	Year
10	2007	1	0.0					
		2	0.0					
		3	0.0					
		4	2195.7	2832	0.996	2186.5	4	2007
		5	4532.4	2909	0.996	4514.9	5	2007
		6	4044.6	2989	0.992	4013.9	6	2007
		7	2520.7	2532	0.995	2508.8	7	2007
		8	781.3	2672	0.993	776.0	8	2007
		9	476.0	1464	0.992	472.3	9	2007
		10	545.7	1674	0.996	543.4	10	2007
		11	473.2	272	0.986	466.4	11	2007
		12	75.4			74.3	11	2007
10	2008	1	0.0					
		2	0.0					
		3	25.1			25.0	4	2008
		4	4717.0	2520	0.996	4698.4	4	2008
		5	3958.0	3426	0.994	3934.8	5	2008
		6	2953.8	2597	0.993	2933.2	6	2008
		7	1461.9	2181	0.992	1449.6	7	2008
		8	1233.4	2304	0.994	1226.0	8	2008
		9	1034.5	1072	0.981	1014.4	9	2008
		10	302.6	1247	0.990	299.5	10	2008
		11	204.1	1273	0.976	199.2	11	2008
		12	81.7	255	0.979	80.0	12	2008
10	2009	1	0.0					
		2	0.0					
		3	0.0					
		4	4020.6	3011	0.992	3988.9	4	2009
		5	3868.1	3653	0.989	3825.7	5	2009
		6	1211.3	1848	0.986	1194.2	6	2009
		7	1002.2	1891	0.995	996.7	7	2009
		8	2569.0	1579	0.987	2536.6	8	2009
		9	2755.3	1915	0.988	2722.8	9	2009
		10	438.2	1051	0.985	431.7	10	2009
		11	8.3			8.1	10	2009
		12	0.0					

SFA	Year	Month	Landing (t)	Samples		Catch estimate (t)	From :	
				N individuals	Ratio *Pandalus borealis*		Month	Year
10	2010	1	0.0					
		2	0.0					
		3	0.0					
		4	4404.7	3714	0.991	4366.9	4	2010
		5	4052.0	2885	0.993	4025.3	5	2010
		6	761.7	2110	0.988	752.8	6	2010
		7	1515.8	1814	0.992	1503.3	7	2010
		8	2080.6	2115	0.977	2032.4	8	2010
		9	1783.4	1853	0.967	1725.0	9	2010
		10	899.2	2353	0.985	885.8	10	2010
		11	256.6	818	0.974	250.1	11	2010
		12	2.0			1.9	11	2010
10	2011	1	0.0					
		2	0.0					
		3	0.0					
		4	4150.6	3713	0.991	4111.5	4	2011
		5	3166.9	2625	0.987	3126.8	5	2011
		6	618.0	2410	0.993	613.6	6	2011
		7	1810.5	2112	0.982	1777.1	7	2011
		8	2193.9	2619	0.987	2165.6	8	2011
		9	1531.4	1319	0.972	1488.3	9	2011
		10	737.4	1278	0.973	717.4	10	2011
		11	167.4			162.9	10	2011
		12	0.0					
10	2012	1	0.0					
		2	0.0					
		3	0.0					
		4	4523.4	3477	0.989	4473.0	4	2012
		5	2269.6	2984	0.996	2259.4	5	2012
		6	651.7	1647	0.996	649.1	6	2012
		7	2085.2	2432	0.990	2063.3	7	2012
		8	1689.7	2253	0.994	1679.8	8	2012
		9	993.5	1659	0.990	983.5	9	2012
		10	269.3	1114	0.992	267.2	10	2012
		11						
		12						

Table 9. Weighting cells used to estimate the numbers at length for Estuary area (SFA=12), by year and by month.

The catch corresponds to the landing that is adjusted for the proportion (ratio) of P. borealis in the samples. The origin (month, year) of the samples used for the estimates is also indicated.

SFA	Year	Month	Landing (t)	Samples		Catch estimate (t)	From :	
				N individuals	Ratio *Pandalus borealis*		Month	Year
12	2007	1	0.0					
		2	0.0					
		3	0.0					
		4	260.8	1022	0.988	257.7	4	2007
		5	99.8	972	0.996	99.4	5	2007
		6	78.9	441	0.996	78.6	6	2007
		7	0.0					
		8	269.8	1215	0.999	269.6	8	2007
		9	264.9	1054	0.970	256.9	9	2007
		10	18.7	558	0.999	18.7	10	2007
		11	29.1	613	0.975	28.4	11	2007
		12	0.0					
12	2008	1	0.0					
		2	0.0					
		3	0.0					
		4	105.7	507	0.961	101.5	4	2008
		5	474.7	1065	0.991	470.6	5	2008
		6	56.7	260	0.987	56.0	6	2008
		7	100.2	1043	0.972	97.4	7	2008
		8	99.5	512	0.966	96.1	8	2008
		9	114.1	804	0.979	111.7	9	2008
		10	29.6	428	0.979	29.0	10	2008
		11	36.6	527	0.999	36.5	11	2008
		12	0.0					
12	2009	1	0.0					
		2	0.0					
		3	0.0					
		4	322.0	1669	0.960	309.0	4	2009
		5	199.5	1345	0.998	199.0	5	2009
		6	0.3			0.3	8	2009
		7	0.0					
		8	182.4	610	0.996	181.8	8	2009
		9	221.1	963	0.924	204.2	9	2009
		10	51.1	528	0.727	37.1	10	2009
		11	16.4	545	0.991	16.3	11	2009
		12	0.0					
12	2010	1	0.0					
		2	0.0					
		3	0.0					
		4	497.1	1372	0.999	496.7	4	2010
		5	117.9	243	0.985	116.2	5	2010
		6	0.0					
		7	0.0					
		8	78.1	550	0.980	76.5	8	2010
		9	117.0	791	0.942	110.2	9	2010
		10	80.3	680	0.901	72.4	10	2010
		11	15.7	559	0.986	15.5	11	2010
		12	0.0					
12	2011	1	0.0					
		2	0.0					
		3	0.0					
		4	106.7	1267	0.976	104.2	4	2011
		5	96.1	512	0.992	95.4	5	2011
		6	0.0					
		7	0.0					
		8	263.3	1831	0.975	256.7	8	2011
		9	313.6	1044	0.978	306.6	9	2011
		10	80.7	773	0.975	78.6	10	2011
		11	19.6			19.1	10	2011
		12	0.0					
12	2012	1	0.0					
		2	0.0					
		3	0.0					
		4	14.7	273	0.994	14.6	4	2012
		5	304.3	1614	0.982	298.9	5	2012
		6	61.3	263	0.983	60.3	6	2012
		7	214.5	862	0.935	200.5	7	2012
		8	79.3	260	1.000	79.3	8	2012
		9	160.0	543	0.989	158.2	9	2012
		10	103.3	835	0.966	99.7	10	2012
		11	18.3			17.7	10	2012
		12	0.0					

Table 10. Commercial catches (in million) by fishing area and by year. M : males, Fp : primiparous females, Fm : multiparous females.

ESQUIMAN	M	Fp	Fm	Total	ANTICOSTI	M	Fp	Fm	Total
1982	213.729	49.090	90.467	353.287	1982	353.588	54.294	60.047	467.929
1983	210.491	37.504	90.993	338.988	1983	371.446	54.076	77.701	503.224
1984	143.980	15.446	84.606	244.032	1984	150.381	36.520	37.848	224.749
1985	150.231	37.454	46.678	234.363	1985	318.120	77.459	75.653	471.231
1986	119.177	31.671	89.408	240.256	1986	439.014	113.352	89.218	641.584
1987	489.897	41.955	67.915	599.767	1987	513.328	124.163	58.641	696.132
1988	651.211	118.139	101.456	870.806	1988	379.483	98.130	74.511	552.124
1989	573.472	123.630	155.819	852.921	1989	649.346	104.474	114.316	868.136
1990	385.416	85.633	97.797	568.847	1990	492.792	195.096	73.229	761.117
1991	563.831	75.805	200.560	840.196	1991	552.822	111.232	106.379	770.433
1992	417.002	101.196	72.810	591.008	1992	403.383	195.699	17.733	616.815
1993	690.080	163.796	85.900	939.775	1993	593.031	220.907	15.880	829.818
1994	613.045	249.976	36.807	899.827	1994	630.361	202.291	22.604	855.256
1995	660.818	239.405	129.040	1029.263	1995	655.881	192.251	21.592	869.724
1996	715.592	248.478	74.439	1038.508	1996	530.261	250.881	48.596	829.738
1997	702.324	321.200	79.516	1103.039	1997	574.654	237.671	72.531	884.856
1998	720.038	191.342	285.781	1197.161	1998	572.183	321.652	92.337	986.173
1999	704.105	283.292	290.477	1277.875	1999	788.364	304.288	51.253	1143.904
2000	878.970	298.558	274.819	1452.348	2000	796.368	362.846	100.973	1260.186
2001	1050.824	347.054	270.578	1668.457	2001	688.093	254.914	31.125	974.132
2002	1112.638	371.751	265.445	1749.834	2002	976.132	490.580	52.917	1519.629
2003	827.987	407.415	150.001	1385.403	2003	829.530	444.028	131.662	1405.220
2004	1029.888	372.888	328.433	1731.209	2004	819.908	529.166	252.057	1601.130
2005	1295.172	405.716	305.153	2006.040	2005	787.390	364.101	194.390	1345.881
2006	1410.620	290.441	441.409	2142.469	2006	886.527	309.541	232.663	1428.731
2007	1425.753	388.918	513.232	2327.903	2007	1010.573	571.207	269.589	1851.370
2008	1435.983	593.803	264.407	2294.193	2008	1191.128	505.452	187.746	1884.326
2009	1550.985	574.905	223.314	2349.204	2009	1139.595	573.836	180.360	1893.790
2010	1359.305	437.295	217.239	2013.840	2010	1395.762	492.403	182.770	2070.935
2011	1088.570	439.495	351.829	1879.895	2011	1169.181	521.739	133.570	1824.490
2012	1456.946	464.855	311.218	2233.018	2012	1136.769	370.654	138.153	1645.576

Table 10 continued. Commercial catches (in million) by fishing area and by year. M : males, Fp : primiparous females, Fm : multiparous females.

SEPT-ILES	M	Fp	Fm	Total	ESTUARY	M	Fp	Fm	Total
1982	372.400	53.405	169.554	595.359	1982	13.690	2.852	3.748	20.291
1983	482.055	57.794	137.596	677.445	1983	26.136	3.414	2.527	32.077
1984	386.815	48.519	191.061	626.396	1984	0.000	0.000	0.000	0.000
1985	312.853	84.069	206.056	602.979	1985	0.000	0.000	0.000	0.000
1986	291.807	69.898	265.924	627.629	1986	21.814	8.868	5.799	36.481
1987	534.992	87.525	288.452	910.970	1987	44.343	18.016	10.803	73.161
1988	607.652	108.155	264.893	980.700	1988	32.322	5.358	37.970	75.650
1989	408.096	153.824	309.604	871.524	1989	0.000	0.000	0.000	0.000
1990	486.534	110.414	358.671	955.619	1990	41.848	3.401	27.340	72.589
1991	472.509	73.379	319.985	865.873	1991	0.000	0.000	0.000	0.000
1992	501.848	116.354	159.801	778.004	1992	8.960	3.195	42.897	55.052
1993	510.306	173.963	155.083	839.352	1993	10.894	1.624	39.638	52.156
1994	626.931	194.072	155.660	976.663	1994	7.232	1.309	41.926	50.468
1995	530.934	235.339	194.870	961.143	1995	8.779	4.514	39.773	53.066
1996	604.658	285.179	172.150	1061.987	1996	3.982	5.681	42.414	52.077
1997	506.700	197.177	335.372	1039.249	1997	14.353	8.639	39.535	62.526
1998	510.867	209.674	387.943	1108.484	1998	12.256	9.739	45.175	67.170
1999	538.380	267.410	402.911	1208.701	1999	16.711	12.180	43.155	72.045
2000	734.268	346.146	385.353	1465.768	2000	15.717	11.106	54.710	81.533
2001	657.107	297.412	575.198	1529.717	2001	38.985	20.599	52.257	111.841
2002	781.683	648.745	316.336	1746.764	2002	47.044	24.402	43.159	114.605
2003	530.663	282.049	720.667	1533.379	2003	26.248	15.524	55.586	97.358
2004	763.335	464.834	952.705	2180.874	2004	40.562	15.895	74.802	131.259
2005	696.425	335.150	789.841	1821.416	2005	28.428	20.257	77.830	126.515
2006	858.544	470.468	834.757	2163.769	2006	37.564	14.978	80.752	133.295
2007	805.542	363.731	854.389	2023.662	2007	35.800	18.786	69.568	124.154
2008	894.496	395.509	934.829	2224.834	2008	38.010	18.756	65.565	122.331
2009	958.064	468.084	853.428	2279.576	2009	60.010	20.298	57.894	138.202
2010	1324.586	337.984	943.138	2605.708	2010	43.182	11.734	68.888	123.804
2011	1143.655	488.707	802.931	2435.293	2011	121.367	22.205	32.453	176.025
2012	916.629	390.367	642.305	1949.301	2012	133.390	26.389	26.277	186.056

Table 11. Number per unit of effort by fishing area and by year for the summer season (months of June, July and August). M : males, Fp : primiparous females, Fm : multiparous females.

ESQUIMAN	M	Fp	Fm	Total	ANTICOSTI	M	Fp	Fm	Total
1982	12748	3086	2764	18598	1982	12334	2315	2402	17051
1983	7345	1204	3271	11820	1983	11196	2065	2167	15428
1984	9967	1232	4273	15472	1984	7184	1928	1839	10951
1985	8163	2505	2582	13249	1985	9799	2834	2353	14986
1986	5962	2546	3990	12498	1986	11664	2915	2276	16855
1987	18844	1728	1924	22496	1987	13179	2945	1142	17266
1988	18616	2966	2220	23802	1988	11424	4219	1982	17625
1989	18517	6142	3766	28425	1989	15105	5080	3220	23405
1990	20064	4212	5873	30149	1990	14791	5859	2240	22890
1991	19842	2316	4597	26754	1991	12947	3648	2494	19089
1992	19208	5033	960	25202	1992	9171	5207	156	14534
1993	24380	5884	580	30844	1993	12722	4807	252	17781
1994	21467	9121	1179	31767	1994	15489	5256	345	21090
1995	22999	9051	1819	33870	1995	19664	5677	606	25947
1996	30059	10318	1644	42021	1996	15265	6879	1010	23154
1997	31459	14986	1979	48423	1997	16949	7159	908	25016
1998	39207	13550	1381	54138	1998	14148	8782	907	23837
1999	31258	19468	2589	53315	1999	19063	7243	625	26931
2000	43171	16618	3231	63020	2000	19127	8858	2175	30160
2001	49769	20026	3320	73115	2001	24819	8703	933	34455
2002	39846	17842	1022	58710	2002	24023	12679	660	37362
2003	41493	20365	3340	65197	2003	25941	13534	2660	42135
2004	53993	23850	12592	90435	2004	19832	13565	5723	39120
2005	59315	32037	8290	99642	2005	34689	17064	3694	55447
2006	78049	26011	16315	120375	2006	37735	14495	7184	59414
2007	70008	26949	11457	108415	2007	28679	15777	7119	51575
2008	71495	32353	10499	114347	2008	38698	18190	6558	63446
2009	70187	26859	6297	103342	2009	41008	20479	4619	66106
2010	73993	20541	11136	105670	2010	40382	14447	5500	60329
2011	88326	33201	12386	133914	2011	36741	16991	3839	57571
2012	81637	28056	9166	118859	2012	40270	12865	3651	56786

Table 11 continued. Number per unit of effort by fishing area and by year for the summer season (months of June, July and August). M : males, Fp : primiparous females, Fm : multiparous females.

SEPT-ILES	M	Fp	Fm	Total	ESTUARY	M	Fp	Fm	Total
1982	6218	1403	1727	9348	1982	6410	1335	1755	9500
1983	9593	1785	2250	13629	1983	8382	986	851	10219
1984	7036	970	2173	10180	1984				
1985	7680	2287	2227	12195	1985				
1986	10579	2285	2002	14865	1986	5432	2298	788	8517
1987	13126	1584	2698	17408	1987	5452	2306	791	8548
1988	9846	1601	2706	14153	1988	7073	2992	1026	11090
1989	7431	1992	2840	12263	1989				
1990	13033	3029	3459	19521	1990				
1991	10631	1941	3765	16337	1991				
1992	6950	3337	397	10684	1992	3078	666	3063	6807
1993	6206	3990	465	10661	1993	3731	807	3713	8251
1994	8593	3960	455	13008	1994	2684	1031	1262	4976
1995	12431	7161	1351	20943	1995	12818	7773	4411	25001
1996	14695	8615	1663	24973	1996	3792	4636	3867	12295
1997	16114	7876	2112	26102	1997	5561	11575	6696	23832
1998	14056	8238	1189	23483	1998	12567	12324	5277	30169
1999	17667	9305	867	27839	1999	9029	15262	2898	27189
2000	19479	9176	2864	31518	2000	20678	11151	5900	37729
2001	14165	9192	3008	26365	2001	19905	3853	3724	27482
2002	17964	15976	498	34438	2002	16938	16772	1245	34955
2003	20186	12701	3441	36328	2003	11310	17064	7428	35802
2004	19820	15677	5164	40660	2004	14891	14710	5836	35437
2005	25563	17648	3604	46815	2005	20538	18471	14090	53098
2006	21537	13326	9759	44623	2006	27833	10208	16063	54104
2007	25051	12238	10884	48173	2007	20939	9704	15111	45755
2008	29805	13613	4561	47979	2008	28080	17951	6237	52268
2009	23512	14307	5132	42952	2009	15311	12741	3828	31880
2010	35689	11749	3689	51127	2010	10790	17084	7322	35196
2011	23776	14983	3153	41913	2011	38306	6002	1790	46098
2012	32952	13251	3360	49563	2012	47357	9258	3030	59646

Table12a. Frequency of observations by category for the Esquiman fishing area.

	Observations		Cumulative	
	n	%	n	%
Year				
1982	1073	2.0	1073	2.0
1983	1401	2.6	2474	4.5
1984	622	1.1	3096	5.7
1985	162	0.3	3258	6.0
1986	943	1.7	4201	7.7
1987	843	1.6	5044	9.3
1988	970	1.8	6014	11.0
1989	1382	2.5	7396	13.6
1990	1867	3.4	9263	17.0
1991	2372	4.4	11635	21.3
1992	1746	3.2	13381	24.5
1993	2271	4.2	15652	28.7
1994	1616	3.0	17268	31.7
1995	1998	3.7	19266	35.3
1996	1614	3.0	20880	38.3
1997	1494	2.7	22374	41.0
1998	1996	3.7	24370	44.7
1999	2029	3.7	26399	48.4
2000	2143	3.9	28542	52.3
2001	1860	3.4	30402	55.7
2002	2276	4.2	32678	59.9
2003	1719	3.2	34397	63.1
2004	1813	3.3	36210	66.4
2005	1620	3.0	37830	69.4
2006	1567	2.9	39397	72.2
2007	2032	3.7	41429	75.9
2008	1692	3.1	43121	79.1
2009	3091	5.7	46212	84.7
2010	2850	5.2	49062	89.9
2011	2910	5.3	51972	95.3
2012	2580	4.7	54552	100.0
Month				
4	5680	10.4	5680	10.4
5	20008	36.7	25688	47.1
6	12161	22.3	37849	69.4
7	6845	12.6	44694	81.9
8	3654	6.7	48348	88.6
9	3122	5.7	51470	94.4
10	2368	4.3	53838	98.7
11	714	1.3	54552	100.0
Vessel length class				
45	2607	4.8	2607	4.8
55	27428	50.3	30035	55.1
65	18907	34.7	48942	89.7
75	3680	6.8	52622	96.5
85	1930	3.5	54552	100.0
Engine power class				
150	3325	6.1	3325	6.1
250	6031	11.1	9356	17.2
350	10914	20.0	20270	37.2
450	10449	19.2	30719	56.3
550	13333	24.4	44052	80.8
650	6396	11.7	50448	92.5
750	3422	6.3	53870	98.8
850	682	1.3	54552	100.0

Table 12b. Frequency of observations by category for the Anticosti fishing area.

	Observations		Cumulative	
	n	%	n	%
Year				
1982	1566	2.7	1566	2.7
1983	1790	3.1	3356	5.8
1984	1407	2.4	4763	8.2
1985	2272	3.9	7035	12.1
1986	2964	5.1	9999	17.1
1987	2319	4.0	12318	21.1
1988	1579	2.7	13897	23.8
1989	1842	3.2	15739	27.0
1990	1979	3.4	17718	30.4
1991	2224	3.8	19942	34.2
1992	2407	4.1	22349	38.3
1993	2445	4.2	24794	42.5
1994	2252	3.9	27046	46.3
1995	1863	3.2	28909	49.5
1996	1992	3.4	30901	52.9
1997	1794	3.1	32695	56.0
1998	2068	3.5	34763	59.6
1999	2286	3.9	37049	63.5
2000	2087	3.6	39136	67.1
2001	1558	2.7	40694	69.7
2002	2111	3.6	42805	73.3
2003	1592	2.7	44397	76.1
2004	2037	3.5	46434	79.6
2005	1249	2.1	47683	81.7
2006	1348	2.3	49031	84.0
2007	1673	2.9	50704	86.9
2008	1458	2.5	52162	89.4
2009	1474	2.5	53636	91.9
2010	1708	2.9	55344	94.8
2011	1554	2.7	56898	97.5
2012	1473	2.5	58371	100.0
Month				
5	4518	7.7	4518	7.7
6	14390	24.7	18908	32.4
7	18313	31.4	37221	63.8
8	11962	20.5	49183	84.3
9	6204	10.6	55387	94.9
10	2984	5.1	58371	100.0
Vessel length class				
45	1439	2.5	1439	2.5
55	15867	27.2	17306	29.7
65	21667	37.1	38973	66.8
75	12538	21.5	51511	88.3
85	6860	11.8	58371	100.0
Engine power class				
150	1251	2.1	1251	2.1
250	1739	3.0	2990	5.1
350	9505	16.3	12495	21.4
450	10379	17.8	22874	39.2
550	25505	43.7	48379	82.9
650	6427	11.0	54806	93.9
750	2223	3.8	57029	97.7
850	1342	2.3	58371	100.0

Table 12c. Frequency of observations by category for the Sept-Îles fishing area.

	Observations		Cumulative	
	n	%	n	%
Year				
1982	1800	2.1	1800	2.1
1983	1376	1.6	3176	3.7
1984	3424	4.0	6600	7.6
1985	3228	3.7	9828	11.4
1986	2821	3.3	12649	14.7
1987	3431	4.0	16080	18.6
1988	3906	4.5	19986	23.1
1989	3372	3.9	23358	27.1
1990	2771	3.2	26129	30.3
1991	3321	3.9	29450	34.1
1992	3877	4.5	33327	38.6
1993	3980	4.6	37307	43.2
1994	3670	4.3	40977	47.5
1995	2267	2.6	43244	50.1
1996	2063	2.4	45307	52.5
1997	2156	2.5	47463	55.0
1998	2318	2.7	49781	57.7
1999	2515	2.9	52296	60.6
2000	2638	3.1	54934	63.6
2001	3331	3.9	58265	67.5
2002	2949	3.4	61214	70.9
2003	2081	2.4	63295	73.3
2004	2789	3.2	66084	76.5
2005	2251	2.6	68335	79.1
2006	2750	3.2	71085	82.3
2007	2122	2.5	73207	84.8
2008	2450	2.8	75657	87.6
2009	2664	3.1	78321	90.7
2010	2803	3.3	81124	93.9
2011	2841	3.3	83965	97.2
2012	2389	2.8	86354	100.0
Month				
4	17918	20.8	17918	20.8
5	21472	24.9	39390	45.6
6	12665	14.7	52055	60.3
7	8857	10.3	60912	70.5
8	8937	10.4	69849	80.9
9	10071	11.7	79920	92.6
10	4880	5.7	84800	98.2
11	1554	1.8	86354	100.0
Vessel length class				
45	2411	2.8	2411	2.8
55	32364	37.5	34775	40.3
65	33719	39.1	68494	79.3
75	11798	13.7	80292	93.0
85	6062	7.0	86354	100.0
Engine power class				
150	1518	1.8	1518	1.8
250	2361	2.7	3879	4.5
350	17463	20.2	21342	24.7
450	19922	23.1	41264	47.8
550	35780	41.4	77044	89.2
650	6938	8.0	83982	97.3
750	2372	2.8	86354	100.0

Table 12d. Frequency of observations by category for the Estuary fishing area.

	Observations		Cumulative	
	n	%	n	%
Year				
1982	83	1.5	83	1.5
1983	54	1.0	137	2.4
1984	203	3.6	340	6.0
1985	41	0.7	381	6.7
1986	175	3.1	556	9.8
1987	243	4.3	799	14.1
1988	226	4.0	1025	18.0
1989	252	4.4	1277	22.5
1990	194	3.4	1471	25.9
1991	149	2.6	1620	28.5
1992	261	4.6	1881	33.1
1993	151	2.7	2032	35.7
1994	131	2.3	2163	38.0
1995	117	2.1	2280	40.1
1996	109	1.9	2389	42.0
1997	138	2.4	2527	44.4
1998	135	2.4	2662	46.8
1999	120	2.1	2782	48.9
2000	176	3.1	2958	52.0
2001	222	3.9	3180	55.9
2002	239	4.2	3419	60.1
2003	185	3.3	3604	63.4
2004	200	3.5	3804	66.9
2005	212	3.7	4016	70.6
2006	206	3.6	4222	74.2
2007	222	3.9	4444	78.1
2008	208	3.7	4652	81.8
2009	256	4.5	4908	86.3
2010	252	4.4	5160	90.7
2011	275	4.8	5435	95.6
2012	253	4.5	5688	100.0
Month				
3	231	4.1	231	4.1
4	1669	29.3	1900	33.4
5	1076	18.9	2976	52.3
6	278	4.9	3254	57.2
7	434	7.6	3688	64.8
8	588	10.3	4276	75.2
9	665	11.7	4941	86.9
10	529	9.3	5470	96.2
11	218	3.8	5688	100.0
Vessel length class				
45	171	3.0	171	3.0
55	1013	17.8	1184	20.8
65	3630	63.8	4814	84.6
75	874	15.4	5688	100.0
Engine power class				
350	875	15.4	875	15.4
450	1241	21.8	2116	37.2
550	3093	54.4	5209	91.6
650	479	8.4	5688	100.0

Table 13. Results of the multiple regression between the logarithm of catch rates and the different categories (length and power of the vessels, month and year) for Esquiman fishing area.

	DF	Sum of squares	Mean square	F	Pr > F
Model	48.00	20083.85	418.41	1781.16	<.0001
Error	54503.00	12803.30	0.23		
Corrected total	54551.00	32887.15			

R^2 = 0.61 CV = 8.80 Root MSE = 0.48 Ln CPUE mean = 5.51

Source	df	Type III SS	Mean square	F	Pr > F
Month	7	872.7	124.67263	530.7	<.0001
Length	4	127.4	31.84612	135.6	<.0001
Power	7	474.7	67.81829	288.7	<.0001
Year	30	12847.2	428.24158	1823.0	<.0001

Parameter		Estimate	Standard error	t	Pr > |t|
Intercept		5.74	0.03	184.27	<.0001
Month	4	0.52	0.02	26.17	<.0001
Month	5	0.37	0.02	19.43	<.0001
Month	6	0.47	0.02	24.64	<.0001
Month	7	0.35	0.02	17.88	<.0001
Month	8	0.19	0.02	9.15	<.0001
Month	9	0.10	0.02	4.94	<.0001
Month	10	0.03	0.02	1.52	0.1277
Month	11	0.00	.	.	.
Length class	45	0.20	0.02	12.14	<.0001
Length class	55	0.19	0.01	14.92	<.0001
Length class	65	0.19	0.01	15.56	<.0001
Length class	75	0.02	0.01	1.21	0.2269
Length class	85	0.00	.	.	.
Power class	150	-0.44	0.02	-20.58	<.0001
Power class	250	-0.08	0.02	-4.03	<.0001
Power class	350	-0.12	0.02	-6.25	<.0001
Power class	450	-0.05	0.02	-2.74	0.0061
Power class	550	0.02	0.02	0.97	0.3302
Power class	650	0.03	0.02	1.34	0.1797
Power class	750	-0.01	0.02	-0.60	0.5454
Power class	850	0.00	.	.	.

Table 13 continued. Results of the multiple regression between the logarithm of catch rates and the different categories (length and power of the vessels, month and year) for Esquiman fishing area.

Parameter		Estimate	Standard error	t	Pr > |t|
Year	1982	-1.35	0.02	-73.80	<.0001
Year	1983	-1.87	0.02	-111.29	<.0001
Year	1984	-1.70	0.02	-76.95	<.0001
Year	1985	-1.65	0.04	-41.27	<.0001
Year	1986	-1.61	0.02	-84.81	<.0001
Year	1987	-1.56	0.02	-79.13	<.0001
Year	1988	-1.37	0.02	-72.60	<.0001
Year	1989	-1.05	0.02	-61.80	<.0001
Year	1990	-1.18	0.02	-77.83	<.0001
Year	1991	-1.23	0.01	-87.58	<.0001
Year	1992	-1.45	0.02	-94.42	<.0001
Year	1993	-1.27	0.01	-88.62	<.0001
Year	1994	-1.11	0.02	-69.80	<.0001
Year	1995	-1.15	0.01	-78.84	<.0001
Year	1996	-0.83	0.02	-52.71	<.0001
Year	1997	-0.69	0.02	-43.31	<.0001
Year	1998	-0.68	0.01	-46.24	<.0001
Year	1999	-0.76	0.01	-51.61	<.0001
Year	2000	-0.62	0.01	-42.37	<.0001
Year	2001	-0.61	0.02	-39.89	<.0001
Year	2002	-0.63	0.01	-43.94	<.0001
Year	2003	-0.42	0.02	-27.89	<.0001
Year	2004	-0.13	0.02	-8.63	<.0001
Year	2005	-0.02	0.02	-1.05	0.2922
Year	2006	0.02	0.02	1.47	0.1416
Year	2007	-0.33	0.01	-22.49	<.0001
Year	2008	-0.39	0.02	-25.18	<.0001
Year	2009	-0.23	0.01	-17.36	<.0001
Year	2010	-0.13	0.01	-10.15	<.0001
Year	2011	-0.05	0.01	-3.80	0.0001
Year	2012	0.00	.	.	.

Table 14. Results of the multiple regression between the logarithm of catch rates and the different categories (length and power of the vessels, month and year) for Anticosti fishing area.

	DF	Sum of squares	Mean square	F	Pr > F
Model	46.00	15871.81	345.04	1842.11	<.0001
Error	58324.00	10924.46	0.19		
Corrected total	58370.00	26796.26			

R^2 = 0.59 CV = 8.72 Root MSE = 0.43 Ln CPUE mean = 4.96

Source	df	Type III SS	Mean square	F	Pr > F
Month	5	623.54	124.71	665.79	<.0001
Length	4	43.82	10.95	58.49	<.0001
Power	7	383.71	54.82	292.65	<.0001
Year	30	8761.62	292.05	1559.23	<.0001

Parameter		Estimate	Standard error	t	Pr > |t|
Intercept		5.62	0.02	291.07	<.0001
Month	5	0.34	0.01	32.21	<.0001
Month	6	0.42	0.01	45.42	<.0001
Month	7	0.34	0.01	37.57	<.0001
Month	8	0.23	0.01	25.41	<.0001
Month	9	0.13	0.01	13.50	<.0001
Month	10	0.00	.	.	.
Length class	45	-0.20	0.01	-14.01	<.0001
Length class	55	-0.05	0.01	-6.51	<.0001
Length class	65	-0.03	0.01	-4.49	<.0001
Length class	75	-0.05	0.01	-7.74	<.0001
Length class	85	0.00	.	.	.
Power class	150	-0.63	0.02	-35.51	<.0001
Power class	250	-0.55	0.02	-31.97	<.0001
Power class	350	-0.42	0.01	-32.35	<.0001
Power class	450	-0.41	0.01	-30.84	<.0001
Power class	550	-0.34	0.01	-26.46	<.0001
Power class	650	-0.25	0.01	-19.05	<.0001
Power class	750	-0.20	0.02	-12.79	<.0001
Power class	850	0.00	.	.	.

Table 14 continued. Results of the multiple regression between the logarithm of catch rates and the different categories (length and power of the vessels, month and year) for Anticosti fishing area.

Parameter		Estimate	Standard error	t	Pr > |t|
Year	1982	-1.02	0.02	-62.99	<.0001
Year	1983	-1.05	0.02	-66.52	<.0001
Year	1984	-1.40	0.02	-83.97	<.0001
Year	1985	-1.10	0.01	-73.30	<.0001
Year	1986	-1.17	0.01	-81.72	<.0001
Year	1987	-1.10	0.01	-73.80	<.0001
Year	1988	-0.85	0.02	-53.03	<.0001
Year	1989	-0.58	0.02	-37.44	<.0001
Year	1990	-0.65	0.02	-42.50	<.0001
Year	1991	-0.76	0.01	-51.53	<.0001
Year	1992	-0.98	0.01	-67.43	<.0001
Year	1993	-0.98	0.01	-67.83	<.0001
Year	1994	-0.79	0.01	-54.03	<.0001
Year	1995	-0.61	0.02	-40.02	<.0001
Year	1996	-0.64	0.02	-42.76	<.0001
Year	1997	-0.54	0.02	-35.41	<.0001
Year	1998	-0.47	0.01	-31.94	<.0001
Year	1999	-0.57	0.01	-39.15	<.0001
Year	2000	-0.36	0.01	-24.49	<.0001
Year	2001	-0.44	0.02	-27.62	<.0001
Year	2002	-0.25	0.01	-17.09	<.0001
Year	2003	-0.05	0.02	-3.39	0.0007
Year	2004	-0.07	0.01	-4.54	<.0001
Year	2005	0.13	0.02	7.56	<.0001
Year	2006	0.17	0.02	10.23	<.0001
Year	2007	0.09	0.02	5.73	<.0001
Year	2008	0.17	0.02	10.49	<.0001
Year	2009	0.16	0.02	9.90	<.0001
Year	2010	0.05	0.02	3.40	0.0007
Year	2011	0.12	0.02	7.48	<.0001
Year	2012	0.00	.	.	.

Table 15. Results of the multiple regression between the logarithm of catch rates and the different categories (length and power of the vessels, month and year) for the Sept-Iles fishing area.

	DF	Sum of squares	Mean square	F	Pr > F
Model	47	32023.22	681.35	2034.05	<.0001
Error	86306	28909.97	0.33		
Corrected total	86353	60933.19			

R^2 = 0.52 CV =11.82 Root MSE = 0.58 Ln CPUE mean = 4.89

Source	df	Type III SS	Mean square	F	Pr > F
Month	7	1850.32	264.33	789.12	<.0001
Length	4	205.96	51.49	153.72	<.0001
Power	6	662.11	110.35	329.44	<.0001
Year	30	22838.71	761.29	2272.71	<.0001

Parameter		Estimate	Standard error	t	Pr > |t|
Intercept		5.25	0.02	218.13	<.0001
Month	0.64	0.02	40.5	<.0001	<.0001
Month	0.33	0.02	21.15	<.0001	<.0001
Month	0.32	0.02	19.91	<.0001	<.0001
Month	0.40	0.02	24.4	<.0001	<.0001
Month	0.34	0.02	21.18	<.0001	<.0001
Month	0.29	0.02	17.86	<.0001	<.0001
Month	0.10	0.02	6.06	<.0001	<.0001
Month	0.00	.	.	.	.
Length class	-0.29	0.02	-19.02	<.0001	<.0001
Length class	-0.11	0.01	-11.46	<.0001	<.0001
Length class	-0.05	0.01	-6.17	<.0001	<.0001
Length class	-0.14	0.01	-15.02	<.0001	<.0001
Length class	0.00	.	.	.	.

Table 15 continued. Results of the multiple regression between the logarithm of catch rates and the different categories (length and power of the vessels, month and year) for Sept-Iles fishing area.

Parameter		Estimate	Standard error	t	Pr > |t|
Power class	150	-0.53	0.02	-26.64	<.0001
Power class	250	-0.19	0.02	-10.67	<.0001
Power class	350	-0.14	0.01	-10.7	<.0001
Power class	450	-0.12	0.01	-8.99	<.0001
Power class	550	0.01	0.01	0.67	0.503
Power class	650	0.10	0.01	7.3	<.0001
Power class	750	0.00	.	.	.
Year	1982	-1.17	0.02	-63.16	<.0001
Year	1983	-0.97	0.02	-48.55	<.0001
Year	1984	-1.18	0.02	-74.59	<.0001
Year	1985	-1.19	0.02	-74.42	<.0001
Year	1986	-1.10	0.02	-67.32	<.0001
Year	1987	-1.07	0.02	-67.92	<.0001
Year	1988	-1.18	0.02	-77.49	<.0001
Year	1989	-1.09	0.02	-69.83	<.0001
Year	1990	-0.71	0.02	-43.6	<.0001
Year	1991	-0.87	0.02	-55.73	<.0001
Year	1992	-1.27	0.02	-83.58	<.0001
Year	1993	-1.31	0.02	-86.55	<.0001
Year	1994	-1.17	0.02	-76.28	<.0001
Year	1995	-0.72	0.02	-42.25	<.0001
Year	1996	-0.58	0.02	-33.42	<.0001
Year	1997	-0.47	0.02	-27.27	<.0001
Year	1998	-0.33	0.02	-19.79	<.0001
Year	1999	-0.39	0.02	-23.23	<.0001
Year	2000	-0.34	0.02	-20.85	<.0001
Year	2001	-0.46	0.02	-29.11	<.0001
Year	2002	-0.30	0.02	-18.6	<.0001
Year	2003	0.08	0.02	4.88	<.0001
Year	2004	0.12	0.02	7.43	<.0001
Year	2005	0.15	0.02	9.06	<.0001
Year	2006	0.23	0.02	13.87	<.0001
Year	2007	0.37	0.02	21.1	<.0001
Year	2008	0.30	0.02	17.81	<.0001
Year	2009	0.20	0.02	12.52	<.0001
Year	2010	0.09	0.02	5.3	<.0001
Year	2011	0.03	0.02	1.56	0.1194
Year	2012	0.00	.	.	.

Table 16. Results of the multiple regression between the logarithm of catch rates and the different categories (length and power of the vessels, month and year) for the Estuary fishing area.

	DF	Sum of squares	Mean square	F	Pr > F
Model	44	3168.79	72.02	170.79	<.0001
Error	5643	2379.58	0.42		
Corrected total	5687	5548.36			

R^2 = 0.57 CV =12.66 Root MSE = 0.65 Ln CPUE mean = 5.13

Source	df	Type III SS	Mean square	F	Pr > F
Month	8	304.11	38.01	90.15	<.0001
Length	3	3.30	1.10	2.61	0.05
Power	3	27.80	9.27	21.98	<.0001
Year	30	2127.85	70.93	168.2	<.0001

Parameter		Estimate	Standard error	t	Pr > |t|
Intercept		5.52	0.07	78.28	<.0001
Month	3	0.16	0.07	2.23	0.03
Month	4	0.64	0.05	13.26	<.0001
Month	5	0.22	0.05	4.40	<.0001
Month	6	0.21	0.06	3.38	0.00
Month	7	0.12	0.06	2.08	0.04
Month	8	0.14	0.05	2.64	0.01
Month	9	0.07	0.05	1.40	0.16
Month	10	-0.09	0.05	-1.66	0.10
Month	11	0.00	.	.	.
Length class	45	-0.12	0.06	-1.99	0.05
Length class	55	-0.08	0.04	-2.31	0.02
Length class	65	-0.06	0.03	-2.27	0.02
Length class	75	0.00	.	.	.
Power class	350	-0.30	0.04	-7.54	<.0001
Power class	450	-0.29	0.04	-7.22	<.0001
Power class	550	-0.20	0.03	-5.92	<.0001
Power class	650	0.00	.	.	.

Table 16 continued. Results of the multiple regression between the logarithm of catch rates and the different categories (length and power of the vessels, month and year) for the Estuary fishing area.

Parameter		Estimate	Standard error	t	Pr > |t|
Year	1982	-1.37	0.08460974	-16.18	<.0001
Year	1983	-1.65	0.10085034	-16.35	<.0001
Year	1984	-1.42	0.06291356	-22.55	<.0001
Year	1985	-1.38	0.11084993	-12.42	<.0001
Year	1986	-1.57	0.06483143	-24.27	<.0001
Year	1987	-1.43	0.06156807	-23.21	<.0001
Year	1988	-1.17	0.06137633	-19.12	<.0001
Year	1989	-1.19	0.0624009	-19.12	<.0001
Year	1990	-0.75	0.06975341	-10.69	<.0001
Year	1991	-0.72	0.06819142	-10.55	<.0001
Year	1992	-1.34	0.05809759	-23.14	<.0001
Year	1993	-0.68	0.0678799	-10.04	<.0001
Year	1994	-0.87	0.07171342	-12.17	<.0001
Year	1995	-0.39	0.07397883	-5.28	<.0001
Year	1996	-0.26	0.07584568	-3.38	0.0007
Year	1997	-0.19	0.07053032	-2.76	0.0059
Year	1998	0.25	0.0699455	3.63	0.0003
Year	1999	0.24	0.07322508	3.25	0.0011
Year	2000	0.17	0.06509918	2.58	0.01
Year	2001	-0.05	0.06081233	-0.8	0.4249
Year	2002	-0.29	0.0595997	-4.83	<.0001
Year	2003	0.36	0.06382755	5.71	<.0001
Year	2004	0.42	0.06282288	6.74	<.0001
Year	2005	0.37	0.06166912	6.01	<.0001
Year	2006	0.52	0.06232671	8.33	<.0001
Year	2007	0.43	0.06065197	7.14	<.0001
Year	2008	0.39	0.06132538	6.38	<.0001
Year	2009	0.12	0.05865468	2.03	0.0424
Year	2010	-0.12	0.05894314	-2.08	0.0374
Year	2011	-0.21	0.05751789	-3.71	0.0002
Year	2012	0.00	.	.	.

Table 17. Standardised catch per unit of effort and its standard error, landing and standardised effort, by year and by fishing area.

SFA	Year	CPUE std	SE	Landing (t)	Effort std
8	1982	180.70	3.00	2111	11682
8	1983	107.17	1.59	2242	20920
8	1984	127.09	2.63	1578	12417
8	1985	132.99	5.20	1421	10685
8	1986	139.19	2.41	1592	11438
8	1987	145.75	2.64	2685	18422
8	1988	176.63	3.03	4335	24543
8	1989	243.93	3.66	4614	18916
8	1990	212.34	2.79	3303	15555
8	1991	202.12	2.38	4773	23614
8	1992	162.06	2.10	3149	19431
8	1993	195.75	2.36	4683	23924
8	1994	229.44	3.13	4689	20437
8	1995	219.23	2.74	4800	21895
8	1996	304.15	4.08	5123	16844
8	1997	346.64	4.79	5957	17185
8	1998	350.00	4.44	6554	18725
8	1999	325.03	4.08	6732	20712
8	2000	371.52	4.70	7396	19907
8	2001	378.08	4.93	7815	20670
8	2002	369.76	4.42	8250	22312
8	2003	453.88	5.88	6773	14922
8	2004	609.66	7.67	8593	14095
8	2005	682.70	9.23	8867	12988
8	2006	710.33	9.85	8957	12610
8	2007	500.45	6.33	9208	18399
8	2008	471.89	6.34	9110	19305
8	2009	552.81	6.01	9473	17136
8	2010	606.83	6.44	9541	15723
8	2011	660.28	7.27	9177	13899
8	2012	694.07	7.92	10271	14798

Table 17 continued. Standardised catch per unit of effort and its standard error, landing and standardised effort, by year and by fishing area.

SFA	Year	CPUE std	SE	Landing (t)	Effort std
9	1982	113.41	1.43	2464	21726
9	1983	110.24	1.32	2925	26532
9	1984	77.79	1.03	1336	17175
9	1985	105.36	1.14	2786	26443
9	1986	97.91	0.97	3340	34112
9	1987	105.58	1.13	3422	32410
9	1988	134.66	1.66	2844	21119
9	1989	176.93	2.01	4253	24038
9	1990	165.78	1.86	4723	28490
9	1991	147.84	1.56	4590	31047
9	1992	118.89	1.19	4162	35008
9	1993	119.07	1.17	4791	40237
9	1994	142.83	1.50	4854	33986
9	1995	171.71	1.93	4962	28897
9	1996	166.39	1.81	5469	32869
9	1997	183.86	2.06	6058	32949
9	1998	196.88	2.08	6932	35208
9	1999	178.61	1.85	7022	39315
9	2000	220.04	2.34	7941	36088
9	2001	203.56	2.52	5399	26523
9	2002	245.39	2.64	8638	35201
9	2003	299.70	3.56	8742	29169
9	2004	295.42	3.23	10429	35303
9	2005	358.56	4.74	8047	22443
9	2006	373.78	4.84	8754	23420
9	2007	345.58	4.12	10180	29458
9	2008	374.09	4.70	9635	25756
9	2009	370.19	4.55	9644	26052
9	2010	333.09	3.84	10099	30319
9	2011	355.62	4.26	9831	27645
9	2012	316.08	3.87	8273	26174

Table 17 continued. Standardised catch per unit of effort and its standard error, landing and standardised effort, by year and by fishing area.

SFA	Year	CPUE std	SE	Landing (t)	Effort std
10	1982	92.41	1.42	3774	40841
10	1983	112.03	1.92	3647	32553
10	1984	90.84	1.09	4383	48250
10	1985	90.73	1.09	4399	48483
10	1986	98.52	1.24	4216	42792
10	1987	101.78	1.19	5411	53164
10	1988	90.79	1.01	6047	66602
10	1989	99.74	1.16	6254	62701
10	1990	145.80	1.79	6839	46907
10	1991	124.33	1.45	6411	51563
10	1992	83.07	0.93	4957	59670
10	1993	80.29	0.90	5485	68312
10	1994	92.50	1.04	6165	66647
10	1995	144.50	1.94	6386	44194
10	1996	165.68	2.34	7014	42335
10	1997	185.54	2.55	7737	41700
10	1998	212.54	2.88	8981	42256
10	1999	201.99	2.60	9239	45739
10	2000	211.03	2.69	10160	48145
10	2001	187.50	2.28	10965	58480
10	2002	220.49	2.64	11493	52125
10	2003	323.17	4.56	11357	35143
10	2004	334.77	4.22	15932	47591
10	2005	346.45	4.77	12793	36926
10	2006	372.13	4.70	15312	41146
10	2007	428.30	5.90	15645	36528
10	2008	399.77	5.25	15972	39953
10	2009	364.37	4.71	15873	43563
10	2010	323.40	4.12	15756	48720
10	2011	304.42	3.86	14376	47224
10	2012	296.89	4.02	12482	42044

Table 17 continued. Standardised catch per unit of effort and its standard error, landing and standardised effort, by year and by fishing area.

SFA	Year	CPUE std	SE	Landing (t)	Effort std
12	1982	73.64	6.27	152	2064
12	1983	55.58	5.47	158	2843
12	1984	70.17	4.33	248	3534
12	1985	72.89	8.17	164	2250
12	1986	60.09	3.97	262	4360
12	1987	69.46	4.17	523	7530
12	1988	89.69	5.07	551	6143
12	1989	87.95	5.34	629	7152
12	1990	137.52	9.60	507	3687
12	1991	141.18	9.55	505	3577
12	1992	75.61	4.32	489	6467
12	1993	146.67	10.05	496	3382
12	1994	121.05	8.53	502	4147
12	1995	196.06	14.13	486	2479
12	1996	224.18	16.71	505	2253
12	1997	238.62	16.62	549	2301
12	1998	373.69	25.74	634	1697
12	1999	367.70	26.85	646	1757
12	2000	342.89	22.21	739	2155
12	2001	276.25	17.08	832	3012
12	2002	217.51	13.12	799	3673
12	2003	417.55	26.36	796	1906
12	2004	443.00	27.17	1033	2332
12	2005	420.03	25.28	1001	2383
12	2006	487.39	28.48	1029	2111
12	2007	447.12	26.76	1022	2286
12	2008	428.88	26.42	1017	2371
12	2009	326.70	19.40	993	3039
12	2010	256.54	15.33	906	3532
12	2011	234.30	13.88	880	3756
12	2012	290.04	17.10	956	3295

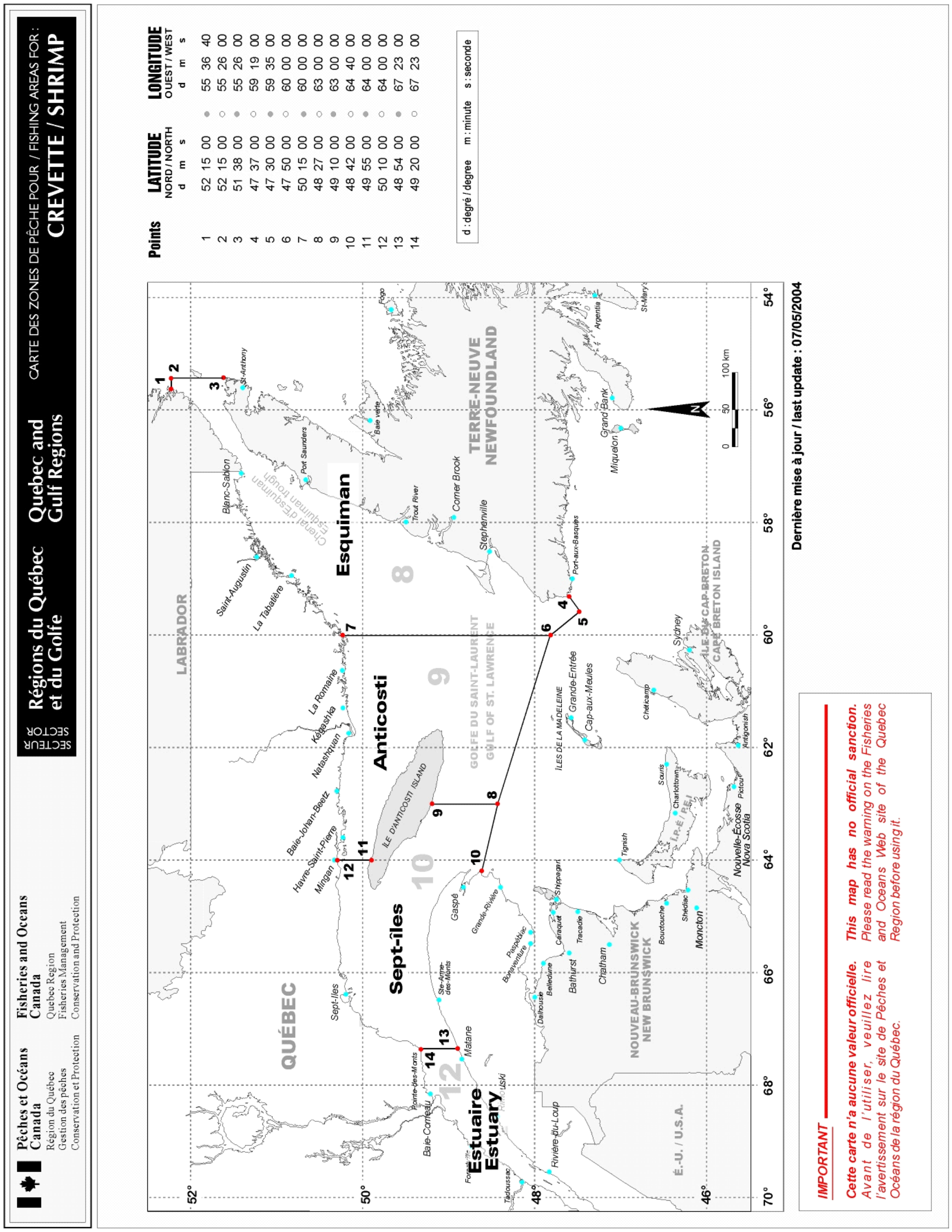

Figure 1. Shrimp fishing areas (SFA) in the Northern Gulf of St. Lawrence: Estuary, SFA 12; Sept-Iles, SFA 10; Anticosti, SFA 9; Esquiman, SFA 8.

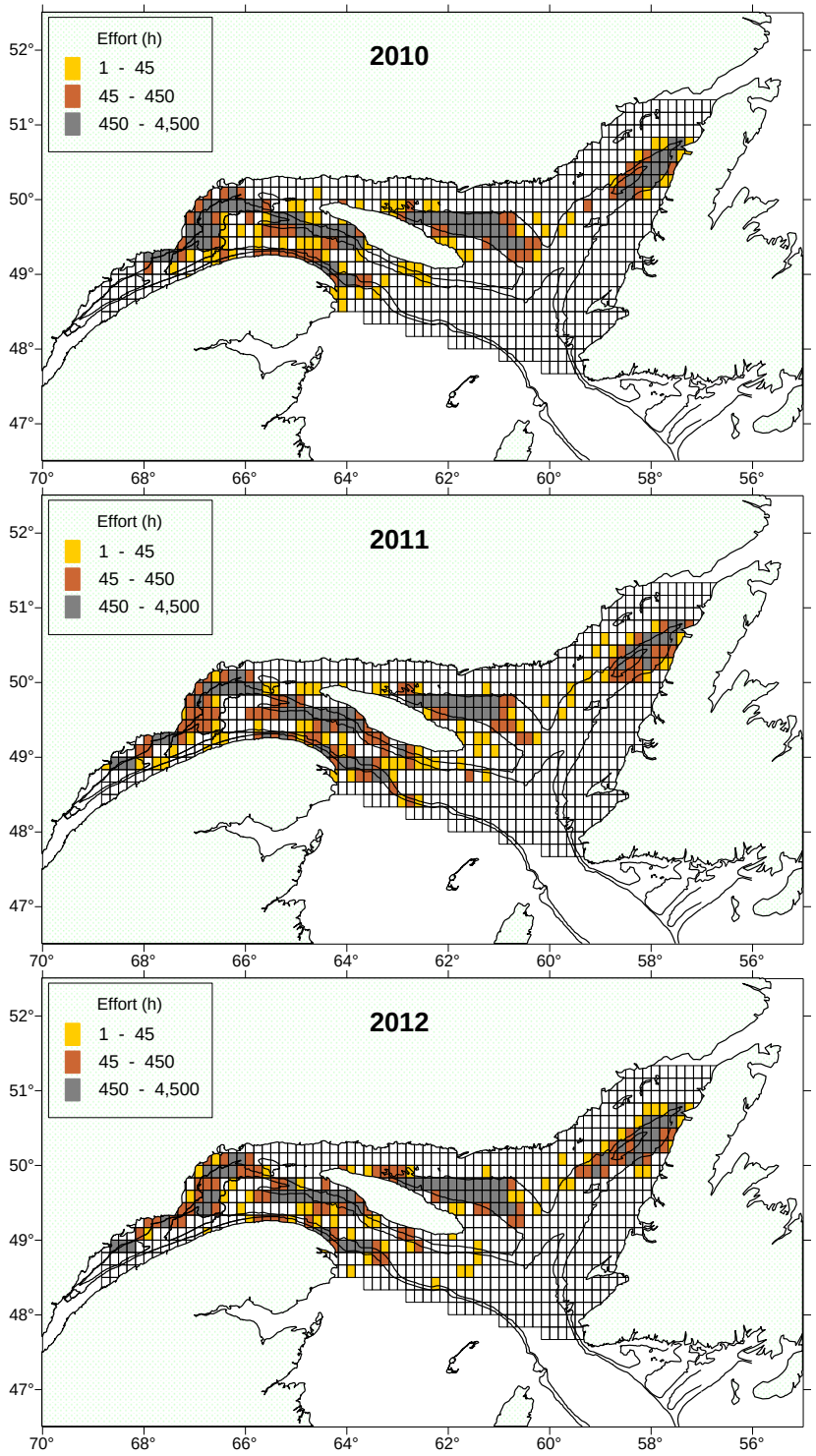

Figure 2. Spatial distribution of the nominal fishing effort in 2010, 2011 and 2012.

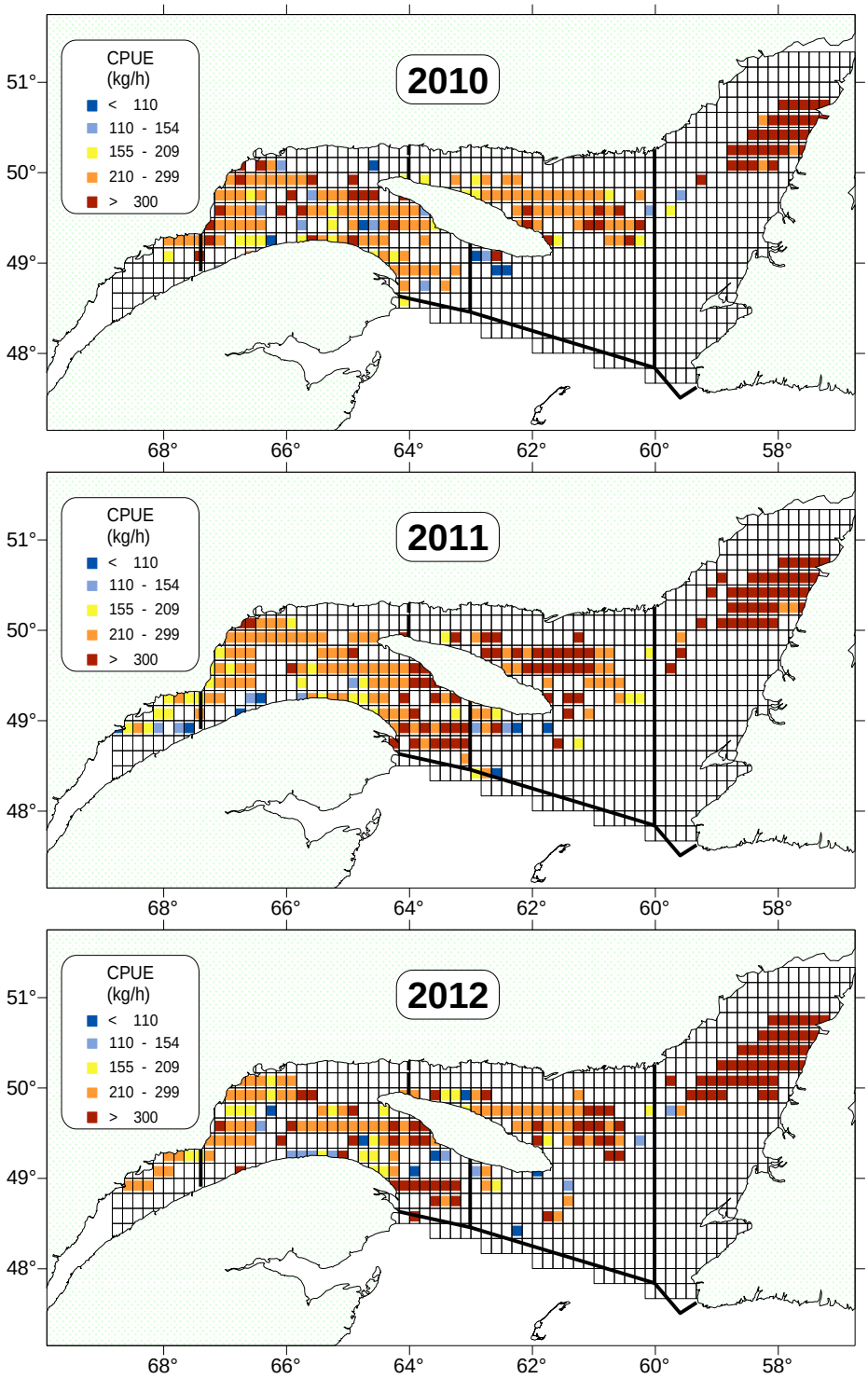

Figure 3. Spatial distribution of commercial fishery catch rates in 2010, 2011 and 2012.

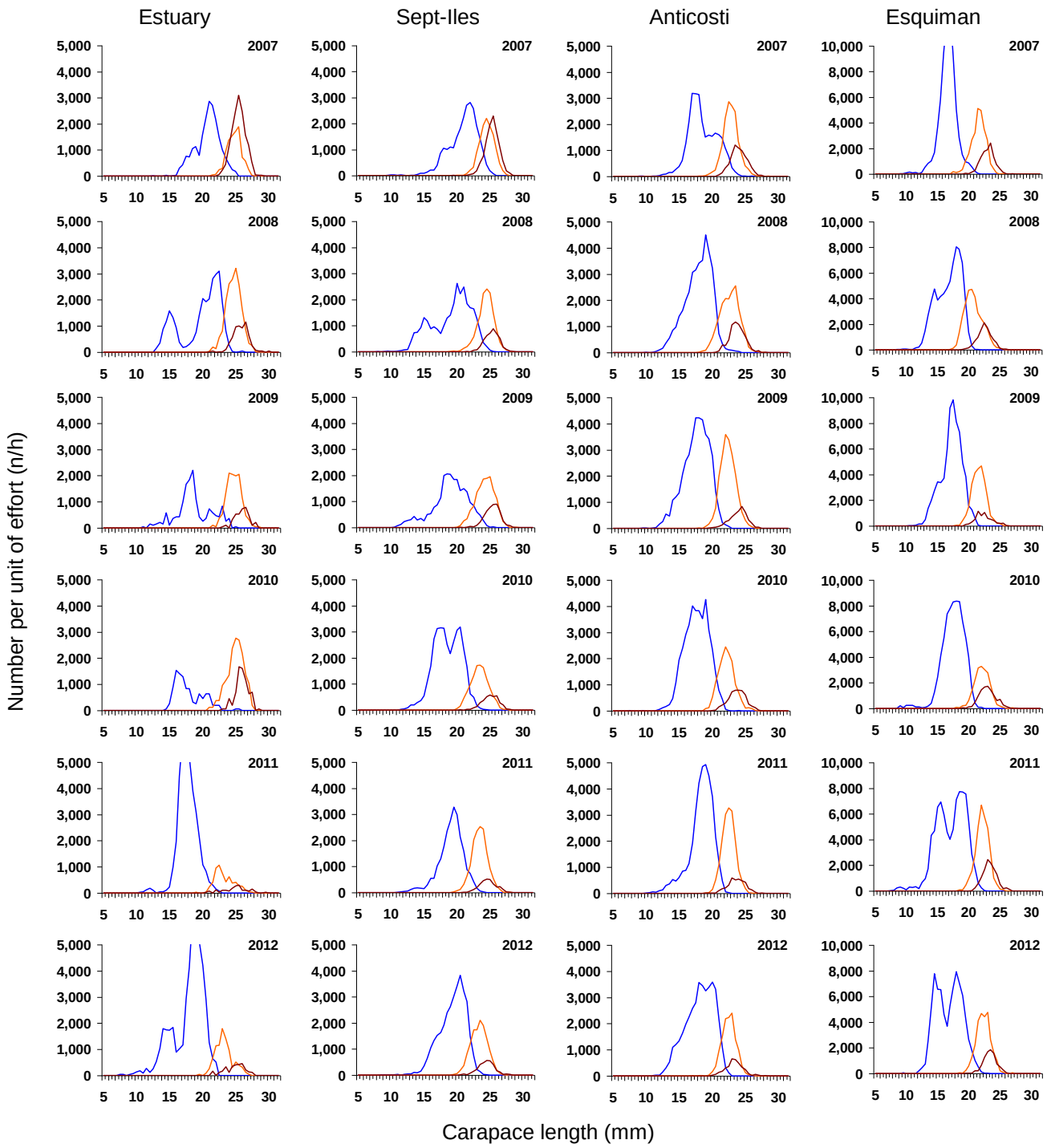

Figure 4. Number per unit of effort by carapace length class by fishing area for the summer season. Males in blue, primiparous females in orange and mutiparous females in brown.

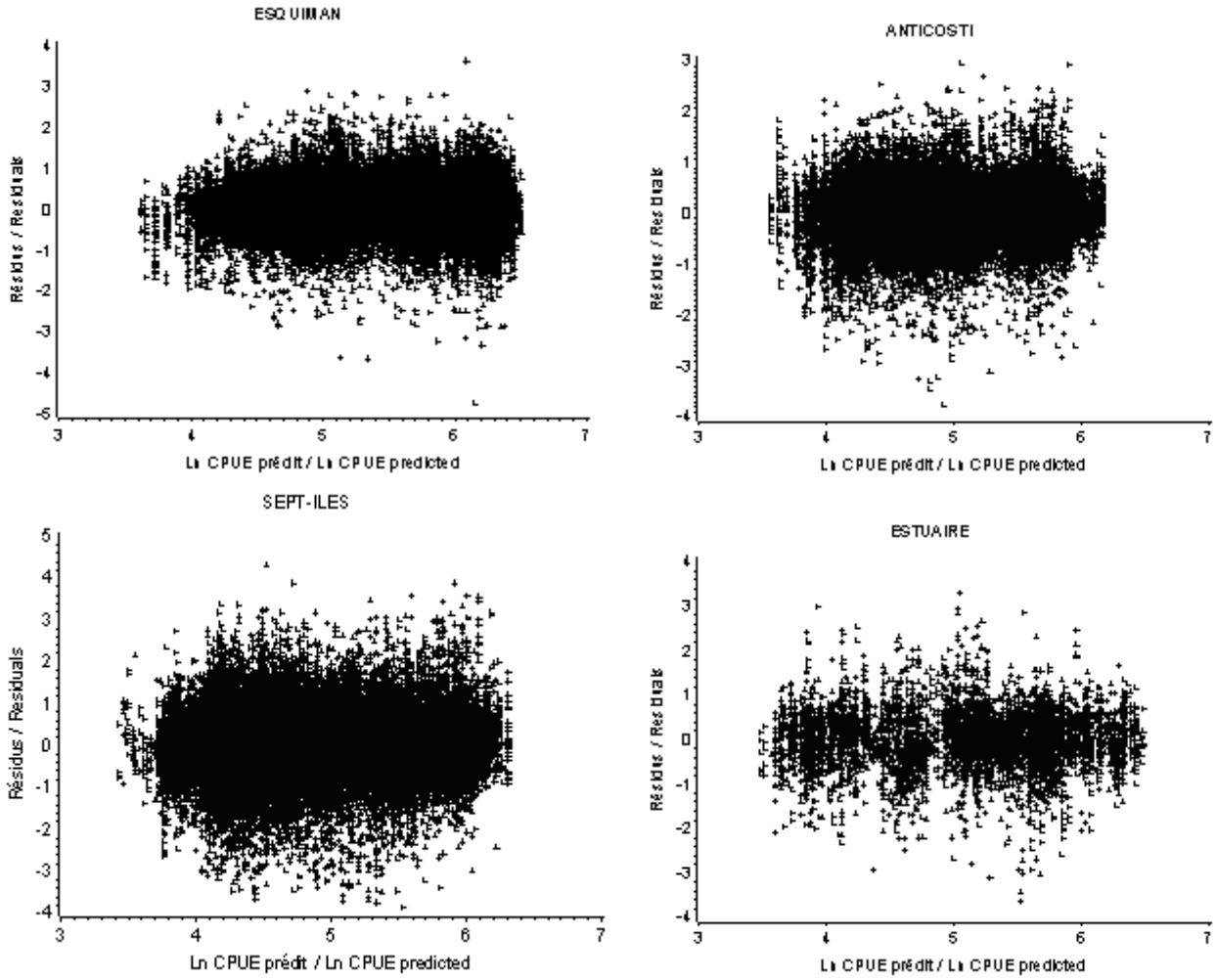

Figure 5. Distribution of residuals of the multiple regression in function of the logarithm of the predicted catch rates by fishing area.

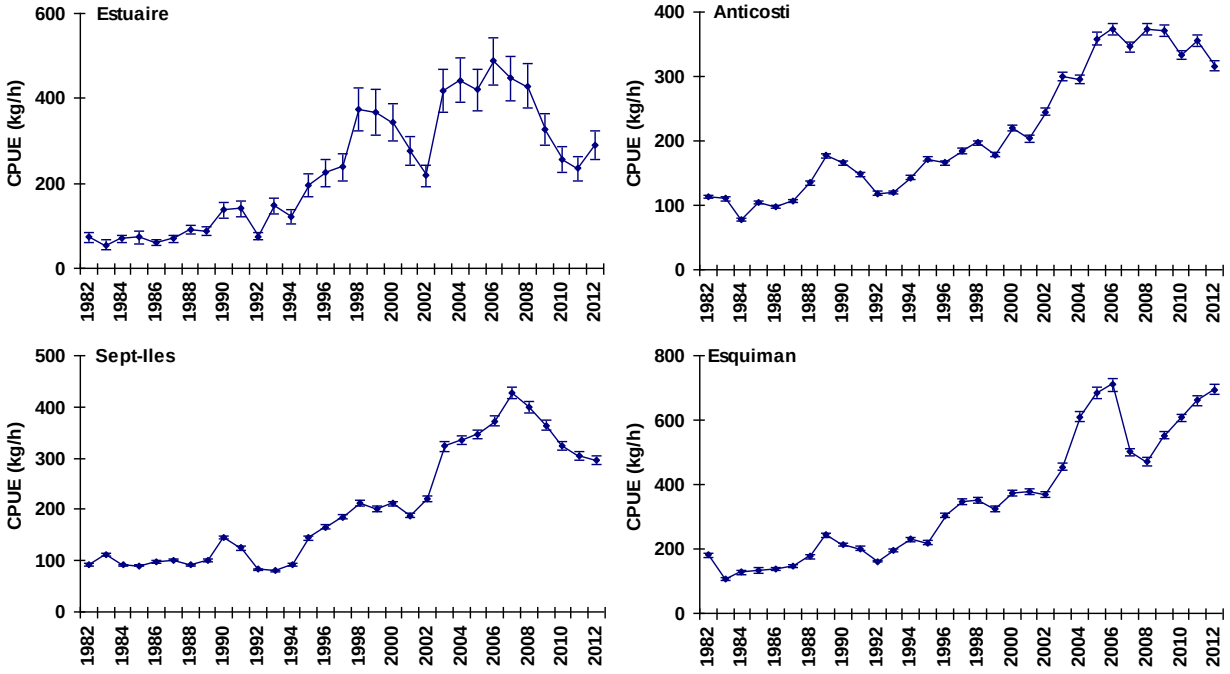

Figure 6. Standardised catch per unit of effort ± confidence interval (95%) by fishing area and by year.