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Sentinel Surveys 1995-2006: Catch per Unit Effort in NAFO Division 2J3KL

Relevés sentinelles 1995-2006 – Prises par unité d'effort dans la division 2J3KL de l'OPANO

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ABSTRACT

Data from the Sentinel program in NAFO Div. 2J3KL are summarized and updated for 2006. They are presented as weekly average catch rates and annual length frequencies scaled to effort and grouped by NAFO Div. In 2006, gillnet catch rates (5½") were similar to 2005 values in 2J and 3L but up slightly in 3K. Small mesh gillnet catch rates increased from 2005 in both 2J and 3K while 3L values were close to the series low. Linetrawl in both 3K and 3L had lower catch rates than in 2005.

RÉSUMÉ

Les données recueillies dans le cadre du programme sentinelle dans la division 2J3KL de l'OPANO sont résumées et mises à jour pour 2006. Elles sont présentées sous forme de taux de prises moyens hebdomadaires et de fréquences de longueurs annuelles, proportionnés à l'effort et groupés selon les divisions de l'OPANO. En 2006, les taux de prises au filet maillant (5 ½ po) étaient similaires à ceux calculés en 2005 dans 2J et 3L, mais légèrement supérieurs dans 3K. Les taux de prises aux filets maillants à petites mailles ont augmenté depuis 2005 dans 2J et dans 3K, tandis que les valeurs enregistrées pour 3L s'approchaient du niveau le plus bas de la série. Les taux de prises à la palangre dans 3K et dans 3L étaient inférieurs à ceux de 2005.

INTRODUCTION

Sentinel survey projects were formally announced by the Minister of Fisheries and Oceans in October 1994. The surveys in the DFO Newfoundland and Labrador Region are an extension of the index fishermen's project from the Northern Cod Science Project Program with modifications to allow for science activities achievable only under a fishing moratorium. Sentinel data collection continued during the commercial/index fisheries that occurred from 1998 to 2002.

The sentinel survey has the following objectives:

1. To develop a catch rate series for use in resource assessments.
2. To incorporate the knowledge of inshore fishers in the resource assessment process.
3. To describe the temporal-spatial distribution of cod in the inshore area over a number of years through, for example, the use of catch rate information, tagging studies, by-catch information and fishers' observations.
4. To gather length frequencies, sex and maturity data and sample ages for use in resource assessment.
5. To establish a long-term physical oceanographic and environmental monitoring program of the inshore areas.
6. To provide a source of biological material for other researchers. For example, tissue for genetic, physiological and toxicological analyses, cod stomachs for food and feeding studies and by-catch information.

PARTICIPANTS

The primary collectors of data in the sentinel survey are inshore fishers. Through consultation with inshore fishers and fisheries organizations, traditional inshore fishing grounds have been identified and mapped.

Fishers from communities within the boundaries of the identified coastal areas and who met eligibility criteria were invited to apply to participate in the survey. Where more than one application was received from an area, the project partner conducted a draw or lottery to select the participant. While there was considerable interest in the project in most areas, there were many sites from which only one application was received and others where additional canvassing was required to enlist participants. Selected participants were required to complete a six-week course designed by the Marine Institute of Memorial University in consultation with DFO. Topics covered included scientific sampling methods and equipment, computer use, resource assessment basics and presentation skills.

In order to minimize inter annual enterprise effects on data collection, participants are expected to remain with the survey over a number of years. It is also expected that most of the sampling activities will continue once commercial fishing operations resume and the sentinel participants will form a core of index fishers.

SITES

In 2006, 44 enterprises participated in sentinel activities in NAFO Div. 2J3KL (down from 57 or 58 prior to 2004). The specific location of each site was chosen after consultation between DFO scientists, fishermen, the Fish, Food and Allied Workers Union (FFAW) and

the Fogo Island and Petty Harbour Cooperatives (for Fogo Island and Petty Harbour). Site selection was based on the need to survey throughout inshore areas and targeted historical fishing areas and historical gear use patterns.

SAMPLING STRATEGY

Table 1 gives the homeport of the participants in the sentinel surveys; showing the number of sets completed in each year, the number of weeks allocated for sentinel activity, and the number of enterprises participating in the survey. The timing of sampling was determined after discussions with fishers but was targeted for seasonally appropriate times based on historical fishing patterns.

Gillnets and linetrawl are used to survey inshore areas in 2J3KL. Cod traps were used from 1998 to 2002 to varying degrees to sample fish, but are no longer used in the Sentinel Survey. Hand lines were used mostly in conjunction with nets or trawls as a means of determining presence of cod for tagging purposes or when nets were not catching fish. Petty Harbour used hand lines exclusively in the sentinel survey, and information from this survey was used mainly for biological sampling as catch rate information from hand lining is difficult to interpret.

Hook and line crews fished two tubs of baited linetrawl. Each tub consisted of approximately 500 hooks for a total of 1000 hooks per fishing day. Gillnet crews fished a maximum of 56 fathom 5½" monofilament gillnets. Nets were rigged 2-3 to a fleet and up to three fleets were fished per fishing day. In addition, selected sites fished one 3¼" monofilament gillnet at least one day per week. All fish caught in gillnets and on hooks were landed and measured. If catches exceeded 500 kg per week, the numbers of nets in a fleet were cut back. However, some consideration was given to bottom topography and net performance when reducing the number of nets in a fleet. Similarly, the number of hooks per tub was reduced if landings exceeded 500 kg per week. Other measures were considered if fish are particularly abundant in an area and catches appear to be excessive even with the minimal amounts of gear possible.

Prior to the start of sampling in 1995, a fixed (control) location on the fishing grounds was established for each site and will remain fixed for the duration of the project. Each fishing day, up to half of the gear was set at the control site. The remainder of the gear (experimental) was set at one or two other locations on the fishing grounds at the discretion of the crew. The location of each fishing set was plotted on a nautical chart. The time of the set and the soak time for the gear were recorded. Other environmental observations were recorded, including wind direction and speed, percent cloud cover, tide conditions, presence of invertebrates (bait) and other fish species in the area, marine mammals, sea birds and any other variables which might have influenced fishing behavior. Selected sites were equipped with a CTD (measuring temperature and salinity at depth). At these locations, casts were conducted in the vicinity of fishing sets each fishing day. CTD locations were fished for subsequent years if possible.

When the gear was retrieved, catches from the control and experimental gear were kept separate and sampled on shore. All fish from gillnet, hand line and linetrawl, and a sample of the catch from traps, were measured for length and sex. Otoliths were sampled on a length-stratified basis and stored in manila envelopes with relevant information recorded on the outside. Every other week, selected sites collected a sample of up to 100 frozen fish. These were transported to St. John's for detailed biological sampling. All information

was recorded on forms similar to those used by the Port Sampling Section and on DFO research vessels. Other biological samples were collected as needed.

DATA PRESENTATION

The data were summarized for each NAFO division and are here presented by gear type. The length frequency plot depicts the number of fish at length scaled by total amount of gear fished. Lengths, in 1cm intervals, are from both control and experimental gear, and for gillnet and linetrawl represent every fish measured, as the total catch is measured. Data are shown as an average of the relative length frequencies for each fisher in the division. The second figure on each summary page gives catch details broken down by year, including number of fish measured (Nmeas), total number of sets (Nhauls) and number of sets in which no fish were caught (Nzero). The catch per unit effort (CPUE) figures (bottom figure on each summary page) give average weekly catch rates, in number of fish per net or 1000 hooks, and are constructed by calculating a daily catch rate for each set and averaging all the CPUEs for all sets (control and experimental) in a given week.

RESULTS

Fourty-four inshore fishing enterprises representing communities from Black Tickle to St. Mary's Bay participated in the 2J3KL sentinel survey for 2006 (43 in 2005). Survey activity covered mostly summer and fall periods in all years, traditional fishing times for the areas involved.

Figure 1-3 shows the catches (in scaled symbols) from every set in 2006 of 5½" gillnet, 3¼'" gillnet and linetrawl. Control sites were generally consistent from year to year but shifts in location may have resulted due to weather or tide conditions or competition for sites by commercial activity.

Figure 4 shows overall average CPUE by division from 1995 to 2006 for the three main gear types used in sentinel activity. 3L had the highest catch rates in gillnet over the time series. Gillnet (5½") catch rates in all divisions declined from 1998 to 2002 and then increased from 2002 to 2005. When compared to division 3L, linetrawl catches were generally higher in 3K until 1998, and once again from 2003-2006. The 2005 value in 3K was the second highest observed. Catch rates in 2J were very low compared to 3K and 3L in all gears in all years. In 2005 and 2006, however, catch rates in 5½" gillnets were much higher than previous years.

Figure 5-7 give mean CPUE by community for gillnet and linetrawl organized from north to south. Catch rates in 5½" gillnet were very low in northern areas and were highest around the Bonavista area in most years (Fig. 5). In 2006, catch rates were similar to or higher than those of 2005 in many areas. Small mesh gillnet (Fig. 6) showed more variability in CPUE from year to year and between locations, with high catch rates in 2J and 3K in some years. Catch rates were most consistent from Wesleyville to Petley. Linetrawl was not as widely used in 2J3KL and catch rates were variable (Fig. 7).

Table 2-6 show the change in mean catch rate for each location between subsequent years. Changes greater than 10% are highlighted. In 2006, 67% of participants had 5½" gillnet control sites that were similar to or 10% higher than in 2005 (63% for experimental sets). For small mesh gillnet 54% of participants had similar or increased catch rates to

2005. Linetrawl, however, showed lower catch rates (10% or higher reduction) in 7/10 of locations when looking at control sites and half of the locations when considering experimental sets. These comparisons could only be made when there were two consequitive years of data in the same gear type.

Length frequencies, scaled by amount of gear used, are summarized in Fig. 8. The same data are given in the length frequency plots on the summary sheets that follow (Fig. 9-65). The 5½" gillnet frequencies (Fig. 8, top plot) show the narrowest range of selectivity (50-80 cm). Catch rates in this gear declined from 1998 to 2002 and then increased from 2003 to 2005. In 2006 frequencies were slightly lower than the 2005 values, particularly in 3L. Division 3L has higher catches than the other divisions.

The small mesh gillnet frequency has two modes (Fig. 8, middle plot), reflecting two size ranges of fish caught in the gear. Catches of smaller fish, caught by meshing in the net, declined in 3K from 1996 to 1999 and have remained at this level since then with the exception of 2003 and 2005 which showed higher catches of small fish. In 3L, catches of these smaller fish have remained relatively constant over the series with the exceptions of 1999, which had lower catches, and higher catches were observed in 2003 and 2005. In 2006, however, this small mode has declined substantially in the 3L length frequency. In 2J, this smaller mode decreased from 1997 to 1999, and has been variable since then, although in 2006, this mode is higher than either 3L or 3K. The larger modes in the small mesh frequencies are due to larger fish that entangle in the net. The catches of these larger fish in 3¼'" gear have declined noticeably from 1998 to 2001 in all divisions, but have increased, although variably to 2006.

Linetrawl frequencies (Fig. 8, bottom plot) show a wider distribution of fish sizes. In 3K, linetrawl catch rates declined from 1997 through 2000 and then increased in 2003 and have remained high since then. Linetrawl catches in 2J were low in all years and no sampling was done with this gear since 2001. Division 3L linetrawl frequencies show a narrower range of fish in 2006 than in 2005.

Figures summarizing the data by gear for the entire stock area and also broken out by division follow on pages 18-29. The bottom figure on each page shows the weekly average catch rate. The decline in catch rate from 1998 to 2002 is most evident in 5½" gillnet plot (Fig. 9-11). Catch rates in small mesh gillnet (Fig. 21-23) were lower in the first part of the year from 2001 to 2004, and good catch rates in the latter part of the year (sites surveyed in the fourth quarter in 3K and 3L) brought the average up. The last two years showed lower catch rates in the fourth quarter. Linetrawl catch rates in 3K (Fig. 39-41) have increased from 2000 to 2001 to 2005, and in 3L have been variable, but increasing from 2003 (Fig. 42-44). In 2006 linetrawl catch rates have declined in 3L and in 3K are similar to 2005, but have a narrower range of sizes represented.

Figure 45-68 show the data grouped for comparison to model formulations presented for this assessment. Information is grouped for three areas by gear type; the northern inshore area (NAFO Subdiv. 2Jm, 3Ka and 3Kd); the central inshore area (Subdiv. 3Kh, 3Ki, 3La and 3Lb); and the southern inshore area (Subdiv. 3Lf, 3Lj and 3Lq).

Table 1. Number of Sentinel sets (all gears) by community since 1995 and the weeks allocated for each year.

Comm	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Black Tickle		48	63	54	64	42	80	72	72	80	80	69
Williams Hr	54	48	58	50	39	49	60	45		49		
Tub Hr	22	25	28	24	39	80	80	80				
Triangle	24	25	29	29	62	70	80	76	78	80	80	80
Penny's Hr	46	50	51	62	64	81	81	56	80	80	71	80
Spear Hr	48	73	81	93	64	80	80	88	80	80	80	80
St. Lewis		72	83	48	60	80	80	79	80	80	80	80
Mary's Hr						76	80	80	80	79	80	72
Cape Charles	28	36	38	32	63							
Quirpon							76					
St. Lunaire	38	52	48	55	64	60	71	76	72	77	70	69
Great Brehat	56	73	68	76	30							
Goose Cove	60	56	68	72	54	60	60	68	80	80	80	74
Conche	40	48	48	48	60	60	60	60	61	60	60	60
Englee	40	46	48	57	55	67	70	70	70	70	70	57
Hr Deep	36	45	45	49	54	59	65	68	70	70	58	59
Jackson's Arm	50	59	57	84	53							
Sopp's Arm						50	60	70	70	67	69	70
Westport						58	69	70				
Coachman's Cove	46	58	51	52	63	70	70	70	70	70	75	63
Ming's Bight	56	46	46	47	44	57	54	60	49	52	52	54
La Scie	36	48	50	49	38	70	67	65	58	61	61	61
Shoe Cove	60	54	51	53	52	60	62	60	54	54	54	54
Smith's Hr	60	64	62	72	48	58	60	60	60	54	60	60
Jackson's Cove	56	48	48	48	32	42	38	40				
Miles Cove	56	76	83	83	56	55	68	59	64	70	70	69
Glover's Hr						54	69	68	69	70	69	63
Summerford	60	78	84	81	91	72	71	70	82	90	84	77
Durrell	56	60	39	38	36	57	55	58				
Too Good Arm	39	48	53	54	48	77	70	68	70	70	70	62
Deep Bay	44	41	45	49	49							
Fogo					64	72	108	113	71	70	70	60
Joe Batt's Arm	48	32	40	41	80	77	71	87				
Tilting	53	49	45	39	82	78	69	83	65	72	67	64
Seldom	38	41	31	45	69	72	76	74	59	60	58	60
Aspen Cove	39	42	45	32	47	59	60	55	47	61	59	60
Lumsden	74	72	74	63	54	56	54	52	53	53	50	46
Wesleyville	64	68	91	78	62	68	67	68	68	67	68	
Newtown												64
Centreville	40	30	32	32	20	36	40	40				
St. Chad's	60	60	62	58								
Happy Adventure					59	56	71	72	70	66	70	70
Plate Cove West	39	46	52	56	48	68	70	70	70	66	70	62
Bonavista	1	41	29	20	30	27	33	38				
Little Catalina	60	59	67	74	36	59	44	60	60	57	60	54
Petley	40	52	56	46	59	80	72	68	63	67	70	70
Thornlea	60	72	72	66	48	77	84	60				
Hopeall	40	32	32	32	32	40	50	50	50	49	50	50
Heart's Content	57	16	40	66	48	74	60	60	60	60	59	54
Bay de Verde		32	49	31	46	68	69	69	69	70	68	57
Ochre Pitt Cove	40	51	48	48	48	60	60	60				
Carbonear	54	75	73	71	46	60	60	60	56	56	56	58
Port de Grave	40		48	48	48	60	60	60				
Foxtrap	74	62	64	65	41	46	52	52	48	48	47	48
Pouch Cove	39	32	43	51	53	56	70	69	70	70	70	70
Petty Hr					47	57	45	32				
Bay Bulls	121	94	102	108	70	48	46	45	31	60	57	54
Calvert	60	45	45	52	46	64	60	60	56	60	60	60
Ferryland	59	44	42	39	40	51	65	68				
Aquaforte	60	47	48	47	32	48	40	40				
Renews	33	37	29	28	32	48	60	60	70	54	62	70
St. Shott's	34	40	49	51	30	47	40	40	36	32	40	40
Riverhead	118	114	94	88	69	66	91	84	40	42	40	22
Admiral's Beach	61	52	68	72	47	57	59	60	60	53	58	60
Point Lance	58	49	48	48	6	24	36	40	36	40	40	40
Number of weeks	**15**	**12**	**12**	**8**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Number of enterprises	**52**	**54**	**55**	**55**	**57**	**57**	**58**	**57**	**43**	**44**	**43**	**44**

* two enterprises

Table 2. Relative CPUE trend for 3¼" gillnet (calculated as annual CPUE divided by mean CPUE for each location).

		Gillnet 3 1/4 in. Experimental											
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
2Jm + 3Kad	Black Tickle			0.192	3.043	0.165		0.222	0.230	0.814	0.608	1.040	2.687
	Williams Hr			1.440	0.821	0.513	0.615	0.628	1.873		1.111		
	Tub Hr		0.281	1.536	3.034	0.474	1.079	0.163	0.433				
	Triangle		0.795	4.013	1.743	0.231	0.532	0.789	1.253	0.422	0.373	0.295	0.554
	Penny's Hr		0.735	0.891	2.075	0.443	0.579	0.735	0.763	0.581	1.590	0.919	1.690
	Spear Hr		0.258	3.033	0.802	0.657	0.983	0.152	1.630	0.584	1.224	0.608	1.069
	St. Lewis			1.248	0.739	0.304	1.118	0.487	0.832	1.060	0.675	0.924	2.613
	Mary's Hr							0.308	0.671	0.539	0.552	2.135	1.795
	Cape Charles			1.302	1.221	0.477							
	Quirpon							1.000					
	St. Lunaire		0.308	0.426	0.752	0.018		0.482	0.423	1.497	0.936	2.436	2.723
	Great Brehat				1.000								
	Goose Cove								0.842	0.987	0.880	1.135	1.156
	Englee				0.467	2.079	1.443	0.503	0.651	1.296	0.701	0.844	1.015
	Hr Deep			0.757	0.842	1.031	0.864	0.711	1.782	1.513	0.500		
	Jackson's Arm			1.706	0.716	0.578							
	Sopp's Arm								1.300	0.781	0.505	1.349	1.065
Northern Inshore area (3Khi+3Lab)	Westport							1.006	0.994				
	Coachman's Cove			2.015	1.179	0.846	0.929	0.958	0.197	1.302	1.169	0.624	0.781
	La Scie			0.135	0.461	0.327	0.702	1.107	0.035	3.864	1.206	1.099	1.066
	Miles Cove		2.867	1.784	0.739	0.571	0.481	0.448	0.680	1.454	0.394	0.878	0.705
	Glover's Hr							1.272	1.260	1.004	0.568	1.082	0.814
	Summerford		2.272	0.538	1.245	1.289	0.343	0.748	1.034	1.421	0.936	0.698	0.475
	Too Good Arm			1.254	1.229	0.999	0.942	0.534	0.432	1.046	0.856	1.511	1.196
	Deep Bay				1.121	0.879							
	Fogo								1.486	0.443	0.737	1.334	
	Joe Batt's Arm				1.819	0.902	1.009	0.526	0.744				
	Tilting				0.925	0.568	0.617	0.963	1.086	0.571	0.735	1.344	2.190
	Seldom				1.000								
	Wesleyville			1.078	0.626	1.031	1.121	0.702	0.618	0.953	1.135	1.736	
	Newtown												1.000
	Happy Adventure						1.446	1.255	1.002	1.276	0.539	0.564	0.918
	Plate Cove West			1.089	1.414	0.422	0.634	0.978	0.836	1.488	1.114	1.290	0.734
	Little Catalina			1.536	1.548	0.577	0.648	0.713	0.436	1.266	0.940	1.531	0.805
	Petley		1.504	1.138	1.334	1.036	0.977	0.541	1.528	0.985	0.926	0.616	0.416
	Hopeall							0.794	1.013	1.232	0.631	1.043	1.288
Southern 3L (3Lfjq)	Heart's Content			0.061	0.658	0.291	0.327	0.228	0.281	2.033	2.070	2.458	1.595
	Bay de Verde			2.113	2.073	0.795	0.413	0.181	0.693	1.365	0.965	0.720	0.682
	Foxtrap		1.267	1.133	1.065	1.041	0.764	0.689	0.745	1.671	0.661	1.249	0.713
	Pouch Cove			0.748	1.285	1.479	1.352	0.889	0.721	0.892	0.726	1.226	0.684
	Bay Bulls			3.822	2.003	0.264		0.181	0.097	0.211		0.422	
	Ferryland		1.657	2.129	0.214	0.713	0.975	1.145	0.167				
	Renews									0.567		0.354	2.079
	St. Shott's			1.592			0.408						
	Admiral's Beach		1.305	2.098	1.594	0.974	1.368	1.058	0.619	1.005	0.611	0.283	0.086

no survey
> 10%
within 10%
<10%

Table 3. Relative CPUE trend for 5½" control gillnet (calculated as annual CPUE divided by mean CPUE for each location).

		Gillnet 5 1/2 in. Control											
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
2Jm + 3Kad	Black Tickle		0.007	0.101	0.557	0.068	0.162	0.032	0.078	0.463	0.368	4.017	5.148
	Williams Hr	1.593	0.348	2.279	1.062	0.239	1.014	0.306	0.088		2.071		
	Tub Hr	0.153		0.757	4.668	1.009	0.580	0.151	0.681				
	Triangle	0.091	0.391	4.658	3.679	0.274	0.274	0.247	0.288	0.152	0.219	0.575	1.151
	Penny's Hr	0.204	0.147	0.293	1.173	0.880	0.335	0.704	0.168	0.469	1.056	2.347	4.224
	Spear Hr	0.065	0.049	2.035	1.002	1.279	0.376	0.541	4.159	0.988	0.153	0.600	0.753
	St. Lewis		0.138		0.085	0.483	0.523	0.055	0.828	0.386	1.822	2.098	4.582
	Mary's Hr							0.022	0.305	0.196	0.327	3.162	1.987
	Cape Charles	0.419	0.733	0.733	1.466	1.649							
	Quirpon							1.000					
	St. Lunaire	0.238	0.899	0.297	0.571	1.428	0.800	0.694	0.258	1.135	0.805	2.835	2.040
	Great Brehat	0.239	1.009	0.828	1.371	1.553							
	Goose Cove		0.179	0.076	0.685	0.152	0.043	0.065	0.177	0.965	0.554	4.299	3.803
	Conche	0.112	0.851	0.752	0.989	1.221	1.318	0.416	0.199	0.433	0.951	1.822	2.936
	Englee	0.140	1.348	0.745	2.708	1.401	0.607	0.228	0.105	0.222	0.420	2.832	1.243
	Hr Deep	0.111	0.692	1.016	3.256	1.071	0.933	0.274	0.215	0.385	0.589	1.862	1.597
	Jackson's Arm	0.250	1.225	1.837	1.281	0.407							
	Sopp's Arm						1.435	0.542	0.898	0.646	0.711	0.950	1.818
	Westport						0.738	1.434	0.828				
Northern Inshore area (3Khi+3Lab)	Coachman's Cove	0.120	3.185	1.703	2.009	0.911	0.346	0.235	0.086	0.395	0.614	0.658	1.738
	Ming's Bight				4.050	0.942	0.188	0.131	0.235	0.262	1.884	0.288	1.020
	La Scie		1.508	0.572	5.006	1.041	0.044	0.128	0.053	0.106	0.218	0.899	1.424
	Shoe Cove		1.243	1.559	1.984	2.092	0.252	0.120	0.226	0.450	0.919	1.015	1.140
	Smith's Hr	0.650	2.215	2.358	2.418	0.948	0.345	0.122	0.298	0.223	0.404	0.910	1.109
	Jackson's Cove	0.779	1.368	1.851	2.942	0.858	0.033	0.134	0.036				
	Miles Cove	0.176	1.861	3.704	2.682	0.750	0.280	0.323	0.128	0.594	0.353	0.353	0.795
	Glover's Hr						0.896	0.110	0.258	0.407	0.657	0.611	4.061
	Summerford	0.685	1.575	2.192	2.823	0.759	0.224	0.197	0.075	0.409	0.866	0.956	1.239
	Durrell	0.284	1.191	1.418	1.125	2.746	0.513	0.290	0.434				
	Too Good Arm	0.408	1.628	1.543	1.722	0.609	0.581	0.859	0.564	0.468	1.118	1.315	1.184
	Deep Bay	0.157	0.870	0.733	1.510	1.729							
	Fogo					2.393	0.703	1.100	0.459	0.120	0.592	0.515	2.118
	Joe Batt's Arm	0.441	3.710	0.588	1.553	0.859	0.580	0.140	0.128				
	Tilting	0.200	1.938	0.802	2.025	1.695	1.411	0.192	0.242	0.231	1.013	1.334	0.916
	Seldom	0.356	1.738	1.097	2.558	1.683	0.674	0.409	0.759	0.611	1.116	0.351	0.647
	Aspen Cove		2.319	0.323	1.669	0.574	0.394	0.472	0.226	0.351	1.942	1.539	1.191
	Lumsden	0.500	2.415	0.612	1.555	0.765	0.653	0.331	0.282	0.518	0.782	1.765	1.822
	Wesleyville	0.413	1.563	1.523	1.898	1.961	0.831	0.530	0.251	0.425	0.556	1.049	
	Newtown												1.000
	Centreville	1.374	1.381	1.951	1.270	0.696	0.782	0.319	0.226				
	St. Chad's	0.508	0.932	1.238	1.323								
	Happy Adventure					1.674	2.199	0.535	0.785	0.469	0.537	0.837	0.964
	Plate Cove West	0.522	0.949	2.061	2.543	0.824	0.533	0.596	0.798	0.463	0.686	0.841	1.184
	Bonavista		0.515	0.955	1.761	1.263	0.985	0.787	0.734				
	Little Catalina	0.360	1.087	1.169	1.563	1.745	1.080	1.027	0.587	0.660	0.519	1.381	0.823
	Petley	0.308	0.725	1.148	1.630	1.061	1.311	1.366	0.888	0.875	0.560	1.127	1.000
	Thornlea	0.399	1.737	2.006	1.448	1.155	0.734	0.308	0.212				
	Hopeall	0.133	1.812	0.976	1.630	0.859	0.855	0.285	0.192	0.768	1.081	0.756	2.654
	Heart's Content		0.904	1.638	2.108	0.850	1.170	0.279	0.389	0.820	0.795	0.970	1.075
Southern 3L (3Lfiq)	Bay de Verde		1.427	0.833	3.401	1.280	0.514	0.183	0.267	0.405	0.593	0.977	1.120
	Ochre Pitt Cove	0.448	1.100	1.272	3.121	1.133	0.466	0.305	0.157				
	Carbonear	0.406	1.785	1.234	2.652	0.767	0.834	0.297	0.402	0.662	0.801	1.225	0.936
	Port de Grave	0.086		1.257	2.990	1.728	0.340	0.379	0.220				
	Foxtrap	0.107	1.744	1.372	2.820	1.689	0.314	0.319	0.314	0.627	0.953	0.669	1.073
	Pouch Cove	0.227	1.837	1.194	2.427	2.146	0.439	0.450	0.059	0.488	1.322	0.797	0.614
	Petty Hr					2.280	0.737	0.686	0.296				
	Bay Bulls	0.445	1.251	1.238	1.751	1.212	0.135	0.177	0.188	0.807	1.953	1.494	1.350
	Calvert		1.541	2.303	2.817	2.454	0.171	0.039	0.115	0.251	0.600	0.430	0.279
	Ferryland	0.290	0.900	0.982	2.604	2.063	0.617	0.118	0.427				
	Aquaforte	0.307	1.662	2.218	1.952	1.256	0.285	0.149	0.171				
	Renews			1.933	2.016	1.909	0.536	0.171	0.196	1.144	0.666	0.661	0.768
	St. Shott's		1.744	1.351	1.365	1.593	1.161	0.441	0.348	1.794	0.537	0.293	0.374
	Riverhead	0.822	1.570	0.967	1.217	0.854	1.211	0.815	0.733	0.807	1.015	1.145	0.843
	Admiral's Beach	0.419	2.577	1.626	2.058	1.102	1.617	0.419	0.249	0.480	0.887	0.410	0.153
	Point Lance	2.073	2.709	1.824	2.215		0.058	0.769	0.084	1.119	0.861	0.098	0.191

no survey
> 10%
within 10%
<10%

Table 4. Relative CPUE trend for 5½" experimental gillnet (calculated as annual CPUE divided by mean CPUE for each location).

		Gillnet 5 1/2 in. Experimental											
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
2Jm + 3Kad	Black Tickle		0.087	0.125	0.329	0.191	0.911	0.210	0.031	0.585	1.941	4.699	1.892
	Williams Hr	0.323	0.345	0.369	0.582	1.413	0.762	0.441	0.905		3.859		
	Tub Hr	0.164		1.354	1.692	3.309	0.474	0.602	0.406				
	Triangle	0.207	0.582	2.061	2.203	1.268	0.221	0.536	0.566	0.529	0.640	1.198	1.989
	Penny's Hr	0.124	0.053	2.726	0.909	0.881	0.525	0.237	0.305	0.299	0.939	2.633	2.369
	Spear Hr	0.148	0.231	1.073	1.111	1.320	0.646	0.256	1.156	0.902	0.656	1.251	3.250
	St. Lewis		0.052	0.188	0.286	0.094	0.265	0.195	0.317	1.238	1.043	3.625	3.696
	Mary's Hr							0.190	0.422	0.717	0.357	1.961	2.354
	Cape Charles	1.574	0.413	0.881		2.132							
	Quirpon							1.000					
	St. Lunaire	0.042	0.779	0.497	0.354	0.782	0.769	0.522	0.180	0.905	0.555	3.739	2.878
	Great Brehat	0.272	1.224	0.839	2.138	0.526							
	Goose Cove		0.442	0.436	0.927	2.220	1.342	0.383	0.270	0.747	0.514	2.424	1.294
	Conche	0.243	1.291	0.729	1.313	0.995	0.928	0.355	0.107	0.565	0.845	2.341	2.288
	Englee	0.095	1.370	1.047	1.021	2.564	0.658	0.341	0.098	0.449	0.560	1.898	1.900
	Hr Deep	1.078	2.033	1.494	2.926	1.055	0.397	0.202	0.095	0.379	0.210	1.218	0.913
	Jackson's Arm	0.255	2.234	1.328	0.948	0.235							
	Sopp's Arm						1.221	0.500	0.520	1.007	0.756	1.491	1.505
	Westport						0.854	1.260	0.886				
Northern Inshore area (3Khi+3Lab)	Coachman's Cove	0.248	2.913	1.827	1.907	0.538	0.241	0.117	0.144	0.361	0.586	1.087	2.032
	Ming's Bight				1.622	0.923	0.708	0.622	0.301	0.344	0.818	1.454	2.208
	La Scie		1.314	0.609	4.094	1.028	0.213	0.074	0.130	0.540	0.457	1.061	1.480
	Shoe Cove		1.386	0.644	1.605	1.107	0.434	0.171	0.303	0.566	0.988	1.772	2.024
	Smith's Hr	0.950	1.648	2.625	2.474	1.002	0.272	0.162	0.083	0.355	0.395	0.574	1.460
	Jackson's Cove	1.114	1.723	1.773	1.985	0.915	0.129	0.206	0.156				
	Miles Cove	0.878	2.221	2.138	1.808	0.360	0.305	0.313	0.280	0.878	0.978	0.891	0.949
	Glover's Hr						0.544	0.131	0.449	0.508	0.660	1.901	2.806
	Summerford	0.627	1.777	1.960	2.350	0.702	0.186	0.186	0.133	0.482	1.287	0.924	1.385
	Durrell	0.709	1.520	1.033	1.101	1.998	0.481	0.572	0.586				
	Too Good Arm	0.545	2.702	1.218	1.920	0.587	0.632	0.296	0.293	0.304	0.894	1.329	1.280
	Deep Bay	0.124	0.753	0.650	2.034	1.439							
	Fogo					1.878	1.192	0.352	0.202	0.332	0.791	1.778	1.474
	Joe Batt's Arm	0.051	4.282	0.532	1.177	0.621	0.950	0.166	0.222				
	Tilting	0.149	1.445	0.533	2.149	1.994	1.822	0.266	0.255	0.146	1.003	0.809	1.430
	Seldom	0.145	1.644	0.947	4.368	1.966	0.559	0.338	0.132	0.316	0.548	0.304	0.734
	Aspen Cove		1.309	0.912	1.968	0.688	0.298	0.216	0.295	0.166	1.574	2.060	1.514
	Lumsden	0.577	1.897	1.147	1.575	0.838	0.753	0.390	0.206	0.462	0.871	1.594	1.690
	Wesleyville	0.646	1.033	1.555	1.742	2.074	1.059	0.547	0.294	0.502	0.971	0.576	
	Newtown												1.000
	Centreville	1.272	1.622	1.679	1.322	0.586	0.882	0.401	0.236				
	St. Chad's	0.314	1.064	1.146	1.475								
	Happy Adventure					1.189	1.370	0.740	0.638	0.730	0.621	1.033	1.678
	Plate Cove West	0.371	1.288	1.408	1.765	0.942	0.739	1.011	0.807	0.524	1.027	0.816	1.303
	Bonavista		0.511	0.623	1.309	0.822	2.124	0.711	0.899				
	Little Catalina	0.375	1.262	0.931	1.504	1.726	1.114	0.656	1.081	0.621	0.623	1.317	0.790
	Petley	0.466	1.002	1.287	1.815	1.175	0.935	0.680	0.920	0.938	1.068	0.903	0.811
	Thornlea	0.257	1.731	2.345	1.061	0.599	0.811	0.634	0.561				
	Hopeall	0.225	1.351	1.392	2.111	0.890	0.873	0.322	0.300	0.748	0.885	0.505	2.396
	Heart's Content		0.679	1.750	1.581	0.743	0.815	0.441	0.527	0.832	0.773	1.652	1.207
Southern 3L (3Lfish)	Bay de Verde		1.062	1.100	3.863	0.984	0.616	0.223	0.272	0.471	0.675	0.828	0.905
	Ochre Pitt Cove	0.202	1.477	0.866	3.249	1.105	0.622	0.278	0.201				
	Carbonear	0.404	1.565	0.973	1.994	0.851	0.569	0.210	0.366	0.782	1.017	1.703	1.565
	Port de Grave	0.069		1.783	2.934	1.528	0.225	0.234	0.229				
	Foxtrap	0.072	0.977	1.217	2.251	1.496	0.493	0.347	0.405	0.907	1.155	1.304	1.376
	Pouch Cove	0.083	1.198	1.156	2.793	2.451	0.336	0.308	0.078	0.454	1.490	0.552	1.102
	Petty Hr					2.434	0.807	0.426	0.332				
	Bay Bulls	0.401	1.803	1.681	2.326	1.370	0.165	0.272	0.291	0.787	0.943	1.185	0.776
	Calvert		1.336	1.081	2.576	2.514	0.166	0.137	0.098	0.614	1.105	0.735	0.637
	Ferryland	0.232	0.706	1.262	2.056	2.565	0.585	0.243	0.351				
	Aquaforte	0.413	1.101	2.430	2.063	1.283	0.355	0.216	0.139				
	Renews			2.420	2.156	1.986	0.379	0.194	0.185	0.284	1.044	0.943	0.407
	St. Shott's		2.558	1.322	1.729	1.726	0.704	0.329	0.085	0.607	1.052	0.588	0.300
	Riverhead	0.342	0.979	0.862	1.302	1.339	1.285	0.737	0.697	1.220	0.834	1.527	0.875
	Admiral's Beach	0.270	2.123	1.865	1.934	1.829	1.874	0.625	0.249	0.385	0.493	0.275	0.077
	Point Lance	1.890	3.228	1.839	3.172	0.012	0.020	0.319	0.146	0.548	0.626	0.111	0.089

no survey
> 10%
within 10%
<10%

Table 5. Relative CPUE trend for control linetrawl (calculated as annual CPUE divided by mean CPUE for each location).

		Linetrawl Control											
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
2Jm +	Tub Hr		1.102	0.429	1.469								
	Cape Charles		1.699	0.301									
	Goose Cove	0.734	0.762	4.129	1.062	0.404	0.785		0.124				
Northern Inshore area (3Khi+3l ah)	Coachman's Cove	0.288	0.821	1.343	0.623	0.429		1.385		0.485	1.200	2.804	0.623
	Ming's Bight	1.539	1.427	1.936	0.830	0.289	0.099	0.599	0.668	0.644	1.523	1.311	1.136
	La Scie	1.305	1.420	2.197	0.613	0.551		0.446	0.270	1.531	0.974	0.817	0.876
	Shoe Cove	1.082	0.978	1.813	0.926	0.653	0.452	0.944	0.513	1.095	1.003	1.565	0.977
	Durrell	1.719	1.226	2.318	0.640	0.545		0.162	0.390				
	Deep Bay	0.594	0.709	1.696									
	Fogo					1.000							
	Joe Batt's Arm	1.116	0.530	1.414	0.940								
	Tilting	0.464	0.628	1.575	1.332								
	Seldom			1.000									
	Aspen Cove	1.939	0.571	2.013	0.738	0.983	0.321	0.686	0.728	0.519	1.537	1.052	0.912
	Lumsden	0.620	1.414	1.416	1.044	0.829	0.619	0.521	0.532	1.196	1.209	1.688	0.910
	Wesleyville	0.758	0.741	1.253	0.920	1.125	1.590	1.014	0.716	1.206	0.805	0.871	
	Newtown												
	Happy Adventure							1.000					
	Bonavista			1.351					0.649				
	Heart's Content	0.934		1.575	1.353			0.519	0.618				
Southern 3l (3l fin)	Carbonear	0.749	0.658	1.467	0.401	0.980		0.693	1.741	0.469	0.926	1.623	1.293
	Foxtrap	0.680	1.715	2.280	0.514	1.089	0.883	2.065	0.174	0.309	0.947	0.963	0.382
	Bay Bulls	1.717						0.564				0.718	
	Calvert	1.746	1.018	2.435	1.934	0.119	0.276	0.263		0.209			
	Aquaforte		1.000										
	Renews	0.080	0.594	2.326									
	St. Shott's	0.721	1.279										
	Riverhead	0.809	0.861	1.411	0.998	1.707		0.726	0.688	0.716	1.680	0.578	0.826
	Point Lance							4.306		0.189	0.213	0.058	0.233

no survey
> 10%
within 10%
<10%

Table 6. Relative CPUE trend for experimental linetrawl (calculated as annual CPUE divided by mean CPUE for each location).

		Linetrawl Experimental											
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
2Jm + 3Kad	Black Tickle							1.000					
	Williams Hr							1.000					
	Tub Hr		1.639		1.735			1.627					
	Triangle							1.000					
	Penny's Hr							1.000					
	Cape Charles		1.695	0.305									
	Goose Cove	0.727	0.758	1.515									
	Sopp's Arm							1.000					
Northern Inshore area (3Khi+3l ah)	Coachman's Cove	1.798	1.363				0.193		0.848			1.028	0.771
	Ming's Bight	1.531	1.092	2.159	0.925	0.184	0.296	0.387	0.669	0.931	1.077	1.931	0.818
	La Scie	1.033	1.321	2.503	0.642	0.582		0.356	0.256	1.152	0.970	0.949	1.236
	Shoe Cove	1.010	1.128	2.262	0.888	0.523	0.458	0.561	0.700	1.315	0.693	1.121	1.340
	Durrell	1.512	1.720	2.231	0.704	0.495	0.270	0.068					
	Deep Bay	0.420	0.974	1.605									
	Fogo					1.000							
	Joe Batt's Arm	0.960	0.514	1.627	0.899								
	Tilting	1.360	0.863	1.344	1.208					0.224			
	Seldom			1.000									
	Aspen Cove	1.543	1.067	2.470	0.888	0.766	0.197	0.467	0.542	1.333	1.018	1.006	0.701
	Lumsden	0.886	1.506	1.329	0.899	0.791	0.606	0.459	0.524	1.154	1.072	1.299	1.477
	Wesleyville	0.718	1.403	0.986	0.601	0.893	1.181	0.845	0.565	1.203	1.307	1.298	
	Newtown												1.000
	Happy Adventure							1.000					
	Bonavista	1.187	1.347	1.247	0.590			1.093	0.537				
	Petley							1.000					
	Heart's Content	1.270		1.555	1.454			0.321	0.400				
Southern 3l (3l fin)	Carbonear	1.200	1.088	0.762	0.181	0.873		0.494	1.047	0.684	1.849	1.185	1.637
	Foxtrap	1.126	2.236	2.289	0.605	1.227	0.762	1.058	0.148	0.297	0.824	0.962	0.467
	Bay Bulls	1.000											
	Calvert	1.639	1.900	1.319	1.161	0.416	0.451	0.269		0.845			
	Aquaforte		1.000										
	Renews	0.265	1.735										
	St. Shott's	0.771	1.229										
	Riverhead	0.427	0.555	0.937	1.130	2.354	0.380	0.322	0.264	0.699	2.103	1.800	1.030
	Point Lance							0.799		0.668	0.707	0.276	2.550

no survey
> 10%
within 10%
<10%

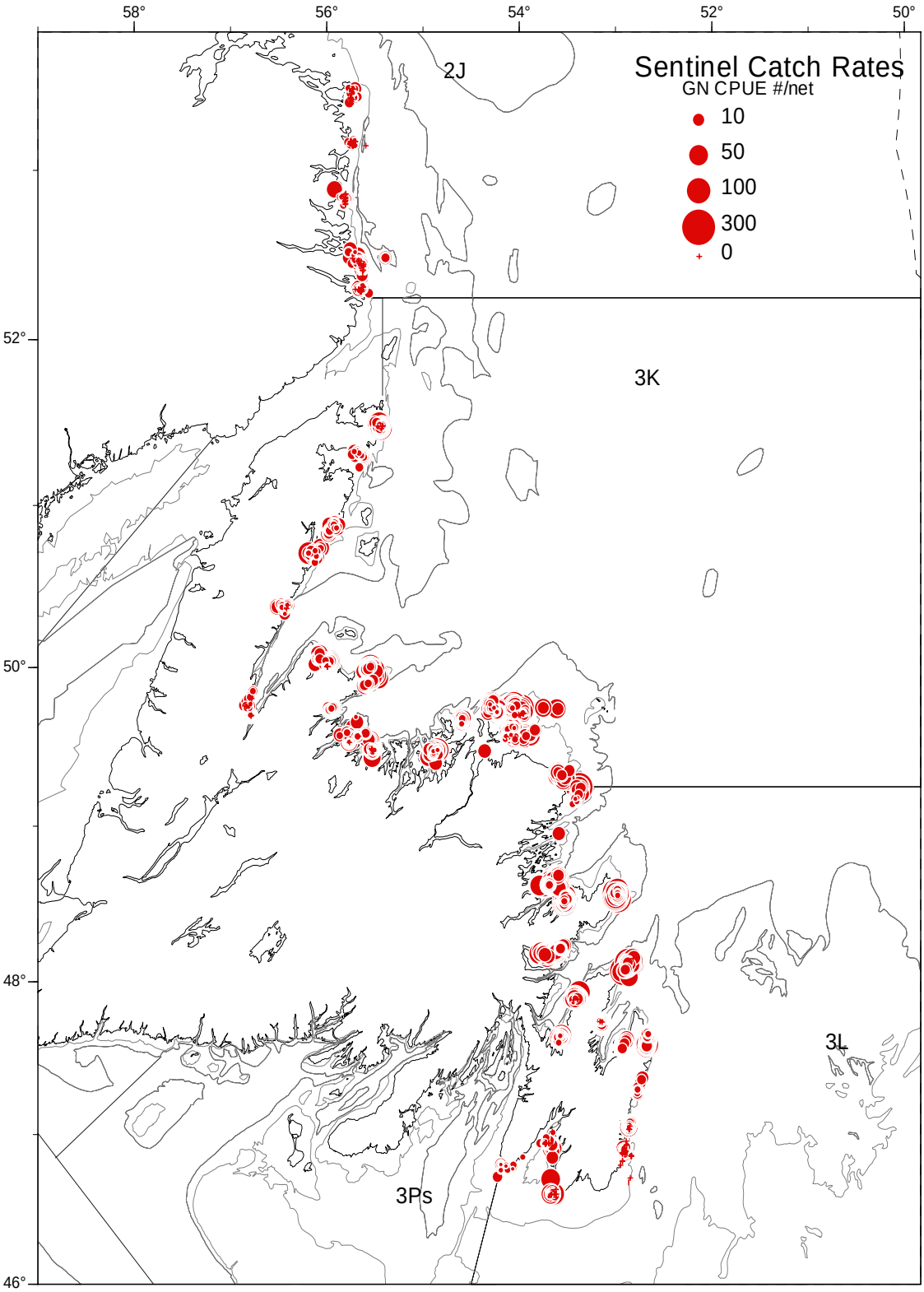


Figure 1. Sentinel survey in 2006 catch per unit effort for 5 1/2" gillnet (#/net).

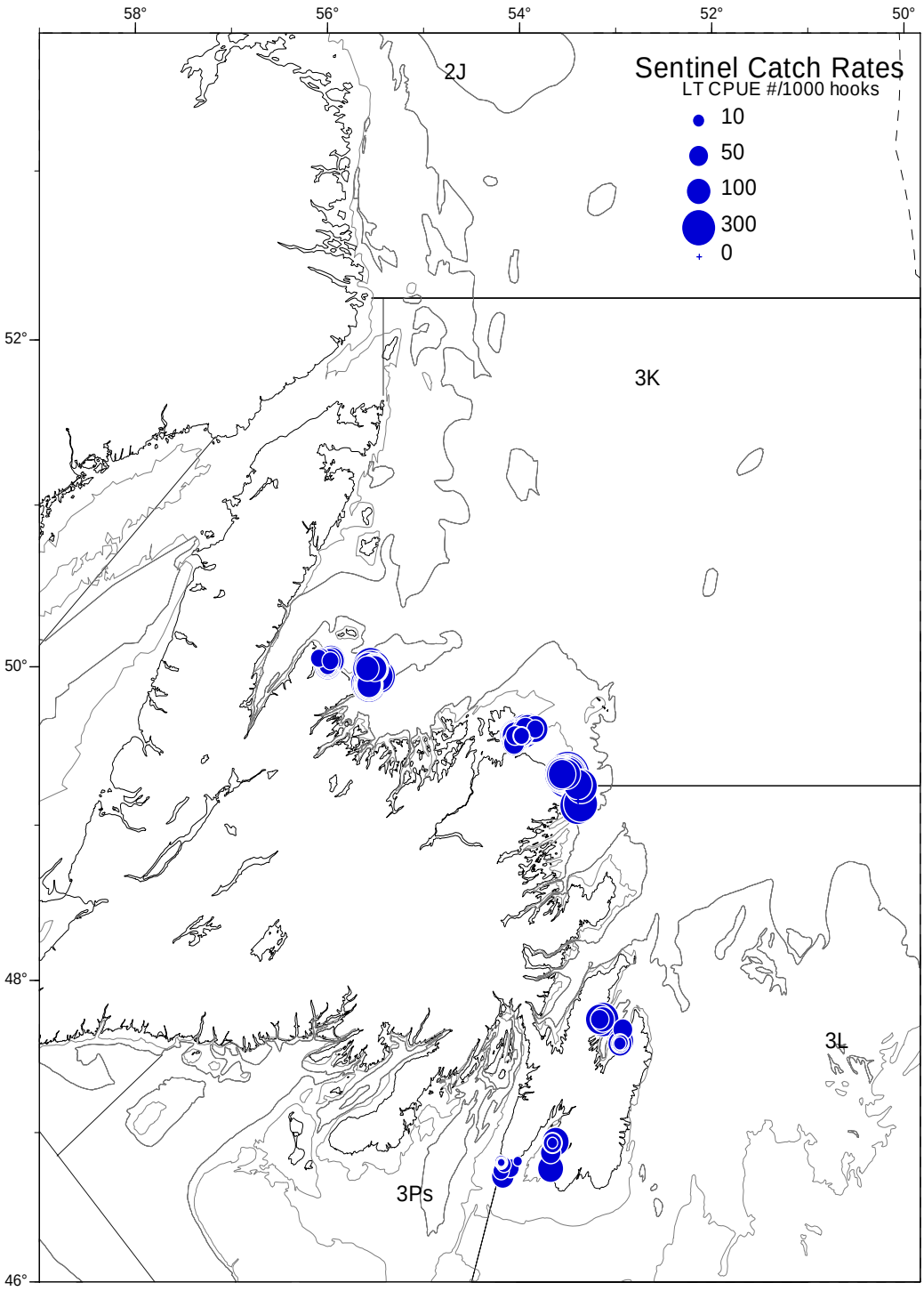


Figure 2. Sentinel survey in 2006 catch per unit effort for linetrawl (#/1000 hooks).

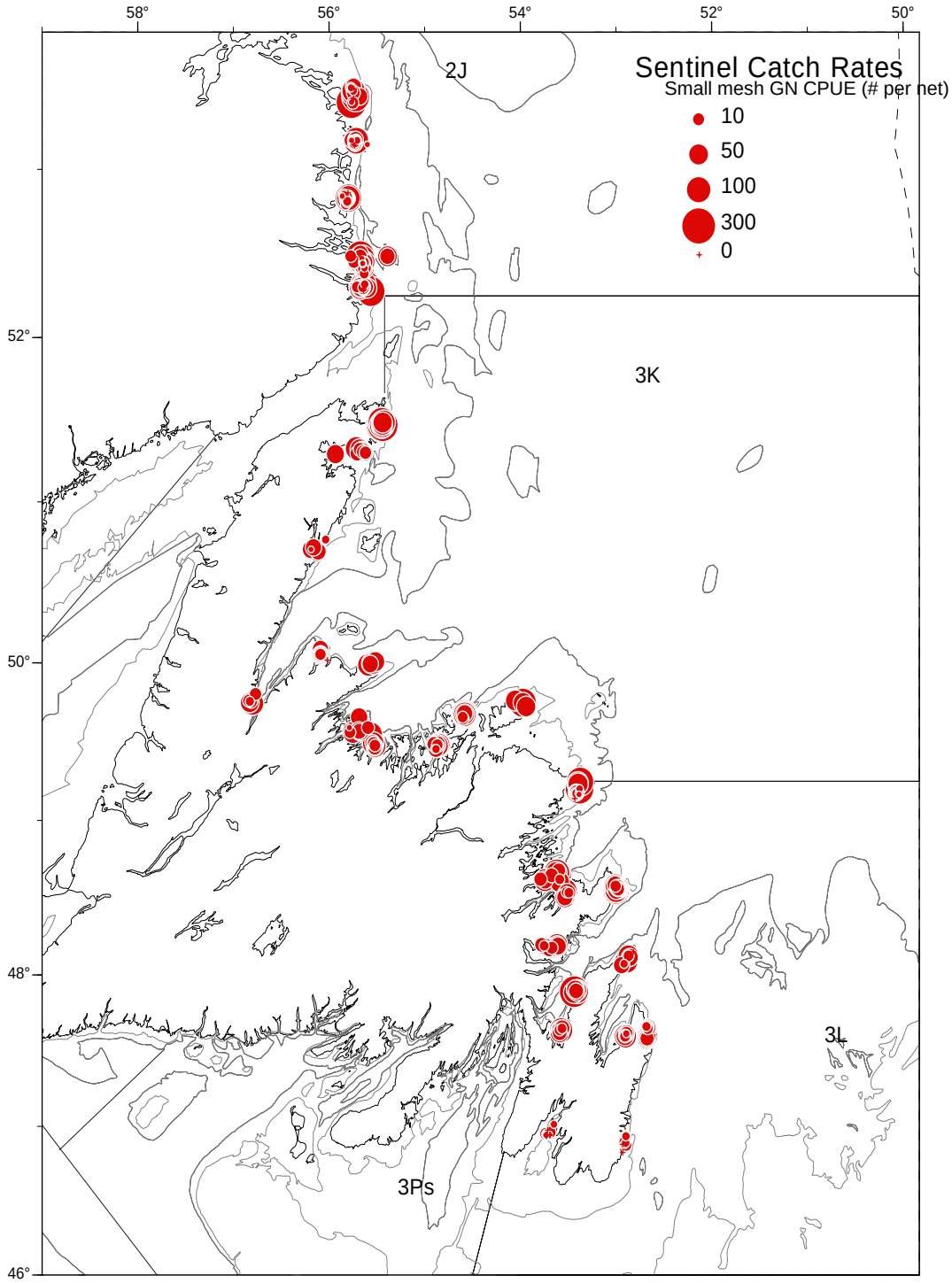
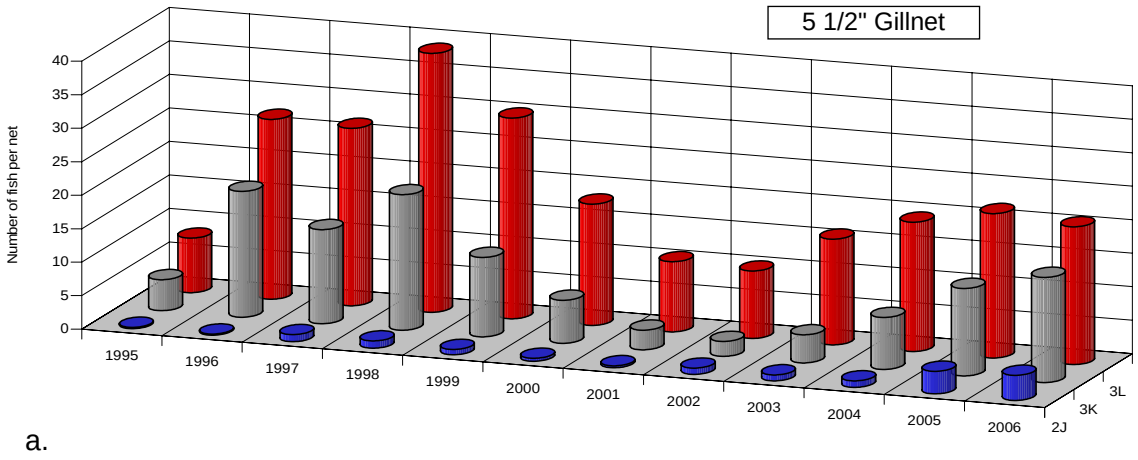
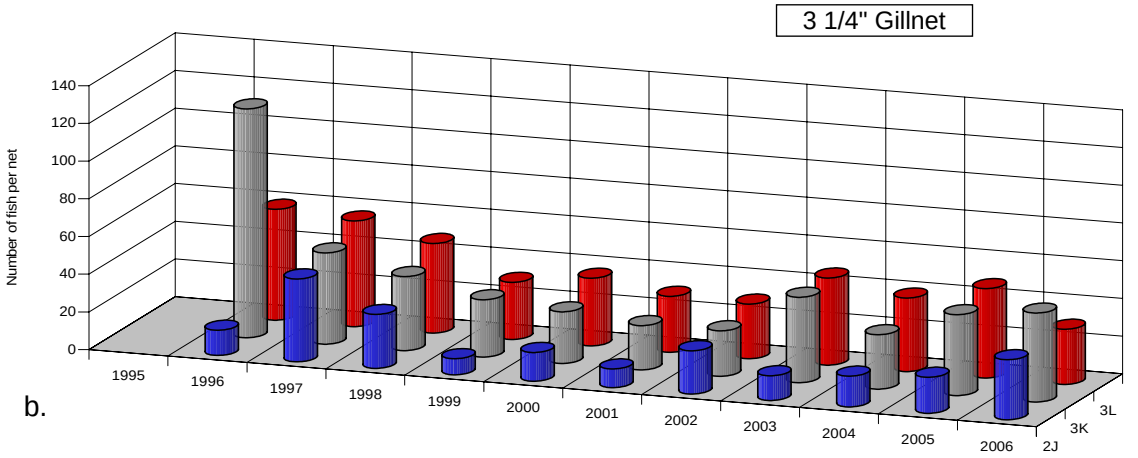


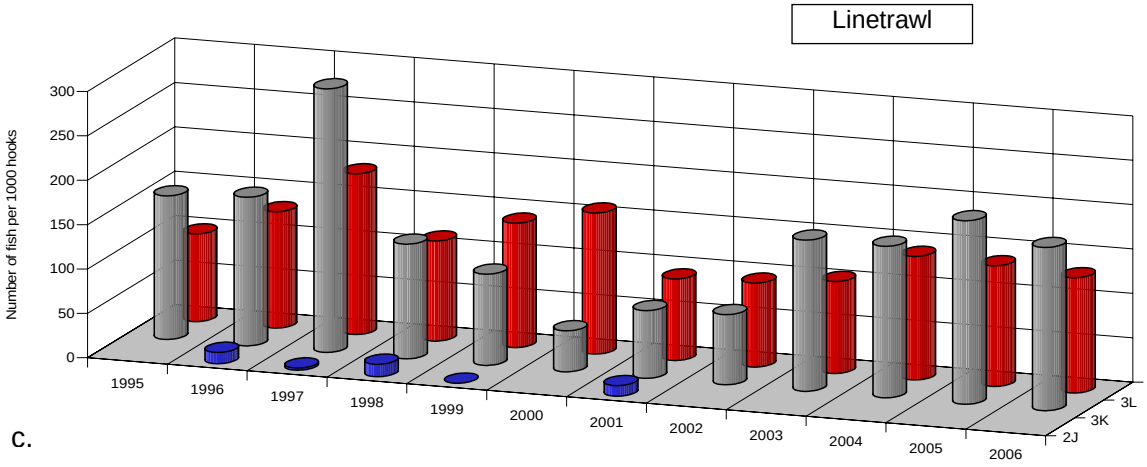
Figure 3. Sentinel survey in 2006 catch per unit effort for 3 1/4" gillnet.



a.



b.



c.

Figure 4. Mean CPUE (# of fish per net or 1000 hooks) by NAFO division for (a.) 5 1/2" gillnet (b.) 3 1/4" gillnet and (c.) linetrawl.

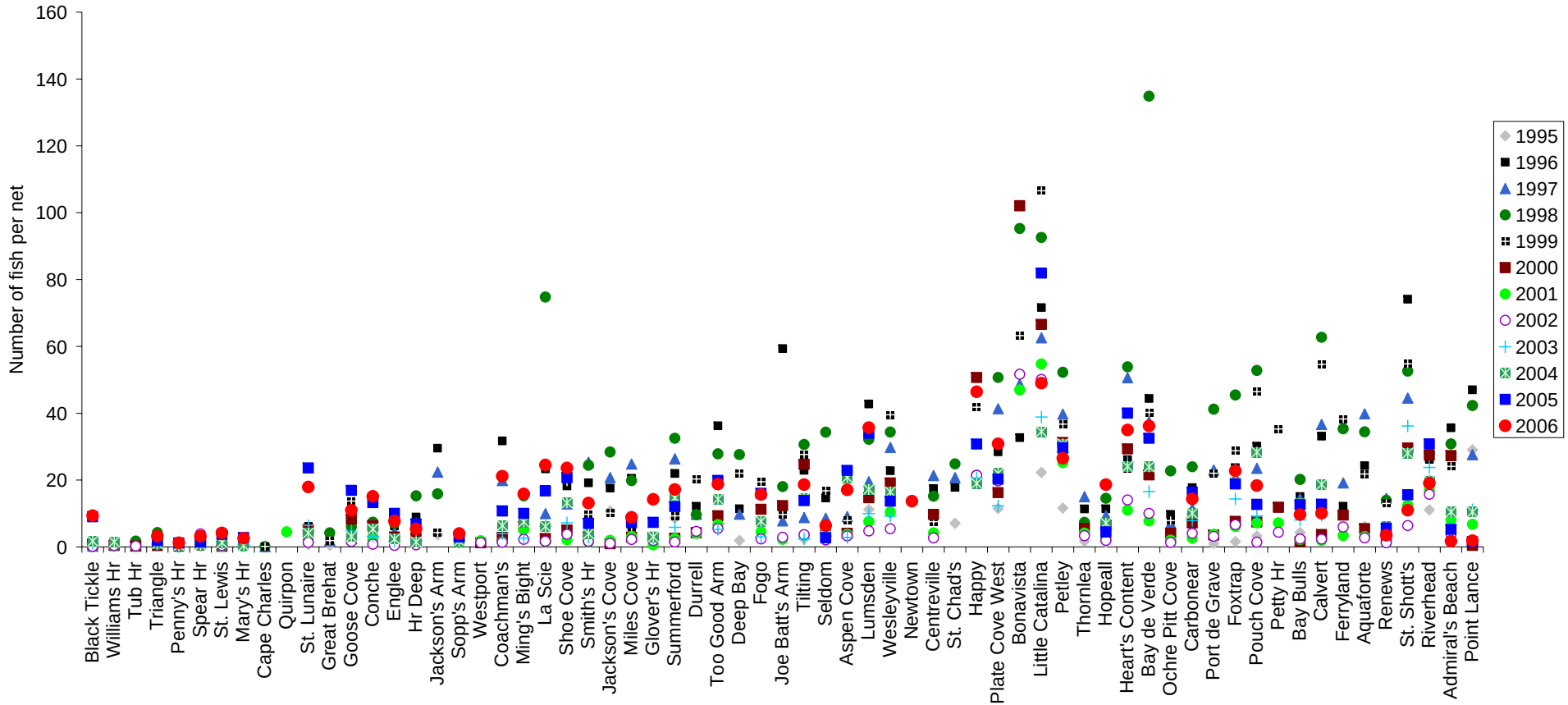


Figure 5. Mean catch per unit effort for gillnet (Number of fish per net) in NAFO divisions 2J3KL by community.

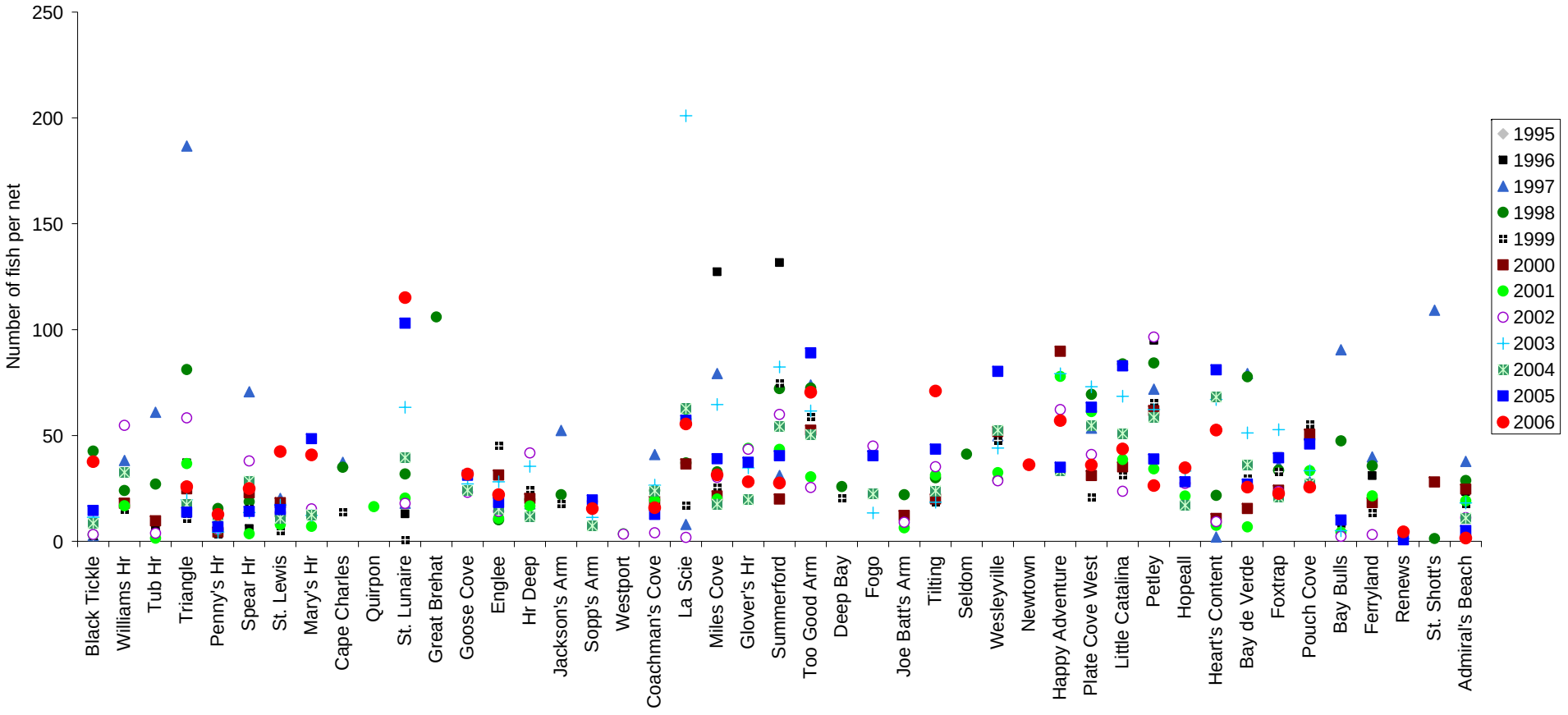


Figure 6. Mean catch per unit effort for small mesh gillnet (Number of fish per net) in NAFO divisions 2J3KL by community.

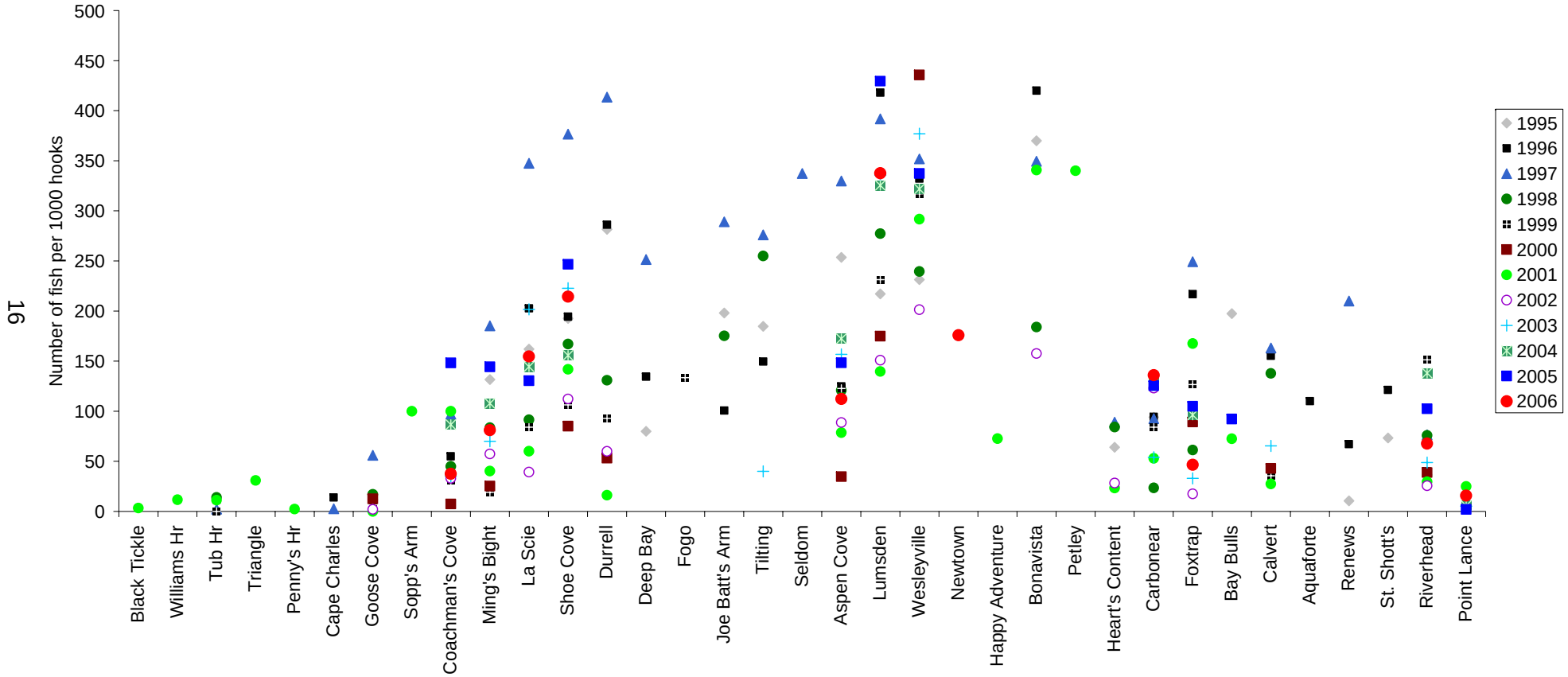


Figure 7. Mean catch per unit effort for linetrawl (Number of fish per 1000 hooks) in NAFO divisions 2J3KL by community.

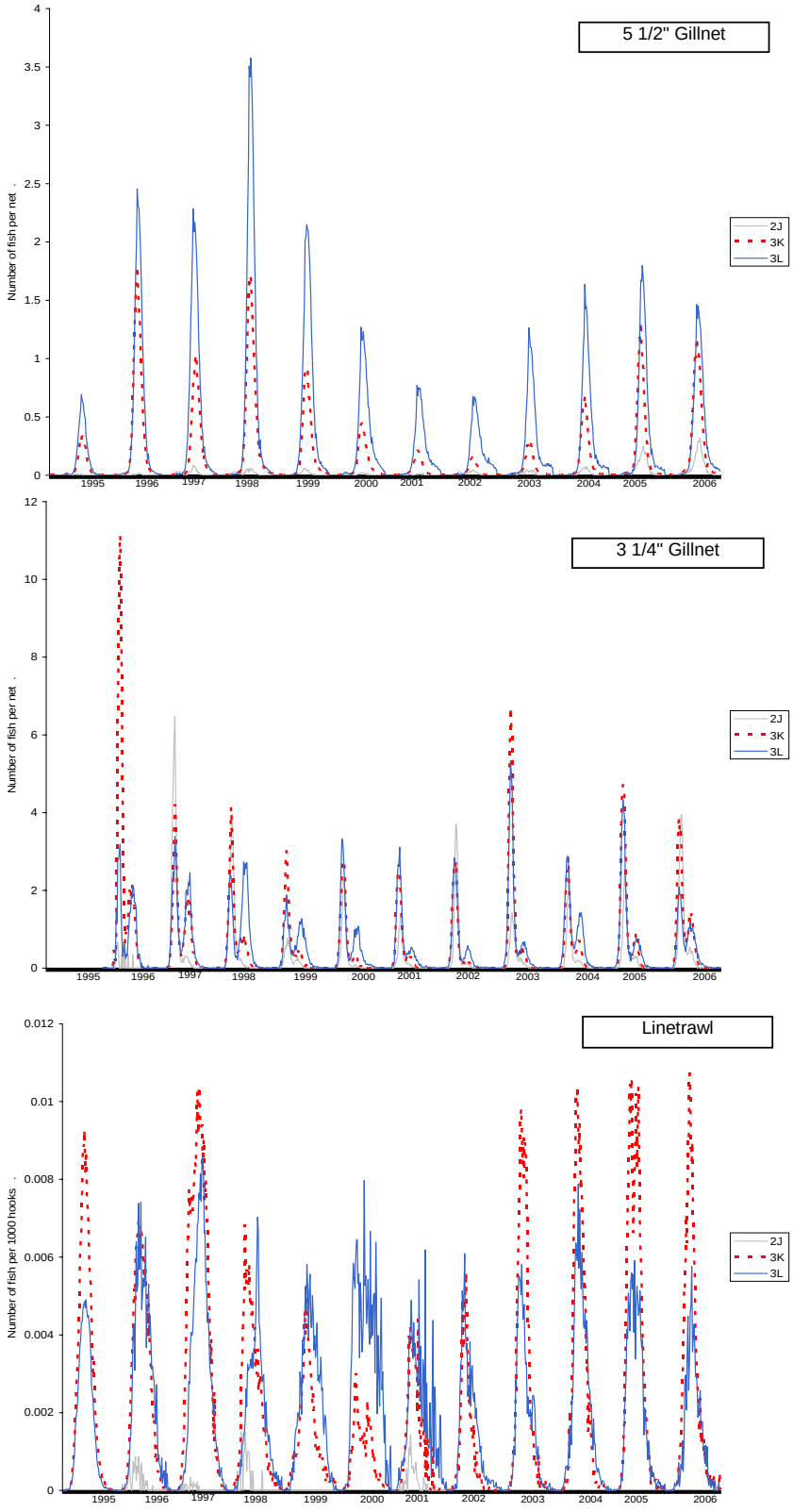


Figure 8. Length frequencies (scaled by amount of gear fished) for gillnet and linetrawl from 1995-2006. Each frequency ranges from 20cm-90cm.

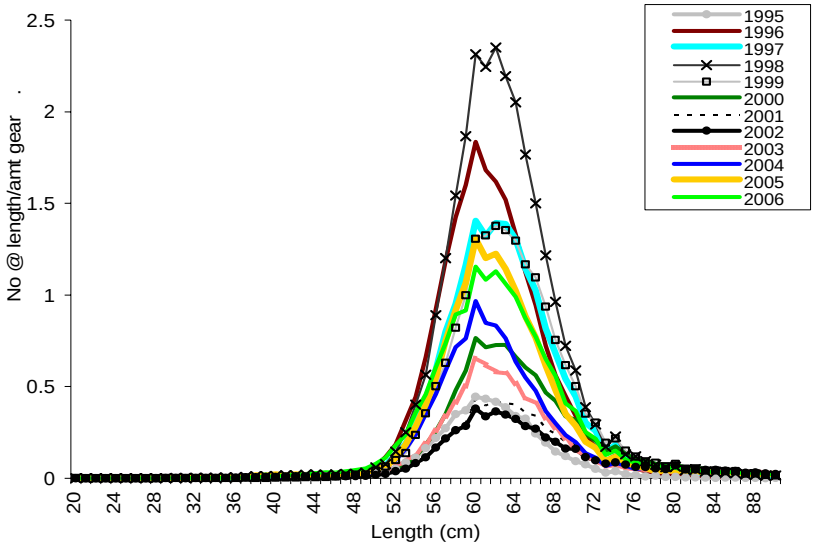
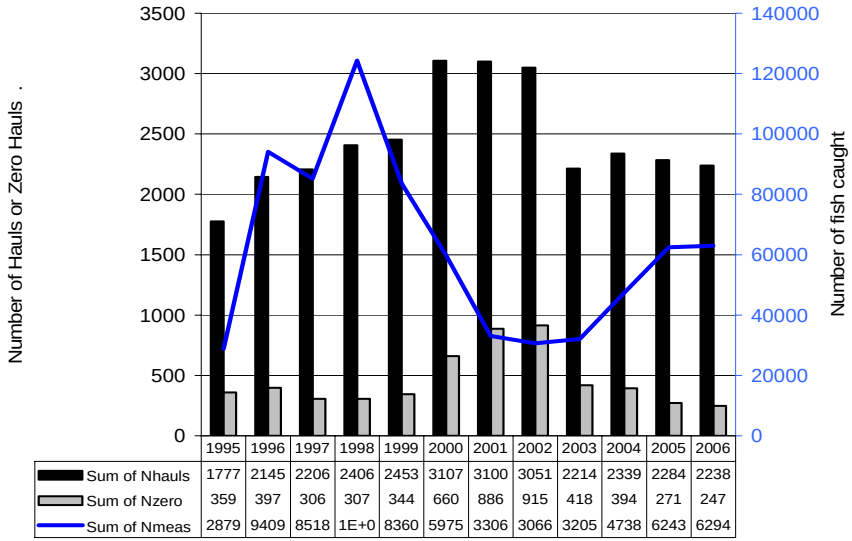


Figure 9. Relative length frequency (number at length / amount of gear) for control and experimental gears, 2J3KL Gillnet 5 1/2 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	1777	2145	2206	2406	2453	3107	3100	3051	2214	2339	2284	2238
Sum of Nzero	359	397	306	307	344	660	886	915	418	394	271	247
Sum of Nmeas	2879	9409	8518	1E+0	8360	5975	3306	3066	3205	4738	6243	6294

Figure 10. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 2J3KL Gillnet 5 1/2 in..

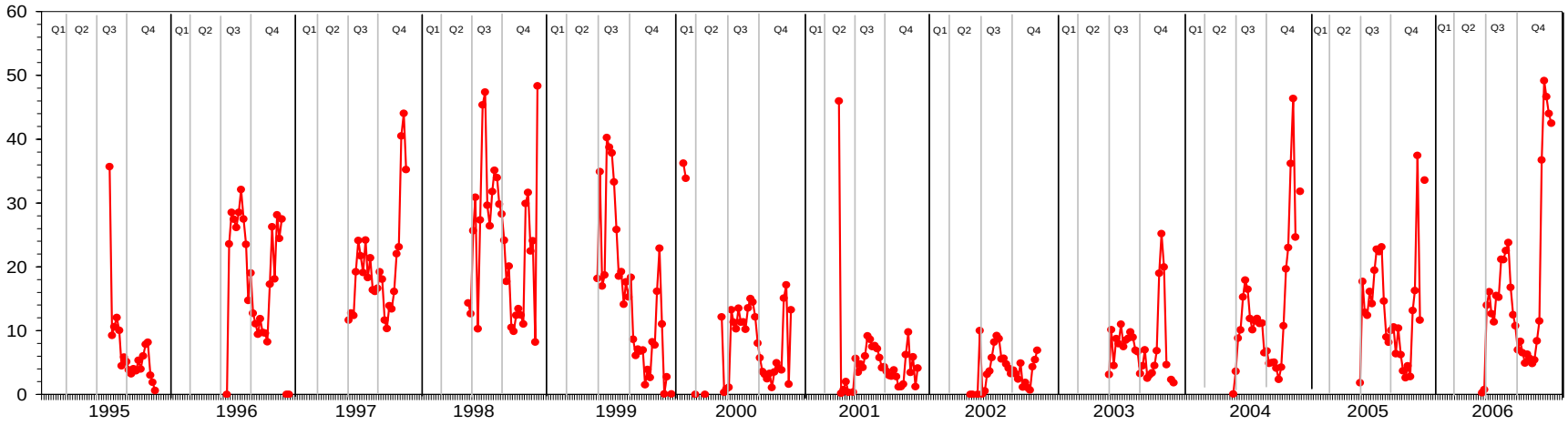


Figure 11. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, 2J3KL Gillnet 5 1/2 in..

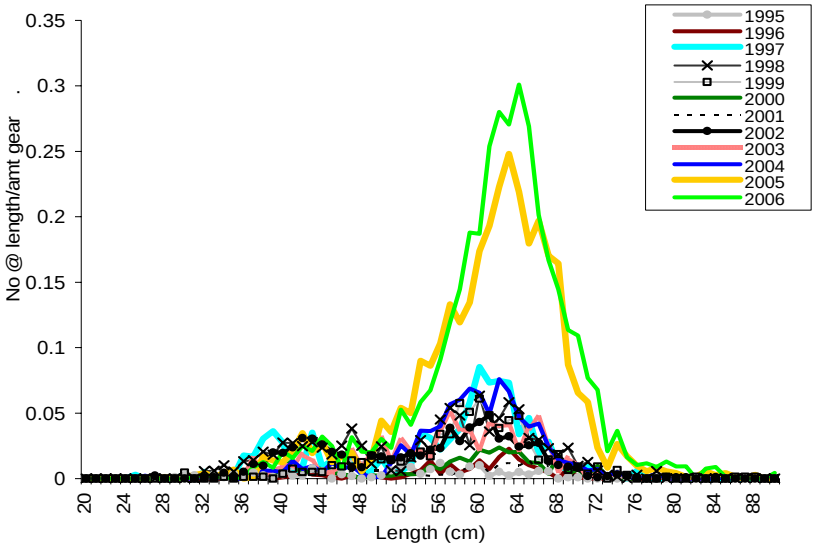
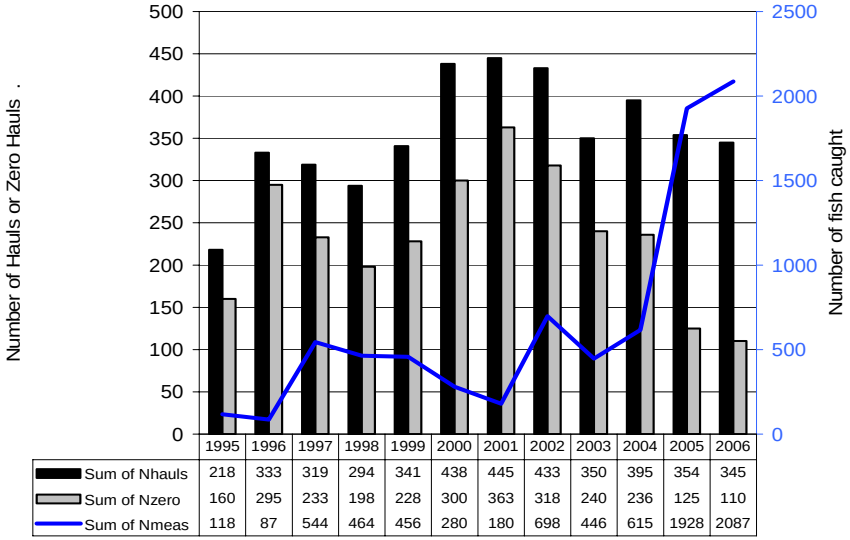


Figure 12. Relative length frequency (number at length / amount of gear) for control and experimental gears, 2J Gillnet 5 1/2 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	218	333	319	294	341	438	445	433	350	395	354	345
Sum of Nzero	160	295	233	198	228	300	363	318	240	236	125	110
Sum of Nmeas	118	87	544	464	456	280	180	698	446	615	1928	2087

Figure 13. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 2J Gillnet 5 1/2 in..

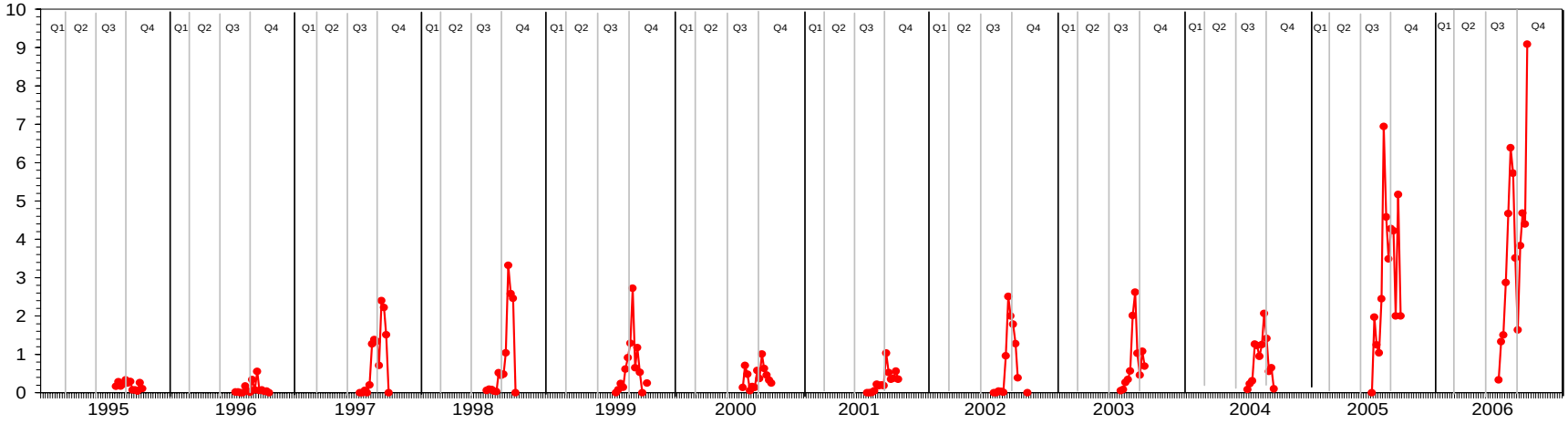


Figure 14. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, 2J Gillnet 5 1/2 in..

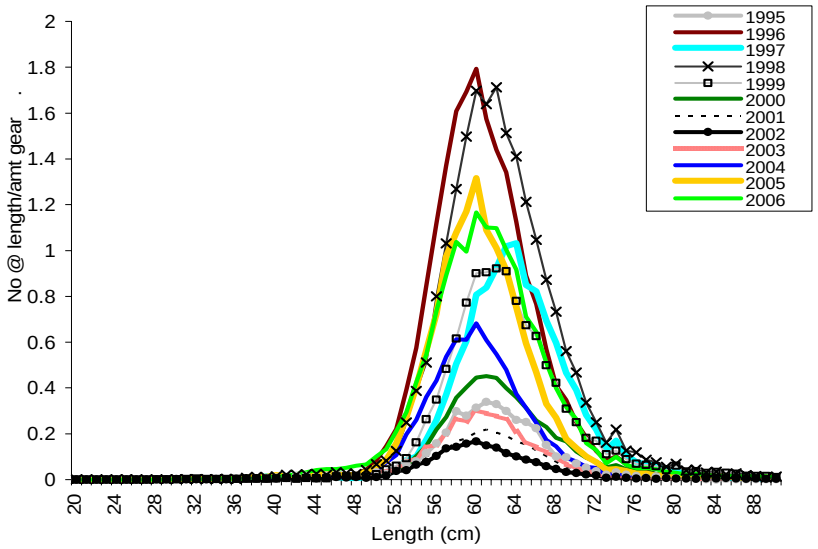
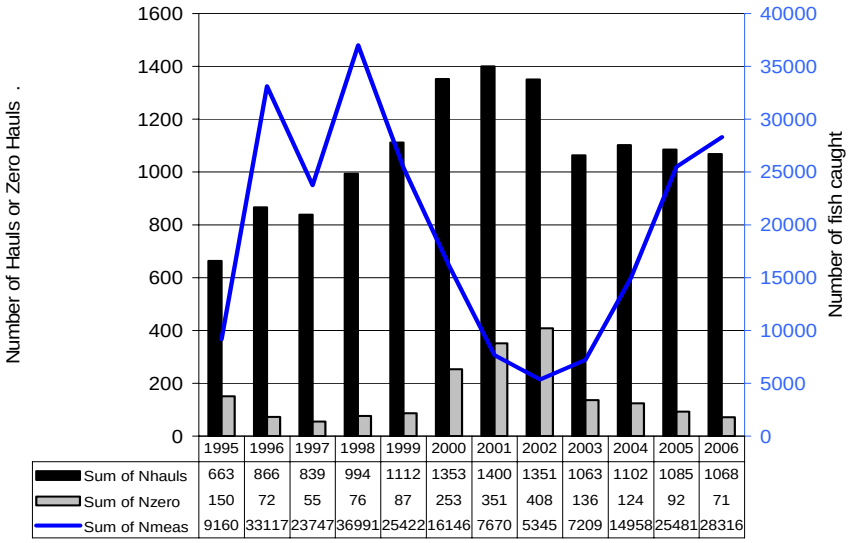


Figure 15. Relative length frequency (number at length / amount of gear) for control and experimental gears, 3K Gillnet 5 1/2 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	663	866	839	994	1112	1353	1400	1351	1063	1102	1085	1068
Sum of Nzero	150	72	55	76	87	253	351	408	136	124	92	71
Sum of Nmeas	9160	33117	23747	36991	25422	16146	7670	5345	7209	14958	25481	28316

Figure 16. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 3K Gillnet 5 1/2 in..

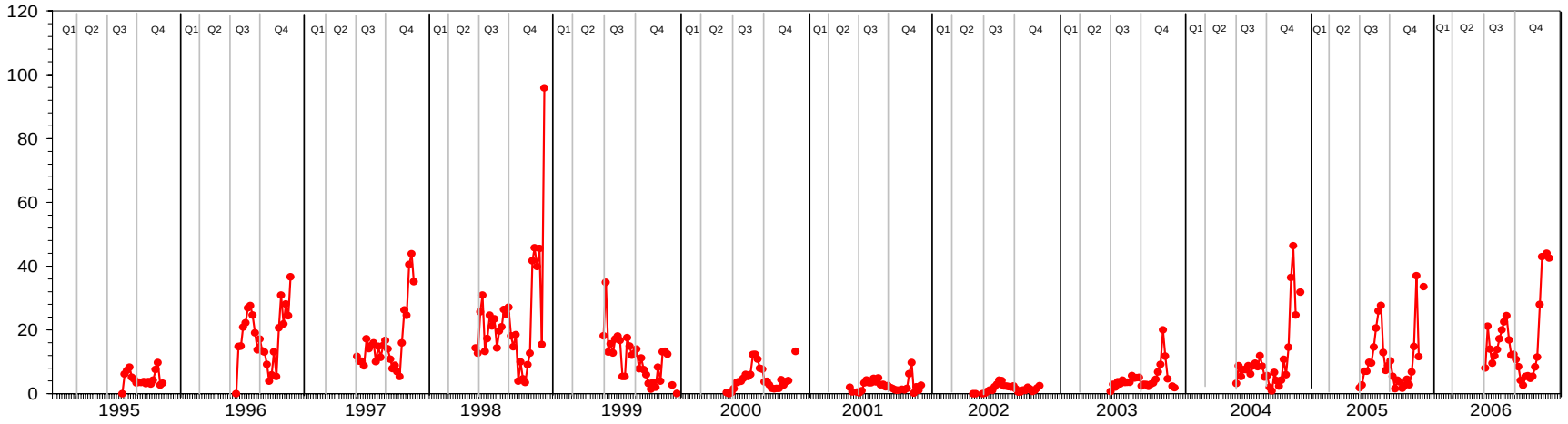


Figure 17. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, 3K Gillnet 5 1/2 in..

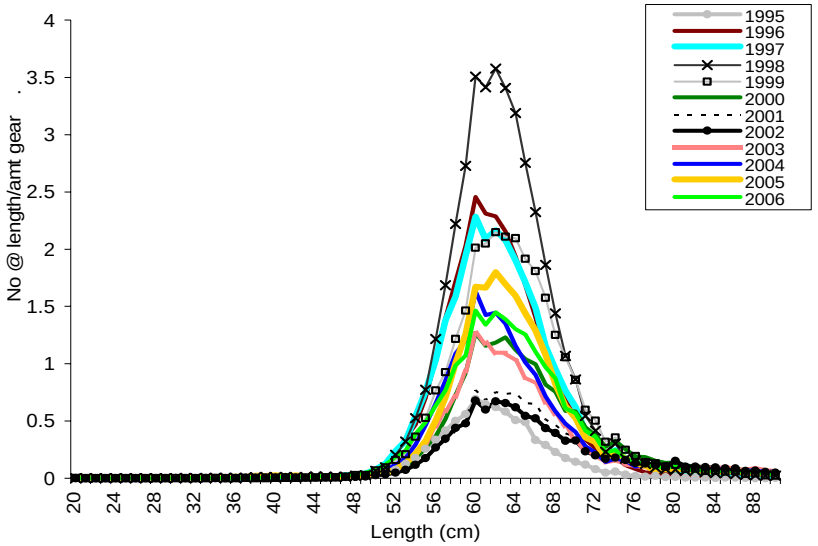
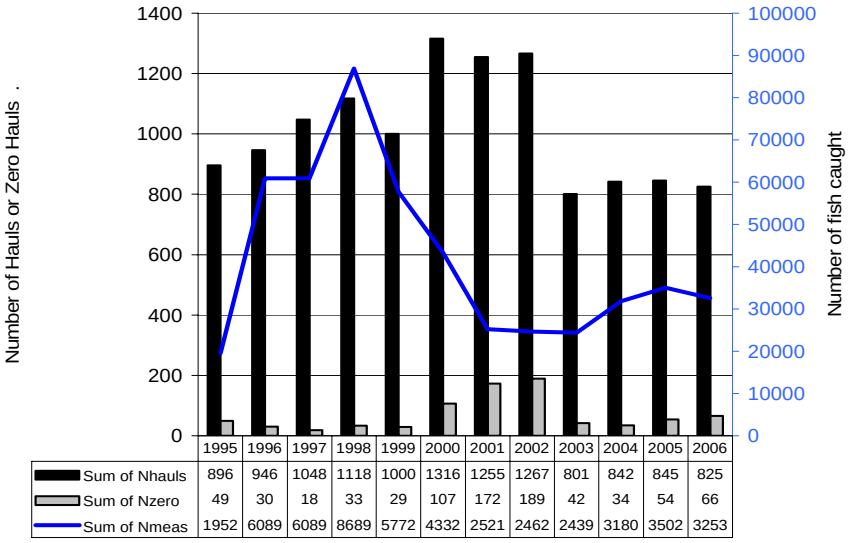


Figure 18. Relative length frequency (number at length / amount of gear) for control and experimental gears, 3L Gillnet 5 1/2 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	896	946	1048	1118	1000	1316	1255	1267	801	842	845	825
Sum of Nzero	49	30	18	33	29	107	172	189	42	34	54	66
Sum of Nmeas	1952	6089	6089	8689	5772	4332	2521	2462	2439	3180	3502	3253

Figure 19. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 3L Gillnet 5 1/2 in..

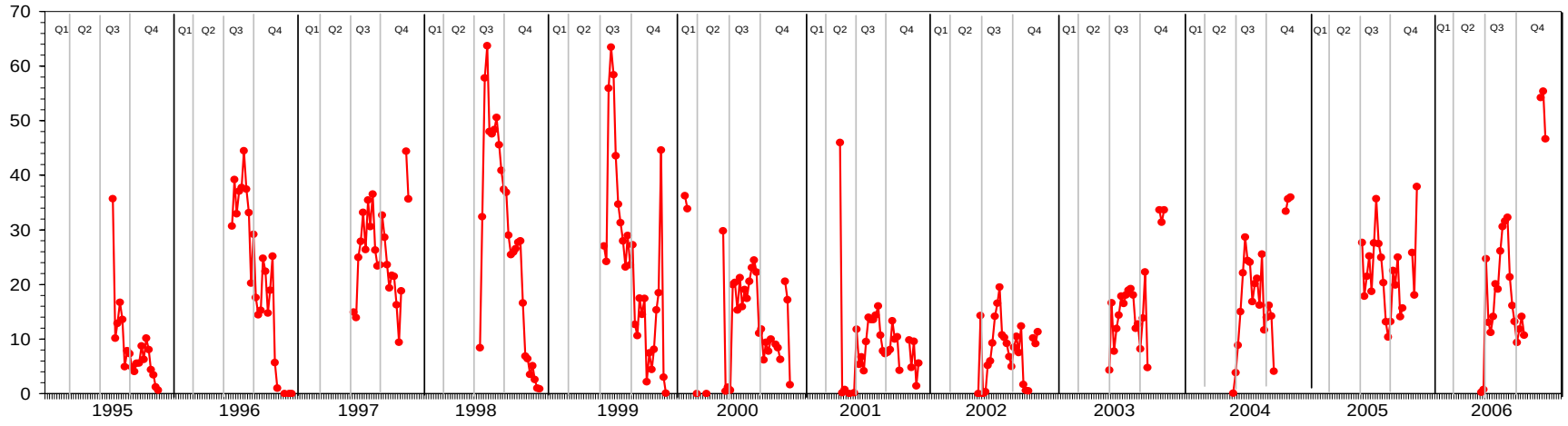


Figure 20. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, 3L Gillnet 5 1/2 in..

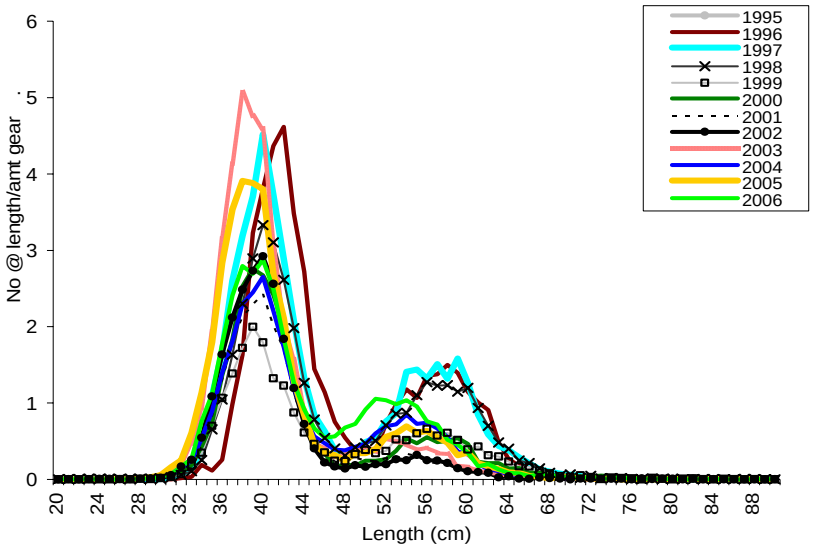
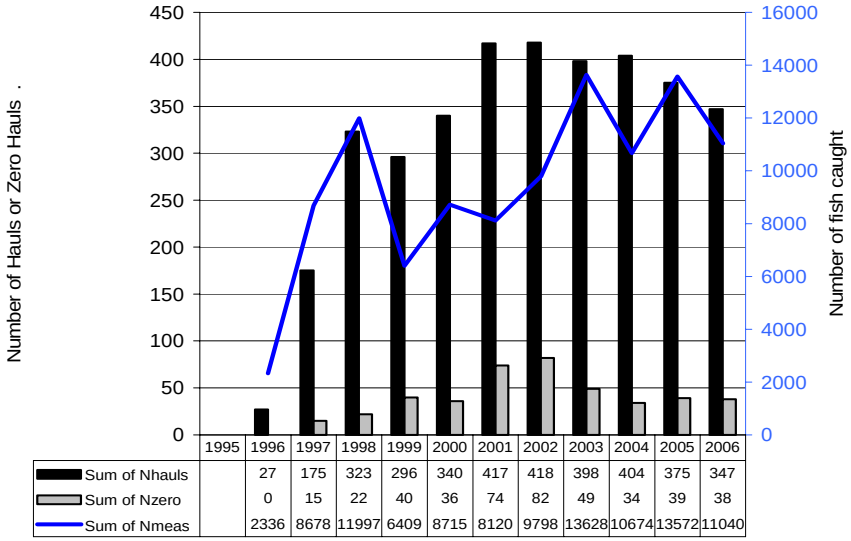


Figure 21. Relative length frequency (number at length / amount of gear) for control and experimental gears, 2J3KL Gillnet 3 1/4 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls		27	175	323	296	340	417	418	398	404	375	347
Sum of Nzero		0	15	22	40	36	74	82	49	34	39	38
Sum of Nmeas		2336	8678	11997	6409	8715	8120	9798	13628	10674	13572	11040

Figure 22. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 2J3KL Gillnet 3 1/4 in..

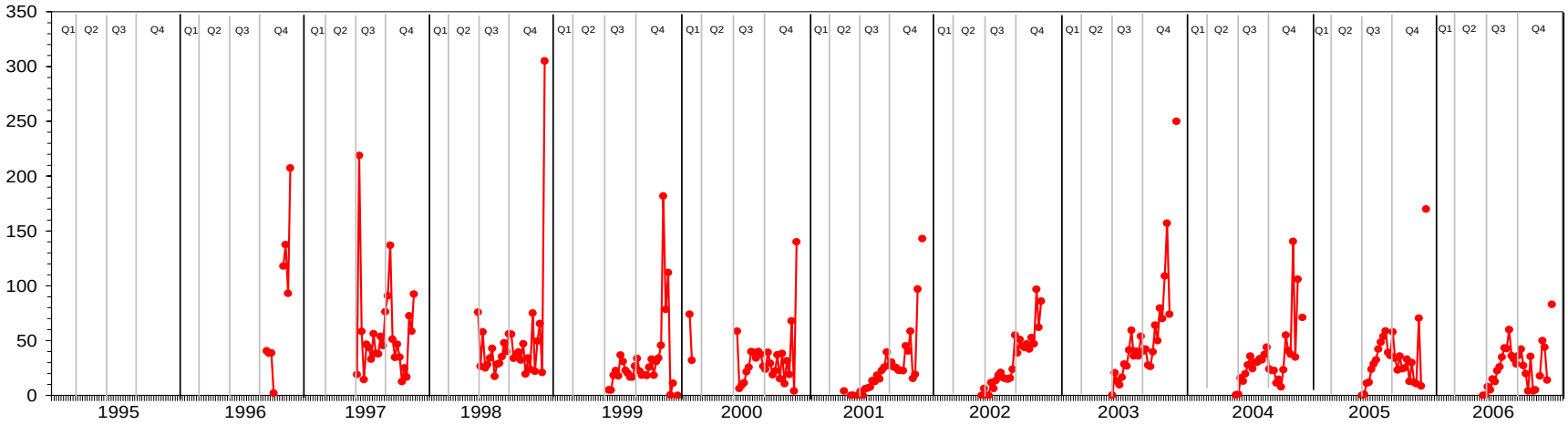


Figure 23. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, 2J3KL Gillnet 3 1/4 in..

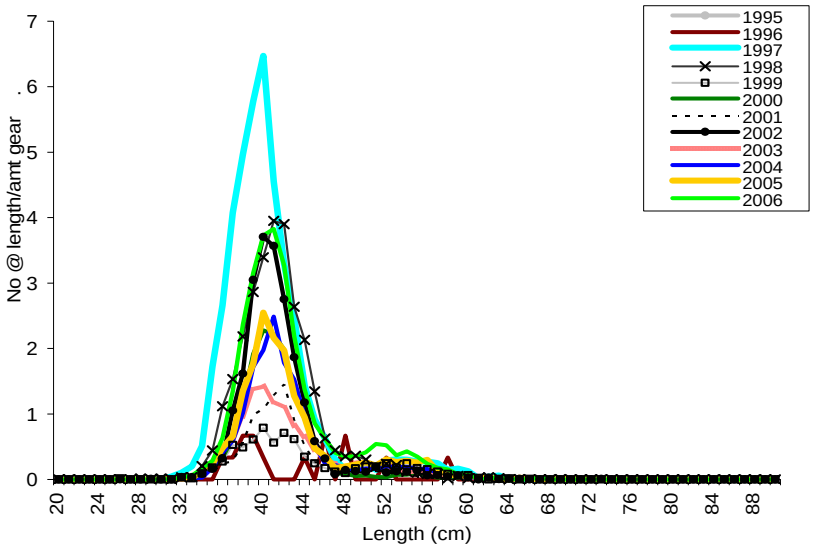
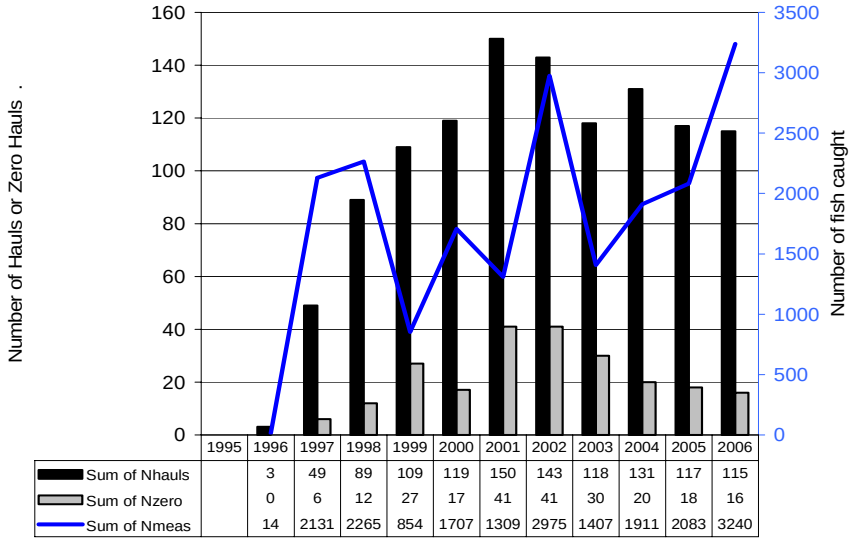


Figure 24. Relative length frequency (number at length / amount of gear) for control and experimental gears, 2J Gillnet 3 1/4 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls		3	49	89	109	119	150	143	118	131	117	115
Sum of Nzero		0	6	12	27	17	41	41	30	20	18	16
Sum of Nmeas		14	2131	2265	854	1707	1309	2975	1407	1911	2083	3240

Figure 25. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 2J Gillnet 3 1/4 in..

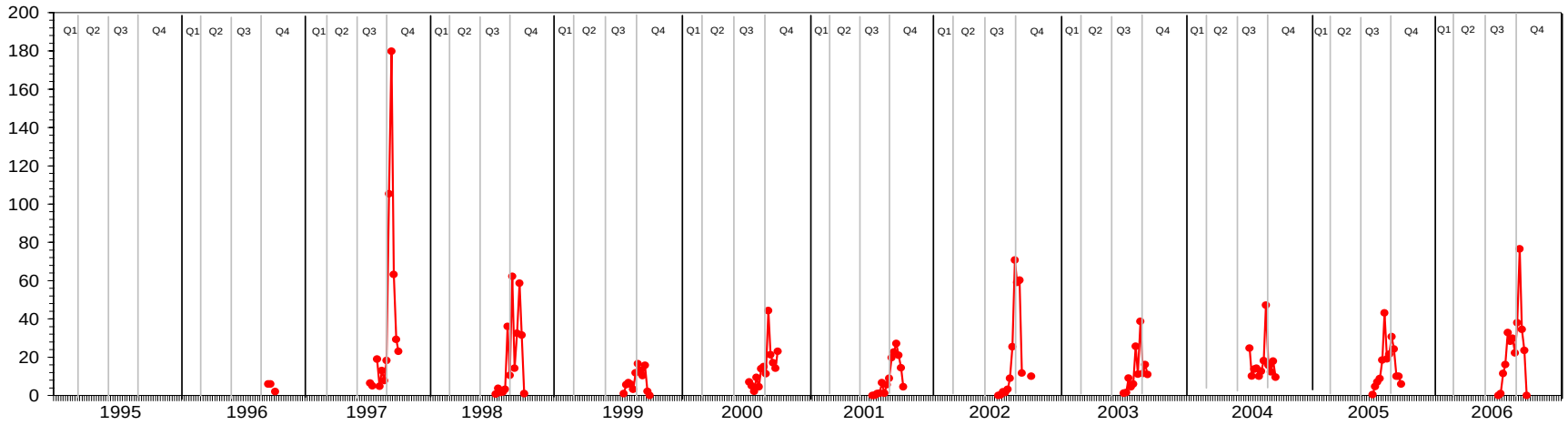


Figure 26. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, 2J Gillnet 3 1/4 in..

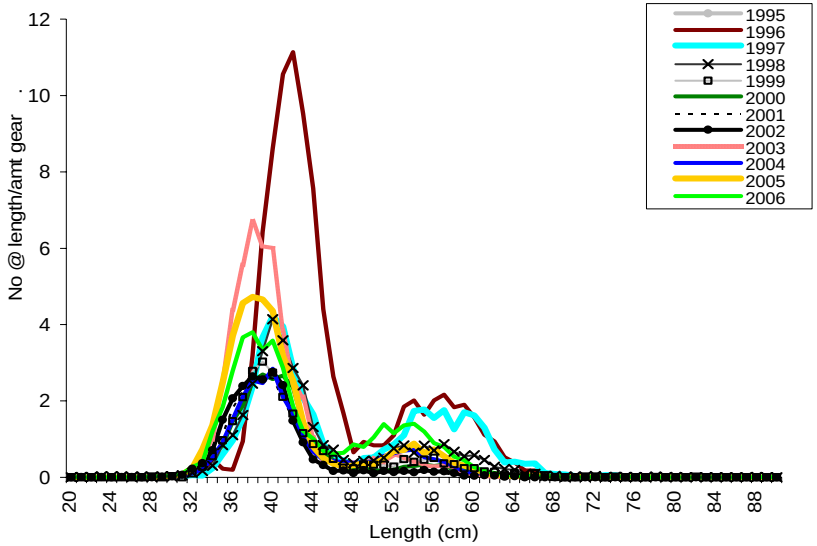


Figure 27. Relative length frequency (number at length / amount of gear) for control and experimental gears, 3K Gillnet 3 1/4 in..

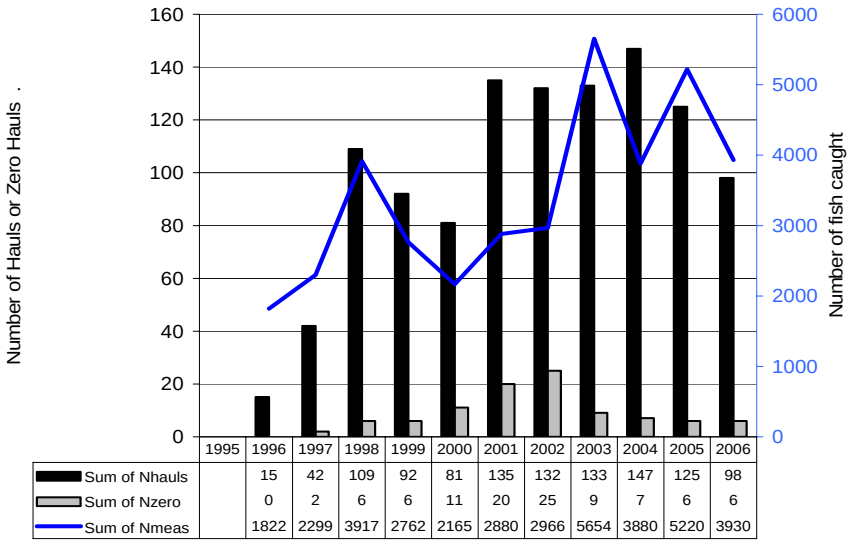


Figure 28. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 3K Gillnet 3 1/4 in..

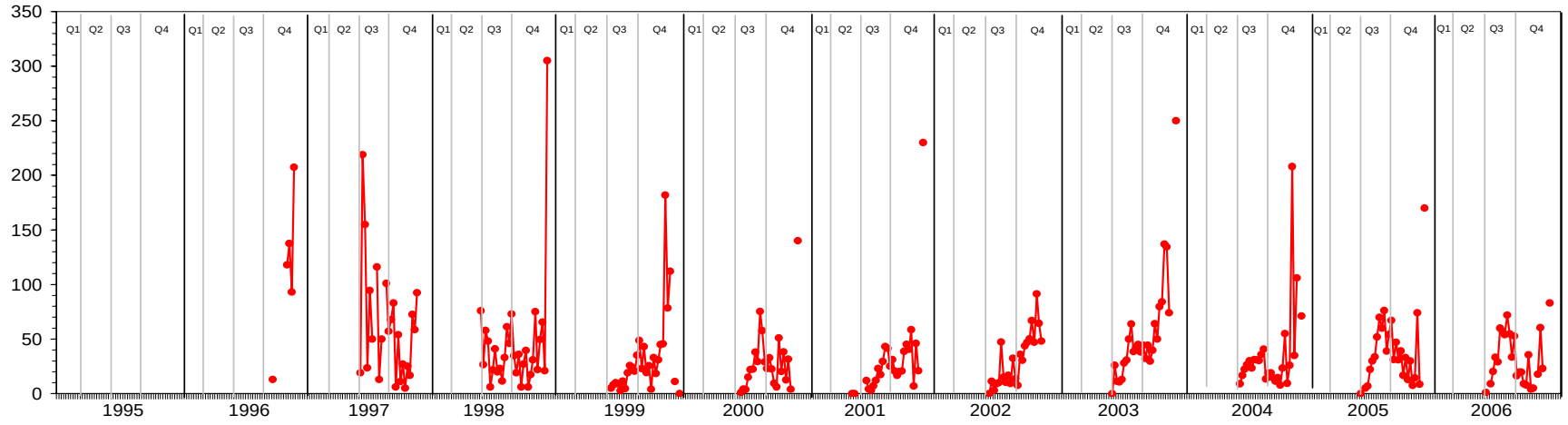


Figure 29. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, 3K Gillnet 3 1/4 in..

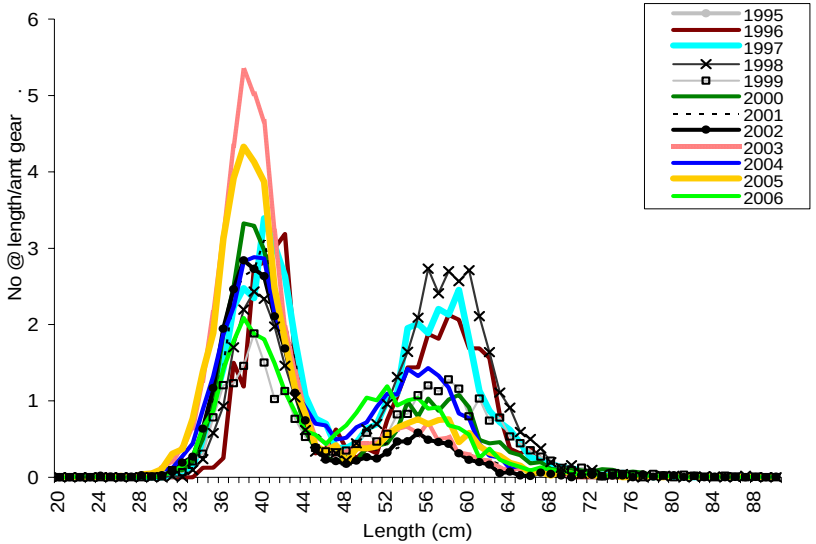
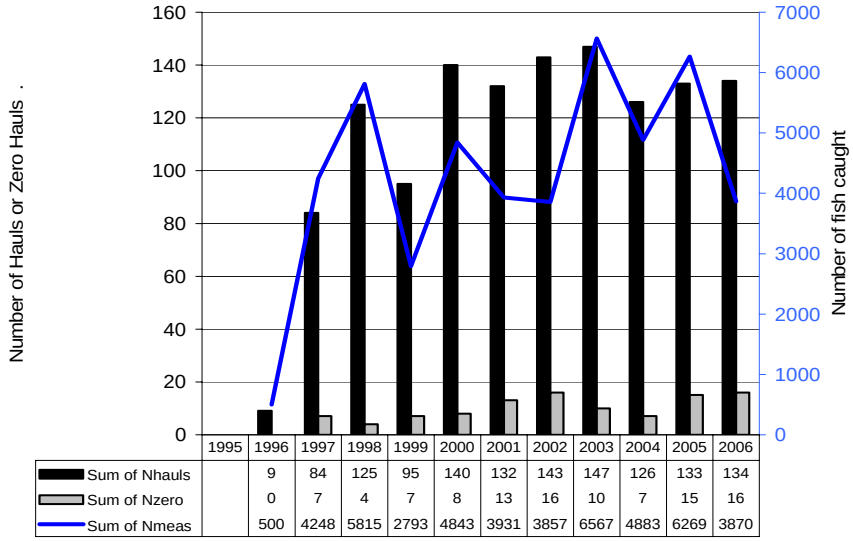


Figure 30. Relative length frequency (number at length / amount of gear) for control and experimental gears, 3L Gillnet 3 1/4 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls		9	84	125	95	140	132	143	147	126	133	134
Sum of Nzero		0	7	4	7	8	13	16	10	7	15	16
Sum of Nmeas		500	4248	5815	2793	4843	3931	3857	6567	4883	6269	3870

Figure 31. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 3L Gillnet 3 1/4 in..

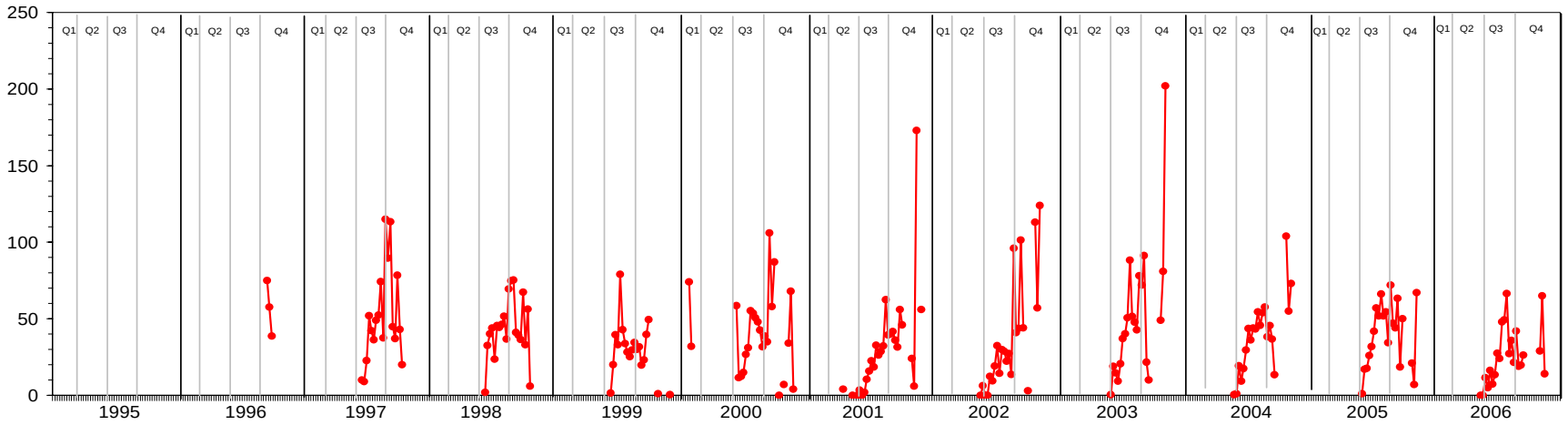


Figure 32. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, 3L Gillnet 3 1/4 in..

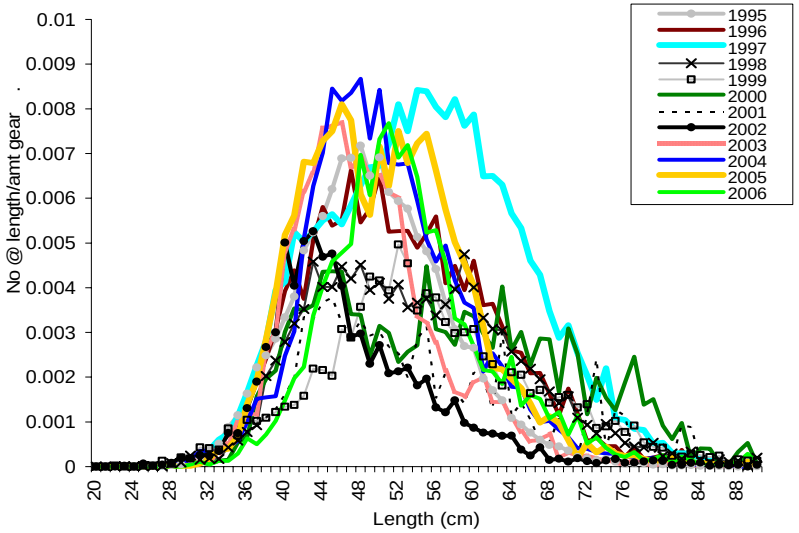


Figure 33. Relative length frequency (number at length / amount of gear) for control and experimental gears, 2J3KL Linetrawl .

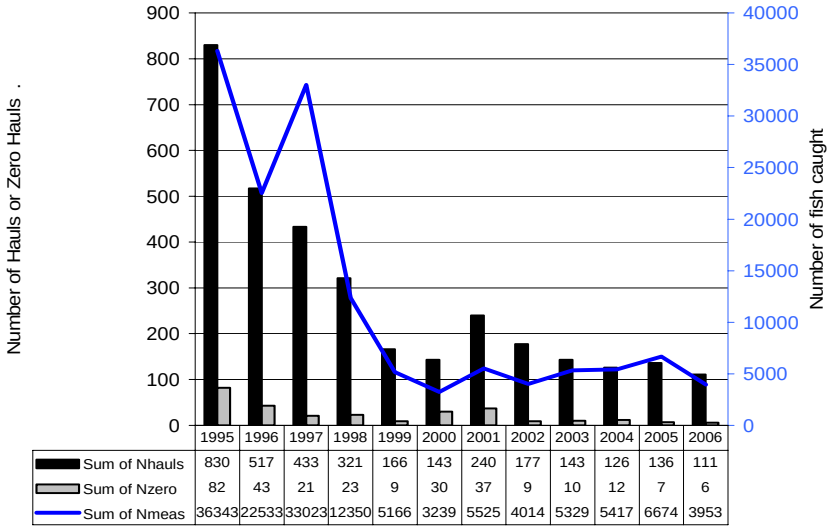


Figure 34. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 2J3KL Linetrawl .

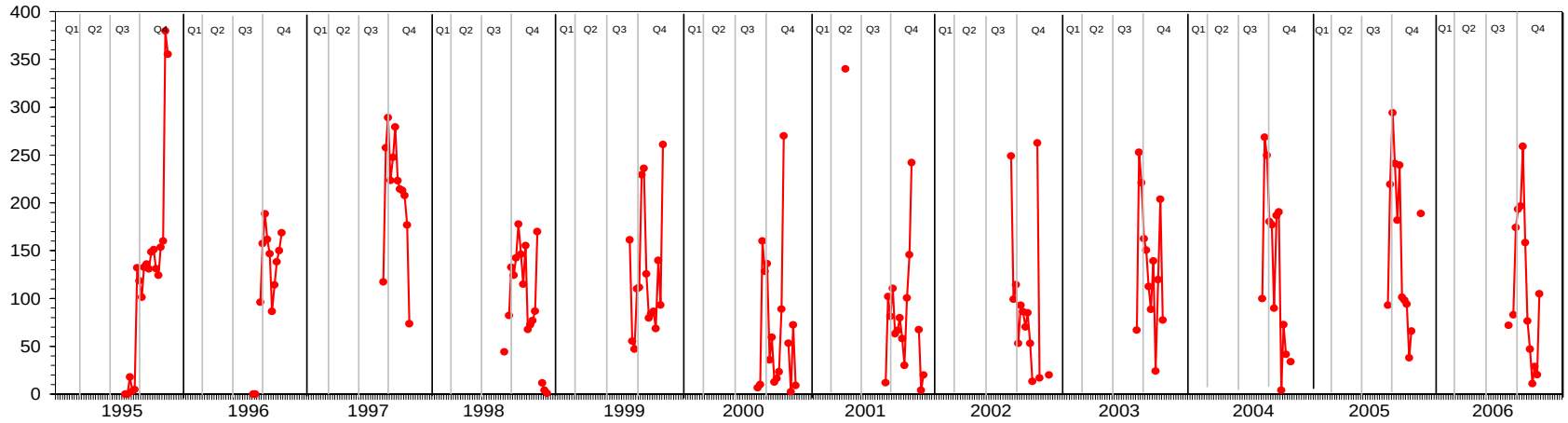


Figure 35. Catch per unit effort (in numbers of fish per 1000 hooks) for all sets (control and experimental) averaged for each week, 2J3KL Linetrawl .

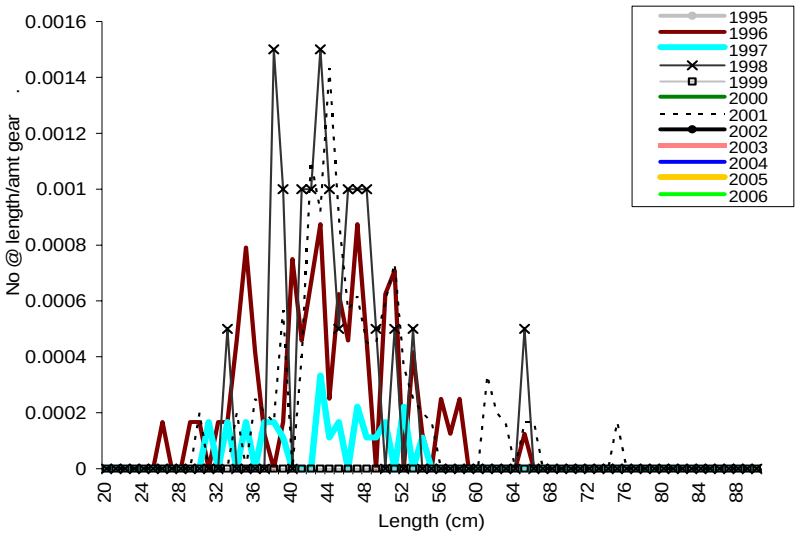


Figure 36. Relative length frequency (number at length / amount of gear) for control and experimental gears, 2J Linetrawl .

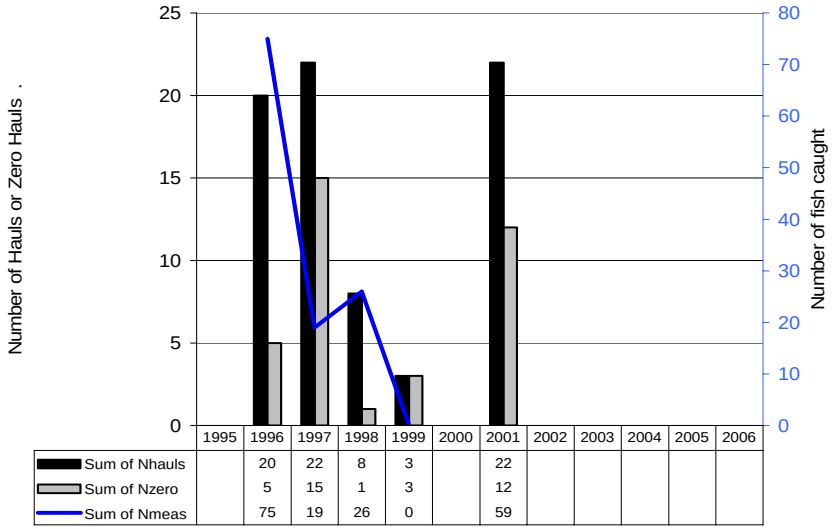


Figure 37. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 2J Linetrawl .

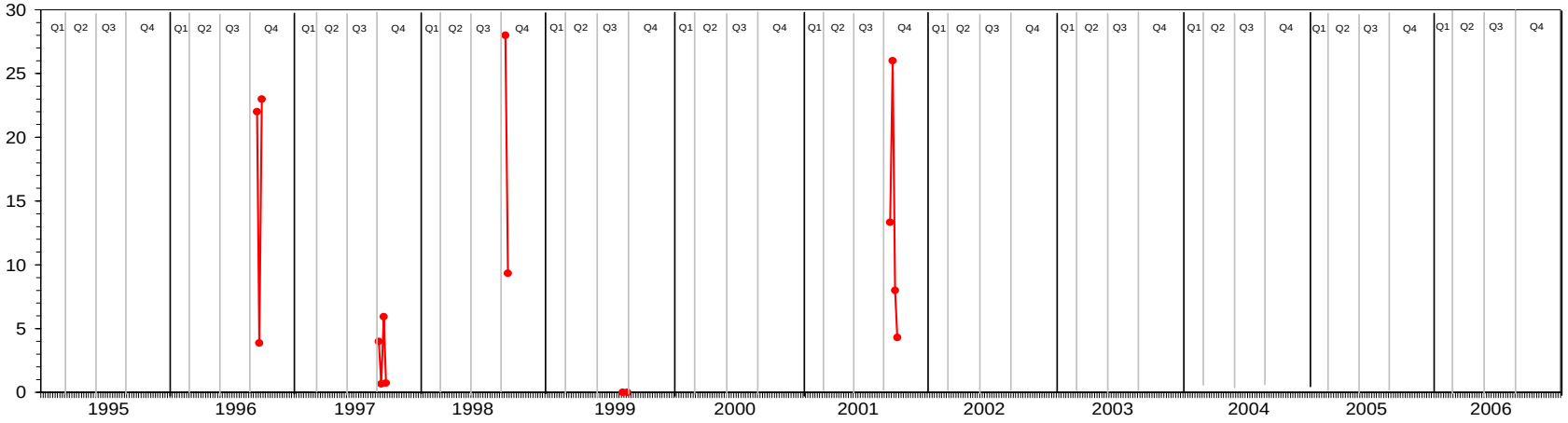


Figure 38. Catch per unit effort (in numbers of fish per 1000 hooks) for all sets (control and experimental) averaged for each week, 2J Linetrawl .

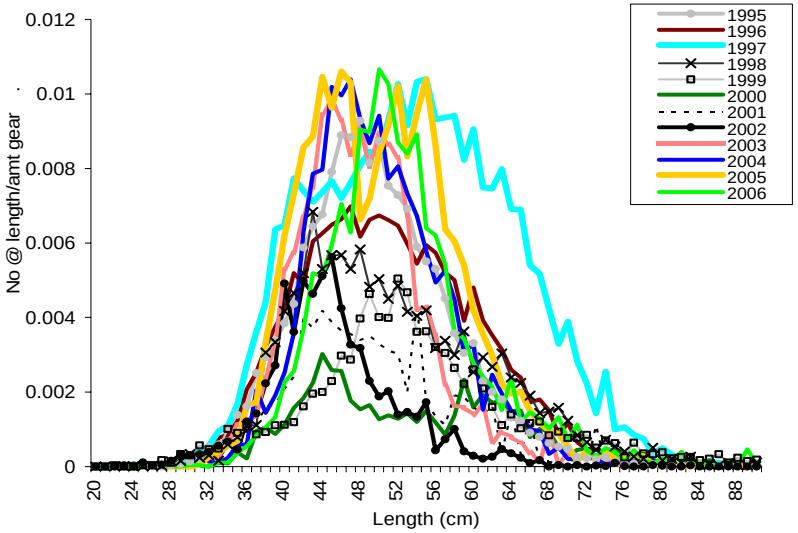
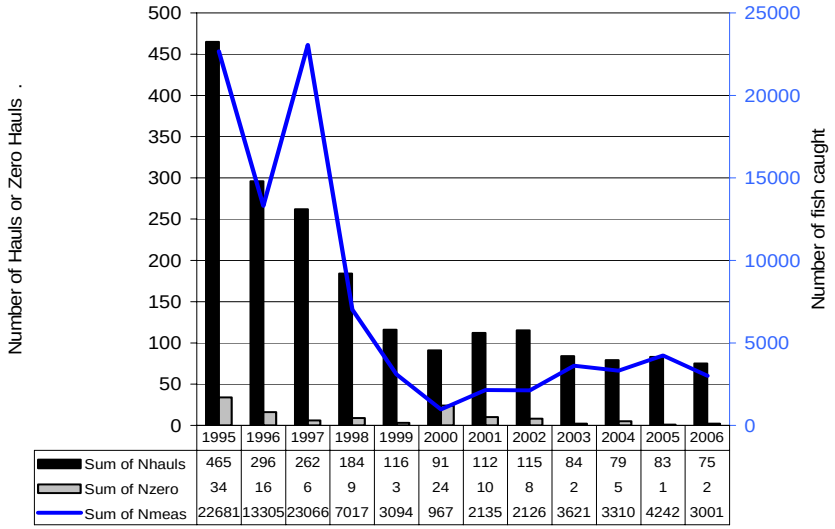


Figure 39. Relative length frequency (number at length / amount of gear) for control and experimental gears, 3K Linetrawl .



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	465	296	262	184	116	91	112	115	84	79	83	75
Sum of Nzero	34	16	6	9	3	24	10	8	2	5	1	2
Sum of Nmeas	22681	13305	23066	7017	3094	967	2135	2126	3621	3310	4242	3001

Figure 40. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 3K Linetrawl .

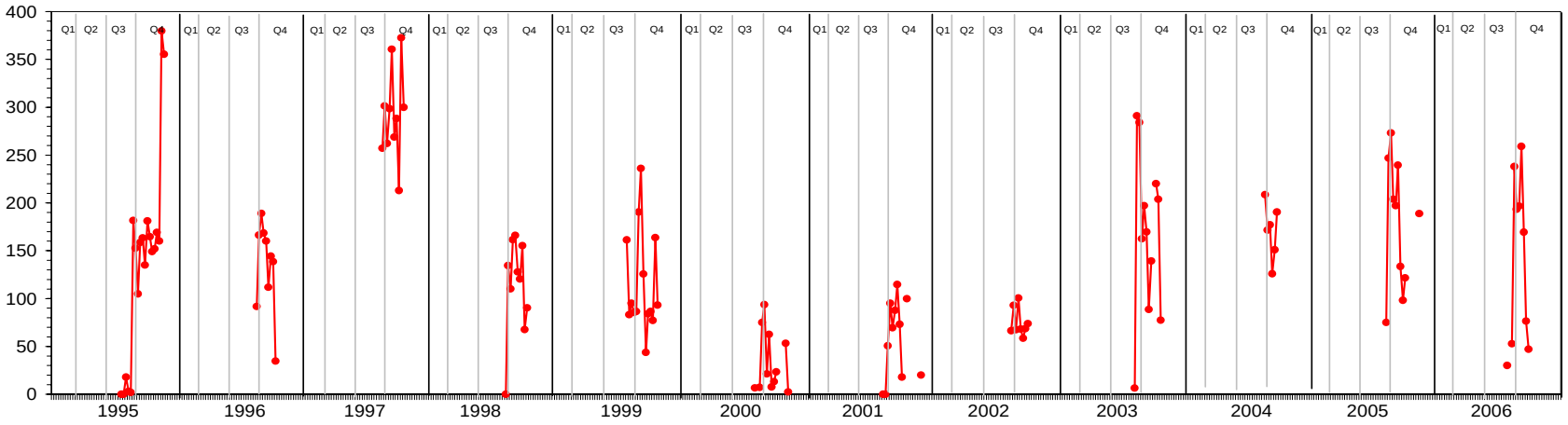


Figure 41. Catch per unit effort (in numbers of fish per 1000 hooks) for all sets (control and experimental) averaged for each week, 3K Linetrawl .

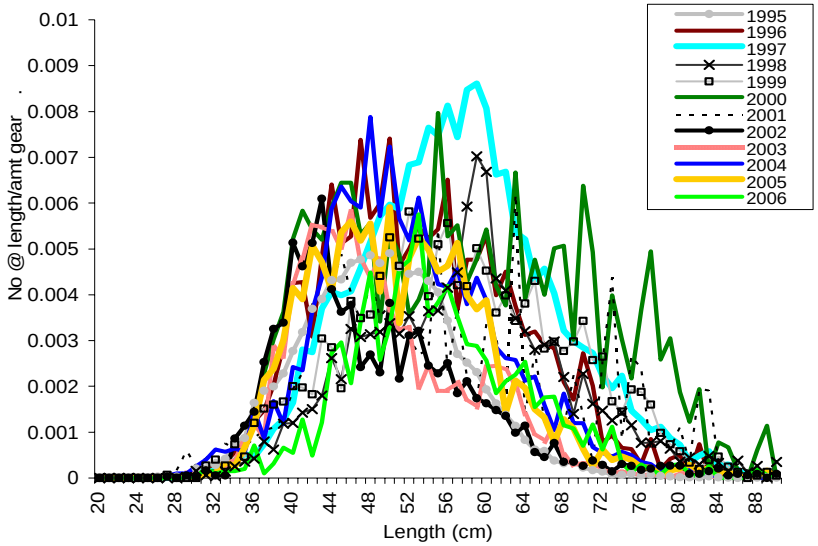
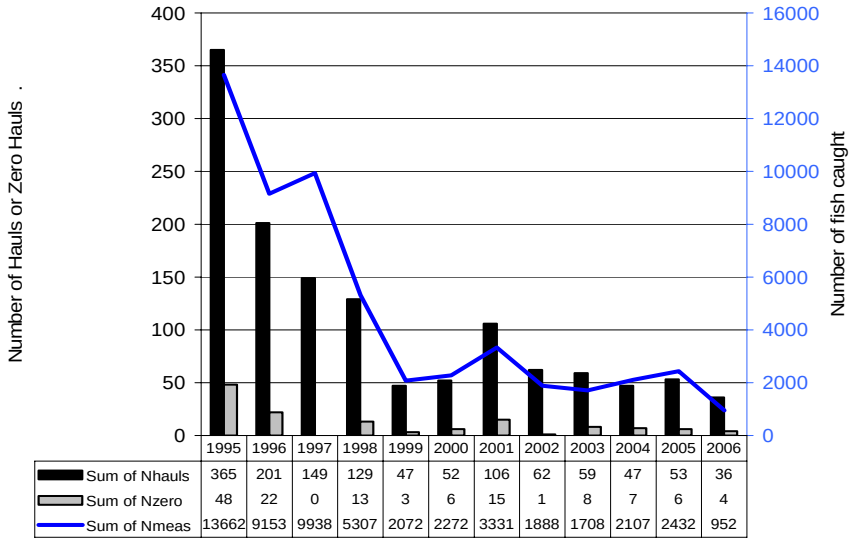


Figure 42. Relative length frequency (number at length / amount of gear) for control and experimental gears, 3L Linetrawl .



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	365	201	149	129	47	52	106	62	59	47	53	36
Sum of Nzero	48	22	0	13	3	6	15	1	8	7	6	4
Sum of Nmeas	13662	9153	9938	5307	2072	2272	3331	1888	1708	2107	2432	952

Figure 43. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, 3L Linetrawl .

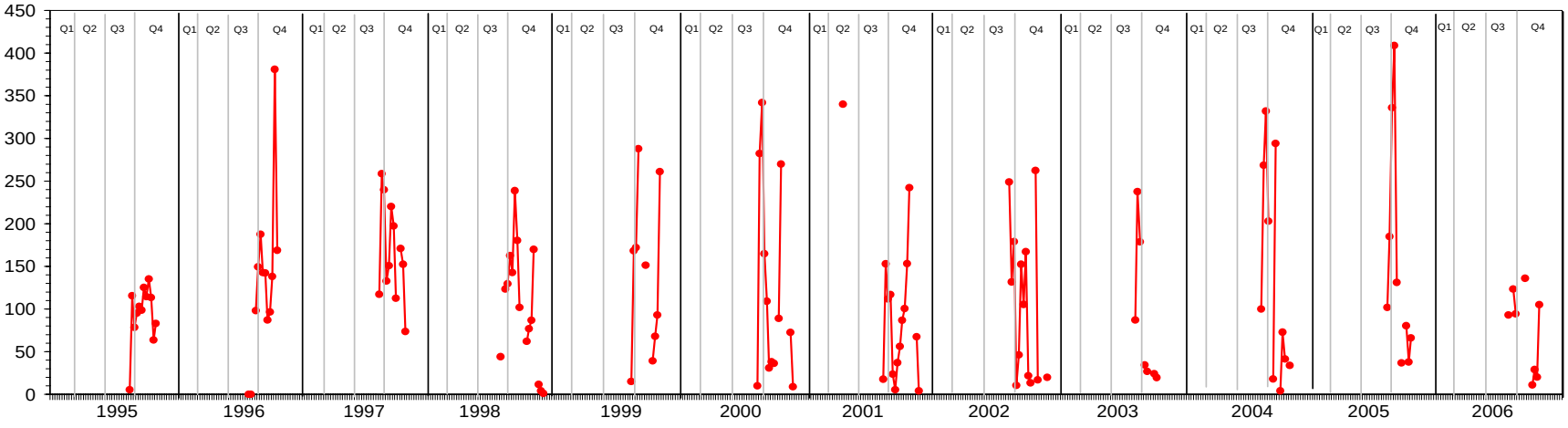


Figure 44. Catch per unit effort (in numbers of fish per 1000 hooks) for all sets (control and experimental) averaged for each week, 3L Linetrawl .

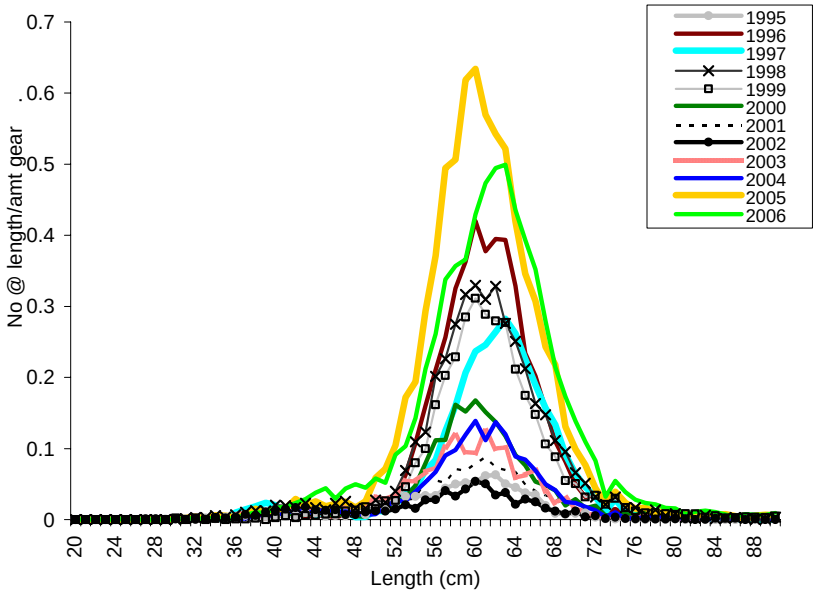
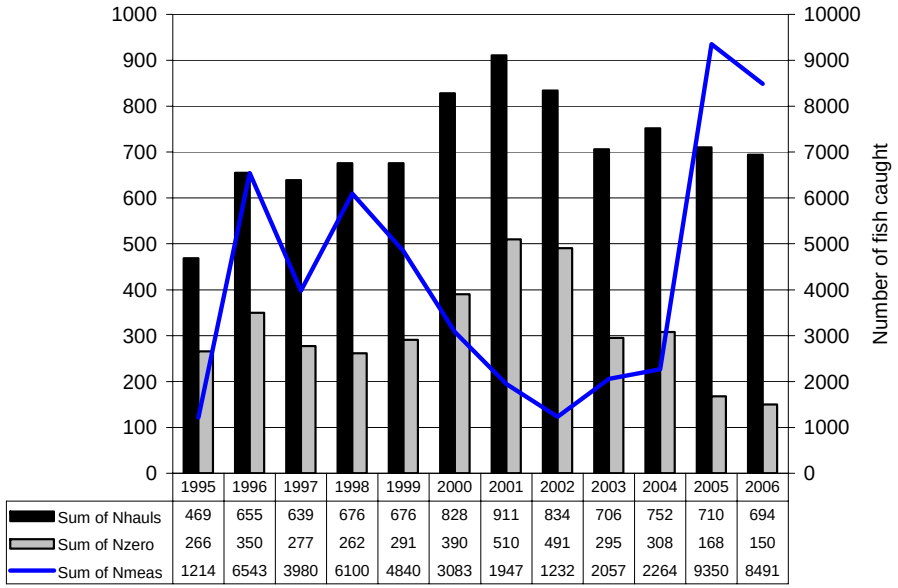


Figure 45. Relative length frequency (number at length / amount of gear) for control and experimental gears, Northern Inshore Gillnet 5 1/2 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	469	655	639	676	676	828	911	834	706	752	710	694
Sum of Nzero	266	350	277	262	291	390	510	491	295	308	168	150
Sum of Nmeas	1214	6543	3980	6100	4840	3083	1947	1232	2057	2264	9350	8491

Figure 46. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, Northern Inshore Gillnet 5 1/2 in..

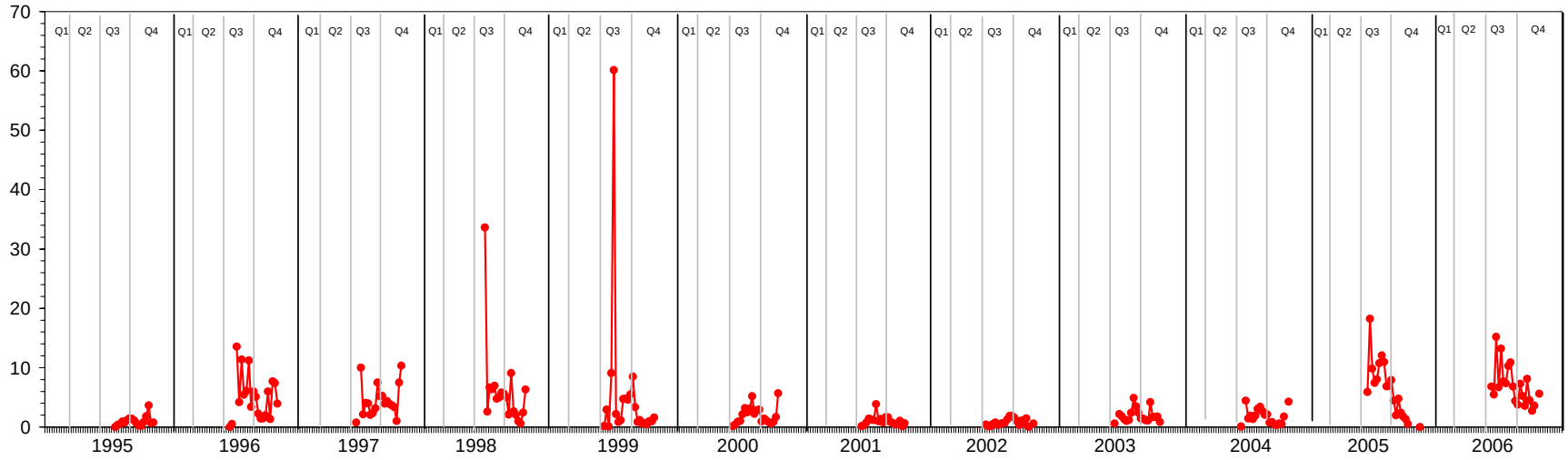


Figure 47. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, Northern Inshore Gillnet 5 1/2 in..

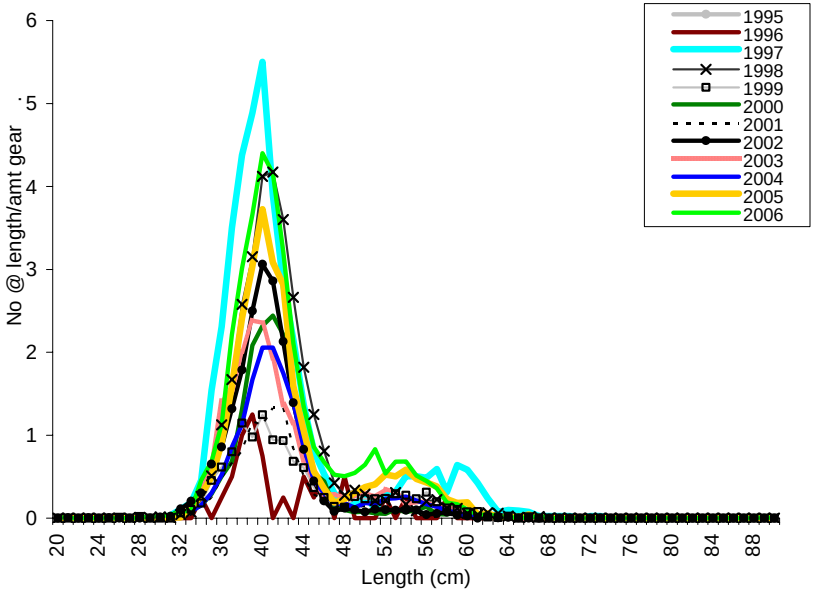
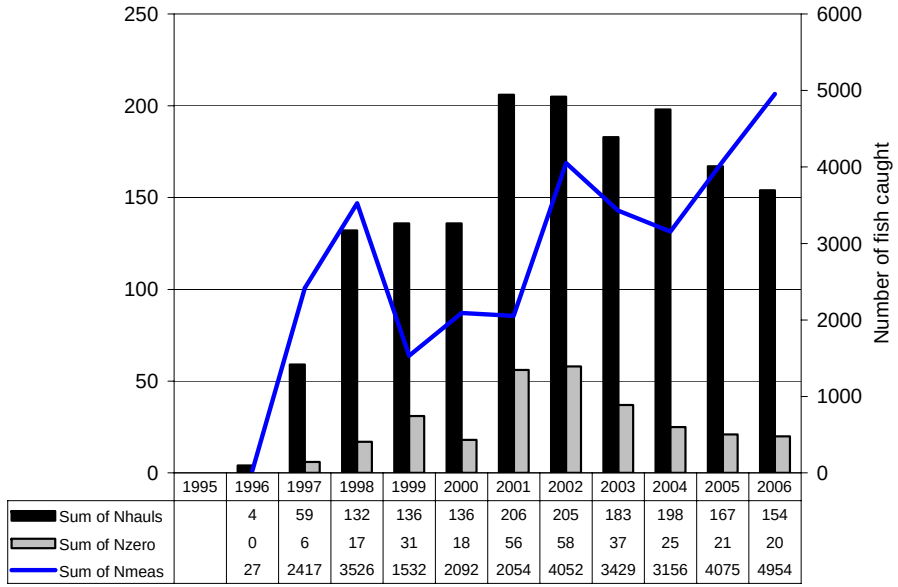


Figure 48. Relative length frequency (number at length / amount of gear) for control and experimental gears, Northern Inshore Gillnet 3 1/4 in.. Not all years shown.



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls		4	59	132	136	136	206	205	183	198	167	154
Sum of Nzero		0	6	17	31	18	56	58	37	25	21	20
Sum of Nmeas		27	2417	3526	1532	2092	2054	4052	3429	3156	4075	4954

Figure 49. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, Northern Inshore Gillnet 3 1/4 in..

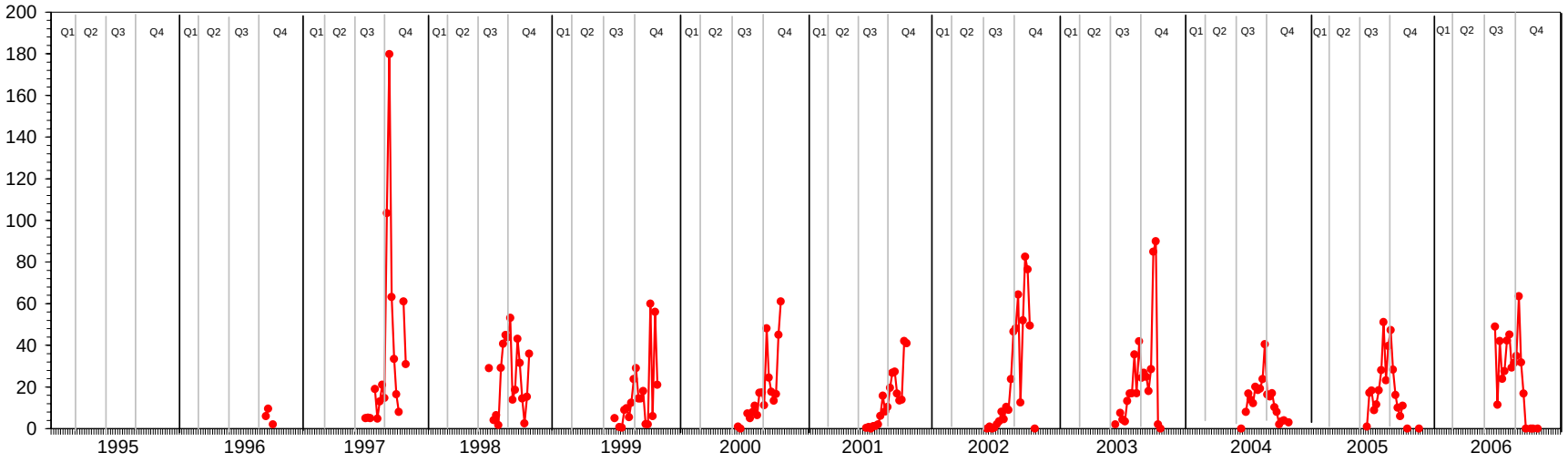


Figure 50. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, Northern Inshore Gillnet 3 1/4 in..

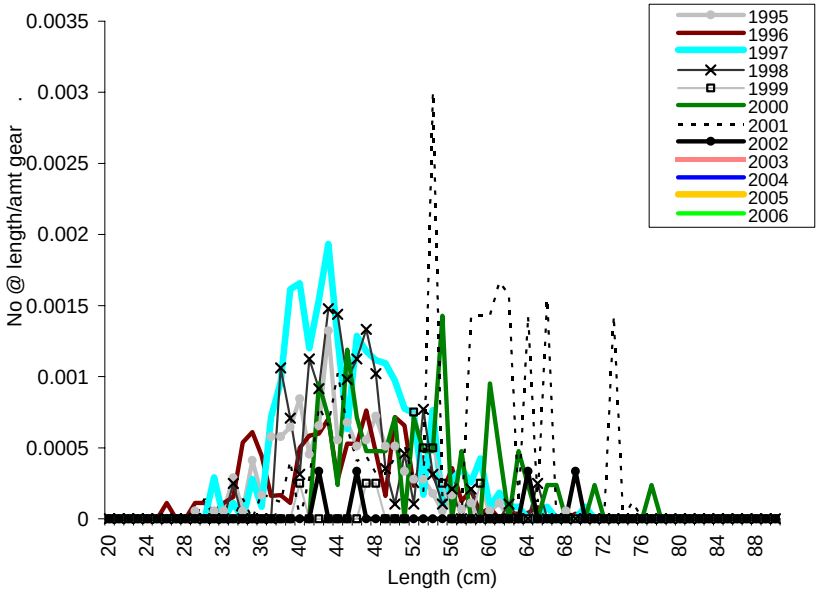
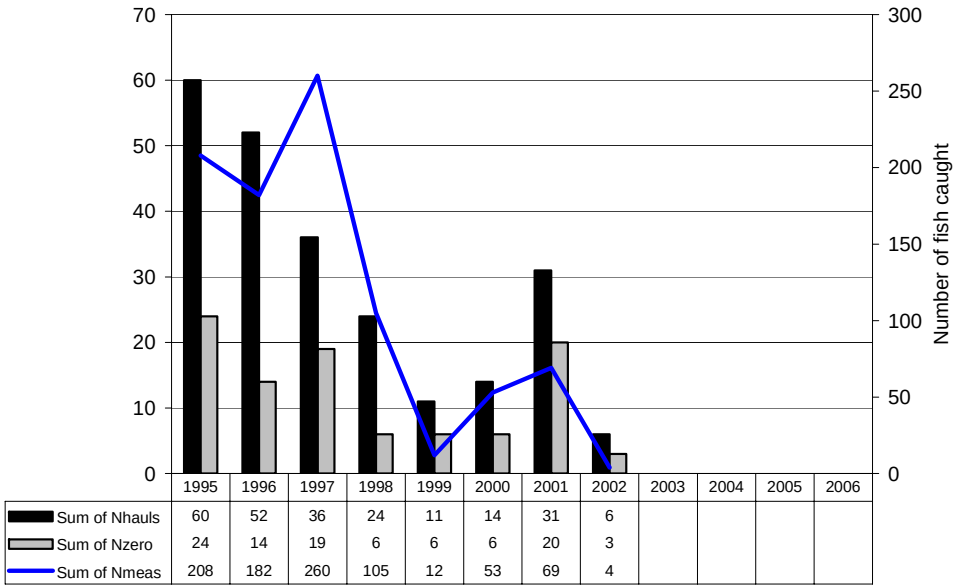


Figure 51. Relative length frequency (number at length / amount of gear) for control and experimental gears, Northern Inshore Linetrawl . Not all years shown.



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	60	52	36	24	11	14	31	6				
Sum of Nzero	24	14	19	6	6	6	20	3				
Sum of Nmeas	208	182	260	105	12	53	69	4				

Figure 52. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, Northern Inshore Linetrawl .

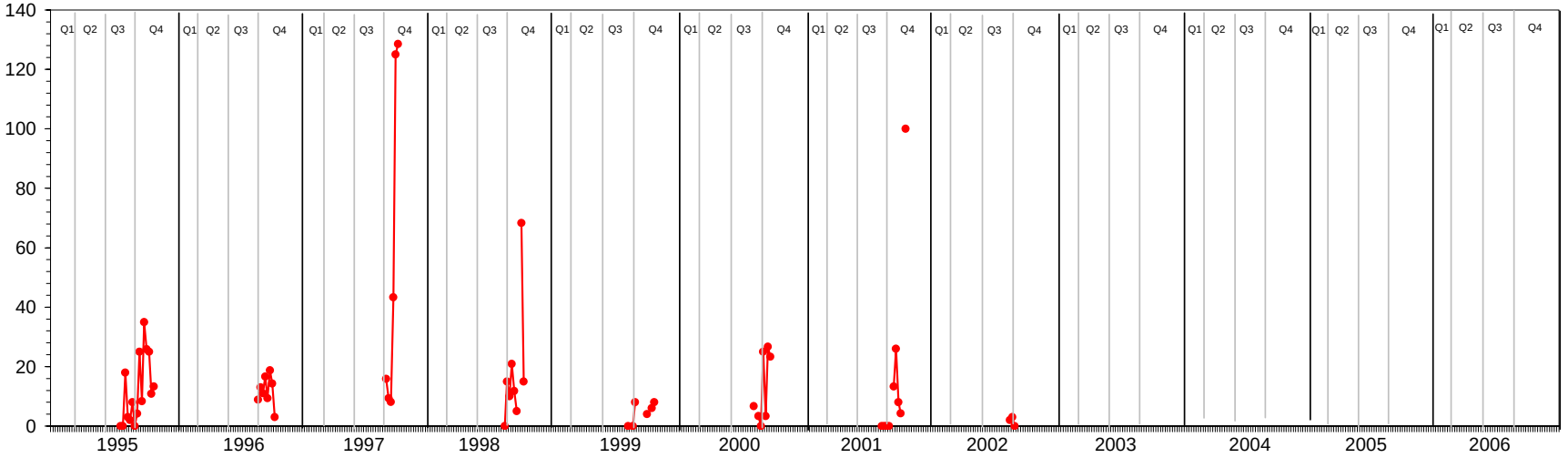


Figure 53. Catch per unit effort (in numbers of fish per 1000 hooks) for all sets (control and experimental) averaged for each week, Northern Inshore Linetrawl .

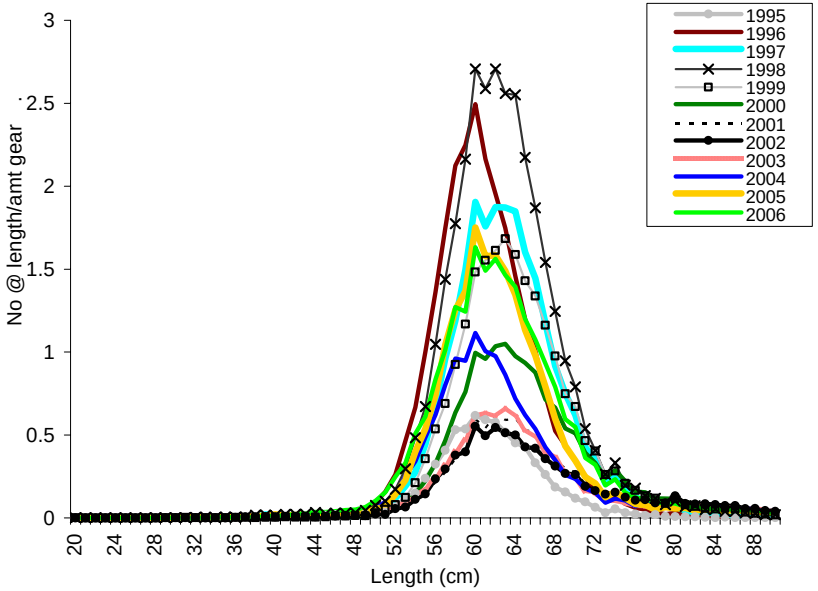
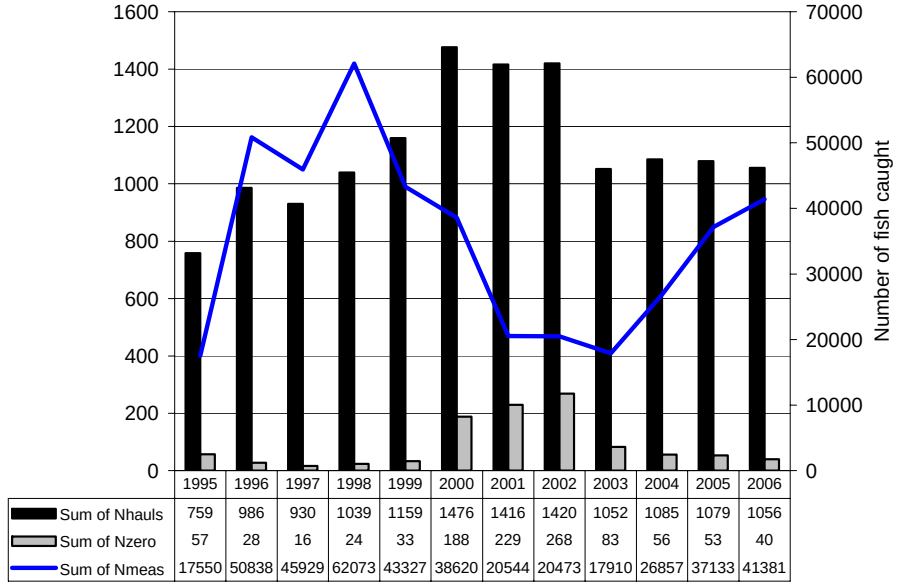


Figure 54. Relative length frequency (number at length / amount of gear) for control and experimental gears, Central Inshore Gillnet 5 1/2 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	759	986	930	1039	1159	1476	1416	1420	1052	1085	1079	1056
Sum of Nzero	57	28	16	24	33	188	229	268	83	56	53	40
Sum of Nmeas	17550	50838	45929	62073	43327	38620	20544	20473	17910	26857	37133	41381

Figure 55. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, Central Inshore Gillnet 5 1/2 in..

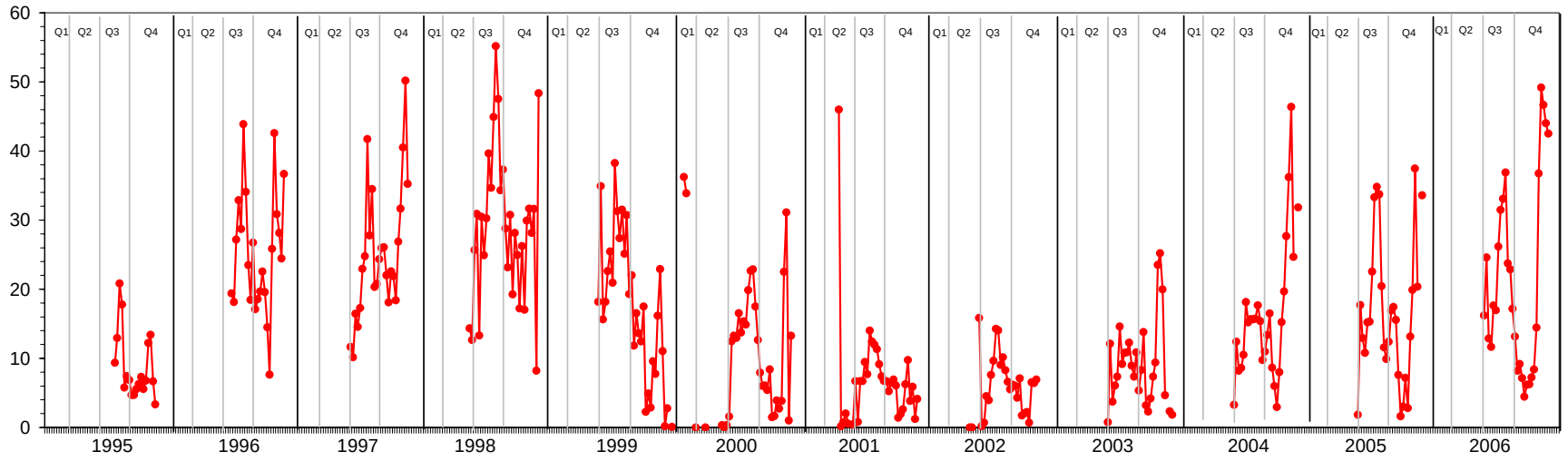


Figure 56. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, Central Inshore Gillnet 5 1/2 in..

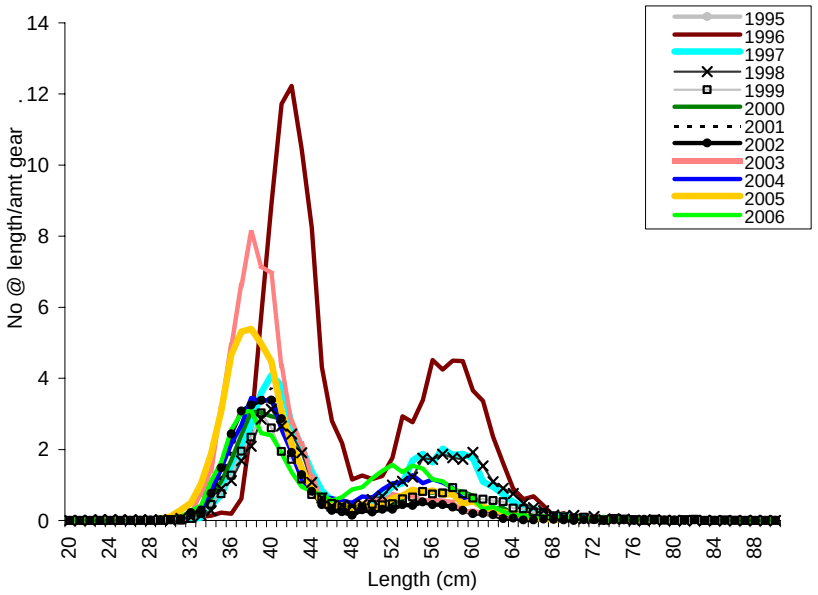
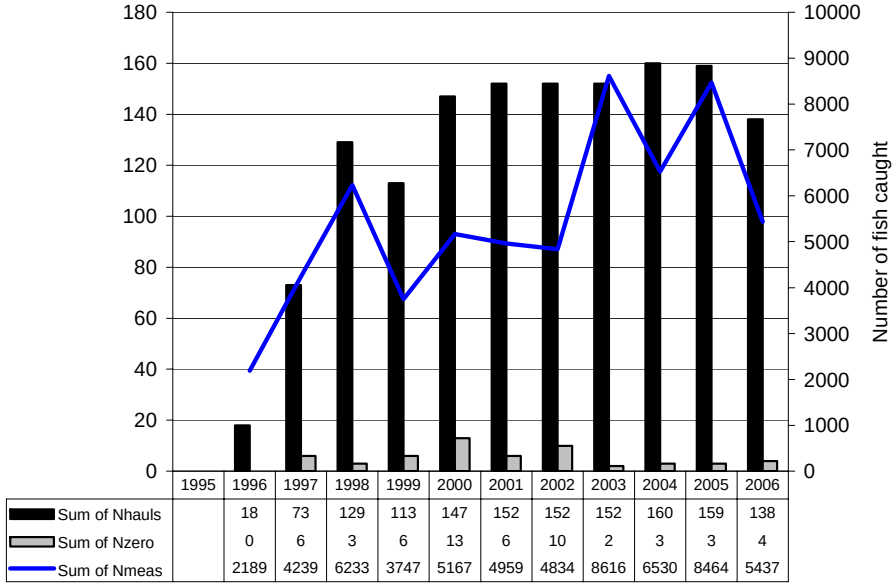


Figure 57. Relative length frequency (number at length / amount of gear) for control and experimental gears, Central Inshore Gillnet 3 1/4 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls		18	73	129	113	147	152	152	152	160	159	138
Sum of Nzero		0	6	3	6	13	6	10	2	3	3	4
Sum of Nmeas		2189	4239	6233	3747	5167	4959	4834	8616	6530	8464	5437

Figure 58. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, Central Inshore Gillnet 3 1/4 in..

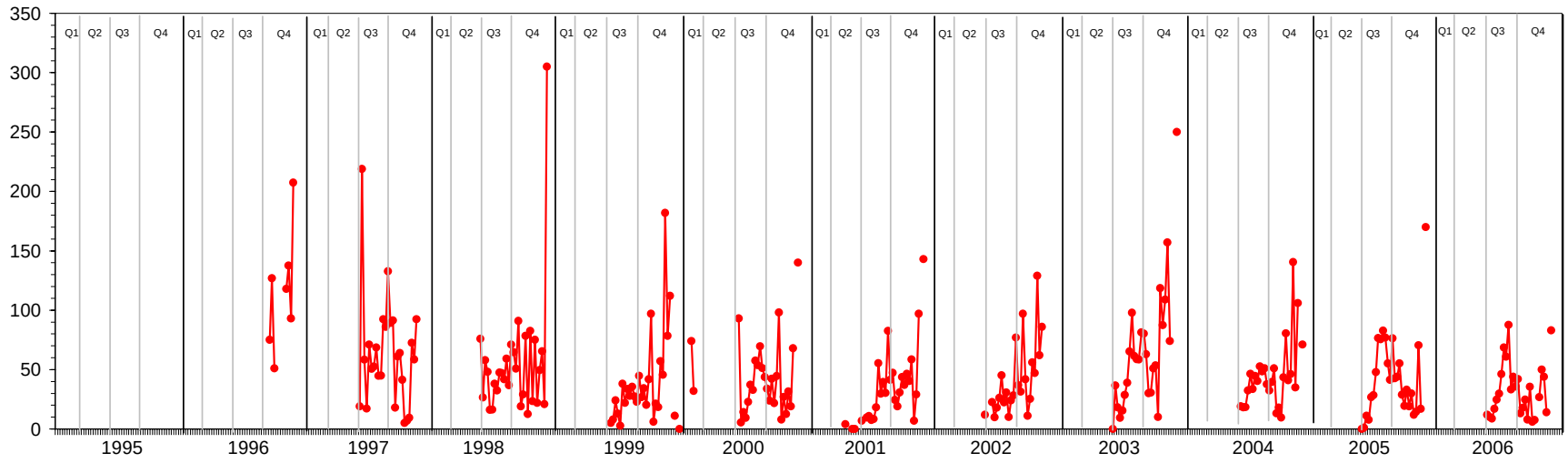


Figure 59. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, Central Inshore Gillnet 3 1/4 in..

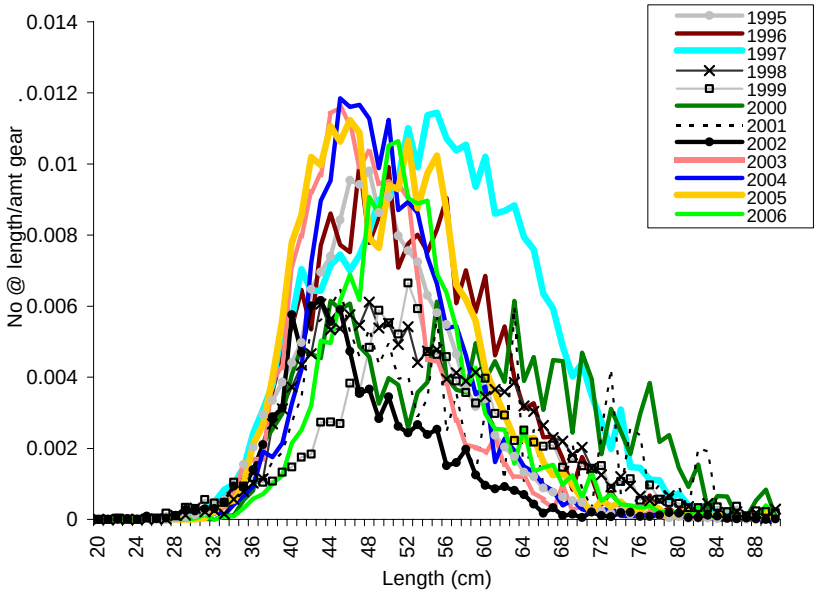
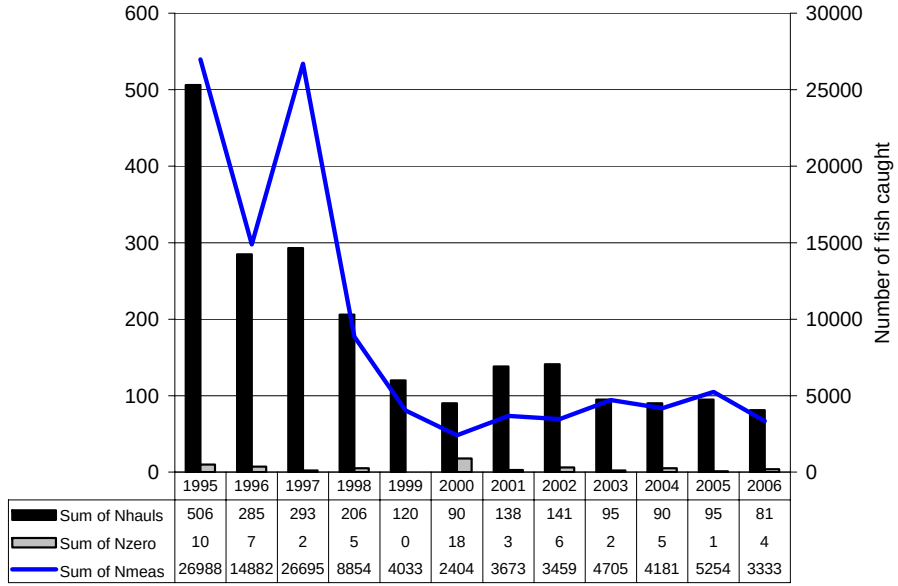


Figure 60. Relative length frequency (number at length / amount of gear) for control and experimental gears, Central Inshore Linetrawl .



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	506	285	293	206	120	90	138	141	95	90	95	81
Sum of Nzero	10	7	2	5	0	18	3	6	2	5	1	4
Sum of Nmeas	26988	14882	26695	8854	4033	2404	3673	3459	4705	4181	5254	3333

Figure 61. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, Central Inshore Linetrawl .

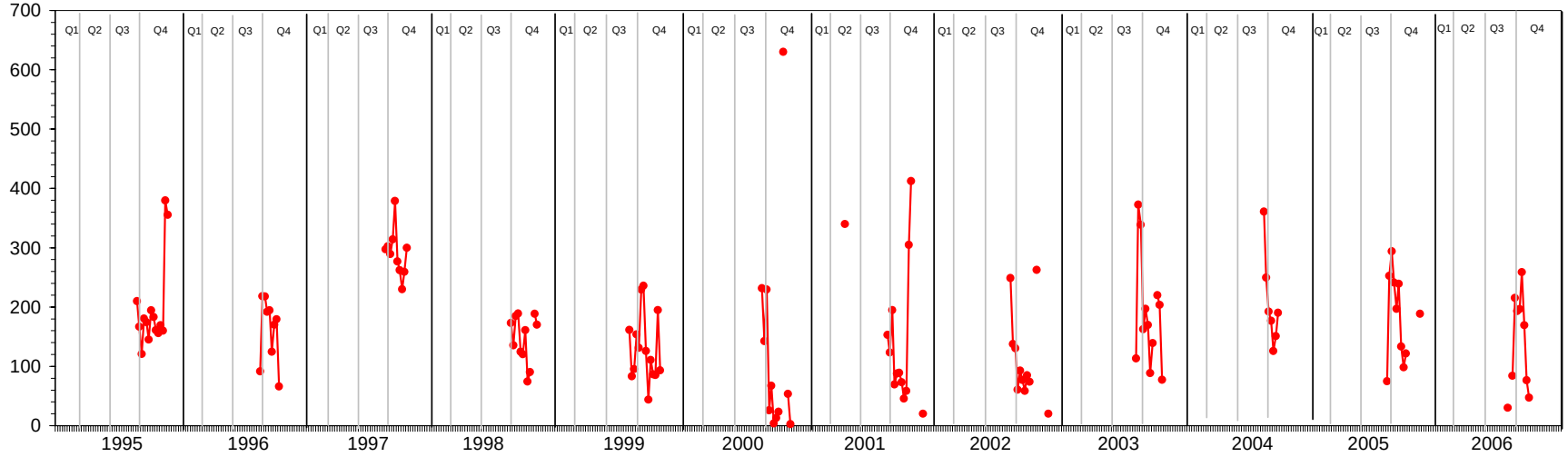


Figure 62. Catch per unit effort (in numbers of fish per 1000 hooks) for all sets (control and experimental) averaged for each week, Central Inshore Linetrawl .

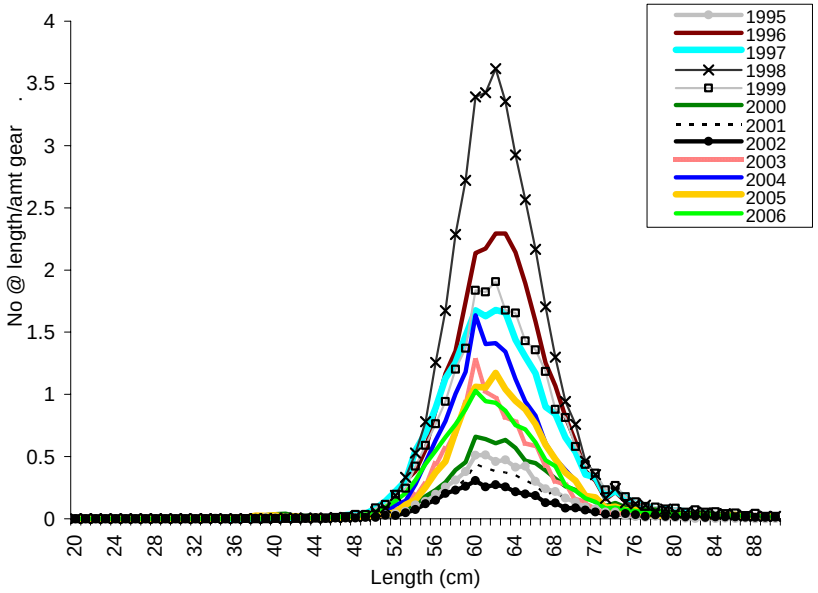
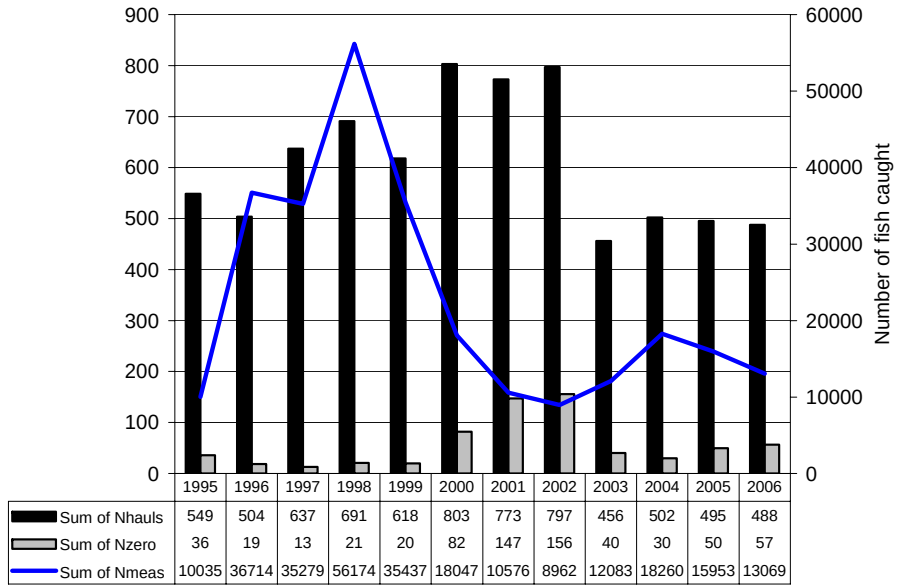


Figure 60. Relative length frequency (number at length / amount of gear) for control and experimental gears, Southern Inshore Gillnet 5 1/2 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	549	504	637	691	618	803	773	797	456	502	495	488
Sum of Nzero	36	19	13	21	20	82	147	156	40	30	50	57
Sum of Nmeas	10035	36714	35279	56174	35437	18047	10576	8962	12083	18260	15953	13069

Figure 61. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, Southern Inshore Gillnet 5 1/2 in..

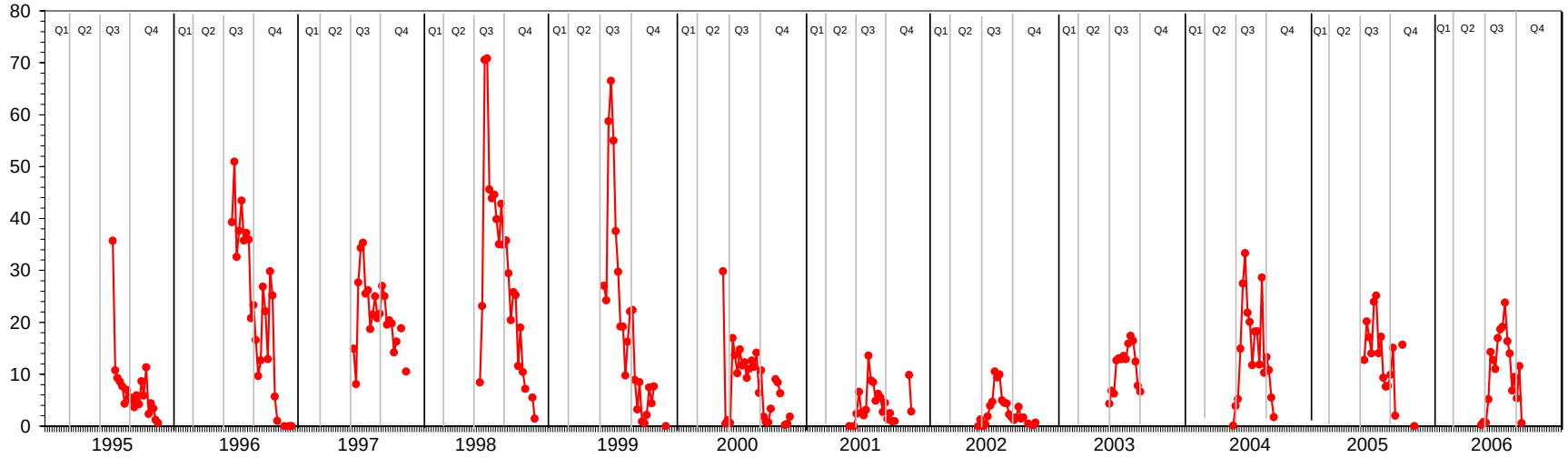


Figure 62. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, Southern Inshore Gillnet 5 1/2 in..

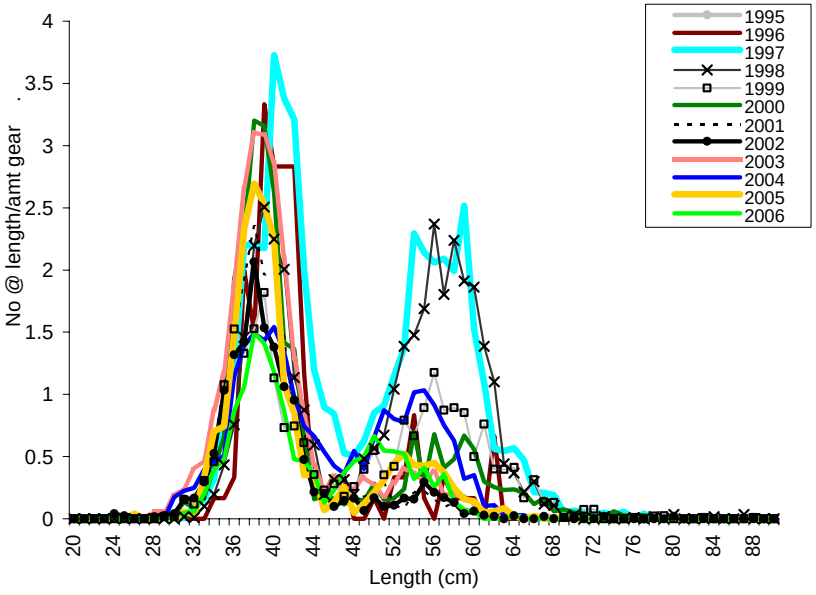
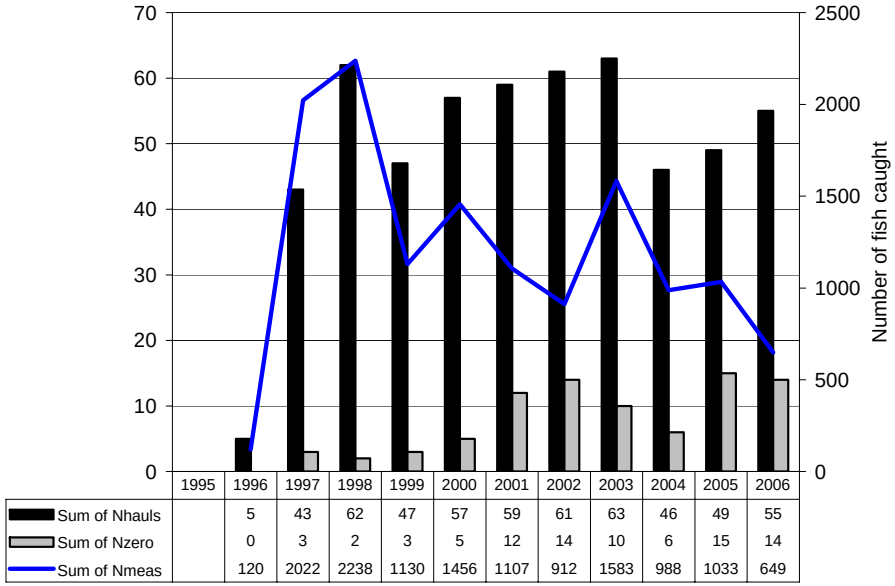


Figure 63. Relative length frequency (number at length / amount of gear) for control and experimental gears, Southern Inshore Gillnet 3 1/4 in..



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls		5	43	62	47	57	59	61	63	46	49	55
Sum of Nzero		0	3	2	3	5	12	14	10	6	15	14
Sum of Nmeas		120	2022	2238	1130	1456	1107	912	1583	988	1033	649

Figure 64. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, Southern Inshore Gillnet 3 1/4 in..

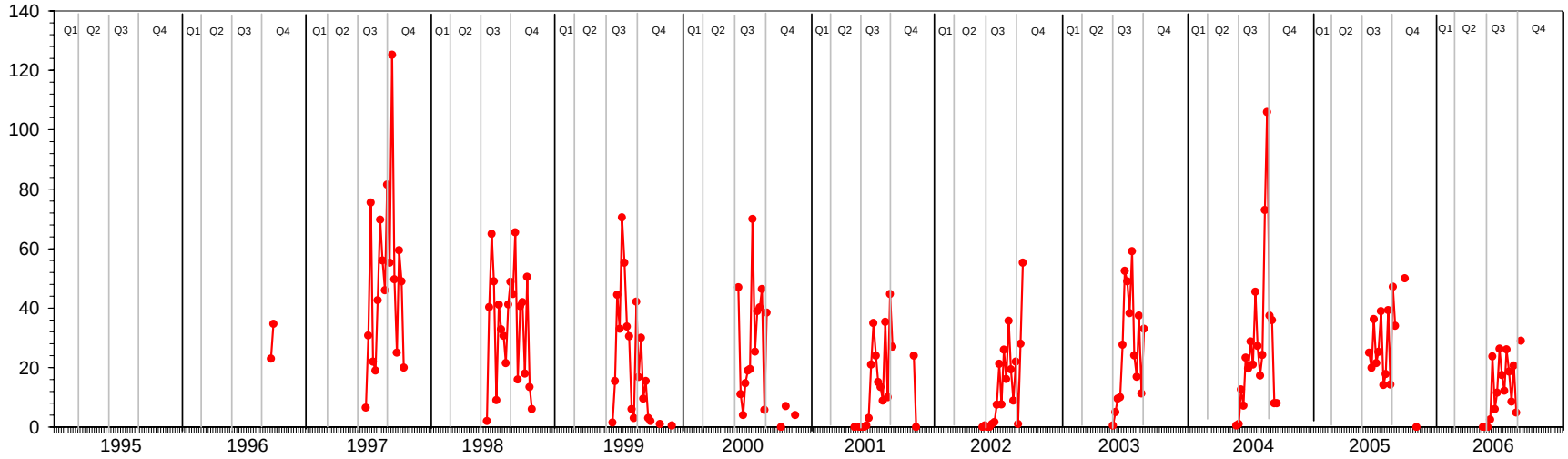


Figure 65. Catch per unit effort (in numbers of fish per net) for all sets (control and experimental) averaged for each week, Southern Inshore Gillnet 3 1/4 in..

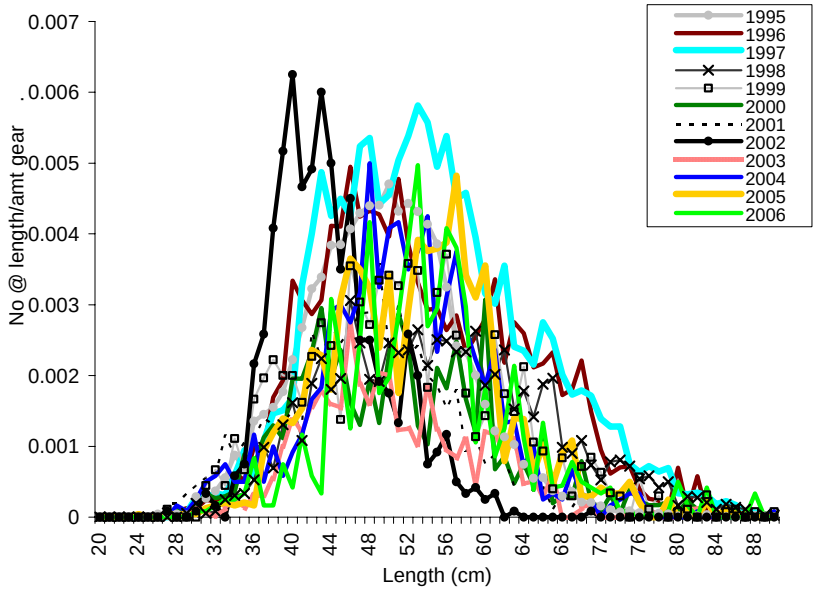
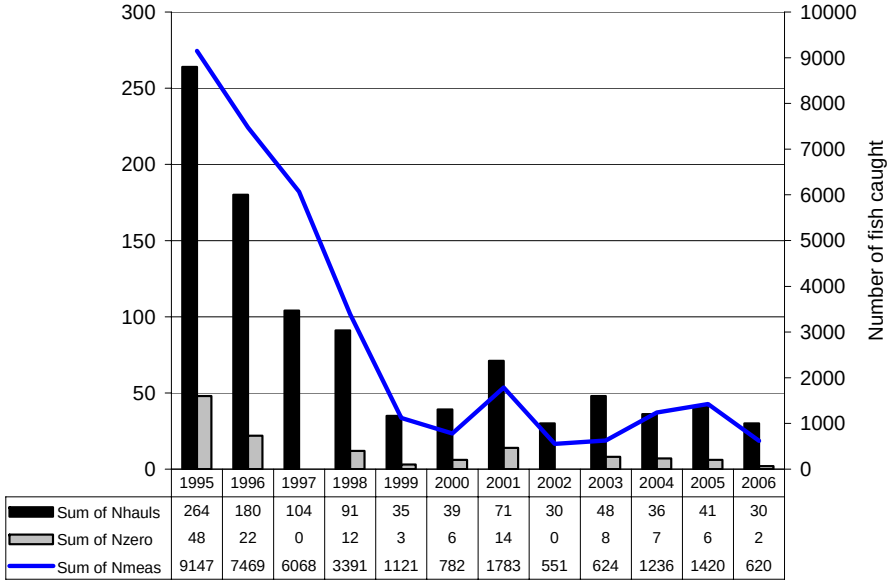


Figure 66. Relative length frequency (number at length / amount of gear) for control and experimental gears, Southern Inshore Linetrawl .



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Sum of Nhauls	264	180	104	91	35	39	71	30	48	36	41	30
Sum of Nzero	48	22	0	12	3	6	14	0	8	7	6	2
Sum of Nmeas	9147	7469	6068	3391	1121	782	1783	551	624	1236	1420	620

Figure 67. Number of hauls (Nhauls), number of zero catch hauls (Nzero) and total number of fish caught (Nmeas), for control and experimental gears, Southern Inshore Linetrawl .

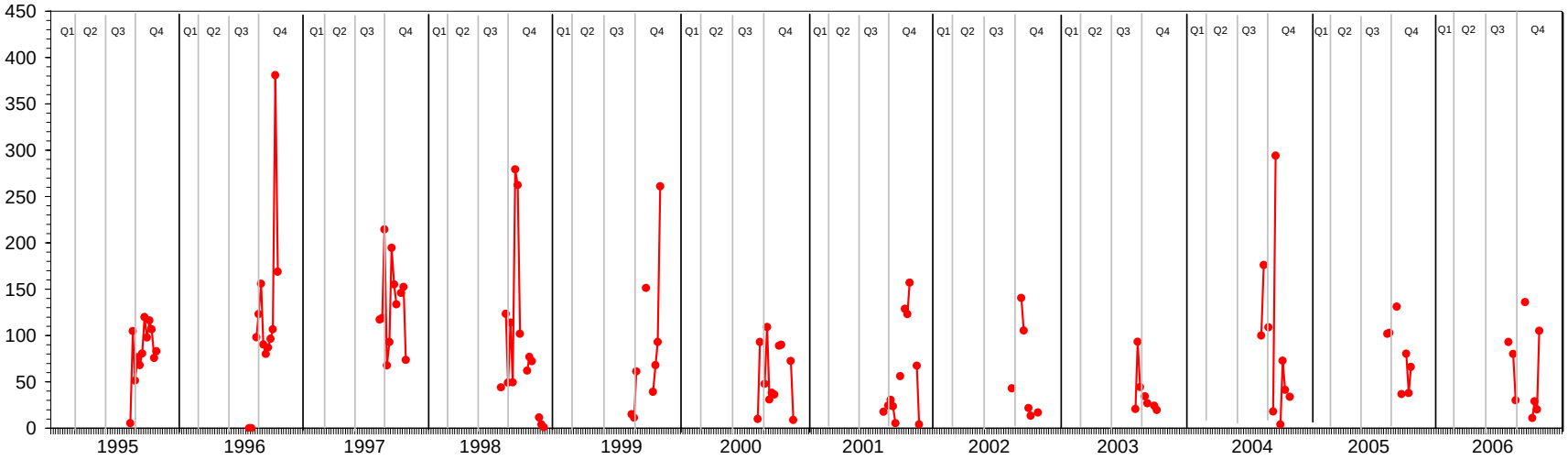


Figure 68. Catch per unit effort (in numbers of fish per 1000 hooks) for all sets (control and experimental) averaged for each week, Southern Inshore Linetrawl .