Season, Gear type, Effort and Landings of Commercial Rainbow Smelt (Osmerus mordax) fisheries in Districts 63-67 (Chaleur Bay, New Brunswick) during Fall 1995 and Winter 1996.

F.K. Mowbray and A. Locke

Department of Fisheries and Oceans
Science Branch
Diadromous Fish Division
Maritime Region
P.O. Box 5030
Moncton, N.B.
E1C 9B6

1998

Canadian Technical Report of
Fisheries and Aquatic Sciences 2202

Canadian Technical Report of
Fisheries and Aquatic Sciences No. 2202

February 1998

SEASON, GEAR TYPE, EFFORT AND LANDINGS OF COMMERCIAL RAINBOW SMELT (OSMERUS MORDAX) FISHERIES IN DISTRICTS 63-67 (CHALEUR BAY, NEW BRUNSWICK) DURING FALL 1995 AND WINTER 1996.

by

F.K. Mowbray
and
A. Locke

Science Branch
Department of Fisheries and Oceans
P.O. Box 5030
Moncton, N.B.
E1C 9B6

Cat. no. Fs -97-6/ E ISSN 0706-6457

Correct citation for this publication is:

Mowbray, F. K. and A. Locke. 1998. Season, gear type, effort and landings of commercial rainbow smelt (Osmerus mordax) fisheries in districts 63-67 (Chaleur Bay, New Brunswick) during fall 1995 and winter 1996. Can. Tech. Rep. Fish. Aquat. Sci. no. 2202: 22 pp.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

Fall 1995 and Winter 1996 commercial rainbow smelt (Osmerus mordax) fishery landings in Chaleur Bay and vicinity (districts 63-67) were estimated from a telephone survey in which 83% of commercial licence holders were contacted. Total catch, extrapolated to all licence holders, was estimated as 140 t, 35% more than landings collated from purchase slips (104 t). Partitioning of catch among statistical districts varied considerably between the two sources (telephone survey and Statistics Branch) in part due to differences in the way district was assigned. Approximately one quarter of the catch occurred in the fall fishery and was primarily taken with gillnets in districts 65-67. The winter boxnet fishery provided the majority of the catch in all districts except 63 and 66. Overall 67% of licence holders were active, although most did not use all their licensed gear. Projected survey results estimate that only 45% of the licensed bagnets, 51% of boxnets and 60% of gillnets were used. Catches and abundance were reported by fishers to have declined in 1995-96 compared to recent years. Declines were more frequently recorded for the easternmost districts.

RÉSUMÉ

On a obtenu les débarquements d'éperlan arc-en-ciel (*Osmerus mordax*) réalisés dans la Baie des Chaleurs et les régions environnantes (districts 63 à 67) pour la pêche commerciale de l'automne 1995 et de l'hiver 1996 lors d'un sondage téléphonique mené auprès de 83% des titulaires de permis de pêche commerciale. Le total des prises extrapolé à l'ensemble des titulaires de permis a été évalué à 140 t, ce qui correspond assez bien aux débarquements indiqués sur les bordereaux d'achat, dont le total était de 104 t. Le partitionnement de ces prises parmi les districts statistiques variait beaucoup d'une source à l'autre (le sondage au téléphone et la Direction des statistiques) à cause des différences dans la méthode d'affectation des districts. Environ un quart des prises globales provenaient de la pêche d'automne et elles provenaient surtout des filets maillants dans les districts 65 à 67. Néanmoins, la pêche hivernale au parc fermé a quand même donné la majorité des prises dans tous les districts à l'exception du district 63 et 66. Dans l'ensemble, 67% des titulaires de permis étaient actifs, bien que la plupart n'aient pas utilisé tous les engins pour lesquels ils disposaient d'un permis. Les resultats extrapolés ont indiqués que seulment 45% des filets à poche, 60% des filets maillants et 51% des parcs fermés autorisés par permis ont été exploités. Les pêcheurs ont déclaré des baisses de capture et ils ont constaté des baisses d'abondance en 1995-1996 par rapport aux années antérieures. Les baisses ont été observées le plus souvent dans les districts situés le plus à l'est.

INTRODUCTION

Rainbow smelt (Osmerus mordax) are fished both commercially and recreationally throughout the southern Gulf of St. Lawrence (Fig. 1). Commercial smelt fisheries occur from October through March, both as an open water fishery in the fall and an ice fishery in the winter. These fisheries are restricted by licence, which specifies the amount and types of fishing gear allowed (boxnet, bagnet or gillnet), and the area in which the licence holder may fish. Recreational fisheries occur in the spring with dipnets and in the fall and winter with set lines or spears. New Brunswick recreational fishers do not require a licence. Both commercial and recreational fisheries are regulated by season (Table 1). Restrictions on mesh size (maximum 31 mm) and length of leaders (maximum 31 m) apply to commercial fisheries, and daily catch limits (60 fish/day) to recreational fishers (Table 1).

In recent years, the smelt fishery has been managed by restricting the length of the commercial fishing season as well as the number of licenses granted. Some monitoring of fishery landings has taken place since 1917. In recent years this monitoring has been conducted by the Department of Fisheries and Ocean's Statistics Branch (purchase slip information supplemented with fishery officer observations). However, as attested to by smelt fishers (Chaput and LeBlanc 1996), current methods for obtaining landings may underestimate the actual amount landed since reports of commercial activity are frequently incomplete and recreational catches are not included.

Until recently Gulf of St. Lawrence smelt fisheries have required little advice on stock status and consequently estimations of stock abundance or composition are few (Cairns 1989, D'Amours et al. 1994, Chaput 1996). Harvest levels are primarily driven by the market, and in the case of the winter fishery, ice conditions. However, due to the recent decline in groundfish fisheries and an increase in smelt prices there is concern that effort in the smelt fishery has, or will, increase. Since the smelt fishery is presently controlled by limiting effort, DFO has partially addressed these concerns by ceasing to issue new licenses. Nonetheless, current licences may be transferred or sold and the proportion of active licenses may vary from year to year.

In order to provide a more complete estimate of smelt landings and effort, we conducted a telephone survey of fishers residing in the vicinity of Chaleur Bay, New Brunswick (statistical districts 63-67) (Fig. 1). The fishery in this region was isolated for two reasons: 1/ it is an important region in terms of total smelt landings; and 2/ there exists a co-management agreement between Quebec (Ministère de l'Environnement et de la Faune) and New Brunswick (DFO) requiring DFO to collect reliable landing statistics and assist in developing a co-operative management plan. Results of this survey will be used to establish current commercial harvest levels, licence activity and smelt abundance, as perceived by the fishers.

METHODS

Commercial smelt licence holders residing in statistical districts 63-67 were contacted by telephone during the fall of 1996 and asked a list of questions. These included their landings for the fall (Sept.- Dec.) 1995 and winter (Jan. - Apr.) 1996 fisheries, gear type fished each season, number of gear used, fishing location and perceived abundance (Appendices 1 and 2).

Results were compiled for each statistical district and with districts 63-65 grouped together under Chaleur Bay. This grouping reflects the Chaleur smelt stock management zone as defined by the Quebec-DFO co-management committee. Numbers of active fishers and gear were compared with the number of licensed fishers and gear obtained from DFO's Licencing Branch, Moncton. The manner in which the amount of gear permitted is recorded on licences depends on the gear type. Boxnets and bagnets are described by number. For example fisher X may have a licence for 2 bagnets and 1 boxnet. Gillnets however are described by the number of fathoms of net allowed (e.g. 150 fathoms of gillnet). Since most gillnet fishers responding to our survey gave their effort as the number of nets fished we were obliged to convert fathoms of gillnet to numbers of nets in order to determine the proportion of active gear. The conversion factor used was 15 fathoms per net. According to local DFO personnel this is the factor previously used to standardize licences (at one time some licences were in number of nets and others in fathoms) and corresponds to the usual length of a gillnets used in the area (G. Chiasson, D.F.O., Tracadie, N.B.).

RESULTS

Of 219 licence holders residing in districts 63-67, 181 (83%) were contacted. Contact rate was highest in district 66 (91%) and lowest in district 64 (31%) (Table 2). The proportion of active fishers (those who fished in the fall, winter or both) ranged from 54% in district 63 to 75% in district 64. In Chaleur Bay (districts 63-65) the majority of active respondents (82%) participated in the winter fishery only, whereas in districts 66 and 67 most fishers (72%) were active in the fall. Only 8% of the active fishers surveyed (districts 63-67) fished both seasons. Fishers who had set nets in at least 8 of the last 10 years were considered regular fishers. The proportion of regular fishers generally increased from west to east with only 8% regulars in district 63 and 45% in district 67. For each district the total number of active fishers was projected by dividing the number of active respondents by the proportion of licence holders contacted. District 64 had the fewest active fishers (10) and districts 65 and 66 the highest (46 each).

The number and type of gear used to fish smelt varied among fishers, season and district (Table 3). The number of reported active fishermen and gear was projected for each district. The number of active fishers was extrapolated by dividing the reported number of active licensed fishers by the proportion of licensed fishers which were surveyed (from Table 2). The number of active gears was extrapolated by multiplying the reported mean number of nets used per fisher by the projected number of active fishers. Projected proportions of active fishers and gear were calculated as the projected active number divided by the number of licenses sold. In all cases only the final figures were rounded.

Gillnets were the most commonly licensed gear (1868 nets licensed in districts 63-67). The mean number of gillnets licensed per fisher ranged from 3.5 to 18.5 across the five districts. The projected proportion of active licenced gillnets ranged from 0 - 74% (Table 3). Boxnets were the second most commonly reported fished gear. In total, 634 boxnets were licensed across the five districts. The majority of these licenses were held by fishers in districts 65 and 66. The projected proportion of active boxnet licenses varied from 32 to 66% (Table 3). Bagnets were popular in the inner Bay (district 63), although overall only 15 bagnets were licensed in 1995-96 and only six of these were used (Table 3).

Allocation of effort among gear types and seasons was compared with the results of a mail-out survey conducted in 1988 (Table 4). In this earlier survey participants were asked to comment on their general catch, season of fishing and gear type during the several years previous to and including 1988 (Cairns 1989).

In the inner Bay (districts 63 and 64) the proportion of fishers using gillnets and bagnets has decreased while those using boxnets has increased (Table 4). In district 65 gear types are essentially unchanged, and in districts 66 and 67 gillnets have replaced boxnets or bagnets in many cases (Table 4).

The seasonal use of each gear type is shown in Table 5. Although general trends in gear type usage are similar to those reported in 1988 some changes were noted. For instance in the present study gillnets were reported fished exclusively in the fall, whereas Cairns (1989) indicated that gillnets were sometimes fished in the winter as well. In both studies boxnets were primarily reported fished during the winter, however in 1995-96 fewer boxnets were fished in the fall than previously reported (Cairns 1989).

The total catch, effort and catch per net (catch per unit effort, CPUE) of survey respondents are reported by season and district in Table 6. Boxnets were by far the most efficient gear with average seasonal catches of 3723 kg/net. CPUE of boxnets was the next highest, and was still almost ten times greater that of gillnets. In the two districts where boxnets were fished in the fall there was no consistent ranking of CPUE by season, one was better in the fall and the other in the winter. Winter boxnet CPUE varied by an order of magnitude among

districts (40 - 325 kg/net). Gillnet CPUE ranged from 15 - 39 kg/net among districts.

Total catch in each district was extrapolated by multiplying the mean catch per net (Table 6) by the projected number of active nets (Table 3). Extrapolated catches were highest in district 65 followed by districts 66, 63, 67 and 64 in order of descending magnitude. In districts 63 and 64, projected catches were lower than the 'official' landings compiled by DFO Statistics Branch but official landings accounted for only 24 - 86% of projected landings in the other districts. Overall, official landings accounted for 72% of the projected catch for Chaleur Bay (calculated from this survey) and 74% of the projected catch for districts 63-67.

There was a distinct geographical trend in fishers' description of 1995-96 catch and abundance (Table 8). In the western end of the Bay catches and abundance were mostly described as good or fair relative to recent years, whereas an increasing proportion of fishers described catches as poor in the eastern end and outside the Bay (districts 65 through 67). Poor catches in districts 63 and 64 were most frequently attributed to poor ice conditions and the number of spring tides which could be fished. Comments for districts 65 -67 centered on interference from seals (all gears) and the unusually large proportion of small smelt in boxnet catches.

DISCUSSION

Overall, commercial smelt catch records maintained by DFO Statistics Branch accounted for close to 74% of the catches estimated by this survey. However the distribution among districts was considerably different (Table 7). This may reflect a difference in the way district was assigned. Smelt landings tabulated by Statistics Branch are recorded by the district in which smelt are landed, which in most cases is the same district in which they are fished. However, for the telephone survey district was recorded as the district associated with the fisher. This is assigned by DFO Licensing Branch as the district of the fisher's major licence (location for crab or lobster fishing). In most cases smelt fishing occurs within this same area, however this is not always the case. Smelt fishing locations are specific to each gear licence and are usually restricted to a given bay or river. A fisher's gillnet licenses may be for the same district as his major licence, but his boxnet licenses for another. An overview of survey responses to questions about fishing location revealed that if this error occurs it typically results in catch and effort being assigned to an adjacent district. Hence, east-west trends in the proportion of active fishers, gear type, catch or effort should not be overly affected by this reporting bias.

Although two thirds of the surveyed smelt licence holders were active, in many cases the active fishers were using only a portion of their licensed gear. While this study cannot predict the rate at which fishing mortality would change if

all the licensed gear was deployed, it is likely that total exploitation would increase. Whether stock levels could support an increased exploitation is unknown. Relatively low catch rates reported in districts 66 and 67 combined with a perceived decline in abundance would suggest that any increase in exploitation within these areas would be inappropriate. In contrast it may be argued that the low effort and high CPUE reported in district 63 may indicate room for an expansion of fishing effort. However, bottom trawl surveys have indicated that this area may be an important region for young (age 1) smelt (D'Amours et al., 1994), hence increased exploitation in this region might adversely affect catches in more easterly districts during subsequent years.

In all districts except 63, the majority of respondents reported that smelt abundance and catch were similar to, or worse than, recent years. Since no other abundance indices are currently available for the New Brunswick Chaleur Bay smelt it is difficult to determine whether this decrease is associated with a true decline in population numbers or a decline in catchability. The Québec provincial government has been sampling catches and collecting catch information for the commercial winter boxnet and bagnet fisheries at Miguasha since 1991 (unpublished data - Ministère de l'Environnement et de la Faune, New Richmond, Québec). Catch rates at Miguasha for the 1996 fishery were among the highest recorded, although total catches were only average. Miguasha catches typically contain fish 1-7 years of age. Catches in 1996 contained the highest proportion of smelt under 3 years of age in the time series.

Qualitative information on by-catch from groundfish surveys (1992-1996) indicates a progressive reduction in the northern distribution and abundance of smelt in conjunction with an expansion of capelin stocks southward towards Prince Edward Island (Mark Hanson, 1997, DFO, Moncton, pers. comm). These changes in by-catch composition correspond to a period of declining bottom water temperatures and an unprecedented (since 1967) late date of ice breakup in 1995 (Drinkwater et al. 1996). A previous analysis of smelt by-catch in ground fish surveys showed a strong seasonal trend in smelt distribution within the Chaleur Bay (D'Amours 1994) that may be temperature-related. It is possible that annual variations in water temperature and other environmental conditions affect smelt distribution and catchability in the commercial fishery. For this reason the seasonal catch per unit effort data obtained through this survey may not be a reliable indicator of abundance. In addition seasonal CPUE values from the phone survey do not reflect annual variations in effort. The duration of a given season is largely dependent on environmental conditions such as ice conditions and tidal cycle (pers comm. Alain Fréchet, 1996, DFO Mont Joli, Québec). However, the availability of favorable conditions, and consequently the number of fishing days, may vary considerably from year to year. This problem could be addressed by asking fishers to report the number of days nets were set, however without logbooks it is unlikely that most fishers would have accurate records or memories of this sort of information. As it stands, usually only the major fishers keep written records of their catch weights and effort. Catches of

the other fishers are frequently estimated and the catch reported in the telephone survey commonly based on memory.

For all the above reasons it is clear that the development of alternate abundance indices is desirable. Two possible sources for such alternative indices are immediately available. These include a quantitative analysis of smelt by-catch in on-going September and January ground fish surveys undertaken by DFO, and an index of spawning biomass which the Québec Ministère de l'Environnement et de la Faune has been developing from visual surveys of spawning schools on index river stretches.

ACKNOWLEDGMENTS

We are grateful for the cooperation of the many fishers who took time to respond to the survey, as we are to Monique Niles for making many of the phone calls. We also extend our thanks to John Halpine for his technical assistance in preparation of this document and to David Cairns and Russell Pickard for their helpful comments on an earlier draft. Insights into the functioning of the licensing system were provided by Louise M. Cormier and helpful information on the workings of the fishery by various DFO Conservation and Protection officers as well as Northeastern New Brunswick area manager Bob Allain.

LITERATURE CITED

Cairns, D.K. 1989. Gear types, seasonal distribution of effort, and bycatch in the smelt fishery of the southern Gulf of St. Lawrence. Can. Tech. Rep. Fish Aquat. Sci. no. 1668 : v+20 pp.

Chaput, G. and C. LeBlanc. 1996. Anadromous rainbow smelt (Osmerus mordax Mitchill) from the Gulf of St. Lawrence - update of fishery and preliminary status of stock. DFO Atl. Fish. Res. Doc. 96/109.

D'Amours, p., S. C. Courtenay, C. LeBlanc and G. Landry. 1994. Débarquements historiques et inventaires de l'éperlan arc-en-ciel réalisés dans la Baie-des-Chaleurs entre 1917 et 1993. Rapp. stat. can. sci. halieut. aquat. no. 933: 57 p.

Drinkwater, K. F., and R.G. Pettipas and W.M. Petrie. 1996. Overview of meteorological and sea ice conditions off eastern Canada during 1995. DFO Atl. Fish. Res. Doc. 96/19

Table 1. Legal gear types and seasons for the commercial and recreational smelt fisheries in statistical districts 63-67, Chaleur Bay.

Fishery	Gear	Location	Season	Limitations[1,2,3]
Commercial	Bagnets	Tidal waters	16 October - 15 March	1,2
	Boxnets	Tidal waters	16 October - 15 March	1,2
	Gillnets	Tidal waters	16 March - 1 October	1,2
Recreational	Spears	Tidal waters	1 December - 15 February	none
	Dipnets	Tidal waters	1 April - 31 May	3
		Inland waters		

1 Mesh size no smaller than 31 mm.
2. Leader no longer than 31 m.
3. Retain no more than 60 fish per day

Table 2. Number of licensed and active commercial smelt fishers in statistical districts 63-67 in fall 1995 and winter 1996.

Statistical District	No. licence holders	Licensees contacted		Active fishers		No. fishers active in:				Projected active fishers (number)
		number	percent	number	percent	fall	winter	both	8 of last 10 yrs.	
63	22	13	59.1	7	54	0	7	0	1	12
64	13	4	30.8	3	75	1	3	1	1	10
65	66	58	87.9	40	69	13	31	4	31	46
66	75	68	90.7	42	62	31	13	2	29	46
67	43	38	88.4	22	58	15	9	2	17	25
Chaleur (63-65)	**101**	**75**	**73**	**50**	**67**	**14**	**41**	**5**	**33**	**67**
Total (63-67)	**219**	**181**	**83**	**114**	**63**	**60**	**63**	**9**	**79**	**139**

Table 3. Number of licensed and active commercial smelt fishing gear in districts 63-67 during the season of fall 1995 and winter 1996. Numbers of licensed gear and fishers were provided by the licensing section of DFO (Moncton), number of active gear and fishers are from telephone survey results. Numbers of licenced nets were calculated by dividing the total length of licenced gillnet by 27.5 m (15 fathoms).

		Statistical District						
Gear	Category	**63**	**64**	**65**	**66**	**67**	**63-65**	**63-67**
Gillnets	# licensed gear	7	62	538	926	335	607	1868
	# fishers licensed for gear	2	8	29	61	20	39	120
	# licensed gear / fisher	4	8	19	15	17	16	16
	reported # active fishers	0	1	12	31	12	13	56
	reported # active gear	0	3	163	625	210	166	1001
	mean # gear used / fisher	---	3	14	20	18	13	18
	project # (%) active fishers	0 (0)	3 (40)	14 (47)	34 (56)	14 (68)	17 (44)	65 (54)
	projected # (%) active gear	0 (0)	10 (16)	185 (34)	687 (74)	239 (71)	195(32)	1121 (60)
Bagnets	# licensed gear	11	0	2	0	2	13	15
	# fishers licensed for gear	4	0	1	0	1	5	6
	mean # licensed gear / fisher	3	--	2	--	2	3	3
	reported # active fishers	1	0	0	0	0	0	0
	reported # active gear	6	0	0	0	0	0	0
	mean # gear used / fisher	6	--	--	--	--	--	--
	project # (%) active fishers[1]	1 (9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	projected # (%) active gear[1]	6 (55)	0 (0)	0 (0)	0 (0)	0 (0)	6 (46)	6 (40)
Boxnets	# licensed gear	73	38	203	206	114	314	634
	# fishers licensed for gear	20	9	52	28	29	81	138
	mean # licensed gear / fisher	4	4	4	7	4	4	6
	reported # active fishers	6	3	31	11	9	40	60
	reported # active gear	26	6	117	82	32	149	263
	mean # gear used / fisher	4	2	4	7	4	4	4
	project # (%) active fishers	11 (56)	9 (100)	35 (68)	12 (43)	10 (35)	55 (68)	77 (56)
	projected # (%) active gear	48 (66)	19 (50)	133 (66)	90 (44)	36 (32)	200 (64)	326 (51)

[1] For district 63 only: projected number of fishers and gear set equal to reported number as all bagnet fishers in district were contacted.

Table 4. Comparison of commercial smelt fishing gear use by fishers in statistical districts 63-67 in 1988 and 1995-96.

	Year of survey	Statistical district						
		63	64	65	66	67	63-65	63-67
No. of fishers licensed	1995-96	22	13	66	75	43	101	219
	1988	32	14	75	69	51	121	241
No. of fishers surveyed	1995-96	13	4	58	68	38	75	181
	1988	16	14	25	13	21	55	89
No of active respondents	1995-96	7	3	40	42	22	50	114
	1988	15	14	24	15	20	53	88
% of active fishers using gillnets[1]	1995-96	0	25	30	72	55	27	49
	1988	0	43	25	60	35	23	33
% of active fishers using bagnets	1995-96	14	0	0	0	0	2	1
	1988	27	7	0	7	0	10	10
% of active fishers using boxnets	1995-96	86	100	80	28	55	84	57
	1988	66	64	83	66	60	74	69

1 Some respondents fish more than one type of gear.

Table 5. Comparison of seasonal gear use by commercial smelt fishers in statistical districts 63-67 in fall and winter 1988 (Cairns 1989) versus 1995-1996. N is the number of active surveyed fishers in each district using a particular gear type followed by the percentage of those active fishers using gear in Winter or Fall. Percentages occasionally exceed 100 since some fishers fish a given gear in both seasons.

		Statistical District																			
		63			64			65			66			67			63-65			63-67		
Gear	Year of survey	N	Winter (%)	Fall (%)	N	Winter (%)	Fall (%)	N	Winter (%)	Fall (%)	N	Winter (%)	Fall (%)	N	Winter (%)	Fall (%)	N	Winter (%)	Fall (%)	N	Winter (%)	Fall (%)
Gillnets	1995-96	0	0	0	1	0	100	12	0	100	31	0	100	12	0	100	13	0	100	56	0	100
	1988	0	0	0	6	0	100	6	17	83	9	0	100	8	25	88	12	8	92	29	10	93
Bagnets	1995-96	1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	1	100	0	1	100	0
	1988	4	100	0	1	100	0	0	0	0	1	100	0	0	0	0	5	100	0	6	100	0
Boxnets	1995-96	6	100	0	3	100	0	32	97	3	12	100	0	12	75	25	41	98	2	65	94	6
	1988	10	100	0	9	89	22	20	95	5	10	100	10	12	92	8	39	95	8	61	95	8

Table 6. Total reported catch and catch per net, by gear type, of surveyed commercial smelt fishers in statistical districts 63-67, in fall 1995 and winter 1996.

			Statistical District						
Gear Type	Season	Category	63	64	65	66	67	63-65	63-67
Gillnets	Fall '95	Total catch (kg)	0	91	6311	18351	3282	6402	28035
		# nets fished	0	3	163	625	210	166	1001
		Mean catch (kg/net)	--	30	39	29	16	39	28
Bagnets	Winter '96	Total catch (kg)	22336	0	0	0	0	22336	22336
		# nets fished	6	0	0	0	0	6	6
		Mean catch (kg/net)	3723	--	--	--	--	3723	3723
Boxnets	Fall '95	Total catch (kg)	0	0	227	0	3133	227	3360
		# nets fished	0	0	2	0	10	2	12
		Mean catch (kg/net)	--	--	114	--	313	114	280
	Winter '96	Total catch (kg)	8453	241	37519	10896	7378	46213	64487
		# nets fished	26	6	117	82	32	149	263
		Mean catch (kg/net)	325	40	321	133	231	310	245
All gears	**Both seasons**	Total catch (kg)	**30789**	**332**	**44057**	**29247**	**13793**	**75178**	**118218**

Table 7. Reported and extrapolated commercial smelt fishery landings and effort for fall 1995 and winter 1996 in statistical districts 63-67.

		Statistical District						
Gear Type	Category	63	64	65	66	67	63-65	63-67
Gillnets	Reported mean catch/net (kg)	0	30.3	38.7	29.4	15.6		
	Projected no. of active nets	0	10	185	687	239		
	Projected catch for gear	0	303	7160	20197	3728	7463	31388
Bagnets	Reported mean catch/net (kg)	3723	0	0	0	0		
	Projected no. of active nets	6	0	0	0	0		
	Projected catch for gear	22336	0	0	0	0	22336	22336
Boxnets	Reported mean catch/net (kg)	325.1	40.1	317.2	132.8	230.6		
	Projected no. of active nets	48	19	133	90	36		
	Projected catch for gear	15605	762	42188	19952	8302	58555	86809
All gears	Projected total catch (kg)	37941	1065	49348	40149	12030	88354	140533
All gears	Statistics Branch total landings	46175	5335	11903	34681	6031	63413	104125

Table 8. Trends in smelt catch and abundance as perceived by commercial fishers in districts 63-67, during the fall 1995-winter 1996 season.

	Catch relative to recent years (% responses)			Abundance relative to recent years (% responses)			
Statistical District	Good	Fair	Poor	Good	Fair	Poor	Comments
63	50	17	33	12	65	23	poor ice conditions
64	0	67	33	18	46	36	none
65	9	28	63	7	36	57	seals destroy catch and nets, fish small
66	2	33	65	7	24	69	seals are a problem
67	0	21	79	0	5	95	seals eating catch, destroying nets
63-65	13	29	58	10	44	46	
63-67	7	29	64	8	31	61	

Figure 1. Map of the southern Gulf of St. Lawrence showing the location of Chaleur Bay and statistical districts 63-67.

Appendix 1. Survey questions asked during the 1995-96 telephone survey of smelt fishers in statistical districts 63-67. Questions were asked in the fisher's language of choice, English or French.

1. Did you fish in 1995-1996?

2. If the answer to question 1 is "no" then participants were asked:
   a) What type of gear do you usually fish? Boxnets? Bagnets? or Gillnets?
   b) What season do you usually fish? Fall? Winter? or Both?
   c) How many nets do you usually set?

3. For each season fished (Fall 1995 or Winter 1996) the participant was asked:
   a) What was your total catch (lbs.)?
   b) What gear type did you use?
   c) How many nets were used of each gear type?

5. Would you describe your catch as Good, Fair or Poor compared to recent years?

6. Would you describe smelt abundance in your fishing area as Good, Fair or Poor compared to recent years?

7. How many of the last ten years did you fish smelt?

8. Are you planning to fish smelt in 1996-1997?

9. Where do you set your nets?

10. Comments?

Appendix 2. Survey questions (in french) asked during the 1995-96 telephone survey of smelt fishers in statistical districts 63-67.

Questions du sondage

1. Avez-vous pêché l'éperlan en 1995-1996?

2. Si le participant répondait non à la question 1, on lui posait les questions suivantes :
a) Quel genre d'engin exploitez-vous habituellement? Le parc fermé (boxnets)? Le filet à poche (bagnets)? Le filet maillant (gillnets)?
b) Pendant quelle saison pêchez-vous habituellement? L'automne? L'hiver? Les deux?
c) Combien de filets mettez-vous habituellement à l'eau?

3. Pour chaque saison exploitée (automne 1995 ou hiver 1996), on posait au participant les questions suivantes :
a) Quel a été le total de vos prises (lb)?
b) Quel genre d'engins avez-vous utilisé?
c) Combien d'engins avez-vous utilisés pour chaque genre?

5. En comparaison avec les dernières années, diriez-vous que vos prises étaient bonnes, passables, médiocres?

6. En comparaison avec les dernières années, diriez-vous que l'abondance des éperlans dans votre zone de pêche est bonne, passable, médiocre?

7. Pendant combien d'années parmi les dix dernières années avez-vous pêché l'éperlan?

8. Avez-vous l'intention de pêcher l'éperlan en 1996-1997?

9. Où mouillez-vous vos filets?

10. Commentaires?