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The inshore capelin fishery in NAFO Div. 3L in 1992

by

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Abstract

Data collected during the inshore capelin fishery in 1992 in NAFO Div. 3L were presented. Provisional inshore landings in 1992 were 1,921 t. Purse seiners and trap fishermen in all areas of Div. 3L failed to land their quotas. The fishery in Div. 3L opened in different areas on different dates in June and all areas closed on July 8. The majority of the landings occurred between July 31 and August 1 when the fishery opened for two days in Conception, Trinity, and Bonavista Bays. Discarding was lower than reported in 1991. The presence of small females was the dominant reason for discarding the catch from traps and purse seines. A low percentage of females was also a factor for traps in Conception Bay. Catch rates in 1992 were the lowest ever for capelin traps and the third lowest for purse seines in their respective series. Fishing effort for traps and purse seines were the lowest ever. The catch was dominated by the 1989 year-class as three-year-olds comprising 61% of the total catch in numbers. Two-year-olds from the 1990 year-class made up 33% of the catch.

Résumé

On présente ici les données recueillies durant la pêche côtière du capelan en 1992 dans la division 3L de l'OPANO. Les débarquements préliminaires se chiffrent à 1 921 t. Dans tous les secteurs de la division 3L, les pêcheurs à la senne coulissante et les pêcheurs au parc en filet n'ont pas atteint leur quota. La pêche ouvre en juin dans la division 3L, à des dates différentes selon les secteurs; elle ferme le 8 juillet dans tous les secteurs. La majorité des prises ont été capturées entre le 31 juillet et 1^{er} août, lors de l'ouverture de la pêche pendant deux jours dans les baies de Conception, de Trinity et de Bonavista. Les rejets ont été inférieurs à ceux de 1991. La présence de petites femelles a été la raison principale des rejets par les pêcheurs à la senne coulissante et par les pêcheurs au parc en filet. Dans le cas de ces derniers, le faible pourcentage de femelles dans les prises de la baie de Conception en a aussi été un élément déterminant. En 1992, les taux de prises des pêcheurs ont été les plus basses de la série dans la pêche au parc en filet, tandis qu'elles se situaient au troisième rang des plus basses dans la pêche à la senne coulissante. L'effort de pêche était lui aussi le plus bas de tous dans les deux types de pêche. La classe d'âge de 1989 (poisson de trois ans) dominait, représentant 61 p. 100 des prises totales. Les poissons de deux ans, c'est-à-dire ceux de la classe d'âge de 1990, représentaient 33 p. 100 des prises.

Introduction

Capelin landings of 1,921 t in NAFO Div. 3L were the lowest reported for the inshore fishery since 1980 (Table 1). In 1992 the opening dates for each area (Fig. 1) varied. The capelin fishery for fixed gear and purse seines was opened on June 5 for St. Mary's Bay and the Southern Shore, on June 15 for Conception and Trinity Bays, and on June 22 for Bonavista Bay. On July 8 the fishery was closed in Div. 3L. The fishery reopened on July 31 and closed on August 1 in Conception, Trinity, and Bonavista Bays. The TAC for the Div. 3L inshore fishery in 1992 was 32,580 t based on a market-related TAC for roe-bearing females.

The data collected here describe catch and effort from research logbook records collected by inshore fishermen and age composition of the catch based on biological samples from the commercial fishery.

Materials and Methods

Research logbooks were mailed to 25 purse seine and 101 fixed gear fishermen who were licensed to fish in NAFO Div. 3L. Fishermen residing in Div. 3L completed seven purse seine and eight fixed gear logbooks (Table 2), the lowest number since the research logbook survey began in 1981. In addition, three purse seiners who reside in Div. 3K fished part of the season in Div. 3L. Of the eight fixed gear fishermen, six fished traps and two beach seines. The proportion of fixed gear fishermen who did not fish capelin in 1992 continues to increase (Table 2).

Biological samples were collected from the commercial capelin fishery on the basis of two random samples per statistical section (Fig. 1) per gear type per week. From each sample, 200 fish were measured for length, sex and maturity stage (LSM). A stratified sample of two fish per sex per 1/2 cm length group was collected from each LSM sample for otoliths. Ages were read from otoliths by the same reader.

In 1992, trap effort was based on three logbook fishermen who fished one trap and three who fished two traps each. However, most fishermen who normally fish and complete research logbooks did not fish capelin in 1992. Trap data were received only from Trinity and Conception Bays.

Results

Discards

Discarding rates in 1992 were 17% of landings for purse seines (Table 3) and 68% of landings for traps (Table 4) which were significantly lower than the 53% and 104% respectively reported for the 1991 fishery (Nakashima and Harnum 1992). The

actual amounts discarded were low. Capelin caught but not landed for sale were considered as discards in this analysis with no distinction between those released alive and those dumped (i.e. dead capelin). Capelin given to other fishermen were included in the estimates of discarding (Tables 3 and 4) but were excluded in assigning proportional weight to the reasons for discarding (Tables 5 and 11).

In 1992 the principle reason for discarding capelin was due to small females except for traps in Trinity Bay (Table 5). A low percentage of females in the catch (83%) was the main reason given for discarding the catch from traps in Conception Bay which was similar to 1991 (Nakashima and Harnum 1992). Redfeed was not mentioned in the logbook reports for 1992.

Catch/effort

Detailed records from logbooks collected from ten purse seiners (Tables 3 and 7) and from nine capelin traps (Tables 4 and 8) were analyzed to calculate catch/effort indices. Fishing effort of traps and purse seines in 1992 was lower than estimated in 1991. The average number of days fished and average number of hauls per trap in 1992 were the lowest ever (Table 6). Especially noteworthy is the dramatic reduction in number of hauls which reflects the very low fishing effort in Div. 3L in 1992. Purse seiners in Div. 3L fished 3.9 days per vessel and averaged 4.3 sets (Table 7) compared to estimates of 9.4 days and 12.9 sets in 1991 (Nakashima and Harnum 1992).

Catch rates for purse seiners and capelin trap fishermen varied among areas (Tables 7 and 8). The lowest purse seine catches/day (C/D) occurred in Trinity Bay followed by Bonavista and St. Mary's Bays and the highest rates were estimated for Conception Bay (Table 7). Landings/day (L/D) varied from 13.0 to 18.3 t/day in Bonavista, St. Mary's, and Conception Bays while Trinity Bay had the lowest landings of 0 t/day (Table 7). The highest landings/set (L/S) and catch/set (C/S) were from Conception Bay. The average C/D for a purse seine vessel in NAFO Div. 3L in 1992 was 16.2 t, the same as in 1991 (Table 13). The C/S in the four areas fished ranged from 12.5 t to 27.2 t and averaged 14.7 t per set for all ten purse seine vessels.

All two catch rates for traps in 1992 (Table 8) were much lower than reported in 1991 (Nakashima and Harnum 1992). The C/D of 1.9 t in Conception Bay and 0.7 t in Trinity Bay reflect the poor fisheries there. The average C/D for capelin traps was 1.3 t and the average C/H was 1.8 t.

By-catch

No by-catches of cod and herring were reported.

Age Composition

The age composition of the commercial catch was estimated from 27 biological samples based on 16 purse seine, nine capelin trap, and two beach seine samples (Table 9). Mean number of otoliths read per sample ranged from 36.2 to 38.5 (Table 9) which was lower than the 41.5 to 43.0 averages for 1991 (Nakashima and Harnum 1992).

Age compositions by sex and with sexes combined of the inshore catch from 1979 to 1992 are given in Table 10. In 1992, the 1989 year-class as three-year-olds represented 61% of the total catch in numbers (Table 10). The 1988 year-class as four-year-olds at 5% was very weak. The 1987 year-class as five-year-olds constituted less than 1% of the catch. The 1990 year-class as two-year-olds comprised 33% of the catch, a significant proportion.

Discussion

Discarding was considerably lower in 1992 than reported in 1991 for both traps and purse seines. When discarding was reported for traps in 1992, the major reasons were small females in the catch (77%) followed by lower percentage of females (23%) (Table 11). Small females (100%) was the only reason reported for discarding fish reported by purse seiners (Table 11).

Four catch rate indices were estimated for capelin traps and for purse seines based on logbook data (Tables 12 and 13). Catch/day (C/D) is the preferred index because it combines both landings and discards to estimate catch. If the discards were in the same proportion to landings in all years then landings would be utilized in place of the catch. However, the level of discarding varies among years. We assumed that C/S and C/H more likely reflect school size and may not necessarily indicate changes in mature biomass. The average C/D for capelin traps in 1992 was 1.3 t which was the lowest in the series (Table 12). The average C/D for purse seines was 16.2 t in 1992 which was similar to 1991 and one of the lowest rates in the purse seine series (Table 13). The trap index indicated that capelin spawning biomass in Div. 3L in 1992 was the lowest observed since 1981 and the purse seine index suggested that the mature biomass available to purse seiners was one of the lowest in the series (Fig. 2). Catch rate trends using numbers of fish suggests that the 1991 and 1992 values for purse seines and the 1991 value for traps may be higher than observed with biomass due to the presence of smaller fish in the catch (Nakashima and Carscadden 1993).

The age composition of the Div. 3L catch in 1992 was comparable to that of the Div. 3K catch (Nakashima and Carscadden 1993) except that the 1990 year-class in Div. 3L was relatively larger than observed in Div. 3K. The 1987 and 1988 year-classes are average and less than 50% of the size of the strong 1986 year-class (Fig. 4).

Fishing in 1992 was influenced largely by the late arrival of the spawning population. Evidence supporting late spawning was based on observations during the aerial survey (Nakashima 1992), egg surveys on spawning beaches (Nakashima and Slaney 1993), comments by fishermen in research logbooks, and unpublished data from spawning beach surveys. Trap fishermen noted the presence of low percentage of females and small females in their catches. Biological samples had more small fish (Table 9) than in 1991. Of consequence is the continuing reduction in total effort as a result of fishermen not participating in the capelin fishery in 1992 (Table 2). Trap and purse seine landings in Div. 3L were negligible in 1992. Fixed gear fishermen reported capelin were scarce in many areas of Div. 3L. Low landings and a poor fishery were the result of late spawning, strong market demand for large females when fish were small, variable local abundance, and a closed fishery being closed when the main spawning took place.

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Table 1. Inshore capelin landings (t) by fishing gear (vessels <21 m in length) by area (Bonavista Bay = BB, Trinity Bay = TB, Conception Bay = CB, Southern Shore = SS, St. Mary's and Trepassey Bays = SMB) in Div. 3L. The mobile fleet was issued ringnet licences until 1982 and purse seine licences from 1983 to the present.

Year	Area	Ringnet and purse seine (<21 m)	Beach seine	Capelin trap	Total
1981	BB	3714	89	62	3865
	TB	6006	1006	2267	9279
	CB	4670	202	5537	10409
	SS	-	14	51	65
	SMB	820	3	-	823
	3L	15210	1314	7917	24441
1982	BB	3429	169	133	3731
	TB	7687	463	2445	10595
	CB	5511	174	5944	11629
	SS	9	33	314	356
	SMB	1056	58	9	1123
	3L	17692	897	8845	27434
1983	BB	2580	96	527	3203
	TB	3801	603	4445	8849
	CB	6349	166	5500	12015
	SS	-	3	3	6
	SMB	983	6	12	1001
	3L	13713	874	10487	25074
1984	BB	3805	49	2037	5891
	TB	4928	799	5531	11258
	CB	6628	89	6806	13523
	SS	-	17	672	689
	SMB	1714	28	159	1901
	3L	17075	982	15205	33262
1985	BB	2286	115	1593	3994
	TB	1624	545	6816	8985
	CB	3649	211	6804	10664
	SS	33	9	348	390
	SMB	1284	12	121	1417
	3L	8876	892	15682	25450
1986*	BB	3323	199	3197	6719
	TB	4005	648	12142	16795
	CB	7454	133	9589	17176
	SS	37	52	1362	1451
	SMB	5685	34	337	6056
	3L	20504	1066	26627	48197

Table 1. Continued.

Year	Area	Ringnet and purse seine (<21 m)	Beach seine	Capelin trap	Total
1987*	BB	2140	76	2139	4355
	TB	1644	193	6780	8617
	CB	1317	120	3084	4521
	SS	106	32	633	771
	SMB	712	0	0	712
	3L	5919	421	12536	18976
1988*	BB	3664	157	3960	7781
	TB	4275	164	15417	19856
	CB	7064	210	10586	17860
	SS	220	33	3194	3447
	SMB	3636	228	605	4469
	3L	18859	792	33762	53413
1989*	BB	2704	111	4426	7241
	TB	4822	172	14845	19839
	CB	8662	75	8579	17316
	SS	207	11	3048	3266
	SMB	3327	1	643	3971
	3L	19722	370	31541	51633
1990*	BB	3171	90	5619	8880
	TB	4408	108	11731	16247
	CB	6852	41	11373	18266
	SS	31	45	2897	2973
	SMB	610	0	1016	1626
	3L	15072	284	32636	47992
1991*	BB	3066	70	3180	6316
	TB	4450	154	6474	11078
	CB	1889	20	2925	4834
	SS	0	7	0	7
	SMB	69	0	3	72
	3L	9474	251	12582	22307
1992*	BB	977	28	60	1065
	TB	69	26	53	148
	CB	411	57	160	628
	SS	0	5	21	26
	SMB	25	3	26	54
	3L	1482	119	320	1921

* provisional

Table 2. Responses from a logbook survey conducted in Div. 3L, 1981-92.

Year	No. contacted	No. logbooks returned	Did not fish capelin	Logbooks not returned
<u>Purse seine</u>				
1981	70 (7)*	37 (44)	11	22
1982	91 (7)*	54 (61)	10	27
1983	75 (9)*	37 (46)	7	31
1984	63 (3)*	39 (42)	3	21
1985	45 (3)*	30 (33)	2	13
1986	36 (7)*	27 (34)	0	9
1987	37	23	4	10
1988	34 (7)*	26 (33)	3	5
1989	34 (9)*	27 (36)	2	5
1990	28 (5)*	18 (23)	1	9
1991	26	8	8	10
1992	25	7	11	7
<u>Fixed gear</u>				
1981	119	74	13	32
1982	136	81	36	19
1983	131	66	38	27
1984	142	91	20	31
1985	93	61	8	24
1986	87	56	5	26
1987	93	62	14	17
1988	95	70	8	17
1989	96	82	2	12
1990	113	76	11	26
1991	103	39	28	36
1992	101	8	68	25

* fishermen who reside in Div. 3K but fished in Div. 3L. These are added to the 'No. logbooks returned' column in parentheses.

Table 3. Total purse seine landings (t) compiled from logbooks in 1992.

Area	Landings by logbook	Discards by logbook*	No. of fishermen
Bonavista Bay	130.1	11.3	4
Trinity Bay	0	27.2	1
Conception Bay	219.1	31.8	5
St. Mary's Bay	193.1	20.4	2
Div. 3L	542.3	90.7	10

* includes capelin given to other fishermen

Table 4. Total capelin trap landings (t) compiled from logbooks in 1992.

Area	Landings by logbook	Discards by logbook*	By-catch		No. of fishermen	No. of traps
			Cod	Herring		
Trinity Bay	0.6	21.0	0	0	4	5
Conception Bay	42.3	8.2	0	0	2	4
Div. 3L	42.9	29.2	0	0	6	9

* includes capelin given to other fishermen

Table 5. Percent contribution by weight of reasons for discarding capelin in 1992. (This excludes capelin given to other fishermen.)

Area	Redfeed	Low % females	Small females	Females picked out	Females spawned out	No market/ quota filled	Misc.	Not given
<u>Traps</u>								
Trinity Bay	-	-	100	-	-	-	-	-
Conception Bay	-	83	17	-	-	-	-	-
<u>Purse Seine</u>								
Trinity Bay	-	-	100	-	-	-	-	-
Conception Bay	-	-	100	-	-	-	-	-

Table 6. Average fishing days (D) and average number of trap hauls (H) per capelin trap per area in Div. 3L from 1981-92. (Number of traps given in parentheses.)

Year	Measure of effort	Areas in Div. 3L				
		Bonavista	Trinity	Conception	Southern Shore	St. Mary's
1981	D	-	10.4 (15)	16.8 (21)	13.6 (5)	-
	H	-	12.1	21.1	11.8	-
1982	D	-	14.6 (23)	24.2 (48)	13.0 (10)	-
	H	-	18.0	30.3	12.5	-
1983	D	14.0 (1)	17.2 (25)	19.8 (40)	-	-
	H	12.0	21.9	21.3	-	-
1984	D	13.7 (7)	19.5 (36)	18.2 (31)	19.0 (8)	19.0 (1)
	H	26.0	30.9	26.4	22.4	47.0
1985	D	11.4 (16)	13.3 (23)	16.8 (24)	10.5 (8)	-
	H	19.8	18.4	23.8	9.4	-
1986	D	11.8 (14)	15.3 (33)	24.9 (22)	17.7 (6)	6.3 (2)
	H	17.7	24.4	28.8	20.8	2.5
1987	D	6.3 (15)	7.7 (31)	7.3 (25)	5.0 (7)	-
	H	13.9	14.3	11.2	6.9	-
1988	D	9.0 (16)	11.6 (44)	12.6 (34)	8.8 (10)	11.1 (1)
	H	16.4	22.5	17.0	14.7	17.0
1989	D	8.2 (24)	8.1 (40)	7.0 (43)	7.6 (10)	2.7 (2)
	H	17.3	16.2	12.2	9.7	8.0
1990	D	4.8 (26)	4.8 (35)	8.3 (45)	4.1 (10)	6.8 (3)
	H	8.8	11.1	11.9	6.6	10.7
1991	D	9.9 (10)	7.8 (21)	9.4 (17)	-	-
	H	21.8	15.0	12.3	-	-
1992	D	-	5.8 (5)	6.5 (4)	-	-
	H	-	5.6	2.8	-	-

Table 7. Catch/effort data for purse seiners from the 1992 logbook survey.

Area	No. days fished	No. sets made	Landings per logbook (t)	Landings and discards per logbook (t)	No. of purse seiners
Bonavista Bay	10	11	13.0/day 11.8/set	14.1/day 12.97/set	4
Trinity Bay	4	1	0.0/day 0.0/set	6.8/day 27.2/set	1
Conception Bay	12	20	18.3/day 11.0/set	20.9/day 12.5/set	5
St. Mary's Bay	13	11	14.9/day 17.6/set	16.4/day 19.4/set	2
Div. 3L	39	43	13.9/day 12.6/set	16.2/day 14.7/set	10

Table 8. Catch/effort data for capelin traps from the 1992 logbook survey.

Area	No. days fished	No. hauls made	Landings per logbook (t)	Landings and discards per logbook (t)	No. of traps
Trinity Bay	28.9	28	0.0/day 0.0/haul	0.7/day 0.8/haul	5
Conception Bay	25.9	11	1.6/day 3.8/haul	1.9/day 4.6/haul	4
Div. 3L	54.8	39	0.8/day 1.1/haul	1.3/day 1.8/haul	9

Table 9. Summary of the commercial samples collected from the inshore capelin fishery in 1992 in Div. 3L.

Gear type	No. of LSM/stratified samples	No. of otoliths aged	Mean number of otoliths aged per sample \pm SD
Purse seine	16	616	38.5 \pm 3.5
Capelin trap	9	326	36.2 \pm 1.9
Beach seine	2	74	37.0 \pm 0
TOTAL	27	1016	

Table 10. Age compositions (%) from the inshore commercial capelin fishery in Div. 3L, 1979-92.

	Age				
	2	3	4	5	6
Males					
1979	0	47.6	36.3	15.1	0.9
1980	0	39.0	57.8	2.9	0.3
1981	0	28.3	40.2	29.7	1.9
1982	+	90.4	8.9	0.7	+
1983	2.3	62.9	34.0	0.9	0
1984	0.4	37.5	61.5	0.7	0
1985	5.8	66.3	26.4	1.5	0.1
1986	0.3	56.0	43.1	0.5	0
1987	0.3	12.7	85.4	1.6	0
1988	5.3	72.4	19.6	2.7	+
1989	0.4	79.3	20.3	0	0
1990	0.7	37.0	61.9	0.4	0
1991	12.6	45.0	40.8	1.4	0.2
1992	25.6	66.8	7.6	0	0
Females					
1979	0.8	59.1	25.4	11.3	3.4
1980	0.3	41.1	58.3	0.2	0.1
1981	+	38.7	31.4	28.9	1.1
1982	1.6	77.7	12.7	6.3	1.7
1983	6.4	59.1	32.1	2.3	0.2
1984	2.8	41.5	47.1	8.3	0.3
1985	16.7	58.0	16.0	8.7	0.6
1986	0.2	66.1	28.9	3.7	1.1
1987	6.6	21.7	63.6	7.7	0.3
1988	14.2	50.8	11.5	21.4	1.4
1989	1.5	72.5	21.8	1.9	2.3
1990	2.2	47.5	47.4	2.8	0.1
1991	18.4	52.0	23.3	6.3	+
1992	36.5	58.7	4.1	0.6	0
Sexes combined					
1979	0.2	50.3	33.8	14.2	1.5
1980	0.2	40.4	58.1	1.1	0.2
1981	0	34.6	34.7	29.2	1.4
1982	0.7	84.6	10.6	3.3	0.8
1983	4.6	60.7	32.9	1.7	0.1
1984	1.7	39.6	53.7	4.8	0.2
1985	12.4	61.3	20.2	5.8	0.4
1986	0.3	62.3	34.2	2.5	0.7
1987	4.0	18.0	72.5	5.2	0.2
1988	11.3	59.0	14.6	14.3	0.8
1989	1.0	75.4	21.2	1.1	1.3
1990	1.6	43.2	53.4	1.8	+
1991	16.3	49.4	29.8	4.5	+
1992	32.9	61.4	5.3	0.4	0

Table 11. Percent contribution to weight of reasons for discarding capelin in Div. 3L, 1981-92. (This analysis excludes capelin given to other fishermen.)

Area	Redfeed	Low % females	Small females	Females picked out	Females spawned out	No market/ quota filled	Misc.	Not given
<u>Traps</u>								
1981	13	43	1	10	+	22	3	8
1982	4	57	+	19	1	4	13	2
1983	17	37	+	3	+	18	13	12
1984	1	31	-	35	6	15	11	1
1985	30	26	4	5	3	22	4	5
1986	45	28	+	10	+	5	10	2
1987	59	22	1	+	2	9	7	+
1988	4	27	6	28	6	8	17	5
1989	12	36	2	12	1	30	7	+
1990	13	31	1	13	5	27	10	+
1991	9	48	15	9	+	13	6	+
1992	-	23	77	-	-	-	-	-
<u>Purse seine</u>								
1981	32	35	14	8*	+	8	+	3
1982	45	41	3	-	+	+	10	1
1983	70	17	1	-	+	5	3	4
1984	18	78	+	-	+	3	2	-
1985	61	15	9	1	3	4	5	2
1986	52	35	1	+	1	3	8	1
1987	73	4	2	-	1	2	11	7
1988	58	21	5	-	8	5	3	-
1989	43	37	+	-	-	6	10	4
1990	41	20	16	-	2	16	5	+
1991	29	23	28	-	13	3	4	-
1992	-	-	100	-	-	-	-	-

* use of separators at sea

Table 12. Catch/effort of capelin traps in Div. 3L utilizing research logbook data.

Year	L = Logbook landings (t)		C = Logbook landings and discards (t)	
	L/day	L/haul	C/day	C/haul
1981	2.2	1.9	2.9	2.5
1982	2.7	2.2	3.1	2.5
1983	2.4	2.1	3.4	3.0
1984	2.6	1.7	2.9	1.9
1985	2.9	2.0	4.6	3.2
1986	3.2	2.4	4.6	3.4
1987	5.1	2.9	8.8	5.0
1988	5.3	2.9	6.2	3.4
1989	5.4	2.9	6.7	3.6
1990	6.5	3.8	8.6	5.0
1991	3.6	2.0	7.3	4.1
1992	0.8	1.1	1.3	1.8

Table 13. Catch/effort of purse seines in Div. 3L utilizing research logbook data.

Year	L = Logbook landings (t)		C = Logbook landings and discards (t)	
	L/day	L/set	C/day	C/set
1981	6.9	3.4	9.4	5.3
1982	13.5	6.7	16.4	8.1
1983	10.4	5.4	18.8	9.7
1984	12.3	6.2	14.3	7.2
1985	10.5	5.5	16.4	8.6
1986	14.4	8.6	19.0	11.4
1987	13.4	9.0	18.1	12.1
1988	18.1	8.9	20.7	10.2
1989	20.1	9.0	24.3	10.9
1990	15.5	8.1	21.4	11.2
1991	10.6	7.8	16.2	11.9
1992	13.9	12.6	16.2	14.7

Table 14. Capelin landings (t), catch rates (t/day), and effort (days fished) for purse seines (PS) and traps (T) in NAFO Div. 3L, 1981-92.

Year	Gear	Landings	Catch rate	Effort
1981	PS	15210	9.4	1618
	T	7917	2.9	2730
1982	PS	17692	16.4	1079
	T	8845	3.1	2853
1983	PS	13713	18.8	729
	T	10487	3.4	3084
1984	PS	17075	14.3	1194
	T	15205	2.9	5243
1985	PS	8876	16.4	541
	T	15682	4.6	3409
1986	PS	20504	19.0	1079
	T	26627	4.6	5788
1987	PS	5919	18.1	327
	T	12536	8.8	1425
1988	PS	18859	20.7	911
	T	33762	6.2	5445
1989	PS	19722	24.3	812
	T	31541	6.7	4708
1990	PS	15072	21.4	704
	T	32636	8.6	3795
1991	PS	9474	16.2	585
	T	12582	7.3	1724
1992	PS	1482	16.2	91
	T	320	1.3	246

Table 15. Catch at age (numbers x 10⁻³) for mature capelin by purse seines and traps in NAFO Div. 3L, 1981-92.

	Year	Ages				
		2	3	4	5	6
Purse seine	1981	0	198444	198587	180638	7945
	1982	3274	424871	64520	19326	5270
	1983	13174	287491	150157	6609	286
	1984	4852	185439	296573	26973	738
	1985	47940	213053	71552	25177	1568
	1986	1172	488272	233688	17926	4705
	1987	6590	35667	130961	8815	95
	1988	56311	346446	94472	109655	6850
	1989	3697	466125	149678	6740	6699
	1990	11090	239597	269759	8578	440
	1991	32795	199416	137253	21975	151
	1992	31787	57103	4678	468	0
Trap	1981	0	106596	100848	74584	4178
	1982	2154	252868	21565	7321	1493
	1983	15952	204722	116720	3430	89
	1984	11991	214639	252096	22153	888
	1985	71940	369247	118585	30125	1932
	1986	3028	518636	316910	22235	6142
	1987	16185	64969	270517	19953	945
	1988	139876	664876	155906	135412	7520
	1989	14173	787595	202973	11150	15346
	1990	14520	460657	594169	21100	137
	1991	126329	281246	155000	22031	678
	1992	5343	11988	1307	7	0

Table 16. Catch at age and total catch (numbers x 10³) for mature capelin from purse seines and traps in NAFO Div. 3L, 1981-92.

	Year	Ages					Total
		2	3	4	5	6	
Purse seine	1981	0	122.6	122.7	111.6	4.9	361.8
	1982	3.0	393.8	59.8	17.9	4.9	479.4
	1983	18.1	39.4	206.0	9.1	0.4	273.0
	1984	4.1	155.3	248.4	22.6	0.6	431.0
	1985	88.6	393.6	132.3	46.5	2.9	663.9
	1986	1.1	452.5	216.6	16.6	4.4	691.2
	1987	20.2	109.1	400.5	27.0	0.3	557.1
	1988	61.8	380.3	103.7	120.4	7.5	673.7
	1989	4.6	574.0	184.3	8.3	8.3	779.5
	1990	15.8	340.3	383.2	12.2	0.6	752.1
	1991	56.1	340.9	234.6	37.6	0.3	669.5
	1992	349.3	627.5	51.4	5.1	0	1033.3
Trap	1981	0	39.0	36.9	27.3	1.5	104.7
	1982	0.8	88.6	7.6	2.6	0.5	100.1
	1983	5.2	66.4	37.8	1.1	0	110.5
	1984	2.3	40.9	48.1	4.2	0.2	95.7
	1985	21.1	108.3	34.8	8.8	0.6	173.6
	1986	0.5	89.6	54.7	3.8	1.1	149.7
	1987	11.4	45.6	189.8	14.0	0.7	261.5
	1988	25.7	122.1	28.6	24.9	1.4	202.7
	1989	3.0	167.3	43.1	2.4	3.3	219.1
	1990	3.8	121.4	156.6	5.6	0	287.4
	1991	73.3	163.1	89.9	12.8	0.4	339.5
	1992	21.7	48.7	5.3	0.3	0	76.0

Table 17. Catch at age (numbers x 10³) for ages 3 and 4 mature capelin combined for NAFO Div. 3L year-classes 1978-88.

Year-class	Purse seine (C/D)	Trap (C/D)
1978	182.4	46.6
1979	599.8	126.4
1980	642.4	104.2
1981	287.6	75.7
1982	610.4	16.3
1983	853.0	279.4
1984	398.0	74.2
1985	484.0	165.2
1986	957.2	323.9
1987	574.9	211.3
1988	392.3	168.4

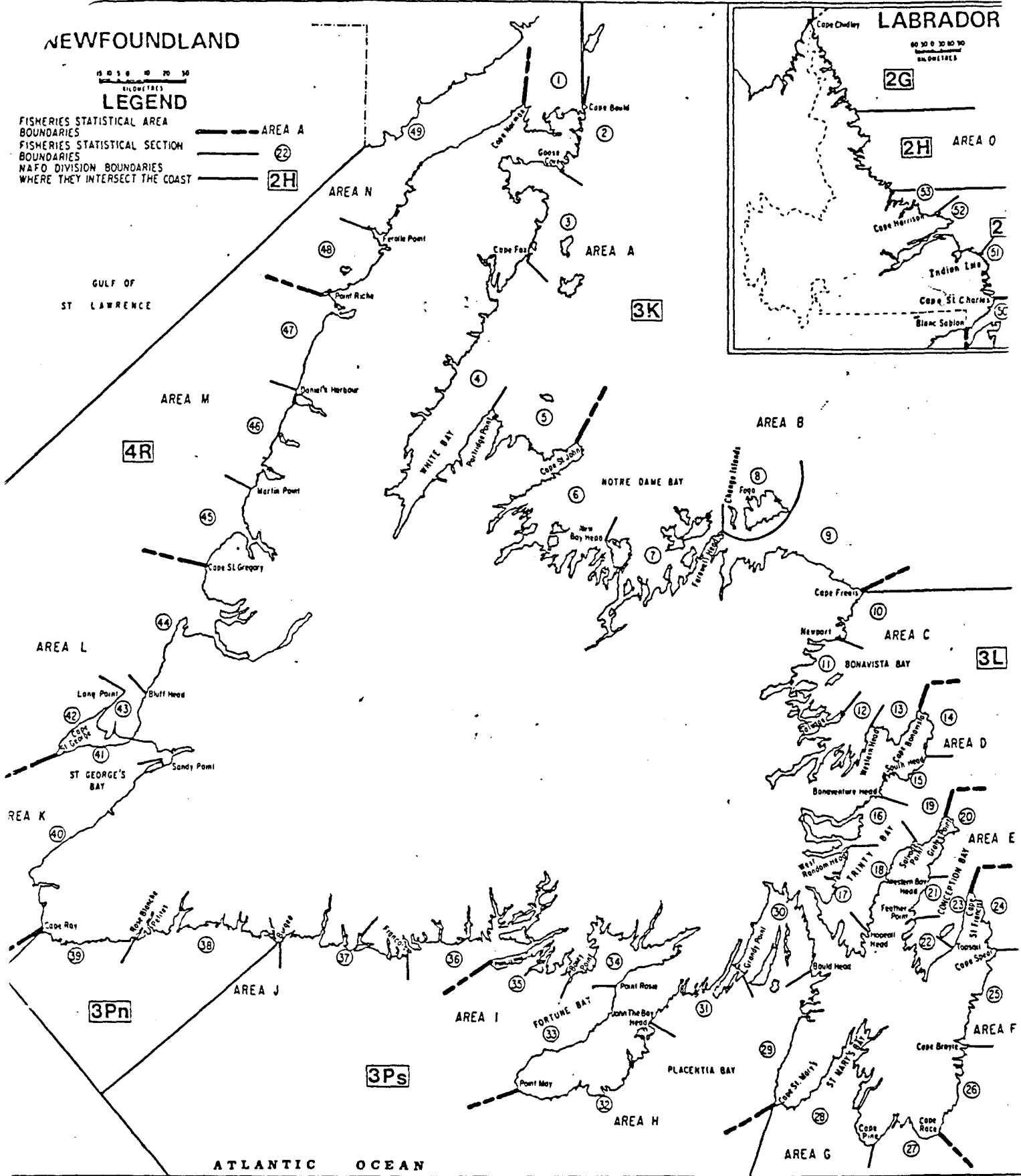


Fig. 1. Statistical areas (C = Bonavista Bay; D = Trinity Bay; E = Conception Bay; F = Southern Shore; G = Trepassey and St. Mary's Bay) and sections (numeric) in NAFO Div. 3L along the coast of Newfoundland.

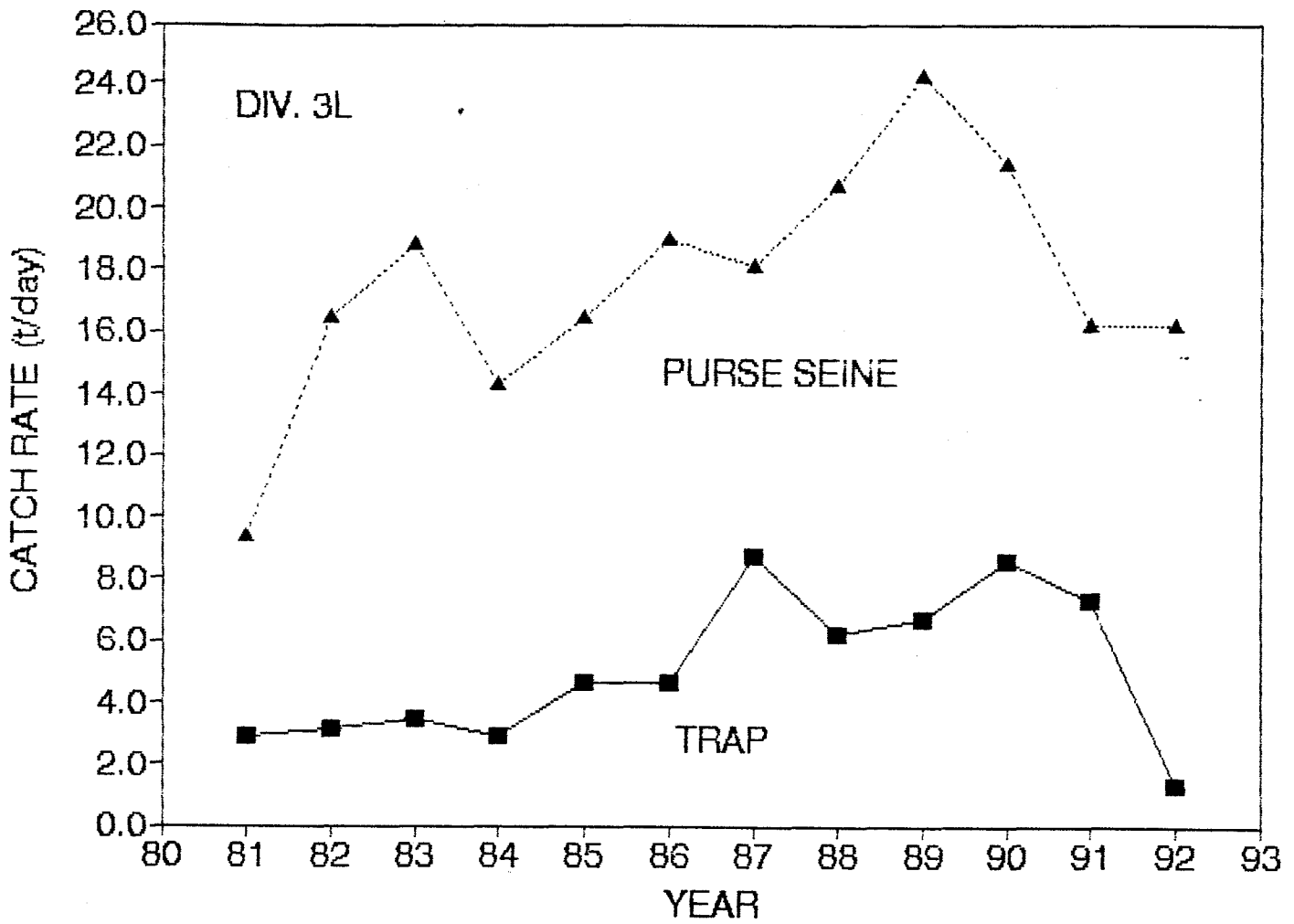


Fig. 2. Catch rate (t/day) trends for purse seines and traps in NAFO Div. 3L.

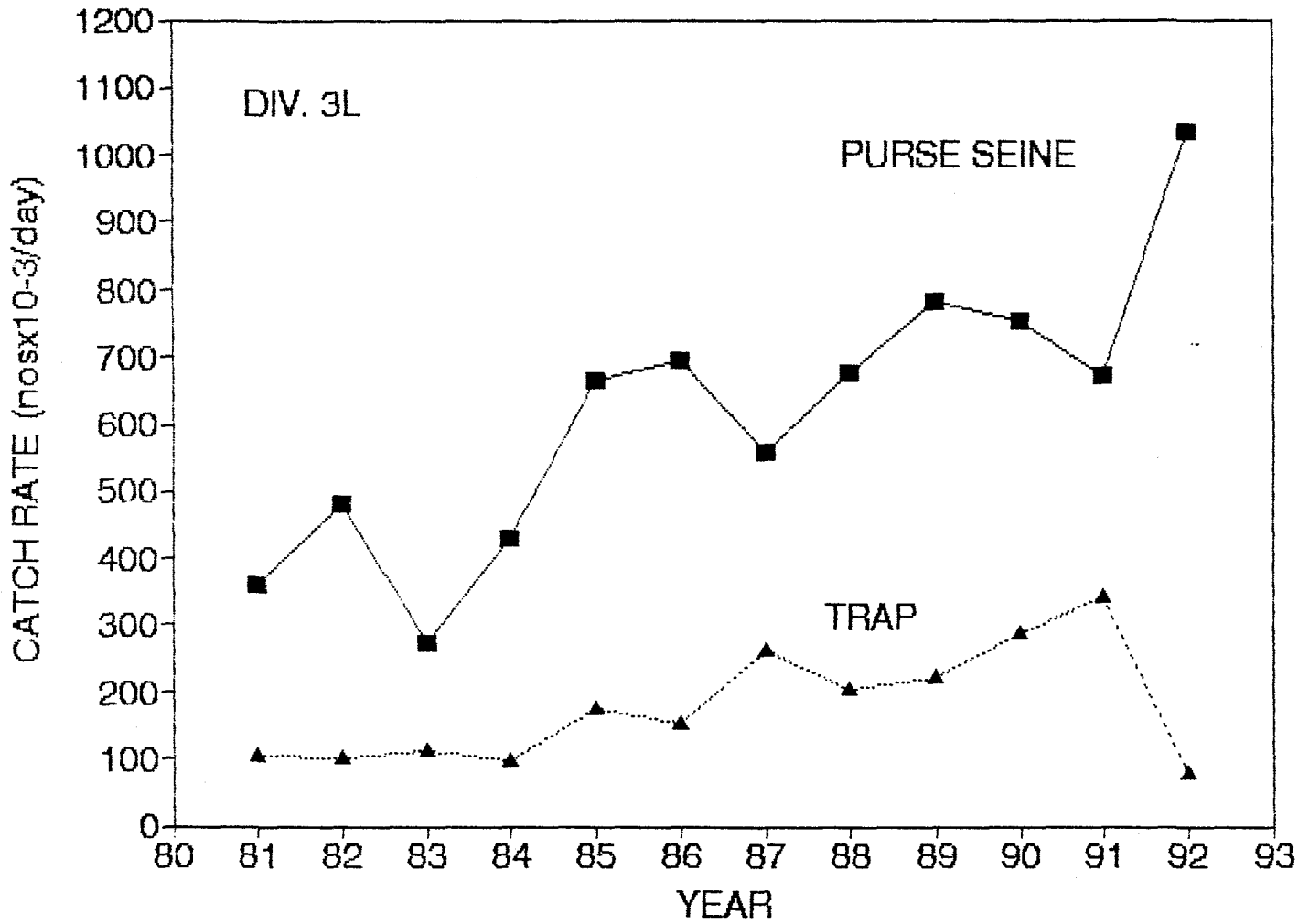


Fig. 3. Catch rate (numbers x 10⁻³/day) trends for purse seines and traps in NAFO Div. 3L.

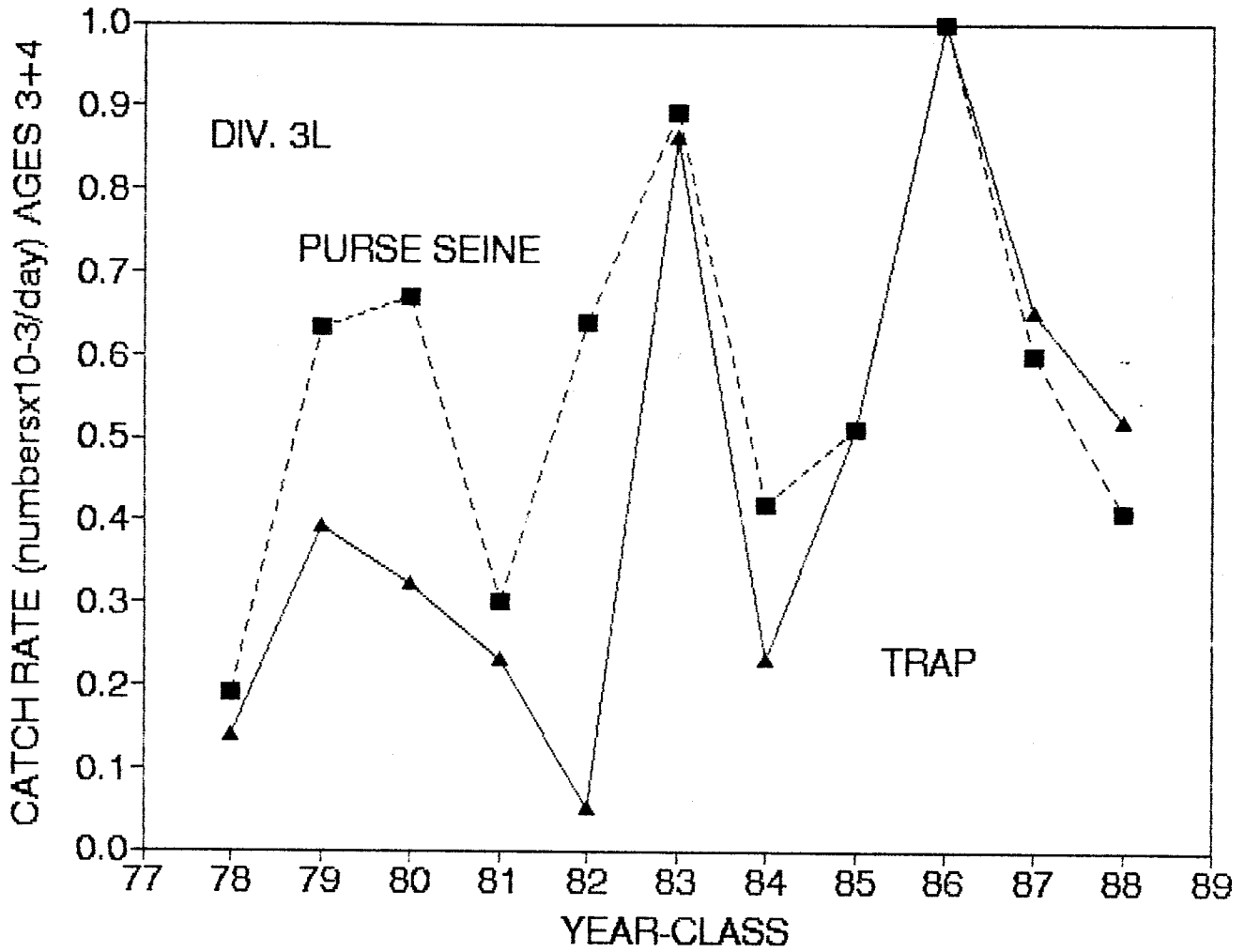


Fig. 4. Standardized catch at ages 3 and 4 combined for purse seines and traps in NAFO Div. 3L.