

Northwest Atlantic



Fisheries Organization

Serial No. N2894

NAFO SCR Doc. 97/60

SCIENTIFIC COUNCIL MEETING - JUNE 1997

An Assessment of Divisions 3LNO American Plaice

by

M.J. Morgan, W.B. Brodie, S.J. Walsh, and D. Orr

Science Branch
Department of Fisheries and Oceans
P. O. Box 5667
St. John's, Newfoundland A1C 5X1

Abstract

There has been no directed fishing on this stock since 1993. The TAC in 1995-97 has been 0. The catch in 1996 was 913 t, taken mainly in the Regulatory area. The Canadian spring and fall surveys show a large decline in abundance and biomass from the mid to late 1980's until 1995. There is no conversion for surveys before the introduction of the Campelen trawl, and therefore the estimates of biomass and abundance from the 1996 spring and 1995 and 1996 fall surveys are not comparable to the earlier time period. The EU-Spain survey estimates of biomass and abundance in 1997 have returned to the levels observed in 1995, following the large increase observed in 1996. Currently the stock is composed mainly of fish less than 6 years old although recruitment was low from 1987 and 1993. The fate of year classes since then remains to be determined. Mortality as estimated on an age by age basis remains high. The inconsistency between the Canadian spring and fall surveys which have been declining since the mid 1980's and the juvenile surveys which have been stable has not been resolved. Most of the indicators evaluated suggest that the stock is at a low level.

TAC regulation

This stock has been under TAC regulation since 1973 when a TAC of 60,000 t was established. From 1973-87, the TAC varied from 47,000 t to 60,000 t (Table 1) but was lowered to 33,585 t in 1988. Further reductions followed, bringing the TAC to 10,500 t in 1993. In 1994, a TAC of 4,800 t was implemented, but the Fisheries Commission of NAFO stated that no directed fisheries were to take place on this stock. The quota has been set at 0 since then.

Catch trends

Catches increased from about 20,000 t in the early 1960s to a peak of 94,000 t in 1967, were relatively stable around 45,000-50,000 t in 1973-82, then declined to 39,000 t in 1984-85 (Table 1, Fig. 1). Catches then increased to 65,000 t in 1986 and then declined steadily to about 13,000 t in 1992, which was the lowest since the 1950's. The catch for 1993 was around 17,500, with the increase coming from fleets of non-contracting parties (NCP) fishing mainly on the Tail of the Bank in the NAFO Regulatory Area (Fig. 2). The 1994 catch was estimated at 7378 t, although some estimates were as low as 2200 t. This catch was mainly taken in the NAFO Regulatory Area and is 1.5 times the TAC. The catch in 1995 was 637 t and in 1996 it was 913 t.

From 1977 to 1982, the catch was taken almost exclusively by Canadian vessels, but the catch by other nations increased rapidly from less than 2,000 t in 1981-82 to over 30,000 t in 1986 as new fisheries were developed in the Regulatory Area. Catches from these fleets have generally declined in recent years, as has the Canadian catch (Tables 1 and 2), although NCP catches in 1993 were an exception to this trend. Considerable doubts have arisen about some nominal catches in recent years, resulting in various catch estimates being used. These include surveillance estimates,

breakdowns of unspecified flounder catches by S.Korea prior to 1991 based on reported flounder catches, and any other estimates deemed by STACFIS to be reliable. For 1992, catches are estimated to be 1,500 t higher than the value used in the 1993 assessment. There is also some uncertainty regarding catches prior to 1973, when large amounts of unspecified flounder catches from some nations were broken down by species based on estimates of species composition.

In 1996, the Canadian catch totalled only about 60 t (Table 3). Approximately 65% of the Canadian catch was taken by inshore gears (Table 3) as opposed to years prior to 1994 when the bulk of the catch was taken by offshore trawlers (Table 4).

There was some sampling from the Portuguese and Spanish by-catch in 1996 from trawlers.

In the Portuguese catch in 3L there was a mode of about 32-38 cm while in 3N the mode was 36 cm (Alpoim et al. 1997). The catch of the Spanish trawler fleet showed a mode of 30-37 cm in 3L and of 26-33 cm in 3NO (Junquera et al. 1997). There was no information on age.

Canadian research vessel surveys

Spring

Stratified-random surveys have been carried out on the Grand Bank on Canadian vessels in the spring of each year from 1971 to 1996, with the exception of 1983. The stratification scheme used is shown in Figure 2.

In Div. 3L, the trawlable biomass was highest from 1978-82, then declined to a lower but stable level from 1985 to 1988. From 1989 to 1994, the index declined by at least 38% in each year (Table 5, Fig. 3). The estimate for 1995 was slightly less than 1994 at 4,600 t. Strata 729-736 in the deep water, which had not been surveyed in this series from 1986 to 1990, accounted for less than 5% of the 1991 estimate. This percentage has increased since then with these strata accounting for 52% of the estimate in 1995 (Table 6). Two stratified-random surveys of the deepwater slope in Div. 3L were carried out in 1994 and 1995, using a similar trawl with different footgear. Common strata between the two surveys gave a biomass index of 4900 t in 1994 and 8400 t in 1995 in the deep water (Bowering et al. 1995).

In Div. 3N, the biomass index also shows a decline in recent years, with 1992, 1994, and 1995 estimates being the lowest points in the series (Table 7 Fig. 3), which casts some doubt on the increase seen in 1993. The estimate from the 1995 spring survey for 3N was 4100 t. There was an increase in the percentage of plaice in deepwater in 1995, with 14.6% of the estimated biomass found in strata 723-728 as opposed to 3% in 1994 (Table 8).

In Div. 3O, the biomass index has shown a consistent decline since 1990 (Fig. 3), with the 1994 and 1995 values being the lowest in the series (Table 9). The estimate from the 1995 spring survey in Div. 3O was 9600 t. Most of the trawlable biomass continues to be found in the shallower strata (Table 10).

Table 11 shows the trawlable abundance at age for Div. 3LNO combined. Figure 4 shows the trends in the total abundance index and Fig. 5 indicates the 95% confidence limits around the abundance estimates in Div. 3L, 3N, and 3O respectively. In all areas, trends in abundance generally track the biomass trends. The abundance of older fish in the stock declined very rapidly, with the 1995 value for age 9+ abundance being 90% lower than the 1990 value, and about 98% lower than the peak values in 1981-82. In 1994 and 1995, the abundance at each age over 3 years was the lowest ever observed.

Campelen Surveys

Beginning in 1996 the spring survey has been conducted using a Campelen 1800 trawl. Until a conversion factor is applied to previous data the results of the spring 1996 survey and preliminary 1997 results are not directly comparable to previous surveys. The biomass estimates by strata for Div. 3L, 3N and 3O are given in Tables 12-14, with biomass by stratum and depth in Tables 15-17. The biomass index for 3L, 3N and 3O were 31 000, 26 000 and 49 000 t respectively. The biomass in the deepest strata in Div. 3L accounted for only 9% of the estimate, 6% in 3N and only 3% in 3O which is in contrast to the results for Div. 3L and 3N for 1995. The largest concentration of fish appeared to be in the south western area of Div. 3O (Fig. 6). Despite not having a conversion of the previous survey data to Campelen equivalents, the biomass from each Division in 1996 is lower than most of those observed prior to 1990 (Fig. 3). The preliminary estimate for Div. 3O for 1997 is 54 000 t.

Table 18 shows the trawlable abundance at age for Div. 3LNO. Most of the population abundance is made up of fish 5 years old and less with the 6+ abundance constituting 40% of the population and age 9+ less than 4%. Figure 4 shows the total abundance and Fig. 5 the abundance by Division with associated confidence limits. Before conversion of the previous data the total abundance is less than that observed in the late 1970's and early 1980's.

Fall

Stratified-random surveys have been conducted in Div. 3L in the fall from 1981 to 1996, usually in October-November and Figure 7 shows the trends in the trawlable biomass and abundance indices. Declines over the time period are apparent in both indices, and like the spring series, 1994 is well below other estimates. Table 19 shows the trawlable biomass estimates by stratum and depth zone for 1990-1994 only. There is no noticeable movement to deeper water in Div. 3L in the fall.

From 1990 to 1994, fall surveys were also carried out in Div. 3NO with the Engel trawl. Tables 20 and 21 give the biomass estimates by stratum and depth zone. Biomass was more or less stable over this period in Div. 3N but decreased substantially in Div. 3O. Abundance at age for Div. 3LNO combined is shown in Table 22. Similar to the spring surveys, the number of older fish declined rapidly between 1990 and 1994, with age 9+ abundance decreasing by 85% in this period. Spring surveys in Div 3LNO have shown an 80% decrease in abundance from 1990 to 1994 while fall Div 3LNO surveys have shown a 75% decrease in abundance over the same time period.

Campelen Surveys

Starting in fall 1995, surveys have been conducted using a Campelen 1800 trawl. The biomass estimates by depth zone and strata for fall 1995 and 1996 in Div. 3L are given in Table 15 for Div. 3N in Table 16 and Div. 3O in Table 17. The biomass estimate for 1995 and 1996 remained stable in 3L, decreased in Div. 3N and increased in Div. 3O with the combined Div. 3LNO estimate being stable from 1995 to 1996. Abundance at age for Div. 3LNO combined in 1995 is given in Table 23. As with spring 1996, most of the fish were less than 6 years old with ages 6+ constituting 40% of the population and ages 9+ less than 5%.

Spring vs Fall

Fig. 8 compares the total abundance estimates for the spring and fall surveys from 1990 to 1996. The index of total abundance for Div. 3LNO combined increased between spring and fall in each year. This pattern is seen in the surveys using both types of survey gear. This spring to fall increase is seen in Div. 3L during this 1990-96 period but was not consistent before that time (Fig. 9).

Proportion of Biomass North of 45 Degrees N latitude

To further investigate changes in the biomass and distribution of this stock, biomass indices from the spring surveys were divided into portions north and south of 45 degrees N latitude (Fig. 2). This showed that from 1985 to 1990, about 80-85% of the stock was located north of 45 degrees, most of which was in Div. 3L (Fig. 10). With the decline in biomass, this proportion decreased, so that the value for 1995 was around 35 %. For spring 1996 this percentage increased to about 45%. Distribution maps from both surveys in 1996 (Fig. 6) as well as those from 1994 and 1995 (Morgan et al. 1996) indicate that more of the biomass is in the southern area compared to earlier years shown in Brodie et al. (1993).

Juvenile surveys

Annual juvenile groundfish surveys of the Grand Bank began in 1985 with the main goal of measuring pre-recruitment indices of yellowtail flounder. From 1985 to 1988, the survey incorporated the area inside the 91-m isobath of the bank., i.e. the distributional area of the yellowtail flounder stock. After the discovery of shallow water nursery areas for plaice and yellowtail in the southern Grand Bank (Walsh 1991; Walsh and Power 1995) the survey was extended to the 183-m isobath in 1989 and to the 273 m isobath in 1992 to investigate distribution of juvenile plaice in deep water, in particular in NAFO Div 3L.

The juvenile groundfish surveys used a stratified-random sampling design similar to that used in the annual spring and fall Canadian groundfish surveys of the Grand Bank. The number of fishing hauls were proportioned according to the area of each stratum and further stratified by historical densities of yellowtail. Stations were randomly derived and in order to account for diel differences in catch rates of yellowtail flounder, fishing hauls in 5 selected strata (352, 360, 361, 375 and 376 -see Fig. 2) were proportioned into a 50:50 day-night allocation prior to each cruise.

The survey gear was a two-bridle Yankee 41 shrimp trawl with a mesh size of 38 mm throughout and included a 12-mm stretched mesh liner inside the codend (see McCallum and Walsh 1996 for details). The groundgear was rigged with 30-cm rubber roller discs in the bosom, 30-cm rubber bunts in the quarters, and 11-cm rubber discs in the wing ends. The standard towing speed used, measured by Doppler speed log, was 2.5 knots with each haul being 30-minutes in duration (on-bottom time), covering an average distance of 1.25 miles as calculated from Loran C and GPS navigation. The surveys were generally conducted from mid-August to mid-September in the 1985-86 and 1988-93 periods, and September-October in 1994, and November 1-13 in 1987 aboard the R. V. WILFRED TEMPLEMAN, a 50-m stern trawler. Sixteen hundred and eighty-two (1682) successful fishing hauls were made during the combined period of 1985-94. Since data on gear efficiency were not available, only relative abundance estimates were derived using a swept area model.

In the 1996 assessment of Grand Bank American plaice stock, NAFO Divisions 3LNO, STACFIS noted that there have been a number of changes in the depth range covered in the Canadian juvenile survey series. It was recommended that the abundance from these surveys be examined incorporating only the strata common to every year. Such analysis should answer the question whether current trends in the abundance and biomass from this time series remains, once the effect of increased coverage is removed.

Only those years which had common strata in all three divisions were selected for analysis. This resulted in 3 common strata out of 23 being selected in Div. 3L, 7 common strata out of 14 in Div. 3N and 4 common strata out of 15 in Div. 3O (Table 24). This excluded survey data in 1985 and 1987.

Tables 25 to 27 show the stratified average catch-per-tow (numbers and weights) along with abundance and biomass estimates of plaice derived from the juvenile groundfish surveys of the Grand Bank from 1985-94. Table 28 shows the results for the common strata chosen for comparison. Figures 11 and 12 show comparative plots of trends in average catch-per-tow of common strata and the total strata for each NAFO division by year. With the exception of the average numbers-per-tow for Div. 3L there is close agreement in the trends of the two data sets.

USSR/Russian RV Surveys

Results of surveys by the former Soviet Union from 1972-1991 have been discussed in detail in the previous assessments of this stock. The results agree with those of the Canadian spring surveys, indicating an increase in stock size in the late 1970's and early 1980's, followed by an almost continuous decline since 1984. Estimates in 1990 and 1991 are the lowest in the time series. Age data are available for only the period 1984-90 and were examined in the 1991 assessment of this stock. No comparable survey was conducted in 1992 and the data for 1993 and 1994 are not available at this time.

EU-Spain Surveys

In spring 1995 to 1997, bottom trawl surveys were conducted by EU-Spain in the NAFO regulatory area of 3NO. The biomass index of A. plaice in commonly surveyed strata showed a large increase between the 1995 and 1996 surveys (Paz et al 1996). A comparison of the 1996 and 1997 surveys showed a decrease of about the same magnitude as the increase between 1995 and 1996 (Paz et al. 1997).

Mean Weight at Age

Mean weights at age were calculated for male and female A. plaice for each Division from 1990-95 using spring RV data. Means were calculated accounting for the length stratified sampling

design. There were no apparent trends in mean weight for males (Fig. 13) or females (Fig. 14) over this period. The increase in mean weight for some ages for both sexes in Div. 3N and 3O in 1995 appears to have been the result of a concentration of sampling in southern strata.

Maturity at Length

Length at 50% maturity (L_{50}) was calculated for Div. 3LNO for males and females from 1975-96. For both sexes, L_{50} has declined substantially starting in about 1984 (Fig. 15). From 1975-82 the average L_{50} for males was 23 cm while since 1990 it has been 19 cm. Females had an average L_{50} of 39 cm from 1975-82 with the average since 1990 being 36 cm. Age at 50% maturity has also been found to have declined considerably over this time period (Morgan et al. 1996).

Relative Cohort Strength

During the 1996 assessment of this stock STACFIS recommended that *multiplicative models be used to estimate relative year-class strength from the 3 main Canadian survey series*. Therefore, an attempt was made to combine the spring, fall and juvenile Canadian survey abundances at age into a single model of relative cohort strength, using the general approach of Sinclair and Chouinard (1991). The model took the form:

$$\log(N_{jkt}) = \tau + \alpha_i + \beta_j + \delta_k + \varepsilon$$

where: N_{jkt} = number at age i from survey j belonging to cohort k in year t

τ = intercept

α_i = age effect for $i=2\dots5$

β_j = survey effect for $j=1\dots3$

δ_k = cohort effect

ε = residuals from the fitted model

To evaluate the fit of the model the residuals were plotted against the predicted values (Fig. 16). This revealed a severe pattern, with the residuals from the juvenile survey forming a separate cluster. The same model without a survey effect was fitted to each survey series separately and the cohort estimates compared. Although the estimates from the spring and fall surveys were highly correlated (Spearman rank correlation coefficient = 0.96, $p<0.0001$) neither the estimates from the spring (correlation coefficient = 0.33, $p=0.36$) or fall (correlation coefficient = 0.25, $p=0.54$) were correlated with the estimates produced from the juvenile survey (Fig. 17).

It was decided to use the spring survey series only and to incorporate all of the data from 1975 to 1996. To do this the following model was applied:

$$\log(N_{jkt}) = \tau + \alpha_i + \beta_j + \delta_k + \varepsilon$$

where: N_{jkt} = number at age i from gear j belonging to cohort k in year t

β_j = gear effect for $j=1,2$

and the other variables are as defined above.

This model showed no obvious pattern in the residuals and a significant fit to the data.

$R^2=0.93$, $n=86$

Source	DF	Type III SS	F Value	Pr > F
AGE	3	136.28	127.84	0.0001
SURVEY	1	28.09	79.04	0.0001
COHORT	26	78.47	8.49	0.0001

The estimated relative cohort strengths were then exponentiated following bias correction and are shown in Fig. 18. Cohort strengths from 1968-78 appear to have varied with little trend. From 1980 to 1993 cohort strengths have been low except for the cohorts of the mid 1980's.

Stock-recruitment data

The relative cohort strengths described above were plotted against female SSB calculated from the spring RV data as described in Morgan et al. (1996). The highest recruitments were from SSB in the middle of the observed range (Fig. 19) while 3 of the 4 lowest have arisen from the lowest observed SSBs. There appears to be temporal trends in the data with high recruitments arising from a range of SSB in the mid to late 1970's and very low recruitment every year since 1987 despite a range of SSB from 11 000 to 150 000 t.

Mortality

Total mortality was calculated from the spring data from 1975-95 for ages 1 to 16. The results are shown in Fig. 20. A Lowess smoother has been added to the plots to help visualize trends. For all ages (with the possible exception of age 3) the trend has been for increased mortality over the time period. To date this trend has not been reversed and the mortalities in the last year are among the highest observed.

Estimates of relative mortality by cohort were obtained from a multiplicative model using the same data. The following model was used:

$$\log(N_{ik}) = \tau + \delta_k + \alpha\delta_k + \varepsilon$$

where: N_{ik} = number at age i for $i=8$ to 13, belonging to cohort k in year t

τ = intercept

δ_k = cohort effect

$\alpha\delta_k$ = combined age cohort effect

ε = residuals from the fitted model

The separate slopes parameter estimates ($\alpha\delta_k$) were plotted as estimates of average total mortality experienced by a cohort over ages 8-13. There was a significant fit of the model with no obvious pattern in the residuals.

R²=0.97, n=120

Source	DF	Type III SS	F Value	Pr > F
COHORT	23	9.45	3.23	0.0001
AGE*COHORT	24	173.63	56.77	0.0001

Relative mortalities increased fairly steadily for cohorts from 1963-82 and then decreased from the 1982 to 1986 cohorts (Fig. 21).

Catch to RV Biomass ratio

As a proxy for the exploitation rate on this stock, the ratio of catch to biomass from spring RV surveys was examined (Fig. 22). The ratio was relatively stable around 15% in the late 1970's and early 1980's, when both the biomass and catch were fairly stable. The ratio was somewhat higher from 1985-90, corresponding to increased catch levels from 1985-87, and a substantial decline in biomass from 1987-90. After 1990, the catch/biomass has been above 27 %, reflecting the sharp drop in stock biomass from 1989 onward. The catch/biomass ratio again dropped to a very low level (below 5%) in 1995, reflective of the low catch in that year. The drop in ratio between 1995 and 1996 reflects the use of the Campelen trawl in the 1996 survey. The stock began its steep decline in the mid to late 1980's, when catch/biomass was generally between 0.15 and 0.20. The values of this ratio from 1991-94 are well above those observed since 1977. This suggests that catches in that time period were excessive and probably exacerbated the decline.

Assessment

The Canadian spring and fall surveys show a large decline in abundance and biomass from the mid to late 1980's until 1995. There is no conversion for surveys before the introduction of the Campelen trawl, and therefore the estimates of biomass and abundance from the 1996 spring and 1995 and 1996 fall surveys are not comparable to the earlier time period. Currently the stock is composed mainly of fish less than 6 years old although there were no good year classes between

1987 and 1993. The fate of year classes since then remains to be determined. Mortality as estimated on an age by age basis remains high. The Spanish survey estimates of biomass and abundance in 1997 have returned to the levels observed in 1995, following the large increase observed in 1996. The inconsistency between the Canadian spring and fall surveys which have been declining since the mid 1980's and the juvenile surveys which have been stable has not been resolved. Most of the indicators evaluated suggest that the stock is at a low level.

References

- Alpoim, R. M.L. Godinho, A.M. Avila de Melo and E. Santos. 1997. Portuguese research report for 1996. NAFO SCS Doc. 97/9, Ser. No. N2857, 43 p.
- Bowering, W.R., D. Power and M.J. Morgan. 1995. Distribution and abundance of five major groundfish species at the continental slope of Divisions 3KLMN based upon Canadian deepwater surveys in 1991, 1994 and 1995. NAFO SCR Doc 95/51, Ser. No. N2562, 26 p.
- Brodie, W.B., D.Power, and M.J. Morgan. 1993. An assessment of the American plaice stock in NAFO Divisions 3LNO. NAFO SCR Doc. 93/91, Ser. No. N2277, 60 p.
- Junquera, S., E. Rodriguez-Marin and E. De Cardenas. 1997. Spanish research report for 1996. NAFO SCS Doc. 97/10, Ser. No. N2873, 9 p.
- McCallum, B.R. and S.J. Walsh 1996. Groundfish Survey trawls used at the Northwest Atlantic Fisheries Centre, 1971-present. NAFO SCR Doc. 96/50 18p
- Morgan, M.J., W.B. Brodie, S.J. Walsh, D. Power and D. Orr. 1996. An assessment of the American plaice stock in Division 3LNO. NAFO SCR Doc. 96/75, Ser. No. N2750, 31 p.
- Paz, J., P. Duran and E. de Cardenas. 1996. Preliminary results from the 96 Spanish bottom trawl survey in the NAFO regulatory area for Divisions 3NO. NAFO SCR Doc. 96/49, Ser. No. N2725, 8p.
- Paz, J., P. Duran and E. De Cardenas. 1997. Preliminary results from the 97 Spanish bottom trawl survey in the NAFO regulatory area for Divisions 3NO. NAFO SCR Doc. 97/25, Ser. No. N2856, 10 p.
- Sinclair, A. and G. Chouinard. 1991. Analysis of research survey catch at age data using a multiplicative model. ICES C.M. D:39, 8 p.
- Walsh, S.J 1991 Commercial fishing practices on offshore juvenile flatfish nursery grounds on the Grand Banks of Newfoundland. Neth. J. Sea Res. 27: 423-432.
- Walsh, S..J and D. Power 1995 Abundance and biomass of American plaice populations on the Grand Bank as derived from the juvenile groundfish surveys, NAFO Division 3LNO. NAFO SCR Doc. 95/59 21 p.

Table 1. Nominal catches (t) of American plaice for NAFO Divisions 3LNO, 1960-96 and TACs from 1973 to 1996.

Year	Canada	France	Poland	USSR	South Korea ^a	Other	Total	TAC
1960	21,352	2,106	-	569	-	20	24,047	-
1961	14,903	1,473	286	1,248	-	3	17,913	-
1962	15,217	973	171	1,841	-	4	18,206	-
1963	24,591	93	457	466	-	112	25,719	-
1964	35,474	1,582	539	680	-	292	38,567	-
1965	45,365	2,056	977	4,544	-	319	53,261	-
1966	51,225	1,246	860	11,484	-	196	65,011	-
1967	54,190	1,326	3,234	35,139	-	524	94,413	-
1968	48,674	406	203	23,751	-	133	73,167	-
1969	64,815	43	34	14,493	-	52	79,437	-
1970	54,929	389	40	10,232	-	1,055	66,645	-
1971	49,394	323	370	17,173	-	628	67,888	-
1972	41,605	322	2,515	14,164	-	755	59,361	-
1973	38,586	310	1,116	12,516	-	315	52,843	60,000
1974	35,101	418	615	10,074	-	89	46,297	60,000
1975	34,015	442	537	7,682	-	545	43,221	60,000
1976	47,806	305	5	3,280	-	429	51,825	47,000
1977	42,579	31	-	1,023	-	348	43,981	47,000
1978	48,634	168	-	1,048	-	178	50,028	47,000
1979	47,131	113	-	1,190	-	135	48,569	47,000
1980	48,296	183	-	336	-	271	49,086	47,000
1981	48,177	210	-	847	-	924	50,158	55,000
1982	49,620	133	-	67	715	517	51,052	55,000
1983	35,907	41	-	170	815	1,602	38,535	55,000
1984	33,756	140	1	360	1,582	3,606 ^b	39,445	55,000
1985	40,024	-	4	81	2,483	11,620 ^b	54,212	49,000
1986	33,409	46	-	188	3,952	26,975 ^b	64,570	55,000
1987	33,967	17	-	47	2,741	18,240	55,012	48,000
1988	26,832	-	-	159	2,522	11,322 ^b	40,835	33,585 ^d
1989	27,901	92	-	6	725	14,645 ^b	43,369	30,300
1990	22,600	-	-	17	1,117	8,767 ^b	32,501	24,900
1991	23,240 ^e	-	-	60	1,910	9,471 ^b	34,681	25,800
1992	10231 ^e	-	-	50	518	2,551 ^b	13,350	25,800
1993 ^e	7,454	-	-	8	13	9,659 ^b	17,122	10,500
1994 ^e	71	-	-	-	100	7,207 ^b	7,378	4.8 ^f
1995 ^e	59	-	-	-	-	578 ^b	637	0
1996 ^e	59	-	-	-	-	854 ^b	913	0

^aIncludes a portion of catches reported as unspecified flounder. See text for details.^bIncludes some catches estimated from surveillance reports.^cCatch may have been as high as 19,400.^dEffective TAC.^eProvisional.^fNo directed fishing.

Table 2. Breakdown of catches from Table 1 listed as "other" for 1984-96.

Year	Spain	Portugal	Panama ^b	USA	Other		Misc. ^a	Total
					Caymen Islands ^b	Misc. ^a		
1984	1,622	-	1,800	-	-	184	3,606	
1985	5,498	27	3,892	1,310	797	96	11,620	
1986	11,882	9,240	3,756	1,506	572	19	26,975	
1987	14,476	2,516	-	1,248	-	-	18,240	
1988	8,956	872	-	1,379	-	115 ^c	11,322	
1989	10,909	583	-	1,134	-	2,019 ^c	14,645	
1990	294	356	-	8	-	8,109 ^c	8,767	
1991	786	187	-	-	-	8,498 ^c	9,471	
1992	412	139	-	-	-	2000 ^c	2,551	
1993	199	92	-	-	-	9368 ^c	9659	
1994	5476	630	-	575	-	526 ^c	7207	
1995	430	148	-	-	-	-	578	

^aCountries not in Tables 1 or 2.^bNot reported to NAFO. Catches estimated from surveillance reports.^cIncludes some estimated catches.

Table 3. Breakdown of Canadian catches of American plaice by division, month, and gear, 1996. Div.

Month	OT	3L			3N		3O		3LN0	
		Gillnet	Inshore	Offshore	Seine	OT	Gillnet	OT	Gillnet	Total
Jan										
Feb										
Mar										
Apr	1							5	1	7
May		1	2				2		2	7
Jun		7	2							9
Jul		16				5		3		24
Aug				2				1		3
Sep	1							3		4
Oct	1									1
Nov								1		1
Dec								1		1
Total	1	26	4	2		5	2	14	3	57
Division Totals		3L 33	3N 7	3O 17		Can(N)=55			Can(SF)=2	
Gear Totals	OT 20	Seine 2	Gillnet 35							

Table ⁴ Canadian catches of *A. plaice* (otter trawl only), by division, from 1973 to 1996.

Year	3L	3N	3Ø	3LNO	Percentage of Canadian Catch
1973	14367	11575	9966	35908	93
1974	11745	13741	7895	33381	95
1975	11356	16306	3859	31521	93
1976	20648	17171	6383	44202	92
1977	19493	15536	3528	38557	91
1978	25574	12527	6242	44343	91
1979	23698	13923	4665	42286	90
1980	28083	14786	1893	44762	93
1981	32297	9308	1810	43415	90
1982	28204	11971	5043	45218	91
1983	19091	8677	4324	32092	89
1984	16784	10950	3312	31046	92
1985	20210	13327	3935	37472	94
1986	17461	8066	3867	29394	88
1987	21511	4396	3843	29750	88
1988	14126	5195	4441	23762	89
1989	15755	4665	4024	24444	88
1990	11464	4181	3611	19256	85
1991 ^b	8487	3153	7573	19213	83
1992 ^b	684	455	5229	6368	62
1993 ^a	6	1874	3939	5819	77
1994 ^a	0	7	10	17	24
1995 ^a	0	0	2	2	4
1996 ^a	1	5	14	20	35

^aProvisional^bincludes unspecified flounder assumed to be *A. plaice*

Table 5 Mean weight (kg) of American plaice per tow, by stratum, from spring R.V. surveys in 3L. Numbers in parentheses are the number of successful 30-minute tows in each stratum. The stratified mean weight per tow (kg/30 min.) and the biomass estimates ($\text{t} \times 10^3$), are given at the bottom of the table.

Depth (fm)	Stratum	No. of trawlable units	Year - Trip											
			1971 ATC 187	1972 ATC 199	1973 ATC 207-209	1974 ATC 222	1975 ATC 233	1976 ATC 246	1977 ATC 262	1978 ATC 276	1979 ATC 289-291	1980 ATC 304, 305	1981 ATC 317-319	1982 ATC 327-329
51 100	328	114,023	-	-	-	-	-	-	26.9(3)	-	27.3(5)	-	27.5(2)	27.8(3)
51 100	341	118,151	-	-	48.4(3)	-	-	-	94.2(4)	43.8(4)	88.8(6)	47.0(6)	136.5(2)	146.6(5)
51 100	342	43,913	-	-	-	-	-	-	75.4(2)	72.6(2)	59.5(4)	77.0(4)	-	43.3(3)
51 100	343	39,409	-	-	-	-	-	-	103.1(2)	112.6(3)	90.2(4)	107.1(4)	177.5(2)	115.8(4)
101 150	344	112,146	-	-	-	-	-	92.3(4)	100.5(4)	62.4(4)	28.6(2)	105.5(3)	105.8(5)	58.0(4)
151 200	345	107,492	-	-	-	-	-	22.8(4)	27.1(4)	56.3(2)	8.4(4)	10.1(5)	32.5(4)	7.6(4)
151 200	346	64,931	-	-	-	-	45.9(2)	22.3(2)	8.4(3)	-	4.8(4)	2.8(3)	29.8(3)	5.3(3)
101 150	347	73,788	28.8(2)	-	-	24.5(2)	61.9(2)	151.5(3)	91.1(3)	59.3(4)	58.3(4)	102.3(5)	86.1(4)	93.0(2)
51 100	348	159,136	214.4(3)	92.3(3)	-	73.6(6)	47.5(4)	83.7(6)	211.6(6)	232.8(6)	150.2(6)	168.7(7)	89.5(7)	118.3(4)
51 100	349	56,686	281.2(3)	46.8(4)	-	17.0(4)	23.8(2)	66.6(3)	124.3(6)	65.1(6)	105.7(7)	110.8(9)	72.8(4)	125.6(6)
31 50	350	155,458	77.9(3)	56.5(2)	33.5(4)	82.3(3)	78.1(3)	99.0(4)	40.5(4)	44.3(6)	45.5(9)	96.8(10)	114.5(3)	76.6(7)
31 50	363	133,614	56.3(3)	111.7(3)	50.1(4)	69.8(4)	21.5(3)	90.4(4)	103.1(5)	96.8(5)	88.0(6)	77.2(5)	62.3(3)	168.0(5)
51 100	364	211,456	155.7(4)	138.8(3)	-	92.3(4)	99.4(2)	164.6(3)	236.1(7)	172.4(6)	195.5(8)	166.9(6)	172.3(3)	195.5(6)
51 100	365	78,142	192.0(3)	158.5(2)	-	43.1(3)	79.0(2)	62.4(3)	243.7(3)	243.3(2)	161.6(4)	156.1(4)	141.5(2)	88.7(3)
101 150	366	104,639	34.4(3)	-	-	63.0(3)	37.8(4)	40.8(4)	76.7(4)	-	7.2(4)	70.5(4)	20.2(3)	8.3(5)
151 200	368	25,071	0.0(2)	-	-	4.8(2)	1.1(2)	29.0(3)	0.0(3)	-	0.7(4)	0.8(2)	6.3(2)	0.5(2)
101 150	369	72,137	31.8(3)	-	-	14.2(3)	23.8(3)	52.9(4)	51.0(3)	18.6(2)	16.8(4)	13.7(3)	39.8(2)	20.5(2)
51 100	370	99,085	44.0(2)	82.5(3)	-	90.5(3)	43.3(3)	93.1(3)	162.1(3)	70.7(3)	211.7(4)	172.2(3)	54.0(2)	133.0(2)
31 50	371	84,147	95.8(3)	91.9(2)	-	63.1(3)	-	-	93.4(3)	114.1(3)	175.8(3)	147.0(3)	177.0(2)	102.9(4)
31 50	372	184,658	27.1(4)	36.3(3)	124.1(3)	50.4(3)	36.1(3)	47.5(3)	35.0(6)	24.5(7)	38.4(9)	39.7(6)	95.8(4)	50.8(6)
31 50	384	84,072	87.9(3)	69.5(2)	12.4(3)	26.6(3)	-	-	54.0(2)	54.5(3)	79.0(4)	48.8(2)	48.8(2)	32.3(2)
51 100	385	176,851	139.5(4)	84.2(4)	34.5(3)	17.3(2)	72.1(4)	79.5(2)	168.0(6)	135.4(6)	102.2(7)	224.4(4)	87.3(3)	70.8(3)
101 150	386	73,788	20.9(2)	-	-	24.1(3)	22.6(3)	51.7(2)	4.8(3)	19.5(3)	11.5(4)	7.2(3)	20.8(2)	9.2(3)
151 200	387	53,896	1.2(3)	-	-	0.5(3)	0.0(2)	1.0(3)	2.5(2)	2.7(3)	1.0(4)	0.7(2)	1.0(2)	1.3(3)
151 200	388	27,098	1.4(2)	-	12.2(2)	2.6(3)	0.2(2)	13.0(2)	0.7(2)	0.3(2)	0.6(3)	0.1(2)	0.4(2)	-
101 150	389	61,628	17.4(3)	17.0(2)	13.4(2)	14.5(3)	22.7(2)	38.8(2)	7.0(3)	8.2(3)	2.3(4)	4.8(3)	23.9(2)	4.5(2)
51 100	390	111,170	236.2(3)	30.1(3)	9.7(3)	1.6(3)	278.2(3)	-	68.1(2)	66.1(4)	93.8(5)	99.0(3)	18.5(2)	35.8(4)
101 150	391	21,168	-	24.1(2)	12.2(2)	43.3(3)	16.8(2)	-	45.4(2)	15.4(2)	17.2(4)	11.0(2)	4.3(2)	10.3(2)
151 200	392	10,884	-	-	291.9(3)	1.8(4)	2.4(2)	-	3.1(2)	1.9(3)	4.2(2)	1.5(2)	2.8(2)	0.8(2)
201 300	729	13,962	-	-	-	-	-	-	-	-	-	-	-	-
301 400	730	12,761	-	-	-	-	-	-	-	-	-	-	-	-
201 300	731	16,214	-	-	-	-	-	-	-	-	-	-	-	-
301 400	732	17,340	-	-	-	-	-	-	-	-	-	-	-	-
201 300	733	35,130	-	-	-	-	-	-	-	-	-	-	-	-
301 400	734	17,115	-	-	-	-	-	-	-	-	-	-	-	-
201 300	735	20,417	-	-	-	-	-	-	-	-	-	-	-	-
301 400	736	13,136	-	-	-	-	-	-	-	-	-	-	-	-
401-500	737	17,040	-	-	-	-	-	-	-	-	-	-	-	-
401-500	741	16,739	-	-	-	-	-	-	-	-	-	-	-	-
401-500	745	26,122	-	-	-	-	-	-	-	-	-	-	-	-
401-500	748	11,935	-	-	-	-	-	-	-	-	-	-	-	-
Mean (#sets) Biomass Index		109.4(58)	79.0(38)	49.2(32)	47.1(70)	60.7(55)	76.8(64)	98.3(102)	87.1(54)	80.9(140)	95.3(115)	80.7(80)	80.4(103)	
		232.8	135.8	53.3	101.7	124.8	163.9	271.3	213.7	223.4	252.1	221	222	

Table 5 Continued

Stratum	AN	1984 28	Year-Trip											
			1985 WT	1986 WT	1987 WT	1988 WT	1989 WT	1990 WT	1991 WT	1992 WT	1993 WT	1994 WT	1995 WT	
328	12.5(2)	51.6(4)	51.2(9)	85.9(7)	23.3(2)	22.9(8)	71.0(7)	14.7(6)	4.8(4)	1.8(6)	0.2(6)	0.5(6)		
341	69.6(4)	40.3(9)	43.7(9)	82.5(6)	50.8(6)	31.4(8)	111.0(4)	8.2(6)	0.7(6)	1.2(6)	0.8(5)	0.1(6)		
342	60.1(4)	35.2(3)	53.5(3)	91.8(2)	94.0(2)	39.6(3)	32.5(2)	3.6(2)	0.5(3)	0.7(3)	0.7(3)	0(2)		
343	-	12.7(3)	48.0(4)	111.5(3)	67.0(3)	135.3(3)	27.4(3)	5.3(2)	3.1(3)	1.7(2)	0.3(2)	0.3(2)		
344	-	41.6(5)	80.3(6)	51.1(4)	83.2(6)	145.6(7)	24.4(6)	2.0(5)	1.7(6)	1.1(6)	0.2(5)	0.2(5)		
345	-	23.3(5)	16.3(7)	11.0(4)	12.9(8)	7.6(9)	6.3(4)	10.7(3)	1.7(6)	1.4(6)	2.3(5)	0.8(5)		
346	-	26.3(2)	33.1(5)	7.3(5)	8.8(4)	6.4(4)	9.4(4)	-	2.7(4)	3.9(4)	2.9(3)	0.4(3)		
347	-	42.1(5)	50.4(5)	43.5(3)	50.5(5)	63.3(6)	43.9(4)	4.1(4)	0.9(4)	2.7(4)	2.5(4)	1.5(4)		
348	-	65.1(18)	104.9(12)	130.1(8)	142.3(11)	79.2(9)	44.5(11)	7.7(8)	3.2(9)	3.0(8)	0.6(8)	0.2(8)		
349	89.5(6)	49.8(14)	58.3(14)	105.1(11)	135.9(8)	45.7(11)	29.4(9)	9.5(9)	2.8(9)	0.8(9)	0.6(8)	0.1(2)		
350	108.2(6)	98.5(12)	99.5(11)	68.7(11)	86.1(8)	61.7(11)	30.6(7)	30.8(8)	2.9(11)	1.1(9)	0.9(7)	0(5)		
363	92.2(5)	107.8(8)	138.4(10)	68.6(9)	97.0(7)	53.6(9)	36.1(7)	23.4(7)	3.4(9)	1.4(8)	0.3(6)	0.1(7)		
364	144.4(5)	102.3(17)	87.4(17)	164.0(15)	136.1(10)	94.4(16)	50.0(12)	18.4(11)	3.8(12)	0.8(12)	1.1(10)	1.1(6)		
365	-	54.1(7)	68.5(5)	107.9(5)	82.5(4)	88.0(6)	13.6(4)	27.8(4)	4.8(4)	1.6(5)	2.2(4)	1.9(4)		
366	-	37.6(6)	21.4(8)	14.5(7)	18.8(6)	15.3(8)	12.2(6)	-	4.0(6)	3.2(7)	3.3(5)	1.9(5)		
368	-	30.5(2)	16.5(2)	1.7(3)	2.0(2)	1.6(3)	7.6(2)	-	20.9(2)	10.0(2)	1.6(2)	1.5(2)		
369	-	71.7(5)	16.1(6)	8.4(5)	6.3(4)	12.5(6)	7.5(5)	5.0(2)	6.0(4)	1.5(5)	3.1(3)	1.0(3)		
370	-	56.6(6)	96.6(6)	69.8(7)	128.5(5)	77.3(6)	26.8(7)	22.9(6)	8.4(6)	1.5(6)	2.1(5)	0.8(5)		
371	-	107.5(7)	68.0(6)	58.3(7)	147.8(5)	108.3(6)	63.3(6)	19.8(6)	0.8(5)	1.8(5)	1.0(4)	0.6(5)		
372	63.7(5)	109.9(12)	69.6(14)	30.1(13)	58.3(11)	52.7(13)	22.8(7)	12.6(10)	2.5(10)	7.0(11)	0.4(8)	0.4(10)		
384	-	100.3(6)	114.0(6)	56.4(7)	53.9(5)	102.0(6)	8.7(4)	6.1(4)	2.8(5)	0.4(5)	0.4(4)	0.5(5)		
385	-	48.8(15)	62.8(13)	74.1(11)	46.3(10)	73.3(12)	8.5(11)	16.2(8)	6.6(10)	2.1(11)	1.6(8)	0.7(9)		
386	-	26.0(5)	9.7(6)	7.5(5)	32.5(4)	12.7(6)	14.2(5)	14.4(3)	9.7(4)	1.2(5)	1.9(4)	1.6(4)		
387	-	20.8(6)	3.0(4)	0.0(4)	1.2(4)	2.5(5)	2.1(4)	8.1(3)	10.9(3)	3.0(3)	2.1(3)	3.6(3)		
388	-	25.5(2)	11.5(2)	1.4(2)	0.9(2)	2.0(3)	0.5(2)	5.5(3)	9.7(2)	2.8(2)	4.0(2)			
389	-	27.2(5)	10.6(6)	27.7(5)	10.6(6)	19.7(3)	14.5(5)	4.8(4)	7.2(3)	3.4(3)	2.9(4)	2.7(4)		
390	-	15.0(9)	14.5(8)	28.0(7)	11.1(5)	9.4(6)	6.1(5)	4.9(5)	1.5(6)	1.0(6)	1.0(5)	0.4(7)		
391	-	9.5(2)	61.0(2)	12.5(2)	27.8(2)	7.4(3)	4.8(2)	13.3(2)	2.3(2)	7.3(2)	4.0(2)	5.4(2)		
392	-	13.8(2)	9.5(2)	0.6(2)	0.9(2)	1.5(3)	3.2(2)	5.8(2)	4.3(2)	3.9(2)	2.4(2)	12.0(2)		
729	0.5(2)	-	-	-	-	-	-	2.2(2)	17.0(2)	15.6(2)	4.2(2)	8.2(2)		
730	0.3(2)	-	-	-	-	-	-	0.1(2)	3.0(2)	5.7(2)	14.4(2)	13.9(2)		
731	-	326.0(2)	-	-	-	-	-	3.4(2)	4.0(2)	6.1(2)	15.7(2)	41.1(2)		
732	-	0.3(2)	-	-	-	-	-	0.9(2)	6.3(2)	3.3(2)	0.7(2)	0.1(2)		
733	-	21.4(3)	-	-	-	-	-	0.5(2)	13.2(2)	15.3(3)	1.4(2)	5.3(2)		
734	-	1.5(3)	-	-	-	-	-	3.4(2)	1.9(2)	0.0(2)	11.8(2)	18.0(2)		
735	-	57.0(2)	-	-	-	-	-	-	63.4(2)	42.1(2)	12.3(2)	21.8(2)		
736	-	5.0(2)	-	-	-	-	-	-	16.8(2)	11.4(2)	16.9(2)	35.1(2)		
737	-	-	-	-	-	-	-	-	-	8.5(2)	-	-		
741	-	-	-	-	-	-	-	-	-	0.0(2)	-	-		
745	-	-	-	-	-	-	-	-	-	0.0(2)	-	-		
748	-	-	-	-	-	-	-	-	-	0.4(2)	-	-		

Mean (#sets) 87.4(37) 60.3(221) 63.1(211) 65.5(181) 69.9(154) 55.4(205) 29.9(156) 12.9(143) 4.5(178) 2.8(181) 1.6(160) 1.6(151)
Biomass Index 97.9 175.1 174.1 180.9 193 153 82.6 34.5 13 8.1 5.1 4.6

Table 6 Biomass estimates (000 t) of *A. plaice*, by stratum and depth zone, from Canadian spring surveys in Div. 3L from 1985-1995. (+) indicates stratum biomass < 50 t and (-) indicates stratum not surveyed.

Depth (fm)	Stratum	Year										
		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
31-50	350	15.3	15.5	10.7	13.4	9.6	4.8	4.8	0.5	0.2	0.1	+
	363	14.4	18.5	9.2	13	7.2	4.8	3.1	0.5	0.2	+	+
	371	9	5.7	4.9	12.4	9.1	5.3	1.7	0.1	0.2	0.1	0.1
	372	20.3	12.8	5.6	10.8	9.7	4.2	2.3	0.5	1.3	0.1	0.1
	384	8.4	9.6	4.7	4.5	8.6	0.7	0.5	0.2	+	+	+
	Total	67.4	62.1	35.1	54.1	44.2	19.8	12.4	1.8	1.9	0.3	0.2
51-100	328	5.9	5.8	9.8	2.6	2.6	8.1	1.7	0.5	0.2	+	0.1
	341	4.8	5.2	9.7	6	3.7	13.1	1	0.1	0.1	0.1	+
	342	1.5	2.3	4	4.1	1.7	1.4	0.2	+	+	+	0
	343	0.5	1.9	4.4	2.6	5.3	1.1	0.2	0.1	0.1	+	+
	348	10.4	16.7	20.7	22.6	12.6	7.1	1.2	0.5	0.5	0.1	+
	349	7.9	9.2	16.7	21.6	7.3	4.7	1.5	0.4	0.1	0.1	+
	364	21.6	18.5	34.7	28.8	20	10.6	3.9	0.8	0.2	0.2	0.2
	365	4.2	5.4	8.4	6.4	6.9	1.1	2.2	0.4	0.1	0.2	0.1
	370	5.6	9.6	6.9	12.9	7.7	2.7	2.3	0.8	0.2	0.2	0.1
	385	8.6	11.1	13.1	8.2	13	1.5	2.9	1.2	0.4	0.3	0.1
390	1.7	1.6	3.1	1.2	1	0.7	0.5	0.2	0.1	0.1	+	
	Total	72.7	87.3	131.2	117	81.8	52.1	17.6	5	2	1.6	0.6
101-150	344	4.7	9	5.7	9.3	16.3	2.7	0.2	0.2	0.1	+	+
	347	3.1	3.7	3.2	3.7	4.7	3.2	0.3	0.1	0.2	0.2	0.1
	366	3.9	2.2	1.5	2	1.6	1.3	-	0.4	0.3	0.4	0.2
	369	5.2	1.2	0.6	0.4	0.9	0.5	0.4	0.4	0.1	0.2	0.1
	386	1.9	0.7	0.6	2.4	0.9	1	1.1	0.7	0.1	0.1	0.1
	389	1.7	1.7	0.6	1.2	0.2	0.3	0.4	0.2	0.2	0.1	0.2
	391	0.2	1.3	0.3	0.6	0.2	0.1	0.3	+	0.2	0.1	0.1
Total	20.7	19.8	12.5	19.6	25.5	9.1	2.7	2	1.2	1.1	0.8	
151-200	345	2.5	1.8	1.2	1.4	0.8	0.7	1.1	0.2	0.1	0.2	0.1
	346	1.7	2.1	0.5	0.6	0.4	0.6	-	0.2	0.3	0.2	+
	368	0.8	0.4	+	+	+	0.2	-	0.5	0.3	+	+
	387	1.1	0.2	+	+	0.1	0.1	0.4	0.6	0.2	0.1	0.2
	388	0.7	0.3	+	+	+	+	0.1	0.3	0.3	0.1	0.1
	392	0.1	0.1	+	+	+	+	0	+	+	+	0.1
Total	6.9	4.9	1.7	2	1.3	1.6	1.6	1.8	1.2	0.6	0.6	
201-300	729	+	-	-	-	-	-	+	0.2	0.2	0.1	0.1
	731	5.3	-	-	-	-	-	+	0.1	0.1	0.3	0.7
	733	0.8	-	-	-	-	-	+	0.5	0.5	0.1	0.2
	735	1.2	-	-	-	-	-	-	1.3	0.9	0.3	0.4
Total	7.3	-	-	-	-	-	-	+	2.1	1.7	0.8	1.4
301-400	730	+	-	-	-	-	-	+	+	0.1	0.2	0.2
	732	+	-	-	-	-	-	+	0.1	0.1	+	+
	734	+	-	-	-	-	-	+	+	0	0.2	0.3
	736	+	-	-	-	-	-	-	0.2	0.1	0.2	0.5
Total	+	-	-	-	-	-	-	+	0.3	0.3	0.6	1
401-500	737	-	-	-	-	-	-	-	-	-	0.1	-
	741	-	-	-	-	-	-	-	-	-	0	-
	745	-	-	-	-	-	-	-	-	-	0	-
	748	-	-	-	-	-	-	-	-	-	+	-
Total	-	-	-	-	-	-	-	-	-	-	0.1	-
Grand Total		175	174.1	180.5	192.7	152.8	82.6	34.3	13	8.3	5.1	4.6

Table 7 . Mean weight (kg) of American plaice per tow, by stratum, from spring R.V. surveys in Division 3N. Numbers in parentheses are the number of successful 30-minute tows in each stratum. The stratified mean weight per tow (kg/30 min.) and the biomass estimates ($t \times 10^3$) are given at the bottom of the table.

Year - Trip

Depth (fm)	Stratum	No. of trawlable units	1971	1972	1973	ATC	1974	1975	ATC	1976	ATC	1977	ATC	1978	ATC	1979	ATC	1980	ATC	1981	ATC	1982
			ATC 187	ATC 199	208, 209	ATC 222	ATC 233	ATC 245	ATC 263	277, 278	ATC 289	ATC 304	ATC 319	328, 329								
151-200	357	12,311	-	-	0.0(2)	-	-	-	-	5.5(2)	-	2.4(3)	0.5(3)	0.0(2)	0.8(2)	-	-	-	-	-	-	
101-150	358	16,889	-	2.4(4)	6.5(3)	-	-	-	66.3(3)	114.4(2)	-	20.0(2)	2.1(2)	1.8(3)	0.0(3)	3.5(2)	-	-	-	-	-	
51-100	359	31,602	-	46.3(3)	31.3(3)	-	-	23.5(4)	44.3(4)	58.8(4)	106.7(4)	60.3(4)	36.0(4)	39.9(11)	43.3(6)	25.4(3)	28.5(2)	-	-	-	-	
31-501	360	224,592	-	34.1(4)	-	25.2(4)	37.2(4)	46.3(4)	21.1(5)	22.1(3)	17.5(4)	20.3(8)	33.7(7)	-	37.8(7)	-	45.5(6)	-	-	-	-	
31-50	361	139,094	17.3(2)	49.2(3)	-	40.8(4)	18.6(3)	38.7(5)	-	27.4(5)	27.6(4)	37.3(12)	46.5(11)	75.8(5)	46.8(8)	-	-	-	-	-	-	
31-50	362	189,162	89.0(2)	110.4(4)	58.0(5)	27.6(4)	12.1(4)	-	75.5(5)	70.5(4)	70.3(5)	35.2(11)	33.6(8)	83.4(5)	31.8(5)	-	-	-	-	-	-	
31-50	373	189,162	93.1(4)	55.6(4)	66.7(2)	45.1(4)	30.4(2)	-	68.1(3)	89.9(3)	46.3(4)	54.7(3)	170.0(3)	12.4(4)	-	-	-	-	-	-	-	
31-50	374	69,885	64.7(2)	41.5(3)	35.6(3)	14.6(3)	-	61.3(4)	39.1(5)	17.7(5)	16.8(4)	10.5(4)	18.5(5)	-	-	-	-	-	-	-	-	
<30	375	119,577	17.3(3)	15.7(3)	-	22.3(3)	-	23.6(2)	33.0(3)	59.0(3)	240.3(2)	25.4(4)	71.3(3)	22.0(4)	22.9(7)	-	-	-	-	-	-	-
<30	376	112,521	-	16.3(2)	-	52.2(2)	19.7(3)	165.3(2)	-	236.1(2)	28.6(2)	15.9(3)	36.1(4)	215.3(3)	62.0(2)	-	-	-	-	-	-	-
51-100	377	7,506	-	24.5(2)	-	22.3(2)	42.7(2)	21.0(3)	-	-	7.8(2)	10.0(2)	6.9(3)	10.0(2)	3.8(2)	6.5(2)	-	-	-	-	-	-
101-150	378	10,434	23.2(2)	-	-	0.5(2)	12.0(3)	-	-	0.2(2)	0.3(2)	4.7(3)	9.7(3)	3.5(3)	2.0(2)	-	-	-	-	-	-	-
151-200	379	7,957	-	0.9(2)	15.7(3)	3.4(2)	-	-	-	2.3(2)	-	1.5(2)	2.7(3)	0.3(3)	-	-	-	-	-	-	-	
151-200	380	8,707	-	3.6(4)	144.1(3)	19.5(4)	15.6(2)	-	15.3(2)	7.6(3)	19.1(3)	13.1(4)	-	-	-	-	-	-	-	-	-	
101-150	381	13,662	22.1(4)	4.5(4)	6.1(3)	-	-	45.6(2)	39.0(3)	32.4(3)	174.9(3)	25.5(4)	103.5(2)	56.8(2)	-	-	-	-	-	-	-	
51-100	382	48,567	23.5(3)	59.9(2)	0.1(2)	51.8(2)	-	-	14.5(3)	62.7(3)	87.7(2)	25.6(3)	33.0(4)	241.7(3)	19.8(2)	-	-	-	-	-	-	-
31-50	383	50,593	69.0(2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
201-300	723	11,635	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
301-400	724	9,308	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
201-300	725	7,882	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
301-400	726	5,405	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
201-300	727	12,010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
301-400	728	11,710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
401-500	752	10,059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
401-500	756	7,957	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
401-500	760	11,560	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mean (#sets)		58.5(24)	48.3(45)	34.2(48)	29.5(37)	25.8(22)	43.9(30)	51.7(48)	75.6(41)	40.4(82)	37.8(81)	67.6(54)	32.7(60)									
Biomass Index		48.6	59.5	35.1	25.2	22.6	43.1	64.5	89.4	50.6	40.7	68.4	59.9									

Table 7. Continued

Stratum	Year-Trip												WT 168-170		
	1984			1985			1986			1987					
	WT	29	AN	43	WT	47	WT	58	WT	60	WT	70			
357	0.0(2)	22.3(2)	0.0(2)	-	0.0(2)	1.5(2)	1.9(2)	0.8(2)	0.8(2)	0.0(2)	0.4(2)	1.5(2)	0.0(2)	4.9(2)	3.1(2)
358	3.5(2)	180.5(2)	2.8(2)	2.8(2)	5.9(2)	3.9(2)	17.5(2)	12.9(2)	10.4(2)	12.9(2)	11.6(2)	30.0(2)	7.2(2)	61.7(2)	5.3(2)
359	51.8(2)	28.0(2)	27.0(2)	5.9(2)	10.4(12)	22.2(15)	18.3(15)	15.6(12)	5.8(14)	10.4(2)	17.8(2)	104.0(2)	3.6(2)	2.8(2)	
360	47.3(7)	38.2(16)	32.5(13)	15.3(15)	36.9(8)	26.5(7)	39.6(10)	39.0(9)	11.7(8)	3.3(8)	17.7(11)	4.5(8)	4.4(12)	4.4(12)	
361	39.0(5)	47.0(7)	22.7(10)	36.9(8)	50.6(13)	56.9(13)	49.9(10)	29.8(10)	6.1(12)	10.9(9)	23.0(5)	10.8(7)	23.0(5)	10.8(7)	
362	89.9(7)	66.9(11)	82.6(14)	55.4(13)	50.6(10)	50.6(10)	56.9(13)	49.9(10)	25.9(11)	9.5(10)	6.1(12)	10.9(9)	1.3(6)	0.8(10)	
373	66.1(7)	67.3(9)	26.4(14)	78.6(13)	44.1(10)	60.5(13)	9.5(10)	25.9(11)	3.7(10)	3.3(9)	3.7(10)	3.3(9)	0.9(7)	0.1(10)	
374	112.1(3)	49.5(4)	15.0(6)	36.5(5)	20.2(5)	30.8(5)	10.4(5)	15.6(5)	3.4(5)	3.4(5)	3.4(5)	3.8(3)	2.1(3)	1.1(4)	
375	46.2(5)	32.8(8)	45.6(8)	69.4(8)	36.8(6)	23.4(8)	24.9(8)	4.8(6)	11.9(6)	10.1(6)	3.1(4)	3.1(4)	2.5(6)	2.5(6)	
376	10.6(4)	21.7(7)	22.4(9)	27.4(8)	6.0(6)	19.8(8)	6.3(7)	10.9(7)	1.2(7)	10.7(6)	1.9(4)	0.3(6)	0.3(6)	0.3(6)	
377	319.5(2)	37.3(2)	34.0(2)	32.8(2)	26.8(2)	36.9(2)	56.3(2)	27.2(3)	19.8(2)	62.0(2)	5.7(2)	2.2(2)	2.2(2)	2.2(2)	
378	21.5(2)	36.5(2)	68.1(2)	7.0(2)	10.5(2)	2.1(2)	45.2(2)	11.7(3)	24.8(2)	126.5(2)	20.6(2)	2.4(2)	2.4(2)	2.4(2)	
379	4.5(2)	5.8(2)	1.0(2)	7.8(2)	0.1(2)	0.0(2)	0.9(2)	3.0(2)	13.0(2)	1.4(2)	7.4(2)	0.7(2)	0.7(2)	0.7(2)	
380	1.3(2)	10.8(2)	3.6(3)	0.0(2)	0.0(2)	2.6(2)	6.0(2)	3.7(2)	10.5(2)	13.5(2)	2.5(2)	3.4(2)	3.4(2)	3.4(2)	
381	53.8(2)	26.3(2)	15.3(3)	2.4(2)	5.8(2)	7.6(2)	15.7(2)	7.2(2)	10.0(2)	19.3(2)	11.3(2)	3.2(2)	3.2(2)	3.2(2)	
382	2.8(3)	63.4(4)	6.5(4)	50.3(3)	5.5(2)	15.7(3)	7.5(3)	1.4(2)	2.6(3)	2.0(2)	1.7(2)	0.5(3)	0.5(3)	0.5(3)	
383	61.5(3)	22.2(3)	19.9(4)	36.3(3)	24.0(3)	22.0(3)	56.4(2)	3.5(3)	2.1(2)	1.2(3)	0.6(2)	0.2(3)	0.2(3)	0.2(3)	
723	-	-	-	-	-	-	-	0.2(2)	-	0.1(2)	3.0(2)	0.1(2)	0.1(2)	0.1(2)	
724	-	-	-	-	-	-	-	0.0(2)	0.0(2)	3.9(2)	0.2(2)	2.3(2)	2.3(2)	6.5(2)	
725	-	-	-	-	-	-	-	0.2(2)	-	0.6(2)	2.4(2)	3.1(2)	3.1(2)	3.1(2)	
726	-	-	-	-	-	-	-	0.9(2)	1.9(2)	5.6(2)	0.7(2)	2.0(2)	2.0(2)	2.0(2)	
727	-	-	-	-	-	-	-	2.8(2)	7.6(2)	16.4(2)	9.4(2)	9.0(2)	9.0(2)	9.0(2)	
728	-	-	-	-	-	-	-	1.1(2)	12.8(2)	15.0(2)	9.5(3)	28.1(2)	28.1(2)	28.1(2)	
752	-	-	-	-	-	-	-	-	-	-	11.1	-	-	-	
756	-	-	-	-	-	-	-	-	-	-	0.6	-	-	-	
760	-	-	-	-	-	-	-	-	-	-	0	-	-	-	
Mean (#sets)	54.7(60)	47.8(85)	35.0(101)	42.6(91)	25.9(77)	34.1(94)	24.0(85)	15.2(93)	6.0(93)	13.6(85)	5.6(76)	3.1(89)			
Biomass Index	47.4	75.3	43.8	52.8	32.4	42.8	30.1	19.9	7.8	17.8	7.6	4.1			

Table 8. Biomass estimates (000 t) of *A. plaice*, by stratum and depth zone, from Canadian spring surveys in Div. 3N from 1985-1995. (+) indicates stratum biomass <50 t and (-) indicates stratum not surveyed.

Depth (fm)	Stratum	Year											
		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	
<30	375	3.9	5.5	8.3	4.4	2.8	3	0.6	1.4	1.2	0.4	0.3	
	376	2.4	2.6	3.1	0.7	2.2	0.7	1.2	0.1	1.2	0.2	+	
	Total	6.3	8.1	11.4	5.1	5	3.7	1.8	1.5	2.4	0.6	0.3	
31-50	360	8.6	7.3	3.4	2.3	5	4.1	3.5	1.3	4	1	1	
	361	6.5	3.2	5.1	3.7	5.5	5.4	1.6	0.4	2.3	3.2	1.5	
	362	12.7	15.6	10.5	9.6	10.8	9.4	5.6	1.2	2.1	0.2	0.2	
	373	12.7	5	14.9	8.3	11.4	1.8	4.9	0.7	0.6	0.2	+	
	374	3.5	1.3	2.6	1.4	2.2	0.7	1.1	0.2	0.3	0.1	0.1	
	383	1.1	1	1.8	1.2	1.1	2.8	0.2	0.1	0.1	+	+	
	Total	45.1	33.4	38.3	26.5	36	24.2	16.9	3.9	9.4	4.7	2.8	
51-100	359	0.9	0.8	0.2	0.1	0.6	0.4	0.3	0.6	3.3	0.1	0.1	
	377	0.3	0.3	0.3	0.2	0.3	0.4	0.2	0.1	0.5	+	+	
	382	3.1	0.3	2.4	0.3	0.8	0.4	+	0.1	0.1	0.1	+	
	Total	4.3	1.4	2.9	0.6	1.7	1.2	0.5	0.8	3.9	0.2	0.1	
101-150	358	3	+	+	+	+	+	0.2	0.5	0.1	1	0.1	
	378	0.4	0.7	+	0.1	+	0.5	0.1	0.3	1.3	0.2	+	
	381	0.4	0.2	+	+	0.1	0.2	0.1	0.4	0.3	0.2	+	
	Total	3.8	0.9	+	0.1	0.1	0.7	0.4	1.2	1.7	1.4	0.1	
151-200	357	0.3	0	-	0	0	+	+	+	0	0.1	+	
	379	+	+	+	+	0	+	+	0.1	+	0.1	+	
	380	+	+	0	0	+	+	+	+	0.1	+	+	
	Total	0.3	+	+	+	+	+	+	0.1	0.1	0.2	0.1	
201-300	723	-	-	-	-	-	+	+	+	+	+	0.1	
	725	-	-	-	-	-	+	+	+	+	+	+	
	727	-	-	-	-	-	+	+	+	0.2	0.1	0.1	
	Total	-	-	-	-	-	+	+	+	0.2	0.1	0.2	
301-400	724	-	-	-	-	-	-	0	+	+	+	0.1	
	726	-	-	-	-	-	+	+	+	+	+	+	
	728	-	-	-	-	-	+	0.1	0.2	0.1	0.1	0.3	
	Total	-	-	-	-	-	+	0.1	0.2	0.1	0.1	0.4	
401-500	752	-	-	-	-	-	-	-	-	-	0.1	-	
	756	-	-	-	-	-	-	-	-	+	-	-	
	760	-	-	-	-	-	-	-	-	-	0	-	
	Total	-	-	-	-	-	-	-	-	-	0.1	-	
Grand Total		59.8	43.8	52.6	32.3	42.8	29.8	19.6	7.6	17.9	7.4	4.1	

Table 9. Mean weight (kg) of American plaice per tow, by stratum, from spring R.V. surveys in 3O. Numbers in parentheses are the number of successful 30-minute tows in each stratum. The stratified mean weight per tow (kg/30 min.) and the biomass estimates ($t \times 10^{-3}$) are given at the bottom of the table.

Depth (fm)	Stratum	No. of trawlable units	Year-Trip										
			1973 ATC*		1975		1976		1977		1978		1979
			207, 209	ATC 233	ATC 233	ATC 245	ATC 263	ATC 263	276, 277	ATC	ATC	ATC	1980
51 100	329	129,185	7.8(2)	-	91.7(2)	80.2(3)	18.6(5)	61.6(6)	45.8(2)	157.0(2)	54.9(6)	-	-
31 50	330	156,809	47.6(6)	25.7(3)	26.9(3)	101.1(3)	40.0(6)	78.4(7)	22.0(2)	54.8(4)	24.2(7)	-	-
31 50	331	34,229	28.6(2)	6.4(2)	41.2(2)	-	6.8(2)	28.9(3)	28.3(2)	-	24.0(4)	-	-
51 100	332	78,592	-	23.6(2)	13.5(3)	10.3(3)	14.9(3)	12.9(4)	18.9(2)	-	18.3(4)	-	-
101 150	333	11,335	-	5.7(2)	1.8(2)	4.3(2)	2.3(3)	5.3(2)	0.1(2)	-	1.3(4)	-	-
151 200	334	6,908	-	-	0.0(2)	0.0(2)	0.0(3)	0.6(3)	0.0(2)	-	0.1(4)	-	-
151 200	335	4,354	0.5(2)	-	13.3(3)	-	7.1(2)	4.1(2)	1.5(3)	-	0.7(2)	-	-
101 150	336	9,083	4.6(3)	7.6(2)	30.9(2)	10.4(2)	6.8(2)	8.1(4)	0.3(2)	-	2.5(2)	-	-
51 100	337	71,161	16.3(3)	3.0(3)	16.3(2)	21.8(2)	30.5(2)	1.3(4)	6.5(3)	-	22.3(3)	-	-
31 50	338	142,472	38.8(5)	20.0(2)	62.7(3)	22.9(4)	7.6(5)	19.9(7)	30.2(5)	-	13.2(5)	-	-
51 100	339	43,913	152.4(2)	47.2(2)	-	-	65.5(2)	262.4(3)	-	96.5(2)	27.0(4)	-	-
31 50	340	128,810	-	20.0(3)	81.2(6)	52.1(3)	18.0(3)	59.2(7)	85.8(2)	97.3(3)	35.3(6)	-	-
31 50	351	189,182	65.7(5)	73.5(4)	56.3(4)	62.7(5)	18.5(6)	46.8(11)	78.3(10)	180.0(4)	46.3(9)	-	-
31 50	352	193,666	25.8(5)	77.9(4)	61.1(4)	17.1(5)	8.4(4)	25.5(12)	38.0(11)	-	36.6(7)	-	-
31 50	353	96,232	42.0(3)	72.0(3)	46.3(2)	42.4(3)	41.5(3)	36.0(5)	75.9(4)	-	35.0(3)	-	-
51 100	354	35,580	49.0(3)	-	32.4(3)	34.5(2)	-	17.7(4)	101.8(3)	10.8(2)	34.8(2)	-	-
101 150	355	7,732	0.5(2)	3.6(2)	7.3(2)	-	-	16.8(4)	8.5(2)	28.5(2)	14.0(2)	-	-
151 200	356	4,579	0.9(2)	-	-	-	-	11.6(2)	4.8(2)	30.5(2)	-	-	-
201 300	717	6,981	-	-	-	-	-	-	-	-	-	-	-
301 400	718	8,332	-	-	-	-	-	-	-	-	-	-	-
201 300	719	5,705	-	-	-	-	-	-	-	-	-	-	-
301 400	720	7,882	-	-	-	-	-	-	-	-	-	-	-
201 300	721	5,705	-	-	-	-	-	-	-	-	-	-	-
301 400	722	6,981	-	-	-	-	-	-	-	-	-	-	-
401-500	764	7,882	-	-	-	-	-	-	-	-	-	-	-
401-500	772	10,134	-	-	-	-	-	-	-	-	-	-	-
Mean (#sets) Biomass Index			41.2(45) 46.1	42.9(34) 49.1	52.2(45) 67.6	47.4(39) 59.2	21.2(51) 27.5	46.5(90) 62.5	46.5(59) 60.1	115.1(21) 79.2	31.8(74) 42.4		

Stratum	Year-Trip												
	1984 AN 27	1985 AN 43	1986 WT 47	1987 WT	1988 WT 60	1989 WT 70	1989 WT 82	1990 WT 94, 95	1991 WT 106, 107	1992 WT 119, 120	1993 WT 136	1994 WT 152-154	1995 WT 168-170
329	25.7(5)	30.5(8)	23.4(8)	49.3(9)	8.2(7)	30.2(9)	19.4(7)	13.0(9)	3.0(8)	5.7(6)	17.2(5)	6.2(5)	
330	48.0(4)	118.4(10)	44.5(9)	56.1(11)	29.6(9)	40.1(11)	33.2(10)	29.4(11)	2.4(10)	3.4(7)	2.0(5)	1.4(7)	
331	80.2(3)	98.8(3)	11.4(4)	46.8(2)	43.8(2)	10.7(2)	-	36.5(2)	10.3(2)	42.7(2)	12.0(2)	12.8(2)	
332	6.0(2)	24.3(5)	38.8(6)	59.4(5)	5.5(4)	16.8(5)	16.9(5)	25.2(6)	20.4(5)	16.9(4)	7.1(4)	7.0(4)	
333	0.0(2)	0.0(2)	0.0(3)	0.4(2)	1.3(2)	0.2(2)	2.4(2)	1.0(2)	0.4(2)	0.2(2)	60.8(2)	5.0(2)	
334	0.0(2)	1.5(2)	0.4(2)	0.8(2)	0.1(2)	0.4(2)	3.9(2)	0.9(2)	2.0(2)	0.6(2)	12.2(2)	4.8(2)	
335	0.4(2)	0.7(2)	0.1(2)	0.4(2)	1.8(2)	0.1(2)	0.0(2)	3.0(3)	4.0(3)	9.8(2)	5.2(2)	5.2(2)	
336	0.0(2)	1.3(2)	0.3(2)	0.0(2)	1.8(2)	0.5(2)	0.6(2)	4.1(2)	17.5(2)	4.8(2)	34.5(2)	4.7(2)	
337	7.0(2)	15.8(5)	12.4(5)	14.3(6)	6.3(4)	10.5(5)	13.3(5)	17.5(5)	14.5(4)	4.9(2)	6.0(3)	10.7(4)	
338	60.1(5)	59.6(9)	28.5(9)	26.7(9)	50.3(8)	21.3(10)	35.9(8)	29.2(10)	19.0(6)	14.8(6)	15.9(6)	8.8(6)	
339	180.0(2)	13.9(3)	5.5(3)	68.5(3)	29.2(3)	84.0(3)	78.6(3)	30.5(3)	55.0(2)	11.2(2)	8.1(2)	4.7(2)	
340	49.5(4)	43.9(9)	35.9(7)	93.7(9)	56.1(7)	26.3(9)	55.1(9)	31.3(9)	16.5(5)	9.4(6)	3.0(5)	2.0(5)	
351	92.9(6)	73.3(9)	80.3(14)	71.1(13)	76.9(10)	57.5(13)	78.6(12)	43.0(12)	14.4(10)	12.0(9)	0.3(7)	0.6(8)	
352	27.0(7)	56.5(11)	34.2(14)	63.5(13)	52.2(11)	35.1(13)	47.4(13)	23.0(14)	30.6(8)	29.8(7)	18.9(8)	11.5(10)	
353	48.5(2)	55.5(6)	29.2(7)	44.4(6)	21.0(5)	28.7(7)	28.3(6)	8.3(7)	26.2(4)	24.7(4)	11.8(4)	22.0(5)	
354	11.8(2)	73.2(3)	9.8(3)	17.3(2)	6.0(2)	14.0(2)	10.4(2)	15.9(3)	22.7(2)	10.5(2)	6.3(2)	8.9(3)	
355	4.8(2)	20.3(2)	1.0(2)	1.8(2)	0.4(2)	13.0(2)	7.1(2)	14.8(2)	13.6(2)	1.5(2)	28.6(2)	5.9(2)	
356	4.3(2)	7.0(2)	0.0(2)	1.2(2)	1.0(2)	0.0(2)	0.5(2)	2.7(2)	12.6(2)	1.8(2)	8.7(2)	10.2(2)	
717	-	-	-	-	-	-	1.0(2)	0.0(2)	1.2(2)	19.6(2)	5.0(2)	-	-
718	-	-	-	-	-	-	0.0(2)	0.0(2)	0.0(2)	2.1(2)	0.0(2)	-	-
719	-	-	-	-	-	-	0.1(2)	1.1(2)	0.1(2)	1.5(2)	2.7(2)	-	-
720	-	-	-	-	-	-	0.0(2)	0.2(2)	0.5(2)	1.9(2)	0.0(2)	-	-
721	-	-	-	-	-	-	0.9(2)	1.6(2)	0.6(2)	4.4(2)	2.9(2)	-	-
722	-	-	-	-	-	-	0.6(2)	1.6(2)	0.5(2)	9.2(2)	38.6(2)	-	-
764	-	-	-	-	-	-	-	-	-	0.5(2)	-	-	-
772	-	-	-	-	-	-	-	-	-	4.5(2)	-	-	-
Mean (#sets) Biomass Index	48.0(56)	57.0(93)	35.9(102)	53.4(100)	37.7(84)	32.6(101)	40.4(92)	24.9(116)	16.9(91)	13.8(81)	9.7(81)	6.9(85)	
Biomass Index	64.5	48.2	71.7	50.7	76.6	43.8	52.9	34.5	23.3	19.1	13.7	9.6	

Table 1 Biomass estimates (000 t) of *A. plaice*, by stratum and depth zone, from Canadian spring surveys in Div. 3O from 1985-1995. (+) indicates stratum biomass <50 t and (-) indicates stratum not surveyed.

Depth (fm)	Stratum	Year										
		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
31-50	330	18.6	7	8.8	4.6	6.3	5.2	4.6	0.4	0.5	0.3	0.2
	331	3.4	0.4	1.6	1.5	0.4	-	1.2	0.4	1.5	0.4	0.4
	338	8.5	4.1	3.8	7.2	3	5.1	4.2	2.7	2.1	2.3	1
	340	5.6	4.6	12	7.2	3.4	7.1	4	2.1	1.2	0.4	0.3
	351	13.9	15.2	13.2	14.5	10.9	14.9	8.1	2.7	2.3	0.1	0.1
	352	10.9	6.6	12.3	10.1	6.8	9.2	4.4	5.9	5.7	3.7	2.2
	353	5.3	2.8	4.3	2	2.8	2.7	0.8	2.5	2.4	1.1	2.1
	Total	66.2	40.7	56	47.1	33.6	44.2	27.3	16.7	15.7	8.3	6.3
51-100	329	3.9	3	6.4	1.1	3.9	2.5	1.7	0.4	0.72	2.2	0.8
	332	1.9	3	4.7	0.4	1.3	1.3	2	1.6	1.3	0.6	0.5
	337	1.1	0.9	1	0.4	0.7	0.9	1.2	1	0.3	0.4	0.8
	339	0.6	0.2	3	1.3	3.7	3.4	1.3	2.4	0.5	0.3	0.2
	354	2.6	0.3	0.6	0.2	0.5	0.4	0.6	0.8	0.4	0.2	0.3
	Total	10.1	7.4	15.7	3.4	10.1	8.5	6.8	6.2	3.2	3.7	2.6
101-150	333	0	0	+	+	+	+	+	+	+	0.7	0.1
	336	+	+	+	+	+	+	+	0.2	+	0.3	+
	355	0.2	+	+	+	0.1	+	0.1	0.1	+	0.2	+
	Total	0.2	+	+	+	0.1	+	0.1	0.3	+	1.2	0.1
151-200	334	+	+	+	+	+	+	+	+	+	0.1	+
	335	+	+	+	+	+	0	+	+	+	+	+
	356	+	0	+	+	0	+	+	+	+	+	0.1
	Total	+	+	+	+	+	+	+	+	+	0.1	0.1
201-300	717	-	-	-	-	-	-	+	0	+	0.2	0.1
	719	-	-	-	-	-	-	+	+	+	+	+
	721	-	-	-	-	-	-	+	+	+	+	+
	Total	-	-	-	-	-	-	+	+	+	0.2	0.1
301-400	718	-	-	-	-	-	-	0	0	0	+	0
	720	-	-	-	-	-	-	0	+	+	+	0
	722	-	-	-	-	-	-	+	+	+	0.1	0.3
	Total	-	-	-	-	-	-	+	+	+	0.1	0.3
401-500	764	-	-	-	-	-	-	-	-	-	+	-
	768	-	-	-	-	-	-	-	-	-	-	-
	772	-	-	-	-	-	-	-	-	-	+	-
	Total	-	-	-	-	-	-	-	-	-	+	-
Grand Total		76.5	48.1	71.7	50.5	43.8	52.7	34.2	23.2	18.9	13.6	9.5

Table 11 [Abundance index (millions) of *A. plaice* from spring surveys in Div. 3LNO.

Age/Year	1973	1975	1976	1977	1978	1979	1980	1981	1982	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	0.1	0	0.2	0	0.1	0.4	0.2	0.68	0.4	0	0.1	0	0.2	0	0	0	0	0	0	0	0
2	1.38	1.6	0.87	0.79	1.19	2.19	2.19	0.85	1.4	0.21	0.1	0.3	1.5	0.4	0.3	0.12	0.3	0.09	0	0	0
3	10.49	9.43	12.91	5.87	17.36	6.71	6.98	20.97	6.31	1.12	2.7	1.6	5.42	4.22	4.79	2.32	1.71	1.8	1.2	0.14	0.14
4	14.57	18.78	23.59	29.84	34.04	25.53	14.75	19.77	20.13	3.4	11.19	6.8	13.03	11.65	26.05	19.57	4.84	3.4	11.2	1.2	0.83
5	57.67	25.96	39.41	77.06	112	71.17	50.65	39.46	22.33	9.99	22.09	17.49	28.52	27.46	26.42	48.32	27.12	7	14.2	7.6	4.8
6	71.88	46.57	136.61	144.25	111.41	98.01	82.72	44.13	35.86	45.49	55.49	74.18	69.38	68.52	35.6	39.74	19.3	22.9	13.1	9.2	9.2
7	95.05	87.05	94.28	196.39	197.83	171.78	173.45	156.98	80.93	94.34	103.9	120.1	147.07	121.72	98.67	60.14	30.47	23.9	28	17.4	11.6
8	59.72	114.25	174.51	249.01	224.83	240.32	271.24	311.17	162.65	135.54	125.7	113.2	152.15	121.62	105.8	63.22	30.88	18.1	23.7	15.8	13.2
9	47.21	119.22	172.69	188.81	163.71	186.35	218.82	285.18	228.15	141.76	94.11	93	92.16	106.5	84.5	59.33	29.37	14.8	11.2	9.5	9.3
10	59.59	104.9	172.08	178.14	130.87	156.82	141.46	173.23	184.42	93.33	71.91	52.8	55.23	46.46	37.62	40.65	18.47	9.2	6.5	5.9	3.55
11	51.7	60.6	107.74	85.87	47.53	76.15	64.6	83.93	105.71	42.85	44.6	25.1	22.81	26.63	19.96	17.8	12.21	5.1	3.3	2.11	1.22
12	43.35	42.65	68.21	57.5	32.74	35.93	40.97	37.65	49.71	26.93	24.2	18.8	18.41	17.72	14.03	11.68	7.36	2.9	1.5	0.75	0.33
13	24.86	23.31	36.23	24.56	15.78	13.51	20.74	16.75	25.2	12.42	12.4	11.8	10.81	10.22	8.42	7.85	4.03	1.7	0.7	0.63	0.05
14	15.75	13.15	13.45	10.87	9.43	7.71	8.48	6.76	13.01	7.6	7.7	4.9	6	6.51	5.11	4.74	3.02	0.9	0.53	0.53	0.02
15	7.55	7.48	11.62	7.48	4.56	5.11	5.78	6	5.1	5.4	5.3	3.9	4.4	4.21	4.6	3.33	2.12	1.3	0.3	0.27	0
16	4.75	4.41	6.01	4.19	2.18	2.8	4.59	3.83	4.1	3.57	2.6	2.1	2.3	2.2	2.32	1.31	0.9	0.41	0.14	0	0
17	2.56	1.15	4.17	1.7	0.98	1.1	1.98	2.25	2.5	1.79	0.6	1.1	0.9	1	1.41	0.71	0.1	0.17	0	0	0
18	2.36	0.38	0.97	1.1	0.4	0.3	0.8	0.69	0.7	0.69	0.2	0.3	0.6	0.5	0.51	0.32	0.3	0.09	0	0	0
19	0.48	0.09	0.59	0.2	0.1	0.2	0.3	0.1	0.1	0.19	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.01	0	0
1+	571	680.98	990	1256.99	1139.99	1115	1127	1281.97	956.98	616.99	574.99	528.98	635.99	579	506.99	378.99	214.01	111.1	126	72.16	54.24
6+	486.81	625.21	913.02	1143.43	975.3	1009.49	1052.23	1177.24	906.41	602.27	538.81	502.79	535.17	451.33	308.48	180.22	98.6	99.31	63.22	48.47	48.47
9+	260.16	377.34	593.76	561.42	408.29	485.98	508.53	626.37	618.7	336.53	263.72	214	222.45	178.34	149.52	79.12	37.3	24.71	16.92	14.47	14.47
10+ 12+	101.66	92.62	141.25	107.6	66.18	66.66	83.65	74.03	100.42	58.59	53.1	43.1	43.72	42.86	36.26	31.74	19.07	8.2	3.71	2.32	0.4

Table 12 Mean weight (kg) of American plaice per tow, by stratum, from spring R.V. surveys in 3L. Numbers in parentheses are the number of successful 15-minute tows in each stratum. The stratified mean weight per tow (kg/15 min.) and the biomass estimates ($t \times 10^3$), are given at the bottom of the table.

Year-Trip			
Depth (fm)	Stratum	No.of trawable units	1996 WT 189-191
51 100	328	208,955	2.3(7)
51 100	341	216,521	8.5(7)
51 100	342	80,473	1.6(3)
51 100	343	72,220	3.5(2)
101 150	344	217,622	4.7(7)
151 200	345	196,987	2.7(6)
151 200	346	118,990	3.6(4)
101 150	347	135,223	4.7(4)
51 100	348	291,630	4.9(10)
51 100	349	290,804	2.6(9)
31 50	350	284,889	2.0(9)
31 50	363	244,859	9.5(8)
51 100	364	387,510	5.1(13)
51 100	365	143,201	7.7(5)
101 150	366	191,760	2.2(5)
151 200	368	45,945	6.3(3)
101 150	369	132,196	2.5(4)
51 100	370	181,581	7.2(6)
31 50	371	154,206	5.6(5)
31 50	372	338,400	4.1(11)
31 50	384	154,068	4.8(5)
51 100	385	324,094	17.4(11)
101 150	386	135,223	3.5(4)
151 200	387	98,769	6.4(3)
151 200	388	49,660	11.8(3)
101 150	389	112,938	3.1(4)
51 100	390	203,728	3.0(7)
101 150	391	38,792	8.3(2)
151 200	392	19,946	23.9(2)
201 300	729	25,586	9.5(2)
301 400	730	23,385	0.7(2)
201 300	731	29,713	16.3(3)
301 400	732	31,777	0.3(2)
201 300	733	64,379	10.8(3)
301 400	734	31,364	1.0(2)
201 300	735	37,417	37.5(3)
301 400	736	24,073	0.7(2)
401-500	737	31,226	-
401-500	741	30,676	-
401-500	745	47,871	-
401-500	748	21,872	-
Mean (#sets)		5.8(188)	
Biomass Index		30.9	

Table 13 Mean weight (kg) of American plaice per tow, by stratum, from spring R.V. surveys in Division 3N. Numbers in parentheses are the number of successful 15-minute tows in each stratum. The stratified mean weight per tow (kg/15 min.) and the biomass estimates ($t \times 10^{-3}$) are given at the bottom of the table.

		Year-Trip		
Depth (fm)	Stratum	No. of trawable units	1996 WT	189
151-200	357	22,580	2.6(2)	
101-150	358	30,951	2.2(2)	
51-100	359	57,913	19.4(2)	
31-501	360	411,583	21.3(11)	
31-50	361	254,901	15.0(7)	
31-50	362	346,654	8.2(9)	
31-50	373	346,654	4.5(8)	
31-50	374	128,069	8.8(3)	
<30	375	219,135	13.1(6)	
<30	376	206,204	3.7(5)	
51-100	377	13,756	11.2(2)	
101-150	378	19,121	6.4(2)	
151-200	379	14,581	2.2(2)	
151-200	380	15,957	13.2(2)	
101-150	381	25,036	12.0(2)	
51-100	382	89,002	1.6(2)	
31-50	383	92,716	5.1(2)	
201-300	723	21,322	10.1(2)	
301-400	724	17,058	13.7(2)	
201-300	725	14,444	8.9(2)	
301-400	726	9,904	3.9(2)	
201-300	727	22,010	23.7(2)	
301-400	728	21,460	24.4(2)	
401-500	752	18,433	-	
401-500	756	14,581	-	
401-500	760	21,184	-	
Mean (#sets)		10.9(82)		
Biomass Index		26.1		

Table 14 Mean weight (kg) of American plaice per tow, by stratum, from spring R.V. surveys in 3O. Numbers in parentheses are the number of successful 15-minute tows in each stratum. The stratified mean weight per tow (kg/15 min.) and the biomass estimates ($t \times 10^{-3}$), are given at the bottom of the table.

		Year-Trip		
Depth (fm)	Stratum	No. of trawable units	1996 WT	188-189
51-100	100	329	238,743	6.6(6)
31-50	100	330	287,385	13.2(8)
31-50	50	331	62,728	21.5(2)
51-100	100	332	144,026	27.3(4)
101-150	150	333	20,221	2.2(2)
151-200	200	334	13,306	14.7(2)
151-200	200	335	7,979	28.5(2)
101-150	150	336	16,645	14.1(2)
51-100	100	337	130,408	35.3(3)
31-50	50	338	261,091	22.9(7)
51-100	100	339	80,473	17.0(2)
31-50	50	340	236,055	9.2(6)
31-50	50	351	346,654	8.5(8)
31-50	50	352	354,908	25.6(9)
31-50	50	353	176,353	44.1(5)
51-100	100	354	65,204	24.2(2)
101-150	150	355	14,169	37.3(2)
151-200	200	356	8,391	16.6(2)
201-300	300	717	22,835	9.5(2)
301-400	400	718	18,433	0.1(2)
201-300	300	719	10,455	8.0(2)
301-400	400	720	14,444	0.6(2)
201-300	300	721	10,455	21.5(2)
301-400	400	722	12,793	80.8(2)
401-500	500	764	14,444	-
401-500	500	772	18,571	-
Mean (#sets)		19.2(88)		
Biomass Index		49.1		

Table 5 Biomass estimates ('000t) of A. plaice, by stratum and depth zone, from Canadian surveys in 3L in 1995/96 using campelen net. (+) indicates biomass <50t (-) indicates stratum not surveyed.

Depth <30	Stratum	Fall 1995		Biomass		Spring 1996		Fall 1996		Biomass		Spring 1996		Biomass		Spring 1996	
		784	-	-	-	+	0.9	2	1.1	201-300	729	+	0.2	0.5	0.2	0.5	0.2
31-50	Total	-	0.8	0.6	2.3	+	0.9	2	1.1	201-300	731	0.2	0.5	0.2	+	0.5	0.2
31-50	363	3.1	0.9	0.9	1.4	1.4	1.6	1.6	1.6	201-300	733	0.2	0.7	0.2	-	0.2	0.7
31-50	371	1.2	0.7	1.4	0.7	0.7	1.6	1.6	1.6	201-300	735	0.7	1.4	0.7	0.2	0.7	0.7
31-50	372	1.4	0.7	1.4	0.7	-	+	-	-	Total	-	-	-	-	-	-	-
31-50	384	1.6	0.7	1.6	0.7	-	-	-	-	Total	-	-	-	-	-	-	-
31-50	785	-	-	-	-	-	-	-	-	Total	-	-	-	-	-	-	-
31-50	Total	8.1	5.9	5.9	7.2	-	7.2	-	-	Total	1.1	-	2.8	-	2.8	-	0.9
51-100	328	3	0.5	0.5	1.6	1.6	1.6	2.8	2.8	301-400	730	+	+	+	+	0	0
51-100	341	1.6	1.8	1.8	0.1	0.1	+	0.1	+	301-400	732	+	+	+	+	+	+
51-100	342	0.6	0.1	0.1	0.3	0.3	0.1	0.1	0.1	301-400	734	0	0	0	0.2	0.2	0.2
51-100	343	0.7	0.3	0.3	1.4	1.4	1.4	1.8	1.8	301-400	736	0.2	0.2	0.2	0.5	0.5	0.5
51-100	348	3.1	1.4	1.4	0.8	0.8	1.4	1.4	1.4	301-400	737	0.4	-	-	0.7	0.7	0.7
51-100	349	3.4	0.8	0.8	2	2	3.6	2	2	301-400	741	-	-	-	1.5	1.5	1.5
51-100	364	2.8	2	2	1.1	1.1	1.1	1.1	1.1	301-400	745	-	-	-	1	1	1
51-100	365	1.7	1.3	1.3	6.3	6.3	6.3	5.6	5.6	301-400	748	-	-	-	0.1	0.1	0.1
51-100	370	2	1.3	1.3	7.6	7.6	7.6	7.6	7.6	301-400	748	-	-	-	1.4	1.4	1.4
51-100	385	3.9	5.6	5.6	0.6	0.6	1.6	1.6	1.6	301-400	748	-	-	-	-	-	-
51-100	390	1.7	0.6	0.6	0.3	0.3	0.3	0.3	0.3	301-400	748	-	-	-	-	-	-
51-100	786	-	-	-	-	-	-	-	-	Total	0.4	-	-	-	4	4	4
51-100	787	-	-	-	-	-	-	-	-	Total	0.4	-	-	-	-	-	-
51-100	788	-	-	-	-	-	-	-	-	Total	0.4	-	-	-	-	-	-
51-100	790	-	-	-	-	-	-	-	-	Total	0.4	-	-	-	-	-	-
51-100	793	-	-	-	-	-	-	-	-	Total	0.4	-	-	-	-	-	-
51-100	794	-	-	-	-	-	-	-	-	Total	0.4	-	-	-	-	-	-
51-100	797	-	-	-	-	-	-	-	-	Total	0.4	-	-	-	-	-	-
51-100	799	-	-	-	-	-	-	-	-	Total	0.4	-	-	-	-	-	-
51-100	Total	24.5	15.5	15.5	29.4	-	29.4	-	-	601-700	739	-	-	-	0	0	0
101-150	344	1	1	1	1.1	1.1	1.1	0.6	0.6	601-700	743	-	-	-	0	0	0
101-150	347	1.8	0.6	0.6	0.7	0.7	0.7	0.4	0.4	601-700	747	-	-	-	0	0	0
101-150	366	1.6	0.4	0.4	1.2	1.2	1.2	0.3	0.3	601-700	750	-	-	-	0.1	0.1	0.1
101-150	369	1	0.5	0.5	1.6	1.6	1.6	0.5	0.5	601-700	750	-	-	-	0.1	0.1	0.1
101-150	386	1.8	0.4	0.4	2.6	2.6	2.6	0.4	0.4	601-700	750	-	-	-	0.1	0.1	0.1
101-150	389	0.6	0.3	0.3	0.6	0.6	0.6	0.2	0.2	701-800	740	-	-	-	0	0	0
101-150	391	0.4	0.3	0.3	0.2	0.2	0.2	+	+	701-800	744	-	-	-	0.5	0.5	0.5
101-150	795	-	-	-	-	-	-	-	-	Total	751	-	-	-	0	0	0
101-150	Total	8.2	3.5	3.5	8	-	8	-	-	Total	-	-	-	-	0.5	0.5	0.5
151-200	345	4.1	0.5	0.5	2.4	-	2.4	-	-	Grand Total	50.9	-	-	-	30.7	30.7	30.7
151-200	346	2.8	0.4	0.4	1.1	-	1.1	-	-	Grand Total	-	-	-	-	57.5	57.5	57.5

Table 16 Biomass estimates ('000t) of *A. plaice*, by stratum and depth zone, from Canadian surveys in 3N in 1995/96 using Campelen net. (+) indicates biomass <50 t (-) indicates stratum not surveyed.

Depth	Stratum	Biomass		
		Fall 1995	Spring 1996	Fall 1996
≤ 30	375	1.9	2.9	1.1
	376	4.7	0.8	2.4
	Total	6.6	3.7	3.5
31-50	360	22.3	8.8	7.4
	361	3.5	3.8	4.1
	362	5	2.8	1.1
	373	1.8	1.6	0.2
	374	2.4	1.1	0.4
	383	-	0.5	0.3
	384	0.3	-	-
	Total	35.3	18.6	13.5
51-100	359	2.2	1.1	0.3
	377	0.5	0.2	0.4
	382	0.3	0.1	0.3
	Total	3	1.4	1
101-150	358	0.8	0.1	0.2
	378	0.1	0.1	0.2
	381	0.1	0.3	0.4
	Total	1	0.5	0.8
151-200	357	0.1	0.1	0.1
	379	+	+	0.2
	380	0.1	0.2	0.2
	Total	0.2	0.3	0.5
201-300	723	+	0.2	+
	725	0.1	0.1	0.1
	727	+	0.5	0.1
	Total	0.1	0.8	0.2
301-400	724	0.1	0.2	0.3
	726	+	+	0.3
	728	+	0.5	0.8
	Total	0.1	0.7	1.4
Grand Total		46.3	26.1	20.9

Table 17. Biomass estimates ('000t) of *A. plaice*, by stratum and depth zone, from Canadian surveys in 3O in 1995/96 using Campelen net. (+) indicates biomass <50 t (-) indicates stratum not surveyed.

Depth	Stratum	Biomass			Fall 1996
		Fall 1995	Spring 1996	Fall 1996	
31-50	330	7.7	3.8	0.8	
	331	1.2	1.4	0.3	
	338	6.6	6	3.3	
	340	7.2	2.2	0.4	
	351	1.7	2.9	0.9	
	352	4.6	9.1	9.1	
	353	5.6	7.8	14.4	
Total		34.6	33.2	29.2	
51-100	329	3.2	1.6	1.5	
	332	3.5	3.9	3.9	
	337	2.4	4.6	25.3	
	339	6.5	1.4	0.9	
	354	4.5	1.6	8	
Total		20.1	13.1	39.6	
101-150	333	+	+	0.1	
	336	+	0.2	5.4	
	355	0.2	0.5		
Total		0.2	0.7	5.5	
151-200	334	0	0.2	-	
	335	+	0.2	+	
	356	0	0.1	0.1	
Total		+	0.5	0.1	
201-300	717	0	0.2	-	
	719	+	0.1	0.2	
	721	+	0.2	0.6	
Total		+	0.5	0.8	
301-400	718	0	+	-	
	720	0	+	+	
	722	0	1	+	
Total		0	1	+	
Grand Total		54.9	49	76.2	

Table 18. Abundance index (millions) of *A. plaice* from spring surveys in Div. 3L NO using the Campelen trawl

Age/year	1	0.4
	2	50.4
	3	122.8
	4	117.2
	5	125.2
	6	127.7
	7	92
	8	36.9
	9	16.5
	10	4.6
	11	1.9
	12	2.1
	13	0.9
	14	0.2
	15	0.3
	16	0.04
	17	0
	18	0
	19	0
	1+	699.14
	6+	283.14
	9+	26.54
	12+	3.54

Table 19. Biomass estimates ('000 t) of *A. plaice*, by stratum and depth zone, from Canadian fall surveys in Div. 3L in 1990-1994.

Depth	Stratum	1990	1991	1992	1993	1994
31-50	350	7.4	1.9	0.7	0.4	0.1
	363	3.8	3.2	1.4	0.2	0.3
	371	3.4	1.4	0.3	0.4	0.1
	372	9.8	5.3	2.0	0.6	0.1
	384	9.5	3.4	0.5	0.5	0.1
	Total	33.9	15.2	4.9	2.1	0.7
51-100	328	1.1	0.1	0.3	0.1	0.1
	341	2.6	0.4	0.4	+	+
	342	8.5	+	0.1	0.1	+
	343	0.3	+	+	+	+
	348	6.9	0.1	0.2	-	0.1
	349	2.5	1.3	0.1	0.4	0.2
	364	22.8	11.0	1.9	1.4	0.3
	365	4.4	0.9	0.5	0.5	0.1
	370	2.8	1.4	1.2	0.7	0.2
	385	5.4	2.0	3.1	0.9	0.7
	390	1.9	2.2	2.7	1.4	1.3
	Total	59.2	19.4	10.5	5.5	3.0
101-150	344	1.7	0.1	0.2	0.1	+
	347	6.9	0.2	0.1	0.1	0.1
	366	14.7	1.6	1.0	0.5	0.1
	369	11.3	12.7	1.3	1.0	0.5
	386	2.7	3.2	2.0	0.5	0.3
	389	1.3	0.9	0.4	0.7	0.4
	391	0.2	0.9	0.1	0.3	0.1
	Total	38.8	19.6	5.1	3.2	1.5
151-200	345	1.8	0.3	0.5	0.8	0.2
	346	1.1	1.0	0.8	0.4	0.2
	368	+	1.0	1.4	0.1	0.1
	387	+	0.6	0.8	0.3	0.2
	388	0.1	+	0.1	0.1	0.1
	392	0.1	0.1	+	+	+
	Total	3.1	3.0	3.6	1.7	0.8
201-300	729	+	+	+	+	+
	731	+	+	+	+	+
	733	+	+	0.2	0.1	0.2
	735	-	0.3	0.3	0.2	0.1
	Total	+	0.3	0.5	0.3	0.3
301-400	730	-	0.0	0.0	+	0
	732	0.0	+	+	+	+
	734	0.0	0.0	0.0	+	+
	736	0.1	0.2	0.1	0.2	0.1
	Total	0.1	0.2	0.1	0.2	0.1
Grand Total		135.1	57.7	24.7	13.0	6.4

Table 201. Biomass estimates ('000 t) of *A. plaice*, by stratum and depth zone, from Canadian fall surveys in Div. 3N in 1990-1994.

Depth	Stratum	1990	1991	1992	1993	1994
≤ 30	375	1.0	3.5	-	1.7	5.2
	376	1.9	1.3	0.6	3.3	1.6
	Total	2.9	4.8	0.6	5.0	6.8
31-50	360	2.9	7.0	11.6	6.7	6.3
	361	0.9	3.4	1.1	3.0	2.7
	362	5.9	10.3	4.3	1.7	0.9
	373	4.2	8.0	0.5	0.6	1.1
	374	1.4	3.3	-	0.7	0.7
	383	0.7	0.3	-	0.1	+
51-100	Total	16.0	32.3	17.5	12.8	11.7
	359	2.8	0.8	5.1	3.5	2.5
	377	0.2	-	0.9	0.8	0.6
	382	2.2	1.0	2.6	3.7	0.7
101-150	Total	5.2	1.8	8.6	8.0	3.8
	358	0.1	0.4	0.6	1.5	0.2
	378	0.5	0.4	0.4	1.4	0.3
	381	-	0.2	-	0.8	0.1
151-200	Total	0.6	1.0	1.0	3.7	0.6
	357	0.4	+	+	0.2	0.3
	379	+	-	+	0.3	+
	380	-	+	-	0.1	+
201-300	Total	0.4	+	+	0.6	0.3
	723	-	+	-	0.1	+
	725	-	-	0.1	0.4	+
	727	-	-	-	+	+
301-400	Total	-	+	0.1	0.5	+
	724	-	+	-	+	+
	726	-	-	-	+	+
	728	-	-	-	-	+
Grand Total		25.1	39.9	27.8	30.6	23.2

Table 21. Biomass estimates ('000 t) of *A. plaice*, by stratum and depth zone, from Canadian fall surveys in Div. 3Ø in 1990-1994.

Depth	Stratum	1990	1991	1992	1993	1994
31-50	330	11.0	7.7	7.0	2.8	0.6
	331	0.9	1.4	1.0	2.8	0.3
	338	4.9	2.6	2.8	2.6	2.4
	340	1.6	19.8	5.0	4.2	1.6
	351	11.1	5.3	1.5	3.6	0.5
	352	4.2	5.4	5.5	3.7	2.1
	353	1.3	2.0	3.4	3.7	3.3
	Total	35.0	44.2	26.2	23.4	10.8
51-100	329	13.8	3.4	1.6	1.1	1.1
	332	2.3	0.5	1.0	2.0	0.4
	337	1.9	1.7	0.7	1.4	1.4
	339	2.7	3.1	1.2	3.2	0.7
	354	3.9	0.9	1.0	2.0	2.0
	Total	24.6	9.6	5.5	9.7	5.6
101-150	333	+	+	+	+	+
	336	+	0.1	+	+	+
	355	-	0.2	+	0.3	0.1
	Total	+	0.3	+	0.3	0.1
151-200	334	+	0.0	+	+	+
	335	+	+	+	+	+
	356	-	+	+	0.2	0.1
	Total	+	+	+	0.2	0.1
201-300	717	0.0	-	-	0.0	+
	719	0.0	0.0	-	+	+
	721	-	+	-	+	+
	Total	0.0	+	-	+	+
301-400	718	-	-	-	0.0	0.0
	720	-	-	-	+	0.0
	722	-	0.0	-	+	+
	Total	-	0.0	-	+	+
Grand Total		59.6	54.1	31.7	33.6	16.6

Table 22 Abundance index (millions) of *A. plaice* from fall surveys in Div. 3LNO.

Age\Year	1990	1991	1992	1993	1994
1	0.6	0.1	0.3	0	0
2	2.8	0.9	0.34	1	0
3	10.3	8.6	7.4	12.3	1.14
4	42.82	20.28	17.8	44.4	8.3
5	72.85	54.63	27.3	36.6	22.6
6	85.08	80.19	55.8	40.1	23.4
7	97.79	61.51	57.6	49.6	27.3
8	75.86	44.62	38	27	23.3
9	61.75	38.74	18.6	12.3	12.4
10	29.72	24.87	11.5	5.89	3.89
11	15.81	14.89	5.4	2.52	1.51
12	9.41	9.09	4	2.24	0.93
13	6.7	6.1	2	1.27	0.51
14	5	4.7	1.8	1.12	0.64
15	2.9	3.1	1.2	0.58	0.26
16	2.5	1.5	0.62	0.5	0
17	0.9	0.9	0.4	0.13	0
1+	522.79	374.72	250.06	237.55	126.18
6+	393.42	290.21	196.92	143.25	94.14
9+	134.69	103.89	45.52	26.55	20.14
12+	27.41	25.39	10.02	5.84	2.34

Table 23 Abundance index (millions) of *A. plaice* from fall surveys in Div. 3LNO using the Campelen trawl.

Age/year	1995
1	33.1
2	203.6
3	127.4
4	125.6
5	238.4
6	263.1
7	127.9
8	63.6
9	42.8
10	13
11	2.3
12	1.3
13	0.5
14	0.2
15	0.07
16	0
17	0
18	0
19	0
1+	1242.87
6+	514.77
9+	60.17
12+	2.07

Table 24 Listing of common strata used in the analysis of trends in abundance and biomass of American plaice from the juvenile groundfish surveys, 1986, 1989-94.

Division 3L	Division 3N	Division 3O
350	360	338
363	361	351
372	362	352
	373	353
	374	
	375	
	376	

Table 25. Mean numbers and weight (kg) of Am. plaice per tow, by stratum from r.v. juvenile surveys in Division 3L. Numbers in parentheses are the number of successful 30-minute tows in each stratum. The stratified mean number and weight per tow (kg/30 min.), abundance (millions), and biomass (1 x 10³).

Depth (m)	Stratum	Category	Year						1993	1994	
			1985	1986	1987	1988	1989	1990			
93-183	328	Av.No./set	-	-	-	-	159.85(3)	238.15(5)	166.67(3)	1033.20(3)	
		Av.wt./set	15.00	15.00	15.00	29.52	141.3	35.96	79.18(3)	6.11	
93-183	341	Av.No./set	-	-	-	1194.50(4)	202.80(5)	735.92(4)	320.78(5)	275.99(5)	
		Av.wt./set	220.88	41.20	69.32	32.23	17.44	4.07	288.17(2)	14.85	
93-183	342	Av.No./set	-	-	-	223.00(2)	-	51.46(2)	35.97(2)	288.17(2)	
		Av.wt./set	51.25	6.36	-	6.36	4.07	4.07	22.80		
93-183	343	Av.No./set	-	-	-	59.00(2)	109.92(2)	154.36(2)	14.96(2)	15.71(2)	
		Av.wt./set	7.50	22.68	18.43	1.62	1.62	1.62	1.60		
184-274	344	Av.No./set	-	-	-	-	-	484.25(2)	137.89(3)	218.98(4)	
		Av.wt./set	-	-	-	42.27	13.26	13.26	19.11		
184-274	347	Av.No./set	-	-	-	-	-	368.17(2)	1192.75(3)	500.86(3)	
		Av.wt./set	-	-	-	-	75.97	133.88	38.83		
93-183	348	Av.No./set	-	-	-	1562.50(7)	773.90(4)	2165.33(7)	745.51(12)	483.99(11)	
		Av.wt./set	146.84	104.21	127.65	35.07	28.73	28.73	42.84		
93-183	349	Av.No./set	-	-	-	1341.40(5)	492.57(7)	803.12(7)	238.07(8)	370.97(7)	
		Av.wt./set	199.62	93.57	68.64	27.99	19.18	19.18	15.14		
57-91	350	Av.No./set	-	-	-	273.99(5)	71.63(8)	27.50(4)	76.07(8)	109.96(6)	
		Av.wt./set	69.25	51.44	33.30	47.12	22.93	42.84	40.35(4)		
57-91	363	Av.No./set	43.60(5)	106.67(6)	-	53.79(6)	315.43(7)	549.50(4)	220.08(4)	288.40(5)	
		Av.wt./set	39.80	93.92	-	27.65	88.70	77.86	58.68	58.54	133.10(5)
93-183	364	Av.No./set	-	-	-	1406.53(11)	2361.80(5)	1370.61(6)	1852.77(17)	1024.75(16)	
		Av.wt./set	-	-	-	113.02	292.07	122.29	130.16	55.59	934.30(11)
93-183	365	Av.No./set	-	-	-	1854.75(4)	912.67(3)	2501.57(4)	1601.88(6)	752.42(6)	
		Av.wt./set	56.30	42.61	-	95.08	89.76	125.65	74.05	48.62	1832.19(4)
184-274	366	Av.No./set	-	-	-	-	-	-	386.39(3)	120.41(2)	
		Av.wt./set	-	-	-	-	-	-	97.58	29.40	32.76
184-274	369	Av.No./set	-	-	-	-	-	-	376.64(3)	771.74(3)	
		Av.wt./set	-	-	-	-	-	-	88.47	96.78	318.76
93-183	370	Av.No./set	-	-	-	1703.83(6)	1119.33(3)	627.85(3)	1305.98(8)	1245.33(7)	
		Av.wt./set	87.53	145.37	60.17	77.81	58.46	58.46	97.84	2064.40(5)	

Table 2.5 (continued)

Depth (m)	Stratum	Category	Year				1990	1991	1992	1993	1994	
			1985	1986	1987	1988						
57-91	371	Av. No./set Av. wt./set	252.00(4) 102.13	-	-	74.34(5) 41.45	67.00(4) 33.50	96.67(3) 40.97	-	1064.19(3) 145.37	369.38(3) 17.28	
57-91	372	Av. No./set Av. wt./set	98.28(9) 72.09	108.50(8) 90.38	-	97.80(8) 55.02	73.00(4) 45.23	62.95(4) 36.25	222.00(6) 45.11	306.16(10) 43.01	211.25(5) 43.17	
57-91	384	Av. No./set Av. wt./set	282.25(4) 105.45	-	-	191.45(5) 88.33	372.25(4) 72.41	246.50(2) 105.15	629.18(3) 146.21	549.25(4) 76.50	1065.98(4) 122.54	
93-183	385	Av. No./set Av. wt./set	-	-	-	-	1085.80(5) 69.33	2084.00(4) 87.62	1354.46(6) 80.72	1984.67(13) 70.31	1688.45(12) 83.13	1729.54(6) 80.42
185-274	386	Av. No./set Av. wt./set	-	-	-	-	-	-	409.50(3) 96.73	387.70(3) 50.80	1670.86(3) 209.46	
185-274	389	Av. No./set Av. wt./set	-	-	-	-	-	-	249.17(3) 35.98	144.30(3) 19.42	486.06(3) 56.69	
93-183	390	Av. No./set Av. wt./set	-	-	-	-	284.00(4) 50.91	234.33(3) 41.27	1228.00(4) 87.72	417.08(4) 55.23	653.25(4) 68.61	409.14(3) 78.45
185-274	391	Av. No./set Av. wt./set	-	-	-	-	-	-	480.96(2) 57.44	327.75(2) 27.18	458.25(2) 34.61	

Table 2.6 Mean numbers and weight (kg) of Arn. plaice per tow, by stratum from r.v. juvenile surveys in Division 3N. Numbers in parentheses are the number of successful 30-minute tows in each stratum. The stratified mean number and weight per tow (kg/30 min.), abundance (millions), and biomass (t x 10³).

Depth (m)	Stratum	Category	Year							
			1985	1986	1987	1988	1989	1990	1991	1992
185-274	358	Av. No./set	-	-	-	-	-	-	-	247.50(2)
		Av. wt./set	-	-	-	-	-	-	-	30.28
93-183	359	Av. No./set	-	-	-	-	2395.50(2)	898.18(3)	284.33(3)	1298.00(3)
		Av. wt./set	-	-	-	-	99.55	51.06	25.24	160.23
57-91	360	Av. No./set	189.67(3)	1823.93(14)	1043.14(19)	1271.32(20)	3015.54(19)	1427.81(2)	1509.73(18)	550.59(16)
		Av. wt./set	29.00	86.67	47.28	83.37	165.56	113.05	104.44	55.96
57-91	361	Av. No./set	31.50(6)	29.88(8)	59.08(8)	64.12(6)	53.78(9)	71.38(10)	76.07(8)	33.00(6)
		Av. wt./set	24.17	19.69	41.80	24.90	188.50	38.18	33.63	12.65
57-91	362	Av. No./set	63.78(9)	62.57(7)	201.84(2)	135.76(6)	177.50(8)	162.14(9)	357.12(7)	144.50(6)
		Av. wt./set	37.72	34.71	84.19	45.55	38.44	90.19	61.44	26.89
57-91	373	Av. No./set	399.80(10)	182.93(7)	-	51.59(6)	95.25(8)	198.00(9)	64.27(7)	88.00(5)
		Av. wt./set	313.34	139.68	-	36.93	54.13	123.16	14.51	37.70
57-91	374	Av. No./set	147.25(4)	408.50(4)	-	166.12(4)	173.33(3)	93.25(4)	42.85(2)	175.67(3)
		Av. wt./set	62.63	218.25	-	53.98	37.00	36.31	27.09	25.61
< 56	375	Av. No./set	57.71(7)	24.38(5)	48.96(7)	23.54(9)	21.63(8)	50.50(11)	24.98(7)	29.64(11)
		Av. wt./set	67.43	31.98	69.54	17.45	17.06	50.58	27.04	27.44
< 56	376	Av. No./set	60.00(2)	221.75(4)	347.63(10)	674.98(12)	71.89(9)	110.38(11)	210.04(10)	389.13(8)
		Av. wt./set	45.50	284.31	18.75	52.81	18.89	23.01	36.19	57.12
93-183	377	Av. No./set	-	-	-	-	-	-	-	98.25(2)
		Av. wt./set	-	-	-	-	-	-	-	128.15
185-274	378 ^a	Av. No./set	-	-	-	-	-	-	-	765.33(3)
		Av. wt./set	-	-	-	-	-	-	-	248.57
185-274	381 ^b	Av. No./set	-	-	-	-	-	-	-	477.13(2)
		Av. wt./set	-	-	-	-	-	-	-	33.46
93-183	382	Av. No./set	-	-	-	-	48.00(2)	58.77(3)	104.00(2)	571.06(2)
		Av. wt./set	-	-	-	-	5.25	46.51	10.80	92.77
57-91	383	Av. No./set	236.00(4)	75.63	-	106.42(4)	268.33(3)	350.86(4)	450.00(2)	90.93(2)
		Av. wt./set	75.63	-	-	42.59	52.50	18.43	41.60	18.59
Mean No./set (# sets)			155.70(45)	494.50(49)	414.97(46)	388.86(66)	723.63(71)	425.72(84)	229.90(66)	446.47(72)
Abundance (Nos x 10 ³)			241.5	731.6	461.5	663.2	1204.7	708.7	754.4	760.1
Mean wt./set			89.11	101.70	54.50	47.10	59.89	76.06	47.12	35.23
Biomass (t)			138.2	150.5	60.6	73.1	99.7	126.6	78.4	59.4

^a New strata in 1983.
^b New stratum in 1984.

Table 27 Mean numbers and weight (kg) of Am. plaice per tow, by stratum from r.v. juvenile surveys in Division 32. Numbers in parentheses are the number of successful 30-minute tows in each stratum. The stratified mean number and weight per tow (kg/30 min.), abundance (millions), and biomass (t x 10³).

Depth (m)	Stratum	Category	1985	1986	1987	Year	Year				1991	1992	1993	1994
							1988	1989	1990	1991				
93-183	329	Av.No./set Av.wt./set	-	-	-	803.63(4)	-	-	-	640.01(6) 41.15	531.30(6) 41.26	1074.17(5) 60.53	456.81(3) 27.43	
57-91	330	Av.No./set Av.wt./set	-	-	-	24.48(2) 40.47	355.06(7) 80.35	182.36(6) 58.35	198.20(5) 61.46	177.06(5) 25.21	170.63(2) 19.56	381.33(4) 17.23	91.46	
57-91	331	Av.No./set Av.wt./set	-	-	-	6.99(2) 2.50	305.09(2) 113.75	749.00(2) 123.06	295.77(3) 43.58	291.50(2) 36.70	95.43(2) 19.56	170.63(2) 17.23	-	
93-183	332	Av.No./set Av.wt./set	-	-	-	-	592.25(4) 80.53	515.00(2) 42.67	435.17(4) 24.82	963.75(4) 80.49	1145.62(4) 115.17	613.89(3) 75.22	-	
185-274	333 ^a	Av.No./set Av.wt./set	-	-	-	-	-	-	-	50.98(2) 10.64	-	-	-	
185-274	336 ^b	Av.No./set Av.wt./set	-	-	-	-	-	-	-	-	57.96(2) 16.91	-	-	
93-183	337	Av.No./set Av.wt./set	-	-	-	357.00(2) 45.38	501.33(3) 37.58	444.66(4) 43.76	874.25(4) 71.29	505.86(4) 63.40	759.00(3) 63.40	759.00(3) 65.27	-	
57-91	338	Av.No./set Av.wt./set	-	33.00(3) 15.50	-	89.60(6) 14.49	289.00(6) 36.87	98.25(4) 17.87	329.58(6) 40.41	647.04(4) 70.03	460.90(4) 57.84	582.81(4) 68.71	-	
93-183	339	Av.No./set Av.wt./set	-	-	-	-	2960.50(2) 449.80	2666.33(3) 253.35	1908.28(4) 178.36	1892.00(4) 178.79	2907.76(4) 210.69	1522.44(3) 117.28	-	
57-91	340	Av.No./set Av.wt./set	-	-	-	19.79(3) 6.09	60.17(6) 36.87	38.14(7) 19.16	244.21(5) 39.37	844.75(4) 64.53	71.94(3) 14.23	679.61(3) 51.02	-	
57-91	351	Av.No./set Av.wt./set	-	-	-	48.11(7) 39.47	334.25(6) 54.54	390.98(6) 70.23	70.83(7) 29.84	481.27(7) 49.43	297.77(6) 50.42	296.56(4) 28.07	-	
57-91	352	Av.No./set Av.wt./set	-	88.62(13) 37.30	120.09(11) 28.22	150.14(14) 39.06	106.46(16) 35.94	112.40(16) 31.21	392.08(13) 53.01	418.14(13) 71.10	282.46(9) 52.60	-	-	
57-91	353	Av.No./set Av.wt./set	-	794.00(5) 51.33	-	700.71(4) 145.90	770.33(3) 108.07	1306.00(4) 113.06	992.44(5) 132.53	889.50(4) 85.47	985.90(4) 133.12	1281.00(3) 240.52	-	
93-183	354	Av.No./set Av.wt./set	-	-	-	-	-	472.50(2) 80.53	692.00(3) 82.46	1334.97(3) 103.79	1760.25(4) 115.41	1511.50(3) 158.24	1282.00(3) 230.92	-
185-274	355 ^b	Av.No./set Av.wt./set	-	-	-	-	-	-	-	-	-	145.00(2) 30.68	-	
		Mean No./set (# sets)	65.95(3)	182.73(30)	126.60(35)	464.37(60)	444.89(60)	406.23(69)	651.57(62)	594.99(63)	587.87(46)	-	-	
		Abundance (Nos x 10 ³)	17.7	180.9	168.9	855.4	738.1	747.7	1199.3	1113.2	1051.46	-	-	
		Mean wt./set	34.97	34.14	38.51	79.94	76.58	52.19	65.97	66.16	76.31	-	-	
		Biomass (t)	9.4	30.1	51.4	147.2	127.0	98.1	121.4	123.8	141.29	-	-	

^a New strata in 1983.

^b New stratum in 1984.

Table 7. Average numbers and weights, abundance and biomass of American plaice from the common strata in Div. 3LNO in the juvenile groundfish survey series from 1986-94.											
Division	Depth (m)	Strata	1986	1988	1989	1990	1991	1992	1993	1994	
3L	57-91	350	Av.No./set	106.67(6)	274.2(5)	71.63(6)	27.50(4)	76.13(6)	109.96(6)	513.86(7)	
		Av.Wt./set	93.92	69.3	51.44	33.3	47.15	22.93	42.87	8.23	
3L	57-91	383	Av.No./set	119.40(5)	53.83(6)	315.43(7)	549.50(4)	220.25(4)	288.40(5)	133.20(5)	
		Av.Wt./set	42.61	27.67	88.7	77.85	58.73	58.54	16.6	15.91	
3L	57-91	372	Av.No./set	108.5(6)	97.88(6)	97.88(6)	73.00(4)	63.00(4)	222.00(6)	308.40(10)	
		Av.Wt./set	90.36	55.06	38.43	45.23	36.28	45.11	43.04	43.17	
Mean Nos./tow			111.0	143.3	150.6	192.5	111.7	204.0	325.6	121.0	
Abundance(millions)			744.4	66.1	101	1291.1	74.9	136.8	218.4	81.2	
Mean wt./tow			78.1	52.0	56.9	50.5	46.2	41.6	35.5	24.0	
Biomass ('000t)			52.4	34.9	36.2	33.9	31.0	27.9	23.8	16.1	
3N	57-91	380	Av.No./set	1767.14(14)	1269.20(20)	3018.07(19)	1428.14(21)	1513.11(18)	550.69(16)	1499.25(14)	
		Av.Wt./set	86.67	83.44	165.56	113.05	104.52	55.98	195.72	212.48	
3N	57-91	381	Av.No./set	29.88(8)	64.17(6)	55.22(9)	71.38(10)	76.13(8)	33.00(8)	139.00(8)	
		Av.Wt./set	19.69	24.92	20.94	38.18	33.66	12.65	43.85	40.39	
3N	57-91	362	Av.No./set	62.57(7)	135.88(6)	177.50(8)	182.14(9)	357.40(7)	144.50(6)	111.55(8)	
		Av.Wt./set	34.71	45.58	38.44	90.19	61.49	26.89	31.52	43.3	
57-91	373	Av.No./set	182.93(7)	51.63(6)	95.25(8)	198.00(9)	64.32(7)	88.00(5)	112.88(8)	411.94(4)	
		Av.Wt./set	139.68	35.96	54.13	123.16	14.52	37.7	15.93	61.61	
57-91	374	Av.No./set	408.5(4)	168.25(4)	173.33(3)	93.25(4)	42.88(2)	175.87(3)	201.50(4)	136.00(3)	
		Av.Wt./set	218.25	54.03	37	36.31	27.11	25.61	14.47	33.12	
3N	<56	375	Av.No./set	24.38(5)	23.56(9)	21.63(8)	50.50(11)	25.00(7)	29.64(11)	112.67(10)	
		Av.Wt./set	31.98	17.47	17.06	50.58	27.06	27.44	45.71	70.34	
<56	376	Av.No./set	221.75(4)	675.50(12)	71.89(9)	110.38(11)	210.20(10)	399.13(8)	208.33(9)	68.17(6)	
		Av.Wt./set	284.31	52.85	18.89	23.01	36.22	57.12	55.97	34.02	
Mean Nos./tow			482.7	402.2	727.5	405.5	440.5	223.1	430.8	516.5	
Abundance(millions)			713.6	584.6	1075.4	599.5	651.2	329.9	836.5	783.8	
Mean wt./tow			101.8	47.4	81.7	78.8	49.6	36.4	68.8	84.0	
Biomass ('000t)			150.5	70	91.1	116.5	73.3	53.8	101.7	124.2	
3O	57-91	338	Av.No./set	33.0(3)	89.67(6)	289.00(6)	99.25(4)	329.83(6)	647.00(4)	461.25(4)	
		Av.Wt./set	15.5	14.5	36.59	17.67	40.44	70.03	57.88	66.71	
	351	Av.No./set	81.33(9)	48.14(7)	334.25(8)	390.99(8)	70.88(7)	481.27(7)	298.00(8)	298.55(4)	
		Av.Wt./set	36.28	39.5	54.54	70.23	29.66	49.43	50.46	28.07	
	352	Av.No./set	88.62(13)	120.18(11)	150.14(14)	108.46(16)	112.48(16)	392.08(13)	418.46(13)	278.12(9)	
		Av.Wt./set	37.3	28.25	39.06	35.94	31.24	53.01	71.15	52.8	
	353	Av.No./set	794.00(5)	701.25(4)	770.33(3)	1073.50(4)	993.20(5)	889.50(4)	999.25(4)	1261.00(3)	
		Av.Wt./set	51.33	146.01	108.07	113.06	132.63	85.47	133.22	240.52	
Mean Nos./tow			182.9	181.2	334.0	341.1	286.0	554.7	481.5	505.8	
Abundance(millions)			161.0	159.5	294.0	300.2	251.7	488.1	423.8	445.1	
Mean wt./tow			34.2	46.8	53.9	54.2	48.8	60.9	71.4	77.9	
Biomass ('000t)			30.1	41.1	47.4	47.7	42.7	53.8	62.9	68.6	
TOTAL ABUNDANCE (millions)			1,619	850.2	1470.4	2190.8	977.8	954.8	1278.7	1288.9	
TOTAL BIOMASS ('000t)			233.0	148.0	178.7	198.1	147.0	135.4	188.4	208.9	

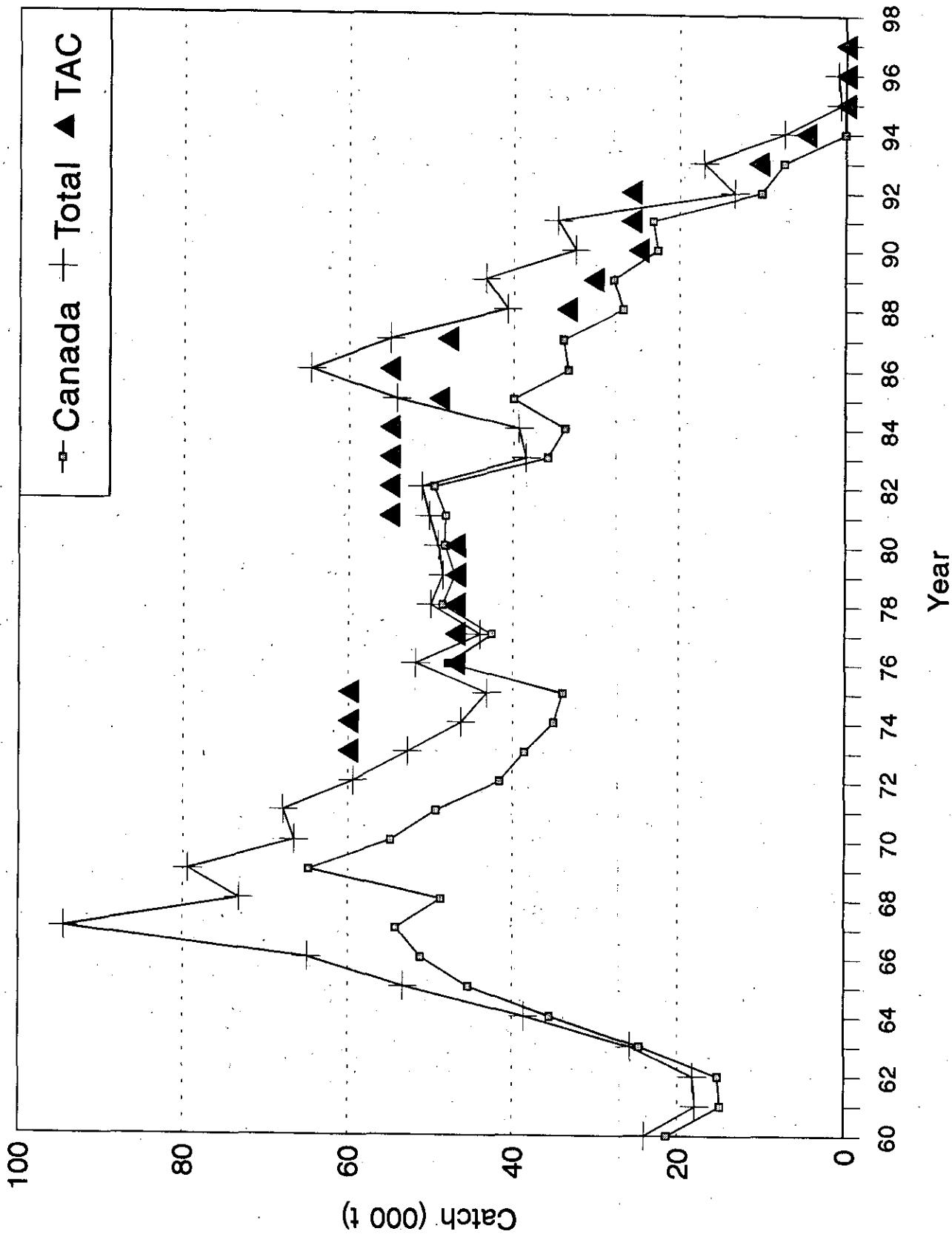


Fig. 1. Catches and TAC's of American plaice in Div. 3LNO.

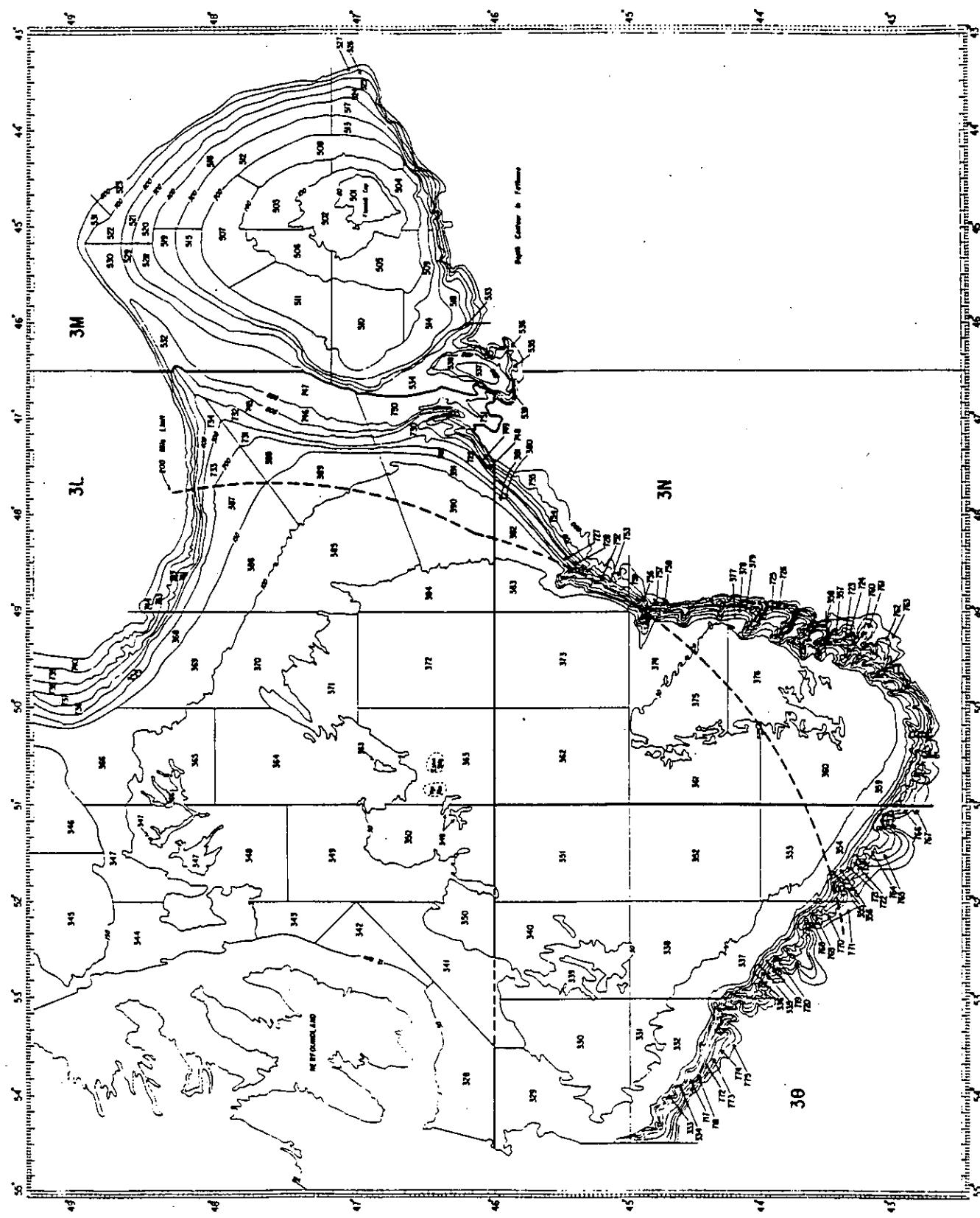


Figure 2. NAFO Div. 3LMNO, showing the Canadian 200 mile limit as well as the stratification scheme used in Canadian groundfish surveys.

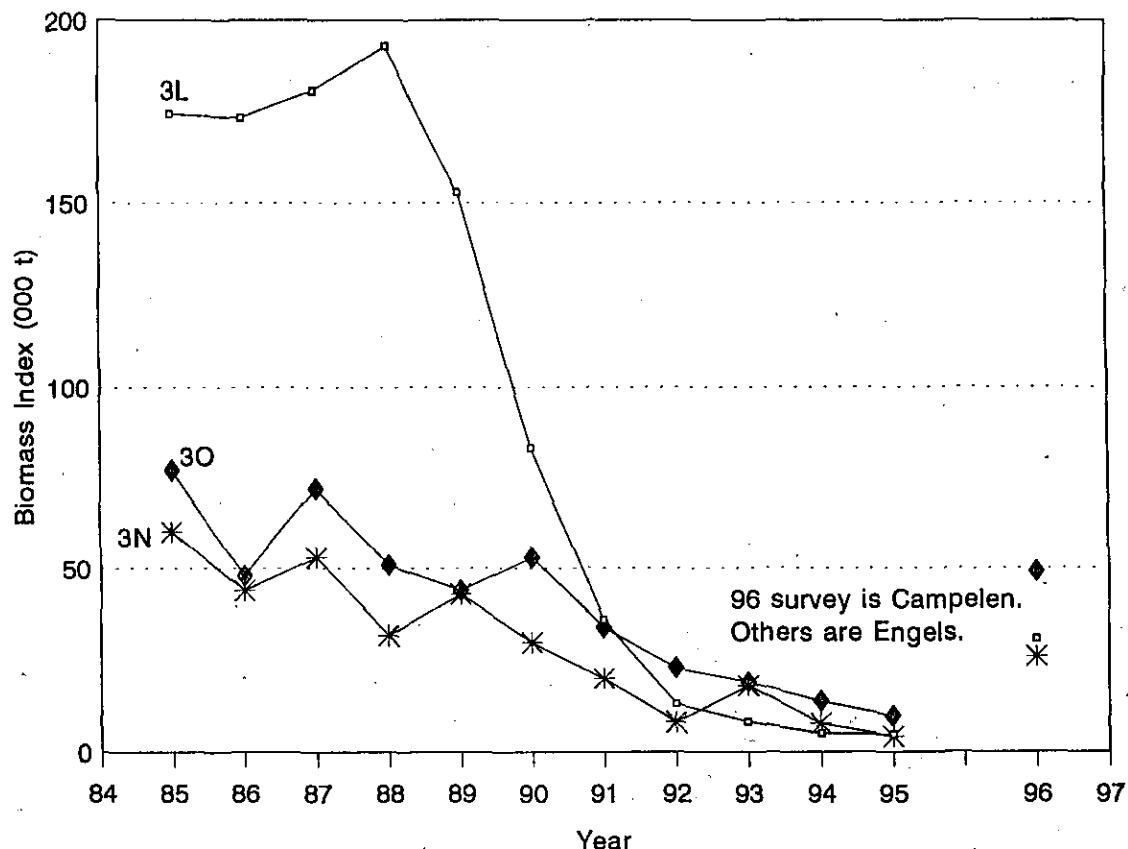


Fig. 3. Biomass indices of *A. plaice* from spring surveys in Divisions 3L, 3N, 3O.

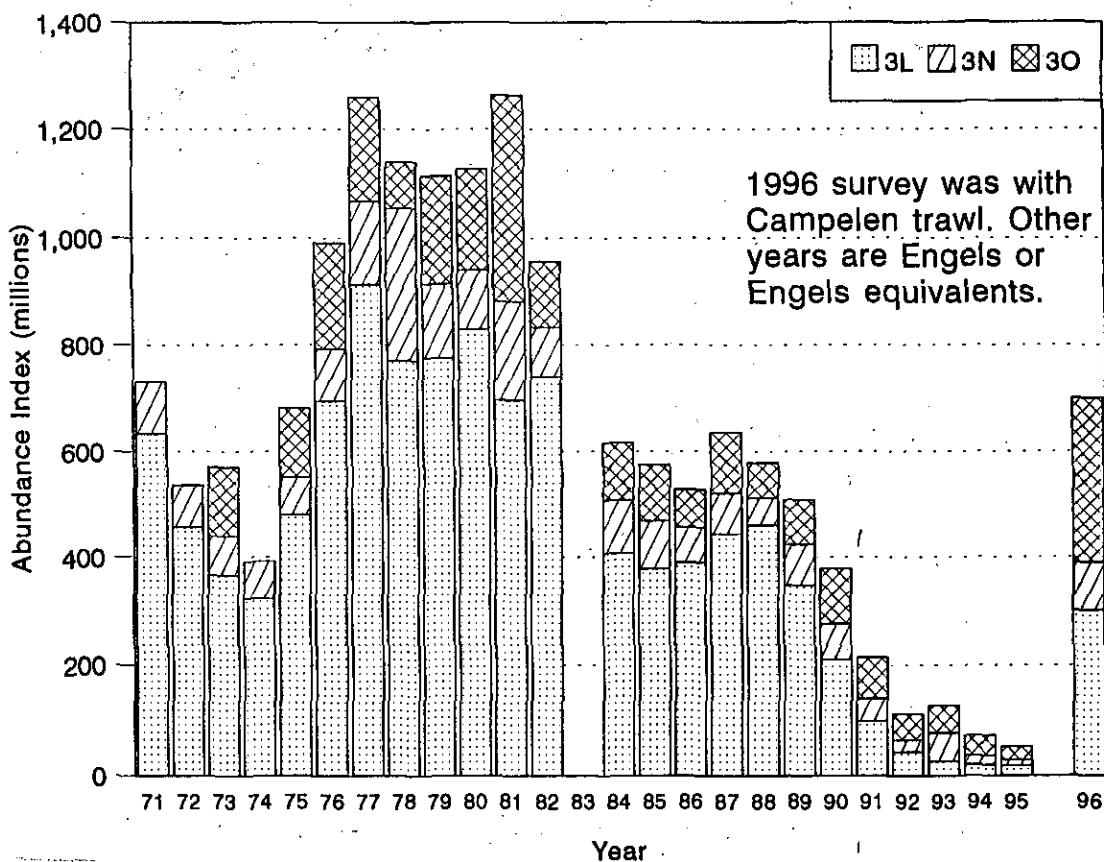
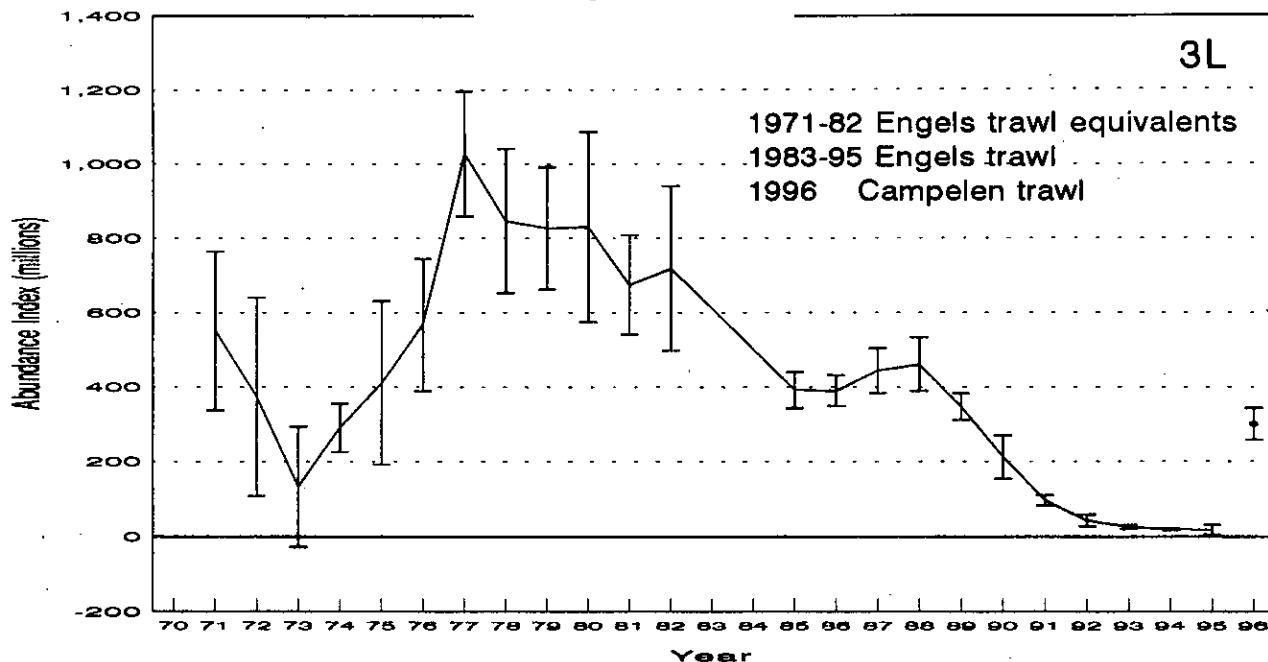
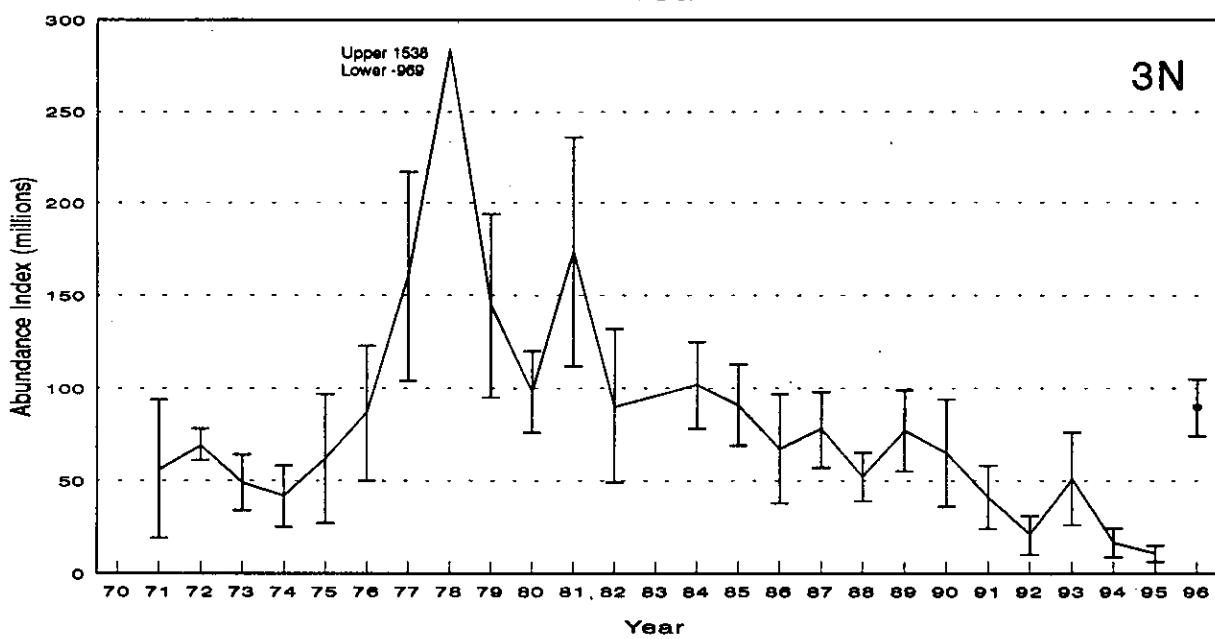


Fig. 4 . Abundance of *A. plaice* from spring RV surveys conducted by Canada in Div. 3LNO.

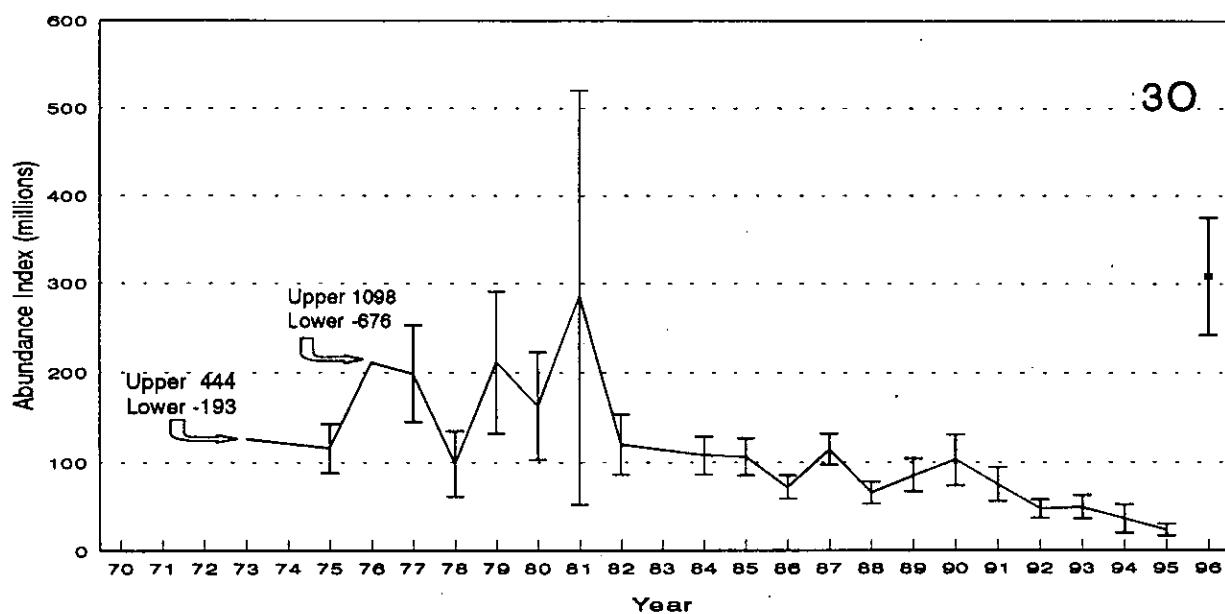
3L



3N



3O



5
Fig. 5. Abundance estimates of *A. plaice* (with approx. 95% C.I.)
from Canadian spring surveys in Div. 3L, 3N, and 3O.

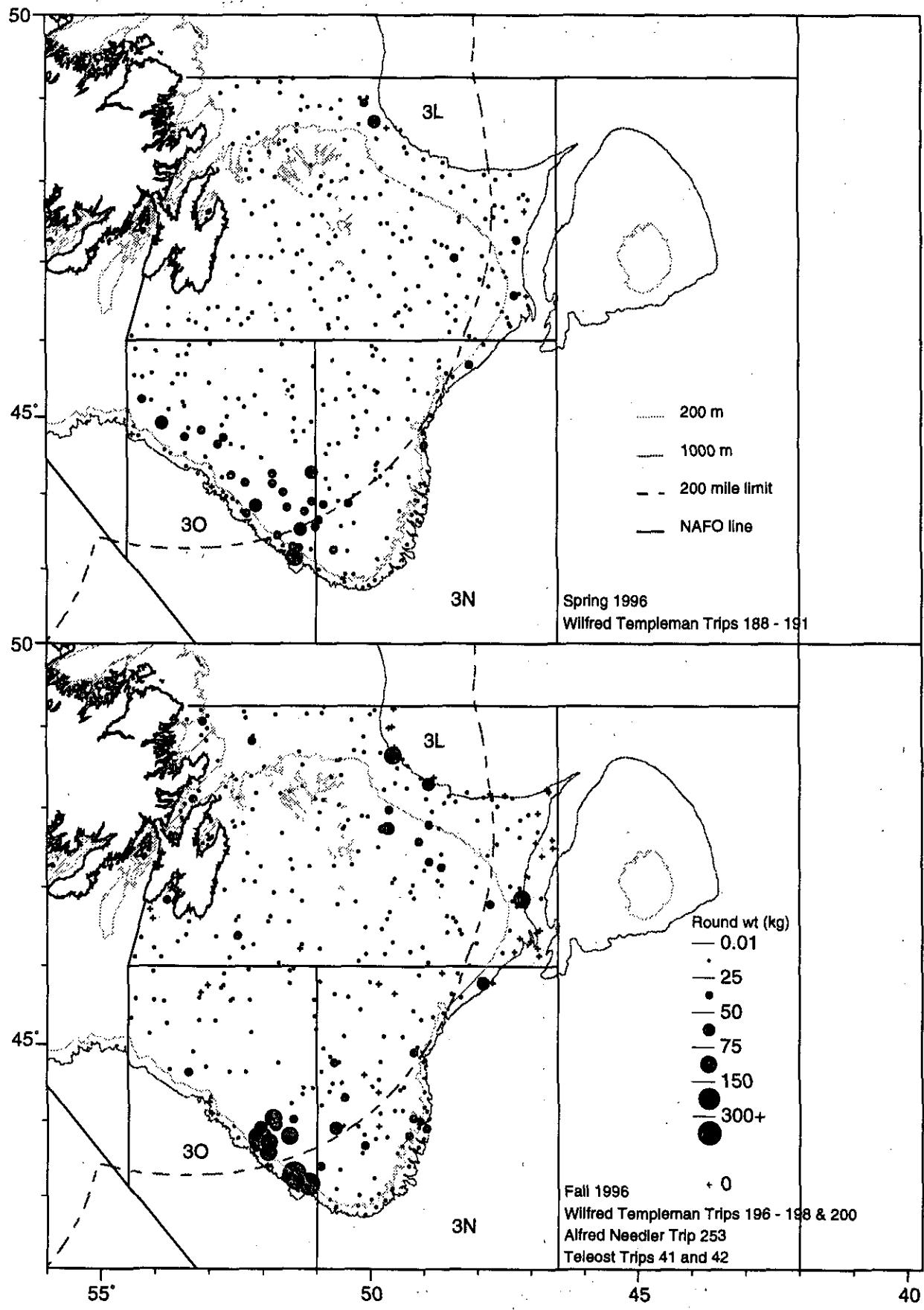


Fig 6 American Plaice distributions on the Grand Banks from 1996 Spring and Fall Canadian Research Vessel Surveys

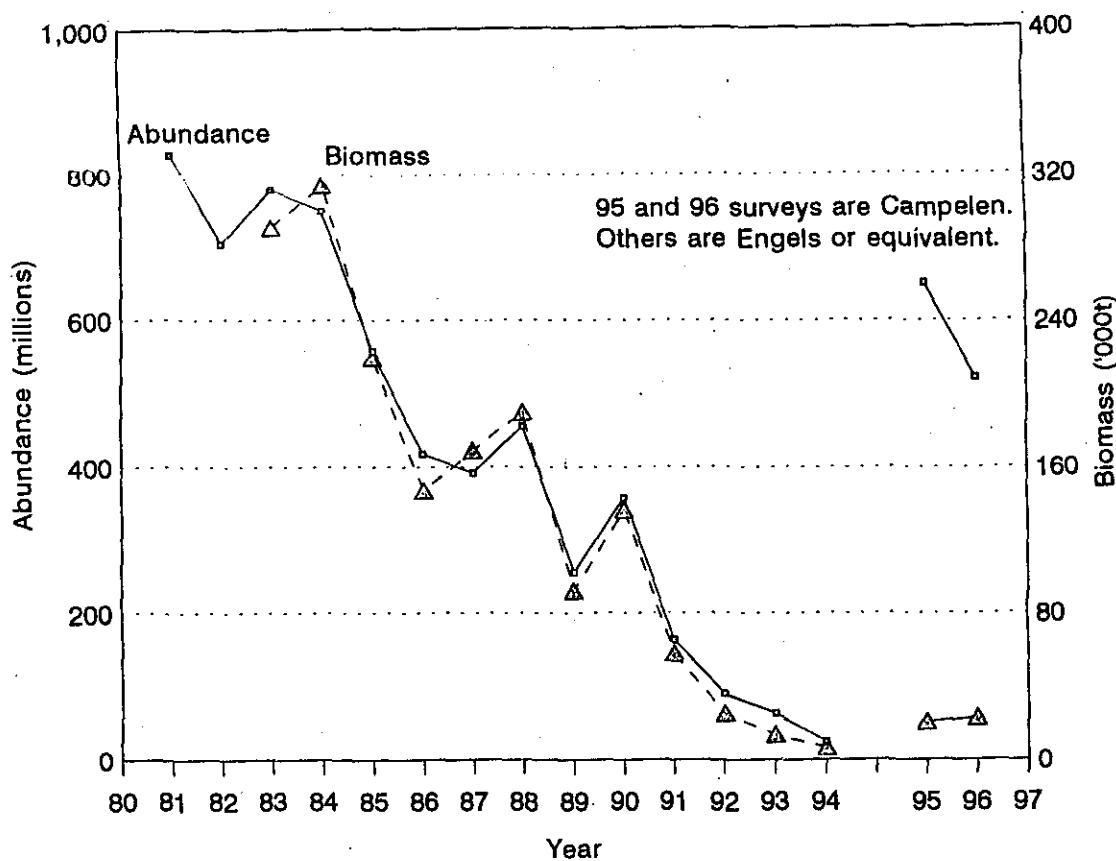


Fig. 7. Abundance and biomass estimates of *A. plaice* from fall RV surveys in Div. 3L.

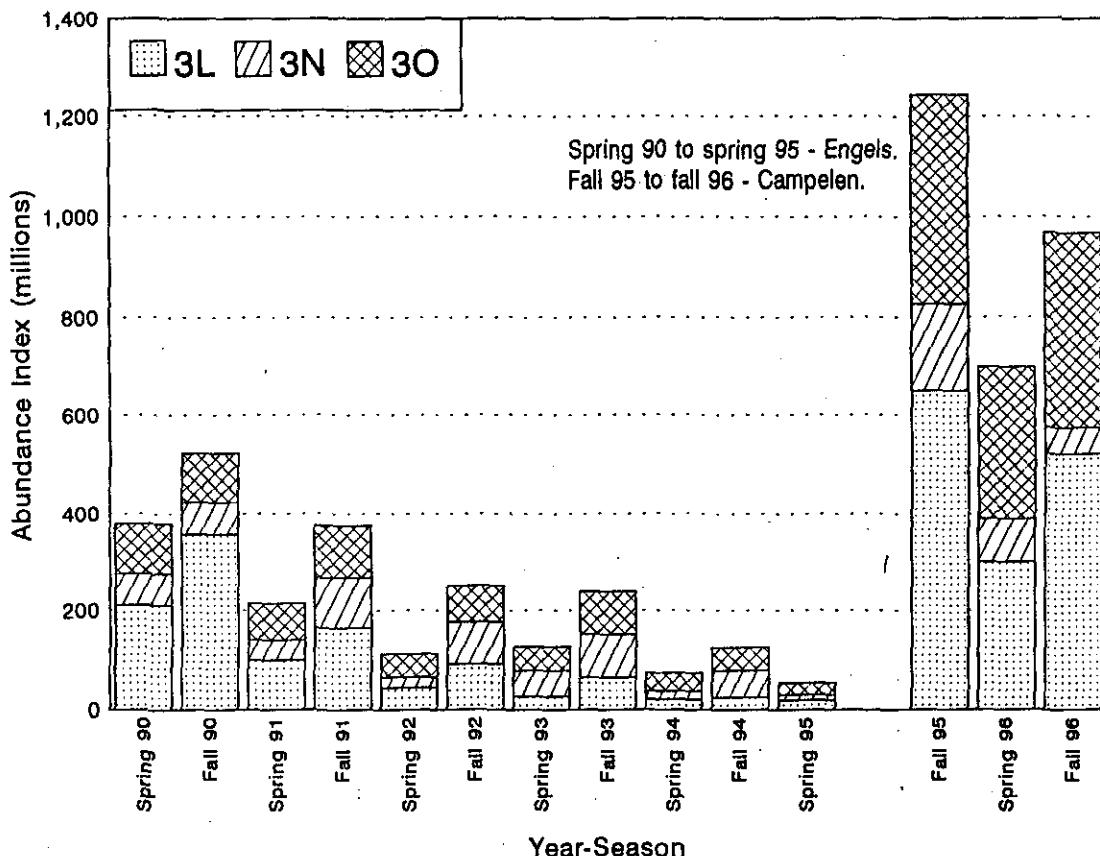


Fig. 8. Abundance of *A. plaice* from surveys conducted during spring and fall in Div. 3L, 3N, and 3O from 1990-1996.

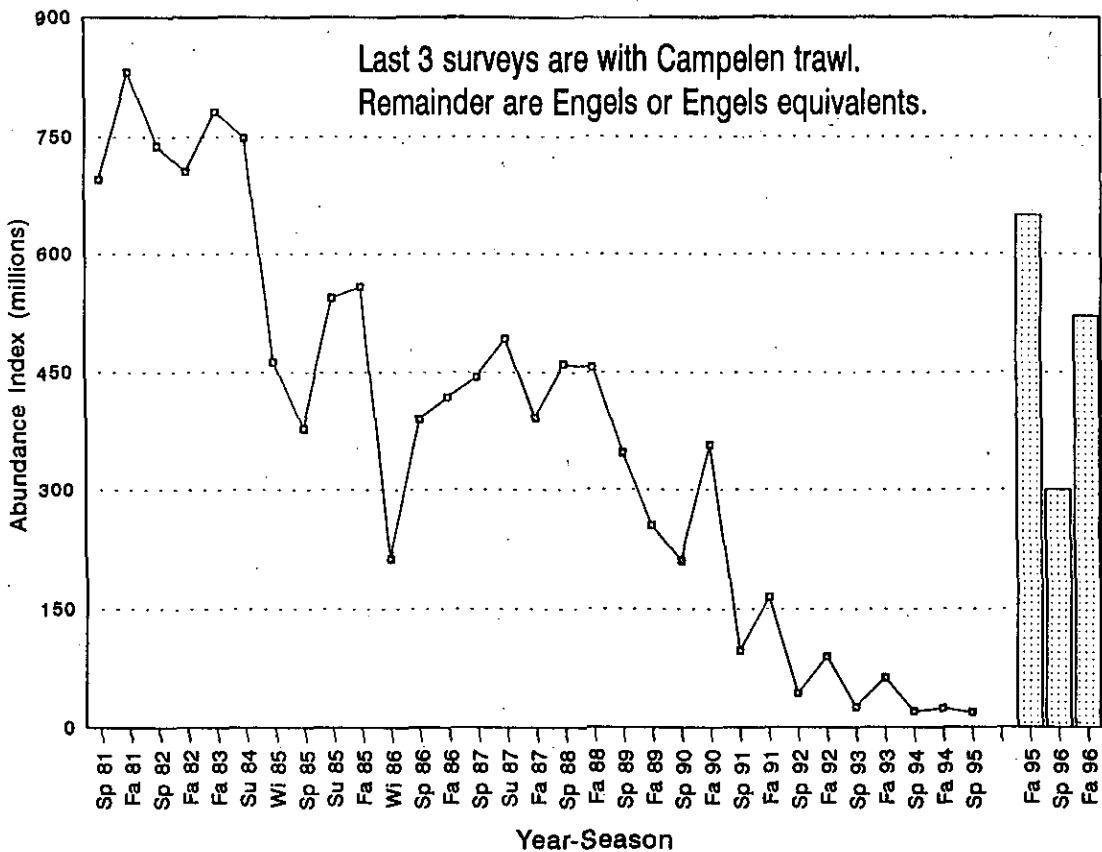


Fig. 9. Abundance of *A. plaice* from surveys conducted at various times in Div. 3L.

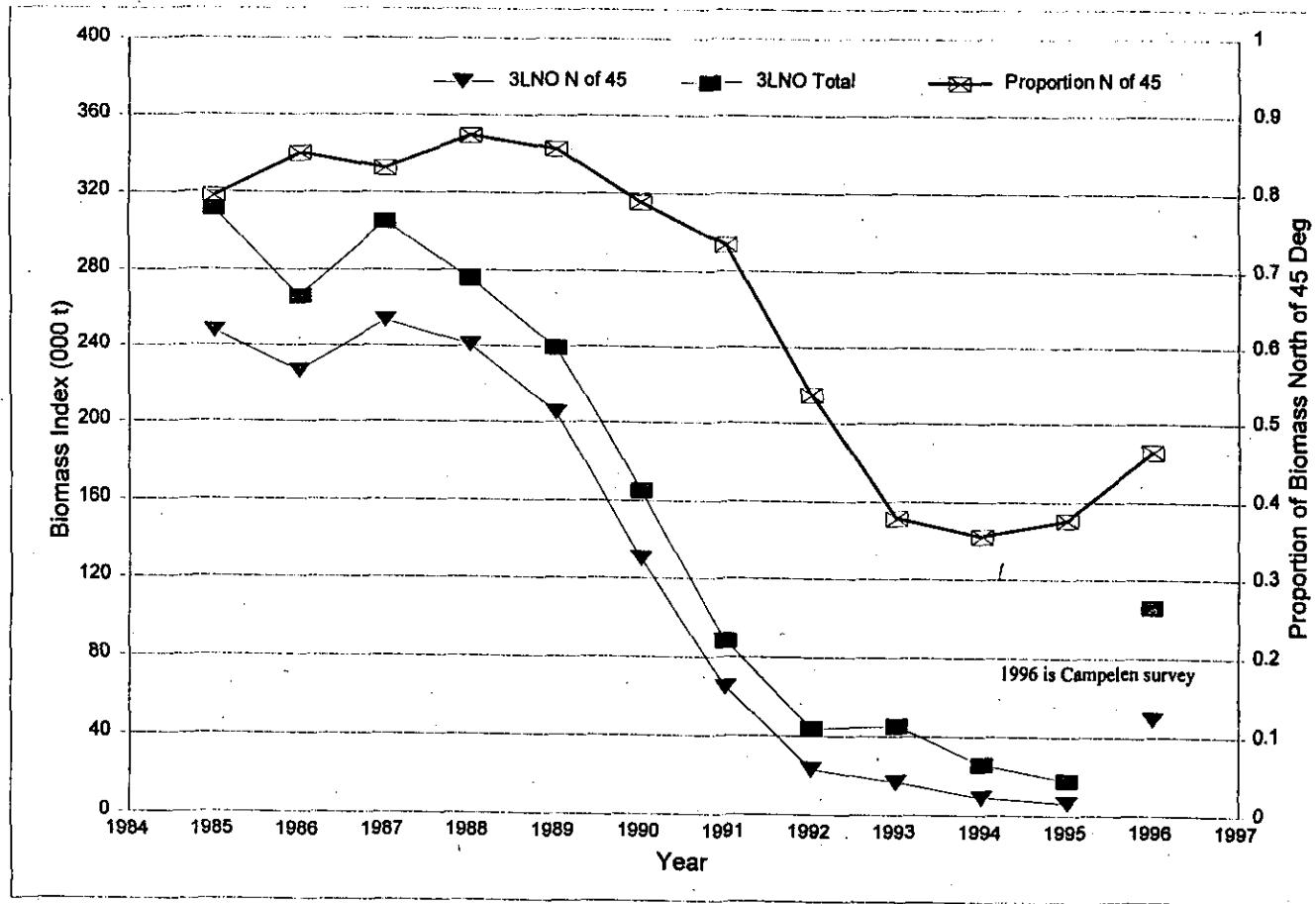


Figure 10. Total biomass index in 3LNO, as well as the biomass north of 45°N in Canadian spring RV surveys.

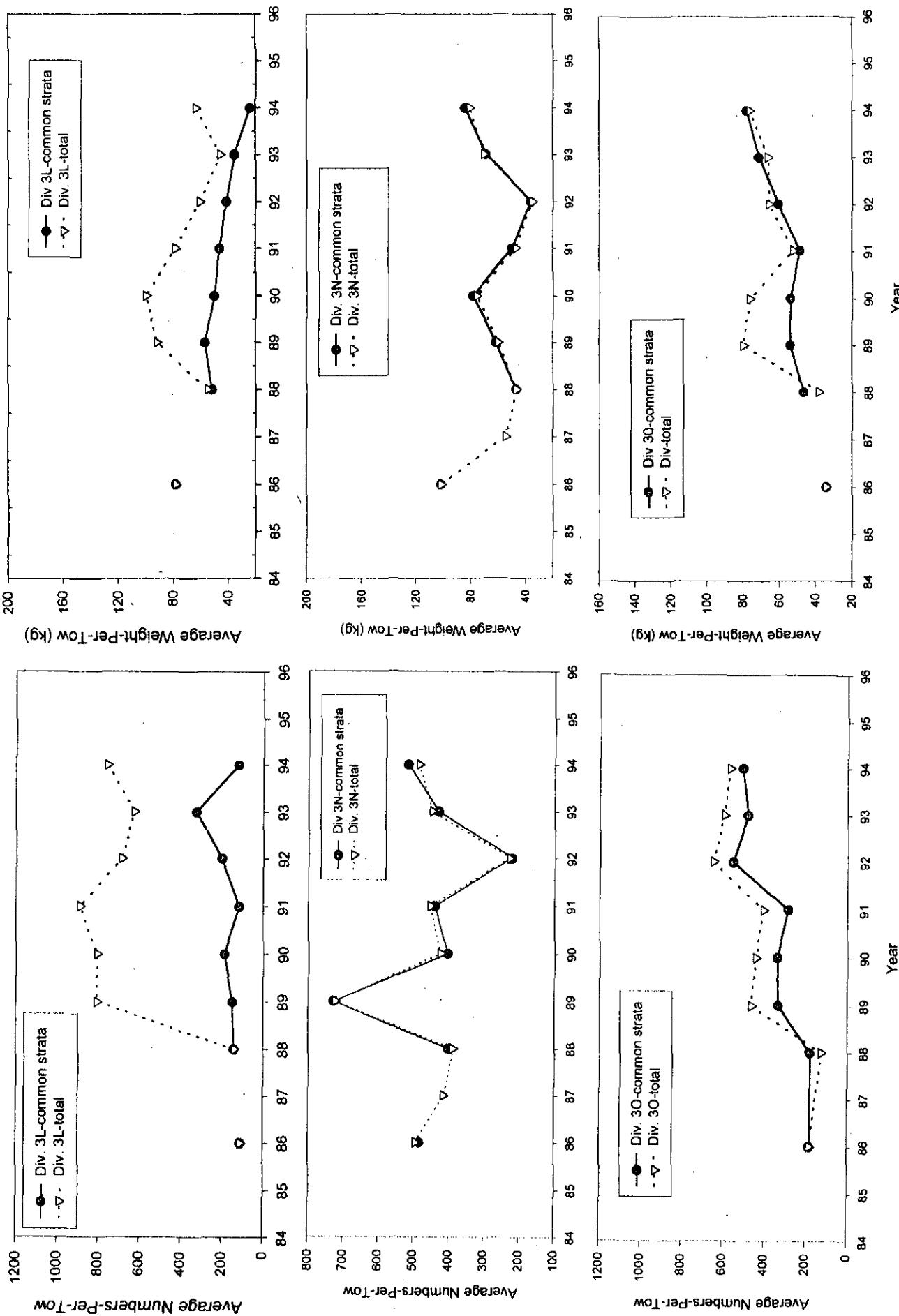


Fig. 11 Comparison of stratified average numbers-per-tow of American plaice from 1986-94 juvenile groundfish surveys using common strata and all strata

Fig. 12 Comparison of stratified average weight-per-tow of American plaice from 1986-94 juvenile groundfish surveys using common strata and all strata

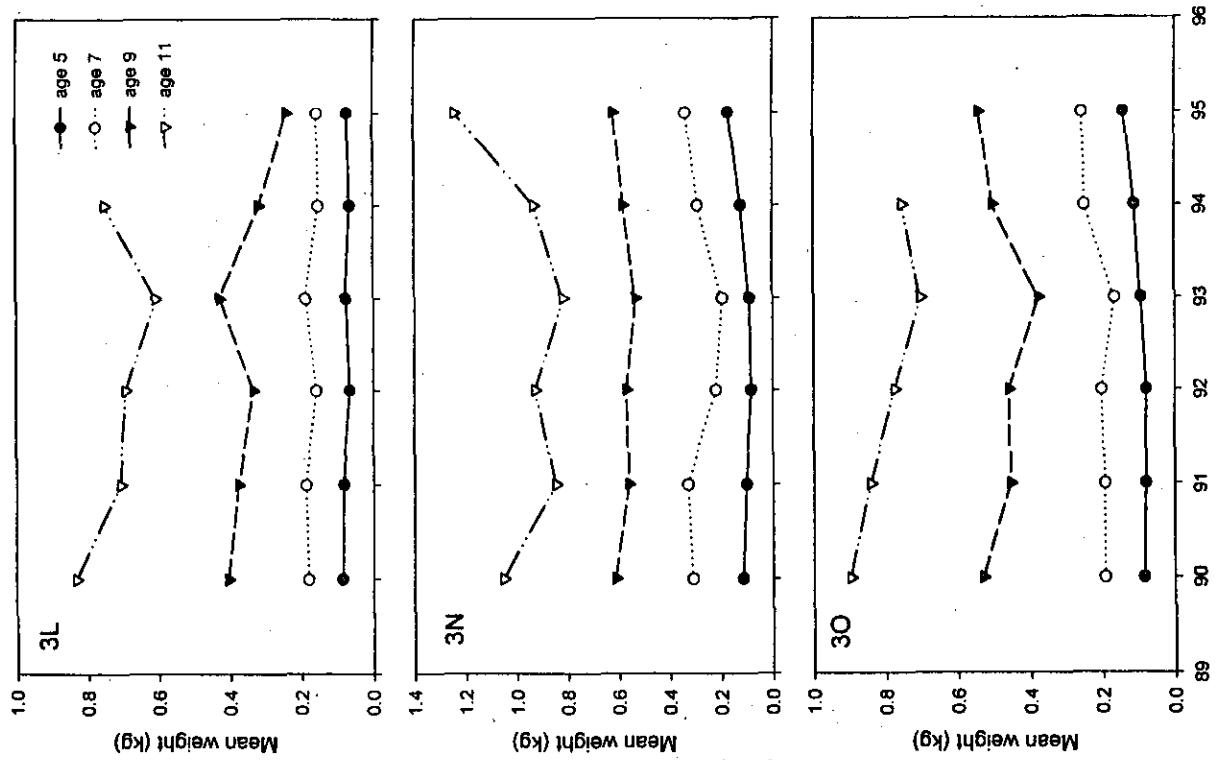


Figure 13 Mean weight at age for selected ages of male *A. plaice*.

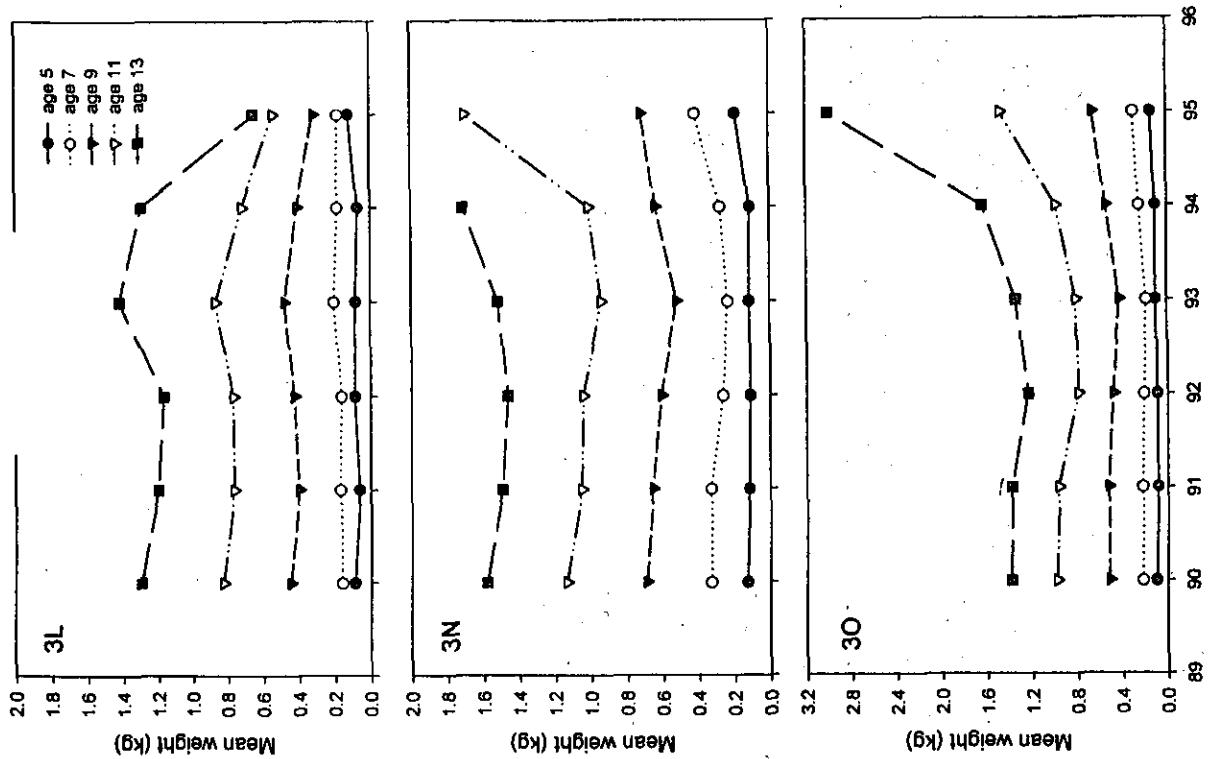


Figure 14 Mean weight at age for selected ages of female *A. plaice*.

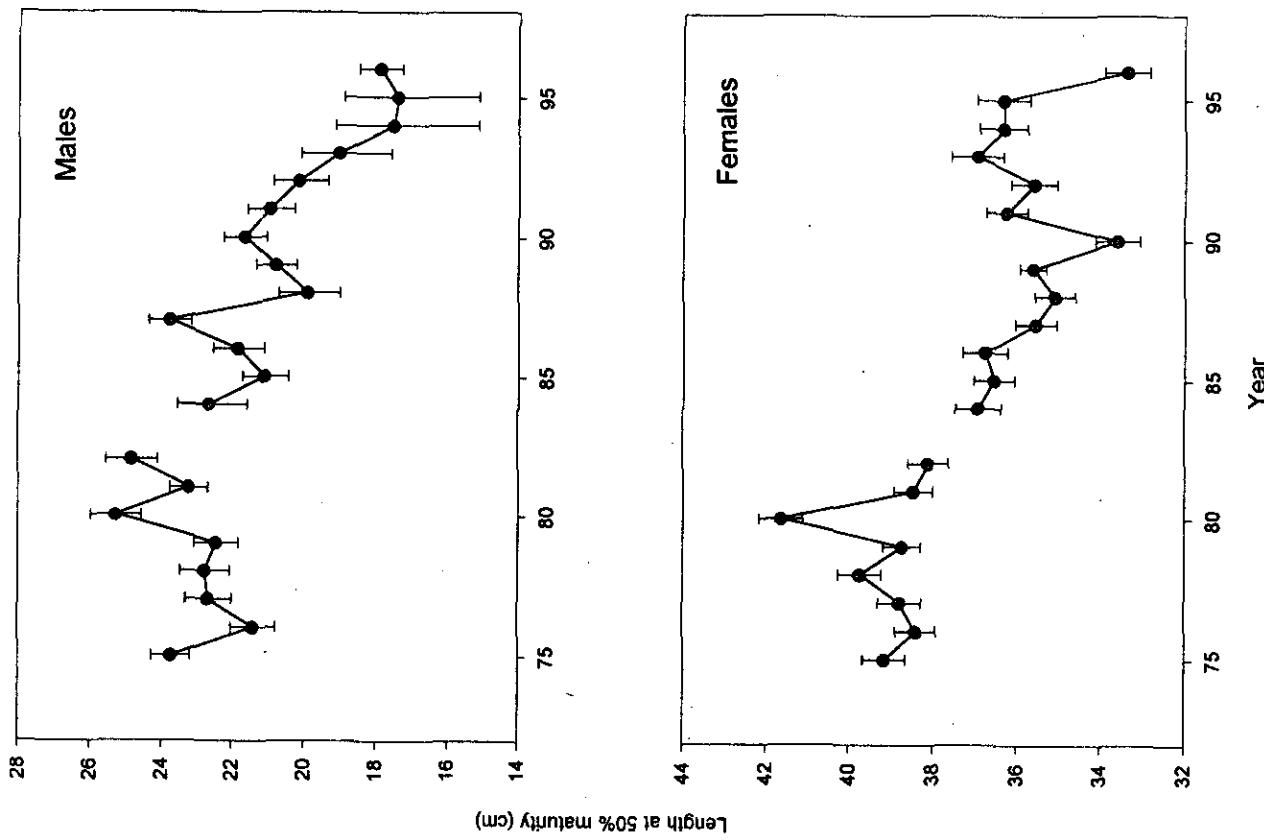


Figure 15 Length at 50% maturity for male and female American plaice in Div. 3LNO.
Error bars are fiducial limits.

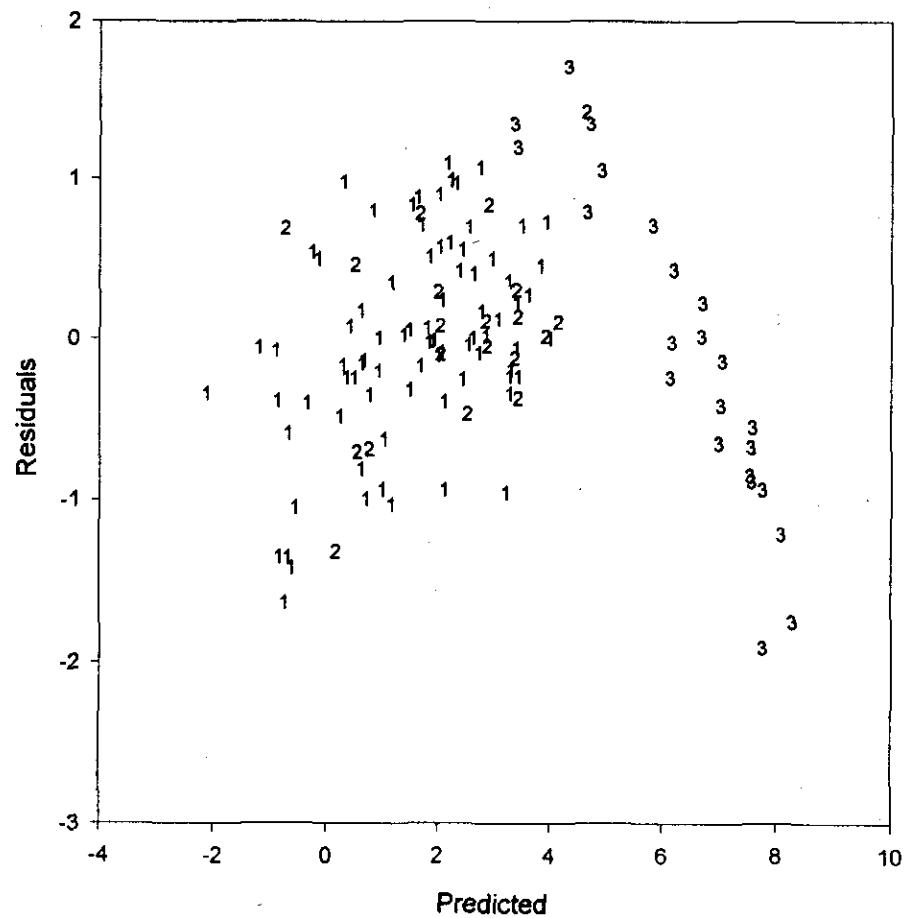


Figure 16 Residuals vs predicted from multiplicative model including three surveys for ages 2 to 5. Symbols denote survey. 1:spring 1975-1995; 2:fall 1990-94; 3:juvenile 1989-94.

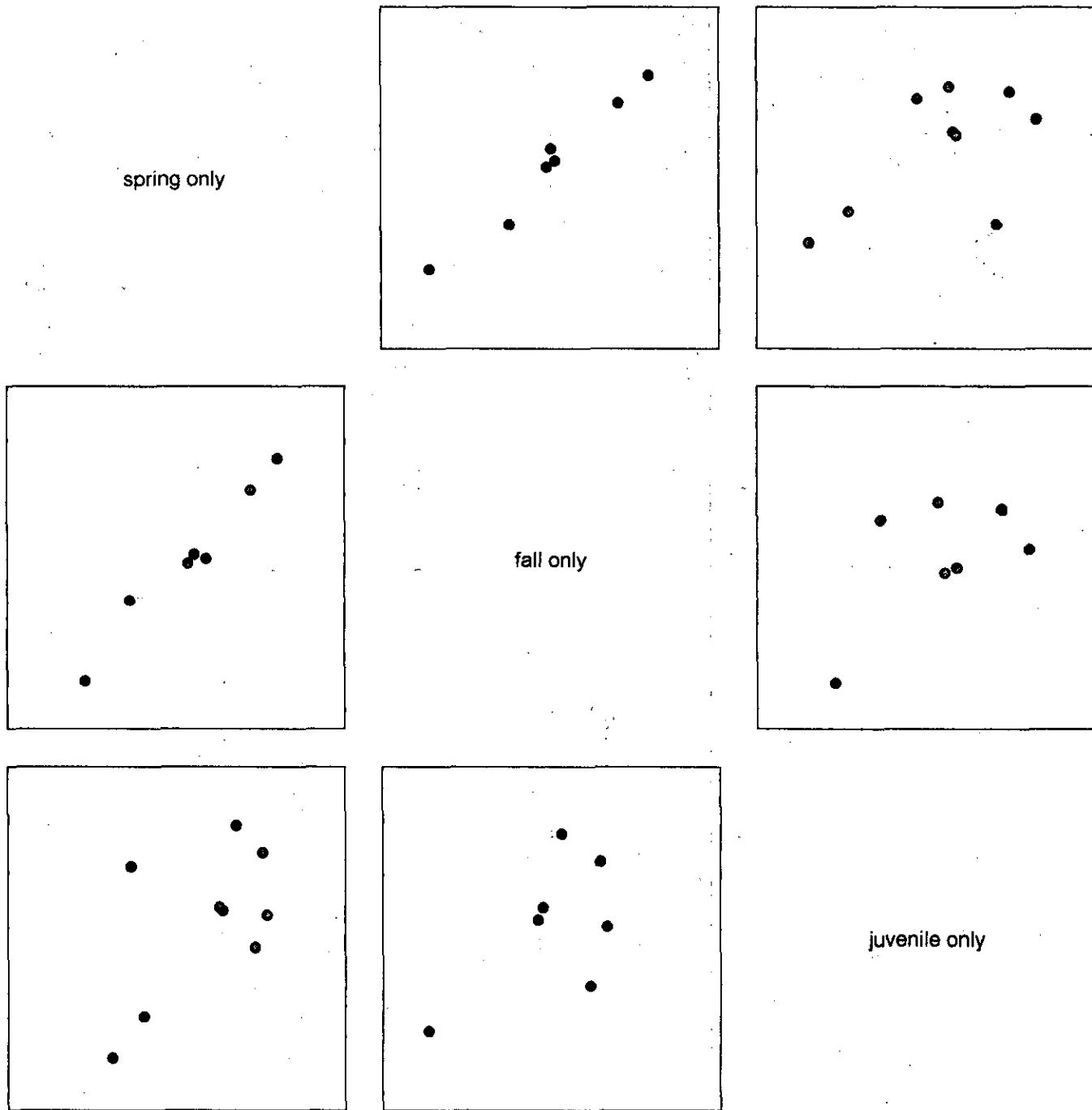


Figure 17. Scatter matrix of relative cohort strength estimates using spring survey data, fall survey data, and juvenile survey data.

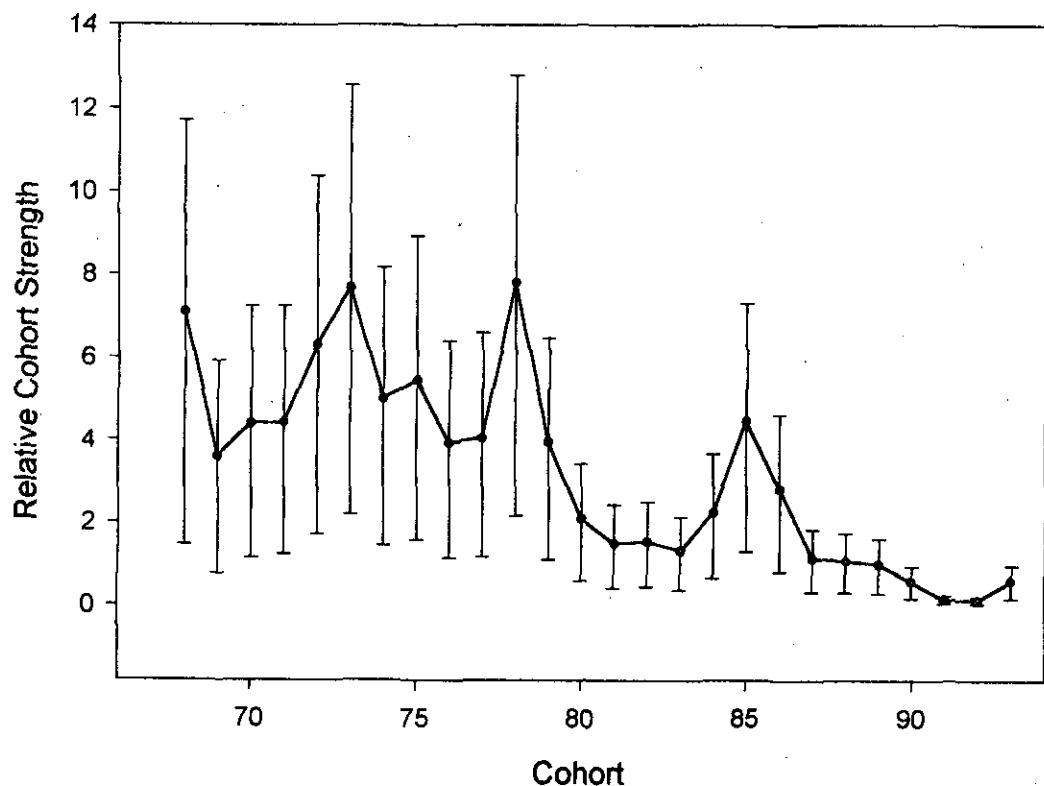


Figure 18 Relative cohort strength for 3LNO A. plaice using Canadian spring data only from 1975-96.

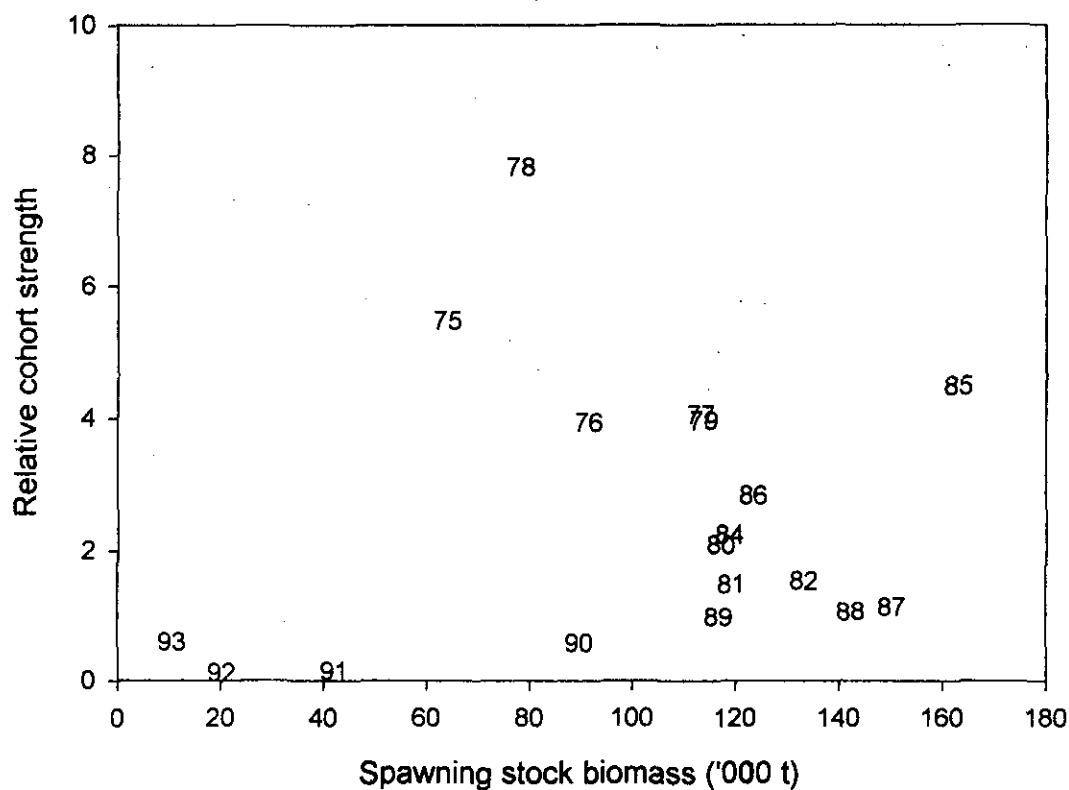


Figure 19 Relative cohort strength vs spawning stock biomass ('000 t) as calculated from Canadian spring rv surveys.

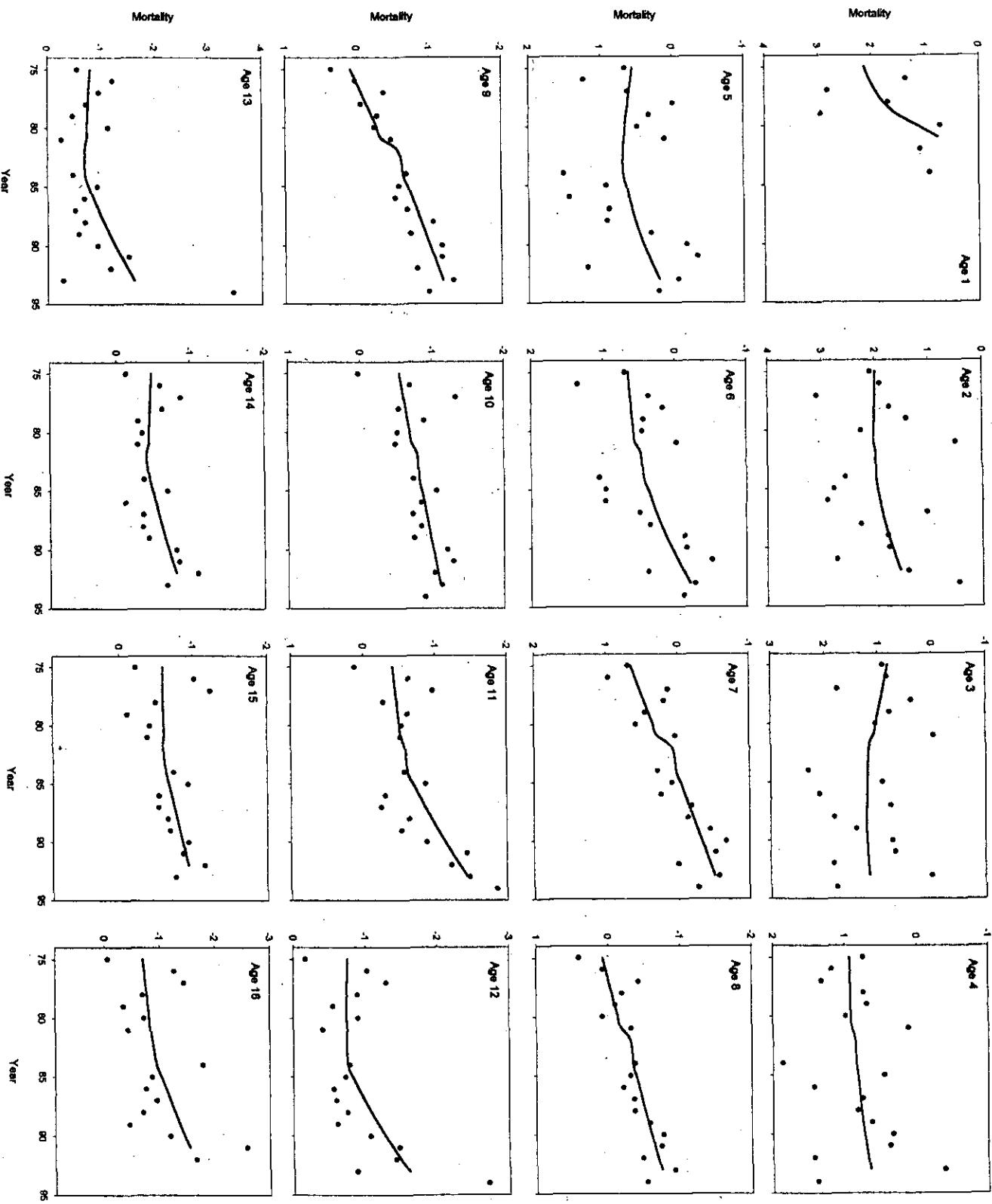


Figure 20 Estimates of mortality for ages 1 to 16 from Canadian spring surveys from 1975 to 1995.

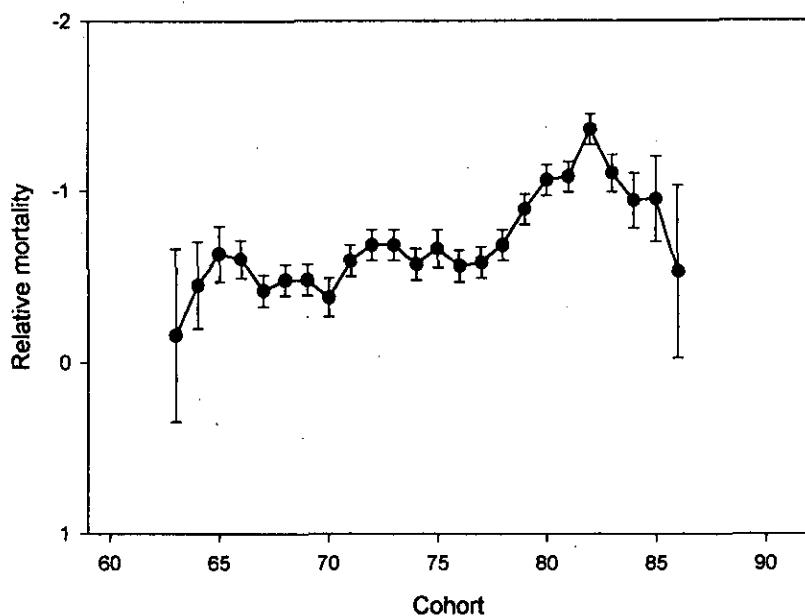


Figure 21 Relative mortality for cohorts 1963 to 1986 for *A. plaice* from Canadian spring surveys.

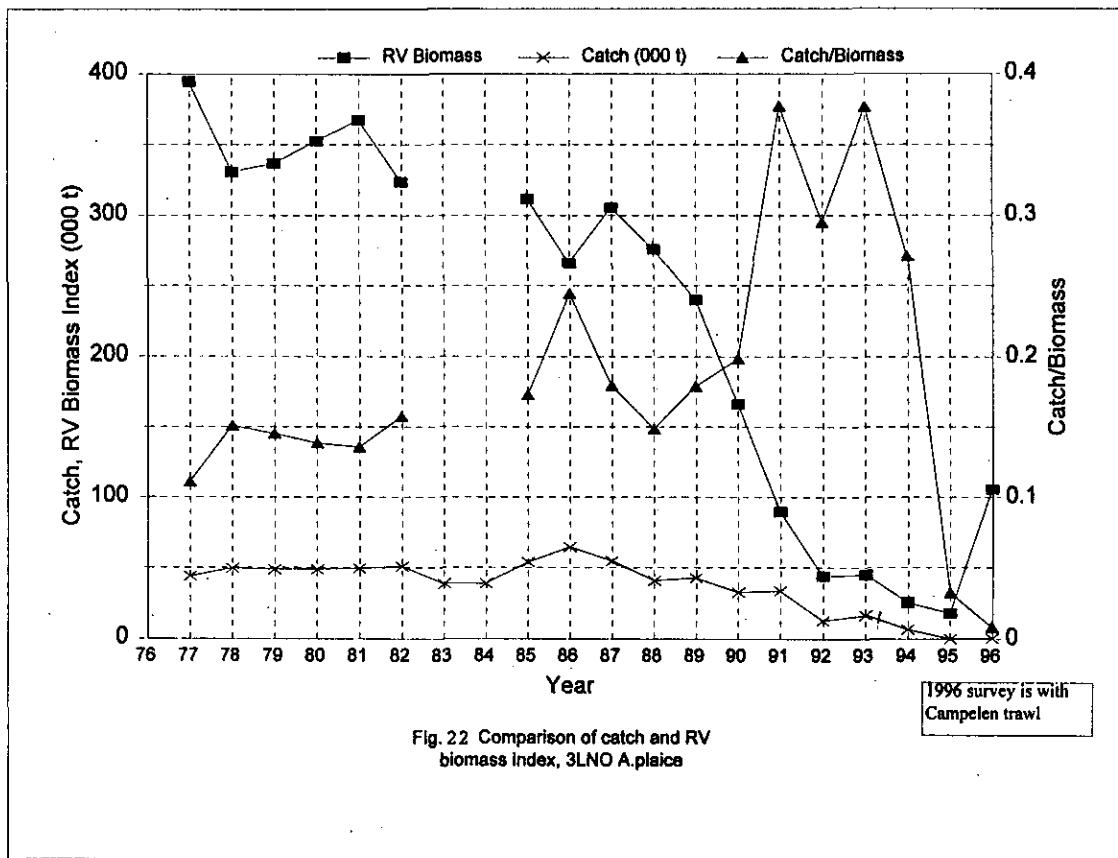


Fig. 22 Comparison of catch and RV biomass index, 3LNO *A.plaice*

1996 survey is with
Campelen trawl