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An assessment of American plaice in NAFO Div. 3LNO

by

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Abstract

Catches from this stock were generally in the range of 40,000 to 50,000 t per year throughout the 1970s and 1980s, before declining to low levels in the early 1990s. There has been no directed fishing on this stock since 1993 and the TAC has been set at 0 since 1995. By-catch of plaice in fisheries directed for other species has been relatively stable over the past five years but STACFIS could not agree on the catch estimate in 2011. The majority of catch was taken in the NAFO regulatory area (NRA). The Canadian spring surveys show a large decline in abundance and biomass from the mid to late 1980s to the mid 1990s and although there has been an increasing trend since that time, biomass index in 2011 (expressed as mean weight per tow) was only 26% of that of the mid 1980s. The Canadian fall survey biomass has also shown large declines since 1990 and a subsequent slow increasing trend to the present. By Division, the largest decrease in both surveys for biomass and abundance has been in Div. 3L but has been stable since the mid-1990s, with a slight increase in 2011. In general, there has been an increase in biomass in Divs. 3NO since the mid-1990s and abundance in these Divisions may be at or near levels of the late 1980s-early 1990s; however, for both spring and fall abundance and biomass, levels are declining or have dropped in 2011 in Div. 3O. The SSB, estimated from the previous assessment in 2011, has been gradually increasing since the mid-1990s and in 2011 was 34, 000 t, still below the B*lim* of 50, 000 t set for this stock. Recruitment has been generally poor since the 1986 year class. The 2003 year class appeared relatively strong in the 2009 VPA. Although still considered above average, its estimated strength was less in the assessment for 2011.

Catch from 2011

This year, STACFIS only had STATLANT 21A available as estimates of catches in 2011. The inconsistency between the information available to produce catch figures used in the previous years assessments and that available for the 2011 catches has made it impossible for STACFIS to provide the best assessment for this stock.

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 (Figure 1). 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 TAC has been set at 0 t since that time.

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, Figure 1). Catches increased to 65,000 t in 1986 and then declined rapidly thereafter, to about 7,400 t in 1994. Following the moratorium in 1995, the catch (by-catch in other fisheries, mainly yellowtail flounder) declined for a couple of years but then began to increase. Catches reached a high of 8 000 t, in 2003, and have been lower since. By-catch levels have been relatively steady at ~3000 t for the past five years. Most of the catch has been taken as by-catch in the skate, redfish and Greenland halibut fisheries in the NRA, while most of the Canadian by-catch is taken in the Canadian yellowtail flounder fishery.

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 (Table 1, Figure 1). Considerable doubts have arisen about some nominal catches in the 1985 to 1994 period, 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 Scientific Council to be reliable. 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. As well, estimates of discards are not available, and are believed to be substantial during some periods. In 2012, a 2011 catch estimate could not be agreed upon in STACFIS and therefore the only estimate available was STATLANT21A data, the total of which was 1, 247 t of American plaice for 2011.

The amount of plaice by-caught in the shrimp fishery was reviewed by Orr et al. (2008). The shrimp fishing area corresponding to Div. 3L is shrimp fishing area 7 (very little shrimp fishing occurs in Div. 3NO). For 2004-2007, the average amount of plaice taken annually in this fishery in this area was 3.3 t. It has increased slightly over that time period. There was only one length frequency available from 2004 and there were only 35 fish measured (all fish were less than 31 cm).

Canadian research vessel surveys

Survey coverage

Poor survey coverage has been an issue for the 2004 fall (incomplete coverage in Div. 3L) and the 2006 spring multi-species survey (no otoliths collected and incomplete survey in Div. 3NO) (Healey and Dwyer 2005; Dwyer *et al.* 2007) and both data points have been removed from the analytical assessment of this stock. Updated information on the Canadian research vessel survey coverage and details on annual sets carried out can be found in Healey *et al*. (2012).

Spring

Stratified-random surveys have been carried out on the Grand Bank by Canadian research vessels in the spring (April to June period) of each year from 1971 to 2011, with the exception of 1983. The stratification scheme used is shown in Figure 2. The data can be split into 3 time periods, based on the trawl used in each period: 1971-82 was Yankee 36, 1983-95 was Engel 145, and 1996-2010 was Campelen 1800 (see McCallum and Walsh (1996) for a description of the various trawls). Conversions exist for the first to second series (Gavaris and Brodie 1984), and from the second to the third (Morgan et al. 1998). However, data from the first series have not been converted to be comparable with the third series. Thus comparable data exist for 1971-95, and for 1984 to 2011. A full comparison between the Engel and Campelen data series is given in Brodie et al. (1998).

Biomass estimates for each Division by stratum and depth for 1996 to 2011 are given in Tables 2-4. Please note the shaded columns which represent years that survey coverage was inadequate. In 2011, the spring survey biomass estimates for 3L, 3N and 3O were 37, 100, 80,400 and 37, 500 t, respectively. Biomass estimates for these Divisions in 2010 were 23, 300, 85,900 and 40, 900 t. From 1996 to 1998 the estimate for Div. 3N biomass was approximately half of the estimate for Div. 3O while from 1999 to 2004 the estimates in the two divisions are about equal. However, from 2005 onwards the biomass estimate from Div. 3N is generally at least double the biomass estimate from Div. 3O. The biomass estimates in Div. 3L declined from 2006-2009 but for the last two years, has increased. Biomass in 3N increased to the highest point in the Campelen time series in 2007 and has generally been declining since. In Div. 3O, the biomass estimate has been slowly declining since 1999. Biomass in Div. 3LNO combined showed a large decrease from 2008 to 2009, with a slight increase in the past two years; however it is currently only 21% of the estimate of the mid 1980s (Figure 3).

Mean weight per tow for Divisions 3LNO combined (Figure 4) shows the same trend as the swept area estimate of biomass with a large decline in the late 1980s (which has been greatest in Div. 3L) followed by a slight increase since 1996. The average mean weight per tow for Div. 3LNO combined in 2011 is only 26% of the average of the mid 1980s. Mean weight per tow in Div. 3L and Div. 3O (Figure 4) has remained low relative to levels of the mid 1980s. By 2006-2007, mean weight per tow in Div. 3N (Figure 4) had increased to levels comparable to those of the mid 1980s but have subsequently declined such that levels in 2009-2011 are 62% of those in 1985-1987.

Total abundance for Div. 3LNO combined has fluctuated since 1996, with a slight increasing trend (Figure 3). Mean number per tow for Div. 3LNO combined shows the same trend (Figure 5). As with the biomass estimate, mean number per tow has shown the greatest decline in

Div. 3L (Figure 5) since the beginning of the time series. Mean numbers per tow in Div. 3N and Div. 3O showed an increase from the mid-nineties, but declined after 2007 and 2006, respectively.

Tables 5-8 and Figure 6 show the abundance at age from the Canadian spring surveys by division and for Div. 3LNO combined. The proportion of fish that are ages 0 to 5 has increased over the time series and has generally been greater than 50% since 2001 (except 2006).

Distribution plots of catch of American plaice from the Canadian Spring RV Survey (kg/tow standardized to tow length) suggest the largest concentrations of plaice to be in Div. 3N, mainly outside the 200-mile limit (Figure 7). Catches of American plaice on the shelf of the Grand Bank in 2011 appear similar to 2010, with a few larger tows in Div. 3L in 2011.

Fall

Stratified-random surveys have been conducted in Div. 3L in the fall since 1981, usually in October-November, but in recent years this has been occurring later. From 1990 to 2011, fall surveys were also carried out in Div. 3NO. Surveys from 1983 to 1994 were done with the Engel trawl and starting in fall 1995, a Campelen 1800 trawl was used.

Biomass estimates by stratum and depth are given for each Division in Tables 9-11. In 2010, biomass estimates from the fall survey were 60,100, 162,100, and 59,500 t for Div. 3L, 3N and 3O respectively. Biomass estimates from 2011 for these Divisions were 61, 000, 172,600, and 43, 800 t. Over the past number of years, there has been a large biomass estimate in Div. 3N fairly consistently, which is heavily influenced by large sets in stratum 360 (Table 10). The biomass estimate for Div. 3O dropped for the third consecutive year in 2011. During 1995 to 1997, Div. 3N constituted on average 40% of the Div. 3NO total while the average since 2000 has been about 70% of the Div. 3NO total. In 2011, Div. 3N is 80% of the Div. 3NO total.

The overall biomass for Div. 3LNO in the fall has shown a slight increasing trend since 1995 (Figure 3). The current biomass index remains well below that of 1990 with the average of the 2011 index representing only about 43% of that of 1990. The biomass index expressed as mean weight per tow shows the same overall trend with the average of the last 3 years being 39% of the level of 1990 (Figure 8). Mean weight per tow has shown the largest decline in Div. 3L (Figure 8). Mean weight per tow estimates from Div. 3N are at or above levels seen in the early 1990s, while mean weight per tow in Div. 3O in 2011 is at the same level as in 2002, which was the lowest point in the time series (Figure 8).

Abundance for Div. 3LNO combined (Figure 3) showed a substantial decline from 1990 to 1998 but has been increasing since 1998. Mean numbers per tow show the same pattern (Figure 9). By Division, the largest decline in the time series was once again in Div. 3L (Figure 9). Mean numbers per tow has increased since the mid 1990s in 3N. In 3O, mean numbers per tow has increased since the early 2000s but has declined now for three consecutive years (Figure 9).

Tables 12-15 and Figure 10 show the abundance by age for 1990 to 2011. The age composition has seen younger ages making up a higher proportion of the population in recent years, increasing from 55% in 1990 to an average of 73% in the last three years (Table 15). Numbers of

fish corresponding to the 2003 year class appears to be large in this survey (Figure 10) but has largely dropped out by 2010. The 2006 YC that looked to be stronger than average also has greatly decreased in 2011.

Plots of distribution by weight per tow (Figure 11) for the fall surveys for 2007-2011 show that American plaice are distributed throughout the Div. 3LNO area. However the area of highest concentration is southern 3NO, particularly on the tail of the bank in Div. 3N. There are fewer large catches in Div. 3L.

Comparison of Spring and Fall Surveys

Overall, abundance and biomass estimated from spring and fall surveys show a similar increasing trend since the mid 1990s, although the spring survey indices have levelled off in recent years (Figure 3). The slight differences in trend may be due to survey timing changes and fish moving into and out of the survey area. Historically, both surveys have shown the largest decline in Div. 3L. There are some larger catches off the Grand Banks in Div. 3L in the fall but overall, distribution is also similar between the two surveys, with the majority of the fish being distributed in southern Div. 3NO (Figures 7, 11).

Maturities

Age and length at 50% maturity were produced from spring RV data. Maturity data were collected during research vessel surveys from 1960-2011. Stratified random surveys were used where possible (1971-2011, except 2006 when survey coverage was considered too poor to be representative). Data from earlier years came from surveys that were conducted mainly as line transects. The coverage of a stock area would generally not be as complete as the stratified random surveys. For the period of the stratified random surveys, observed proportion mature at age was calculated according to the method of Morgan and Hoenig (1997) to account for the length stratified method of sampling. Prior to this, only data from the aged fish was used without weighting by the length frequencies. This should not have a large impact on the model estimates (Morgan and Hoenig 1997). Data from 1985-1995 were converted to Campelen equivalents.

Estimates were produced by cohort. For males, A_{50} were fairly stable for cohorts of the 1960s to mid 1970s, with perhaps a slight increase over that time period. Male A_{50} then began a fairly steady decline to the 1991 cohort which had an A_{50} of just over 3 years. Male A_{50} has increased somewhat but is still below the 1960s and 1970s with an A_{50} of about 4 years compared to 6 years at the beginning of the time series (Figure 12). For females, estimates of A_{50} have shown a large, almost continuous decline, since the beginning of the time series. For females the A_{50} for recent cohorts is less than 8 years compared to 11 years for cohorts at the beginning of the time series.

Estimates of maturity at length were produced using the data described above and are presented by cohort in Figure 13. L_{50} declined for both sexes but increased in recent cohorts. The recent L_{50} for males of about 19 cm is 3 to 4 cm lower than the earliest cohorts estimated. The most recent cohort for which there is an estimate has an L_{50} of 22 cm but is likely to be revised as more data are added as the fiducial limits are wide. The L_{50} of most recent cohorts for females is in the range of 33-34 cm, somewhat lower than the 39 cm of the earliest cohorts.

Weights and lengths-at -age

Mean weights-at-age and mean lengths-at-age were calculated for male and female American plaice for Div. 3LNO using spring survey data from 1990 to 2011, except for 2006 when survey coverage was too poor to be considered representative. Means were calculated accounting for the length stratified sampling design. Although there is variation in both length and weight-at-age there is little indication of any long-term trend for either males or females (Figures 14 and 15).

Mortality

Estimates of total mortality (Z) from the Campelen or equivalent, spring and fall survey data were calculated for ages 1 to 16 (Figures 16 and 17). A Lowess smoother is plotted to help illustrate trends. The smoothing windows were chosen by Aikaike information criteria. The spring survey indicates an increase in mortality up to the mid 1990s for most ages. This trend is also in the fall data but is not as evident. Mortality declined after the mid 1990s in both surveys. This was followed by an increase in the early 2000s. In both surveys, estimates are lower in the mid 2000s for most ages. In both surveys there has been an increase in Z in the last few years and for many ages Z is at or near the level of the mid 1990s.

EU-Spain Div. 3NO survey

Abundance and Biomass Trends

Since 1995, Spain has carried out a stratified random spring bottom trawl survey in Div. 3NO of the NAFO Regulatory Area. In 2001, the trawl vessel (C/V *Playa de Menduiña*) and gear (*Pedreira*) were replaced by the R/V *Vizconde de Eza* using a *Campelen* trawl. There has been a general increase in this index for both biomass and abundance since the beginning of the time series. However, estimates of both indices from the EU-Spain survey followed a trend similar to the Canadian Survey estimates with a drop in both biomass and abundance in 2009; since then the indices for EU-Spain have increased (González-Troncoso et al., 2012).

Numbers at Age

Canadian spring RV age length keys (for Div. 3N only, as the Survey by EU-Spain Div. 3NO survey only covers a small portion of Div. 3O) were applied to EU-Spain length frequency data (separate sexes, mean number per tow) from 1998-2000 converted data and 2001-2005 and 2007-2011 Campelen data (González-Troncoso et al., 2012). Combined spring Canadian ALKs from 1997-2005 were applied to the 2006 length frequencies, as there were no otoliths collected from the Canadian 2006 spring survey. This resulting mean numbers per tow at age data is found in Table 16 and is used as input into the analytical assessment (except for 2011, when it was not carried out). The numbers corresponding to the 2003 year class (and to a lesser extent the 2006 YC) are also evident in this survey (Figure 18). Overall, age composition for this survey was similar to the Canadian RV spring survey, except at ages 6 and 7 and to a lesser degree the oldest ages (12+) (Figure A.4).

Commercial Catch Sampling

There was age sampling of the 2011 by-catch in the Canadian fishery and length sampling of by-catch in the Canadian, EU-Spain, EU-Portugal and Russian (only two length frequency samples) fisheries. STACFIS could not estimate total catch for 2011, therefore the 2011 catch-at-age was not calculated.

In 2011 American plaice were taken as by-catch in the Canadian yellowtail fishery, EU-Spain and EU-Portugal skate, redfish and Greenland halibut fisheries. Length frequency data were available from the Canadian by-catch of American plaice in Div. 3LNO, mainly from the yellowtail fishery. Samples were taken from all 3 Divisions, and lengths ranged from 24-70 cm, with a peak around 38 cm. The by-catch for EU-Spain ranged in length from 17-70 cm, with a peak at 34-38 cm. The by-catch in the EU-Portugal fishery consisted of American plaice ranging from 14-56 cm, with a peak at 26-34 cm. The small amount of sampling data available for Russia indicated a peak at 33 cm and another at 43 cm.

Virtual Population Analysis (VPA)

Since STACFIS was not able to estimate total catch, the analytical assessment using the ADAPTive framework could not be updated in 2012.

From the 2011 assessment (Rideout et al., 2011), the estimate of SSB at the beginning of 2011 was 34, 000 t, 32% below the Blim of 50 000t. Estimated recruitment at age 5 indicates that the 2003 year class is comparable to the 1987-1990 year classes but well below the long term average.

Reference Points

Based on the 2011 assessment the biomass for this stock is estimated to be below B_{lim} (50 000 t) and fishing mortality in 2010 was below F_{lim} (0.3).

Stochastic Projections from 2011 assessment (Rideout *et al.*, 2011)

Simulations were carried out in 2011 to examine the trajectory of the stock under 3 scenarios of fishing mortality: F = 0, F= F_{2010} (0.11), and $F_{0.1}$ (0.16) (Shelton and Morgan 2011). F_{max} is difficult to determine for this stock and highly labile so estimates were not provided under this scenario. For these simulations the results of the VPA and the covariance of these population estimates were used. The following assumptions were made:

Age	Estimate of 2011 population numbers ('000)	CV on population estimate	Weight-at-age mid-year (avg. 2008-2010)	Weight-at-age beginning of year (avg. 2008-2010)	Maturity-at-age (avg. 2008-2010)	Rescaled PR relative to ages 9-14 (avg. 2008-2010)
5			0.200	0.174	0.013	0.030
6	21469	0.323	0.281	0.239	0.060	0.129
7	22676	0.234	0.361	0.317	0.234	0.281
8	27826	0.194	0.476	0.425	0.554	0.553
9	9347	0.174	0.566	0.532	0.776	0.687
10	4754	0.174	0.723	0.657	0.916	0.638
11	5567	0.163	0.829	0.787	0.979	0.628
12	4467	0.158	1.093	0.978	0.995	1.053
13	3882	0.151	1.279	1.230	0.999	1.291
14	1041	0.169	1.571	1.461	1.000	1.703
15	1142	0.181	1.829	1.673	1.000	1.703

Simulations were limited to a 2-year period. Recruitment was resampled from three sections of the estimated stock recruit scatter, depending on SSB. The three sections were 50 000 tons of SSB and below (only low recruitment), greater than 50 000 tons to 155 000 tons (low and high recruitment), and greater than 155 000 tons (only high recruitment). The simulations contained a plus group at age 15. SSB was projected to have a <5% probability of reaching B_{lim} by the start of 2014 when $F = F_{2010}$ (0.11) (Table 17). SSB was projected to have a 50% probability of reaching B_{lim} by the start of 2014 (i.e. end of 2013) when F=0 (Table 17). The current projections predicted yield to increase slightly from 2011 to 2012 under $F_{current}$ and $F_{0.1}$ followed by little or no increase in yield in 2013 (Rideout *et al*., 2011).

Appendix A

Some exploratory analyses were conducted to evaluate the internal consistency in each survey index series, the consistency of the contribution of each year-class to the total survey index, and the consistency of the age-specific information across the survey series.

Pair-wise plots of the each of the survey indices (by cohort on the log-scale) are presented in Appendix A.1 – A.3. The data points in the panels below the numbered diagonal compare the logarithm of survey data at different ages for a common cohort. The solid line in each panel is the linear least squares regression line. Numeric values in the panels above the diagonal provide the correlation coefficient between the survey data at these ages. The p-values for testing whether or not the correlation is significantly different in each panel are indicated by the key shown on the right hand side. Regression and correlations are only computed if there are at least 5 points (i.e. cohorts) available for a given pair of ages. The scatter plots reveal that some of the lower correlation values at some of the ages for some of the survey indices are partially due to one or two outlying points; mostly there are high correlations of ages between cohorts for all surveys.

A comparison of standardized indices illustrating the consistency of dataset currently used to calibrate the analytical assessment is presented in Figure Appendix A.4. In these figures each survey-age time-series is standardized to have mean 0 and variance 1 and are directly comparable. The survey data used to calibrate the VPA appears to be fairly consistent through time over most age groups, though there are some differences between the EU-Spain survey and

the Canadian surveys at age 6 and 7, in a number of years. As well age 14s in 2004 are higher than the Canadian surveys, with less consistency overall in the recent period.

Plots of the standardized proportions by age across years (SPAY) provide additional perspective on the cohort consistency within each of the survey indices (Figures A.5). In the SPAY plots, the annual index proportions were standardized at each age to have a mean of 0 and a variance of 1. (Cohorts are identified with text labels in the margin.) Cohorts can be tracked in all surveys, but especially at the youngest ages in the Canadian fall surveys. In the spring and fall Canadian surveys the youngest ages can be seen to be very strong since 2008 compared to the rest of the time series. This is not seen in the EU-Spain survey.

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Table 1. Nominal catches (t) of American plaice for NAFO Divisions 3LNO, 1960-2011and TACs from 1973 to 2012.

Year	Canada	Other	Total	STACFIS[a]	TAC
1960	21,353	20	21,373		-
1961	14,897	1,476	16,373		-
1962	15,210	982	16,192		-
1963	24,591	1,128	25,719		-
1964	35,474	3,093	38,567		-
1965	45,365	7,896	53,261		-
1966	51,225	13,786	65,011		-
1967	54,190	40,223	94,413		-
1968	48,674	24,493	73,167		-
1969	64,815	14,622	79,437		-
1970	54,929	11,724	66,653		-
1971	49,394	18,494	67,888		-
1972	41,605	17,756	59,361		-
1973	38,586	14,257	52,843		60,000
1974	35,101	11,196	46,297		60,000
1975	34,015	9,206	43,221		60,000
1976	47,806	4,019	51,825		47,000
1977	42,579	1,402	43,981		47,000
1978	48,634	1,394	50,028		47,000
1979	47,131	1,438	48,569		47,000
1980	48,296	790	49,086		47,000
1981	48,177	1,981	50,158		55,000
1982	49,620	717	50,337		55,000
1983	35,907	1,813	37,720		55,000
1984	33,756	2,307	36,063		55,000
1985	40,024	8,057	48,081	54,212	49,000
1986	33,409	24,040	57,449	64,570	55,000
1987	33,967	19,490	53,457	55,012	48,000
1988	26,832	12,096	38,928	40,835	33,585[c]
1989	27,901	13,305	41,206	43,369	30,300
1990	22,600	1,406	24,006	32,501	24,900
1991	22,510	2,993	25,503	34,681	25,800
1992	9,663	1,207	10,870	13,350	25,800
1993[b]	7,454	462	7,916	17,122	10,500
1994	73	487	560	7,378	4,800[d]
1995	67	481	548	637	0
1996	49	826	875	913	0
1997	75	1,290	1,365	1,401	0
1998	227	1,333	1,560	1,618	0
1999	323	2,113	2,436	2,565	0
2000[e]	623	2,071	2,694	5,176	0
2001	1,618	1,850	3,468	5,739	0
2002	1,374	1,795	3,169	4,870	0
2003[e]	1,607	2,062	3,669	8,727	0
2004	1,290	1,368	2,658	6,158	0
2005	1,466	889	2,355	4,110	0
2006	90	799	889	2,828	0
2007	430	1,020	1,450	3,606	0
2008	875	1,017	1,892	2,515	0
2009	1,075	695	1,770	3,015	0
2010	1,155	316	1,471	2,898	0
2011	n/a	n/a	1,247	n/a	0

[a]May include some catch estimated from surveillance reports or miscellaneous information. See text for details.

[b] Catch may have been as high as 19,400.

[c] Effective TAC.

d No directed fishing.

[e] STACFIS unable to determine precise estimates because of discrepancies between various sources.

n/a No estimates of catch other than STATLANT21A data

Table 2 . Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian spring surveys in Div. 3L in 1996-2011 (Campelen). (+) indicates biomass <50 t, (-) means stratum not surveyed.

Biomass

Depth	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
30-56	784	-	-	0.2	+	-	+	0.0	-	-	-	-	-	-	-	-	-
	Total	-	-	0.2	+	-	+	0.0	-	-	-	-	-	-	-	-	-
57-92	350	0.6	0.3	0.3	6.1	1.8	0.4	0.2	0.7	0.7	1.2	1.7	2.3	3.1	0.6	0.2	2.3
	363	2.3	0.8	0.0	3.2	6.2	0.6	0.1	3.4	2.1	4.1	4.5	4.4	6.0	1.3	0.4	1.4
	371	0.9	0.2	0.1	2.4	0.9	0.1	+	0.2	0.5	1.3	1.3	1.4	1.9	+	1.0	0.8
	372	1.4	0.8	1.3	2.7	3.7	1.2	0.3	2.2	1.2	1.8	2.5	1.6	1.8	0.8	2.1	1.5
	384	0.7	0.9	0.2	0.8	1.2	0.3	0.4	0.3	0.5	0.9	1.6	1.6	2.5	0.1	0.3	1.2
	785	-	-	0.2	0.5	-	0.7	+	-	+	-	-	-	-	-		-
	Total	5.9	3.0	2.1	15.7	13.8	3.3	1.0	6.9	5.0	9.2	11.5	11.3	15.4	2.8	4.0	7.1
93-183	328	0.5	0.5	0.1	2.4	0.9	1.3	0.5	0.2	0.6	3.6	1.6	1.4	-	2.9	0.9	6.2
	341	1.8	0.5	0.7	4.5	0.8	1.5	0.2	0.6	0.6	2.3	1.7	1.2	4.4	0.9	0.4	2.8
	342	0.1	0.1	0.4	0.4	0.2	0.1	+	0.1	+	0.1	0.6	0.8	0.1	0.1	0.0	0.6
	343	0.3	0.0	+	0.6	0.2	+	+	0.1	+	0.1	0.3	0.1	0.0	0.2	-	0.4
	348	1.4	0.8	1.2	2.8	1.5	0.4	0.3	0.4	1.3	1.5	7.0	2.7	0.8	0.2	0.7	0.5
	349	0.8	0.3	0.2	4.4	1.3	0.5	0.3	0.6	1.1	1.1	3.6	1.6	1.8	0.3	0.5	0.8
	364	2	1.0	0.9	5.6	1.3	1.5	1.2	0.7	1.7	5.8	7.5	0.7	3.5	0.4	1.1	1.8
	365	1.1	0.5	0.9	1.4	1.2	0.3	0.6	0.6	0.5	1.3	6.2	2.3	2.5	0.3	1.1	0.4
	370	1.3	0.6	1.6	2.4	1.9	0.9	0.6	0.5	1.1	4.0	5.1	0.8	3.1	0.4	1.4	0.6
	385	5.6	0.9	0.5	2.5	1.9	1.4	0.7	0.4	1.4	2.4	4.0	1.7	3.9	0.8	1.5	1.6
	390	0.6	0.4	0.5	0.3	0.3	0.4	1.0	0.3	0.2	0.9	0.9	1.8	2.6	0.1	0.2	0.3
	786	-	-	0.3	0.5	-	0.4	-	-	0.1	-	-	-	-	-	-	0.6
	787	-	-	0.5	0.8	-	0.1	-	-	+	-	-	-	-	-	-	0.9
	788	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-
	790	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	793	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	794	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
	797	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
	799	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Total	15.5	5.5	7.8	28.9	11.5	8.8	5.4	4.5	8.6	23.2	38.5	15.0	22.7	6.5	7.9	17.4
184-274	344	1	0.3	0.8	1.8	0.5	0.3	0.2	0.3	0.3	1.7	2.9	1.7	0.5	0.3	0.4	0.3
	347	0.6	0.2	0.6	0.6	0.2	0.4	0.1	0.5	0.3	1.7	1.7	5.3	0.2	0.5	0.2	0.2
	366	0.4	0.3	0.3	0.5	0.7	0.7	0.9	0.6	0.6	1.3	3.0	3.3	0.7	0.7	1.1	0.5
	369	0.3	0.2	0.2	1.2	0.7	0.9	0.8	0.4	0.5	2.8	4.4	2.0	0.7	0.8	1.3	0.3
	386	0.5	0.2	0.4	1.4	1.7	0.4	0.5	0.4	0.5	2.0	2.6	2.5	0.9	0.5	1.2	0.2
	389	0.4	0.2	0.4	0.6	0.8	0.8	0.3	0.4	0.7	0.4	1.1	0.7	0.7	0.2	0.7	0.9
	391	0.3	0.1	0.2	0.1	+	0.2	0.2	0.2	0.1	0.1	0.1	0.4	0.6	0.1	0.1	0.5
	789	-	-	-	0.5	-	-	-	+	-	-	-	-	-	-	-	-
	791*	-	-	-	0.3	-	-	-	-	0.1	-	-	-	-	-	-	-
	795	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-
	798	-	-	-	0.1	-	-	-	+	-	-	-	-	-	-	-	-
	Total	3.5	1.5	2.9	7.2	4.6	3.7	3.0	2.8	3.0	10.0	15.8	16.0	4.2	3.1	5.0	2.9
275-366	345	0.5	0.2	0.3	1.5	0.5	0.7	0.7	0.2	0.4	2.9	1.4	1.9	0.7	1.2	0.6	0.5
	346	0.4	0.3	0.2	0.2	0.5	0.1	0.8	0.8	0.9	1.6	0.7	1.2	0.8	1.0	1.1	0.4
	368	0.3	0.0	0.1	0.3	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.5	0.7	0.5	0.3
	387	0.6	0.6	0.8	0.4	1.6	0.8	0.1	0.4	0.4	0.7	0.6	0.5	1.8	0.2	0.6	1.6
	388	0.6	0.2	0.2	0.8	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.2	0.9	0.2	0.3	0.7
	392	0.5	0.1	0.4	0.2	0.1	0.1	0.3	0.1	0.2	+	0	0.0	0.0	0.3	1.1	0.1
	792	-	-	-	+	-	0.1	-	0.1	-	-	-	-	-	-	-	-
	796	-	-	-	0.1	-	-	-	0.1	-	-	-	-	-	-	-	-
	800	-	-	-	0.2	-	-	-	-	0.1	-	-	-	-	-	-	-
	Total	2.9	1.4	2.0	3.7	3.4	2.4	2.2	1.8	2.4	5.5	2.9	3.9	4.6	3.6	4.2	3.6
367-549	729	0.2	0.6	2.2	0.1	1.3	1.1	1.3	1.2	+	+	0.0	0.0	0.0	1.5	-	0.2
	731	0.5	0.1	+	0.1	1.2	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.4	0.1	0.1
	733	0.7	0.0	0.3	1	0.1	2.3	0.5	2.1	0.3	+	0.1	0.0	0.5	+	0.7	0.1
	735	1.4	1.6	1.2	0.6	1.2	2.1	1.2	4.9	-	+	+	0.1	2.3	0.9	1.3	5.6
	Total	2.8	2.4	3.7	1.8	3.8	5.8	3.2	8.3	0.4	0.0	0.1	0.2	2.9	2.8	2.0	6.0
550-731	730	+	0.0	0.2	+	0.1	0.1	0.3	+	+	0.0	-	0.0	0.0	+	0.0	0.0
	732	+	0.0	0.0	+	0.3	3.4	0.6	0.6	0.0	0.0	-	0.0	0.0	0.2	0.0	-
	734	+	0.0	0.1	0	0	0.1	0.9	0.5	0.0	0.0	-	0.0	-	1.2	0.1	0.0
	736	+	0.1	0.0	+	+	+	0.5	0.1	+	+	-	0.0	0.1	0.5	0.1	0.0
	Total	0.1	0.1	0.3	+	0.4	3.6	2.3	1.2	0.0	0.0	0.0	0.0	0.1	1.9	0.2	0.0
732-914	737	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	741	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	748	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
915-1097	738	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	742	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	746	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	749	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1098-1280	739	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	743	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	747	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1281-1463	740	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	744	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	751	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grand Total		30.7	13.8	19.0	57.3	37.5	27.6	17.1	25.4	19.3	47.9	68.8	46.3	50.0	20.6	23.3	37.1

* 1996 had a depth range of 184-366

Table 3. Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian spring surveys in Div. 3N in 1996-2011 (Campelen). (+) indicates biomass <50 t, (-) means stratum not surveyed.

Biomass

Depth	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
≤ 56	375	2.9	2.2	1.1	1.8	5.1	2.1	3.9	2.1	2.3	0.6	4.5	3.7	6.3	2.2	2.6	2.2
	376	0.8	1.8	2.0	3.2	5.1	9.3	8.6	9.6	11.7	37.2	32.1	7.5	7.9	9.7	3.3	6.9
	Total	3.7	4.0	3.1	5.0	10.2	11.4	12.5	11.8	14.1	37.8	36.5	11.2	14.3	11.9	5.9	9.1
57-92	360	8.8	8.6	7.9	27.4	22.8	50.3	28.0	29.6	29.2	37.5	54.2	100.7	78.3	17.8	47.1	42.4
	361	3.8	1.9	2.0	5.5	4.2	9.0	6.0	9.3	8.3	4.7	3.8	2.8	3.1	2.1	1.2	3.0
	362	2.8	5.5	4.0	4.6	6.6	7.0	2.7	4.7	2.5	5.7	4.5	4.2	4.5	2.4	2.7	4.1
	373	1.6	0.5	0.9	8.3	3.2	2.5	0.4	2.7	1.1	2.7	-	3.0	10.2	1.5	4.9	1.2
	374	1.1	0.4	0.3	1.7	0.9	1.0	0.6	3.2	2.1	3.5	0.1	5.0	5.0	2.9	7.4	4.5
	383	0.5	0.1	+	1.0	0.2	0.1	+	0.3	0.5	1.8	-	2.7	2.6	0.2	0.4	0.2
	Total	18.6	17.0	15.1	48.5	37.9	69.9	37.7	49.7	43.7	55.7	62.6	118.4	103.7	26.8	63.8	55.4
93-183	359	1.1	1.1	1.6	3.3	5.1	5.1	0.6	7.0	3.7	15.3	-	4.1	9.3	4.5	11.7	3.5
	377	0.2	0.1	+	0.2	+	0.9	0.1	0.2	0.2	0.4	-	4.8	2.0	0.8	0.6	0.5
	382	0.1	0.1	0.7	0.2	0.4	0.1	0.1	0.1	0.1	3.9	-	0.1	1.6	+	0.5	0.1
	Total	1.4	1.3	2.3	3.7	5.5	6.1	0.8	7.3	4.0	19.6	-	9.0	12.9	5.3	12.8	4.0
184-274	358	0.1	0.1	1.4	0.3	0.6	0.5	0.1	0.3	0.3	0.4	-	0.7	0.5	1.5	0.7	0.2
	378	0.1	0.2	0.2	0.9	+	0.1	0.1	0.5	0.4	0.1	-	0.4	0.3	9.0	1.1	1.5
	381	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.8	0.1	-	0.7	0.8	0.2	1.0	0.1
	Total	0.5	0.4	1.7	1.4	0.7	0.7	0.3	1.0	1.5	0.6	-	1.8	1.6	10.7	2.7	1.7
275-366	357	0.1	0.1	0.1	+	0.1	0.1	0.1	0.1	0.1	0.1	-	0.1	0.0	0.4	0.0	0.0
	379	+	0.1	0.1	0.1	0.1	0.1	0.1	0.3	+	+	-	+	0.0	0.2	+	0.1
	380	0.2	0.8	0.1	0.2	+	0.1	+	0.4	0.2	0.0	-	0.0	0.1	0.3	0.3	0.3
	Total	0.3	1.0	0.3	0.3	0.2	0.3	0.2	0.9	0.3	0.1	-	0.1	0.1	0.9	0.3	0.5
367-549	723	0.2	0.4	0.3	+	0.0	0.1	0.3	1.1	0.1	0.1	-	+	0.0	+	0.0	0.0
	725	0.1	0.5	0.2	+	0.4	0.1	+	0.3	+	+	-	0.0	0.0	0.0	0.0	0.7
	727	0.5	2.2	2.0	0.4	1.2	2.5	0.1	0.5	0.4	+	-	+	+	1.7	0.1	8.3
	Total	0.8	3.1	2.5	0.4	1.6	2.7	0.4	1.8	0.6	0.1	-	0.0	0.0	1.7	0.1	9.1
550-731	724	0.2	0.5	0.2	+	0.1	0.1	0.5	0.1	+	0.1	-	0.0	-	0.0	+	0.0
	726	+	0.1	+	+	0.1	+	+	+	+	0.0	-	0.0	0.0	0.0	0.0	0.0
	728	0.5	-	0.3	0.2	0.5	1.0	0.4	0.1	+	0.1	-	0.0	0.0	3.8	0.2	0.5
	Total	0.7	0.5	0.5	0.2	0.7	1.1	0.9	0.3	+	0.2	-	0.0	0.0	3.8	0.2	0.5
732-914	752	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	756	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	760	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total			-	-	-	-	-	-	-	-	-	-	-	-	-	-
915-1097	753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	757	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	761	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1098-1280	754	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	758	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1281-1463	755	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grand Total		26.0	27.4	25.5	59.5	56.8	92.1	52.8	72.7	64.1	114.2	99.1	140.4	132.5	61.1	85.9	80.4

Table 4. Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian spring surveys in Div. 3O in 1996-2011 (Campelen). (+) indicates biomass <50 t, (-) means stratum not surveyed.

Biomass

Depth	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
57-92	330	3.8	0.8	6.9	3.5	5.9	4.2	2.1	1.3	2.9	6.5	4.9	4.7	6.5	3.2	3.7	4.9
	331	1.4	0.3	0.3	2.7	2.3	2.6	2.2	2.6	0.8	0.9	-	2.5	1.9	0.4	1.2	0.6
	338	6.0	5.7	6.0	4.0	2.3	6.0	3.1	5.0	4.3	4.5	6.4	3.2	2.5	3.2	3.3	3.4
	340	2.2	1.7	1.8	2.9	1.9	1.7	0.5	1.5	0.7	1.7	1.4	2.4	3.5	1.4	3.0	1.9
	351	2.9	4.4	3.8	4.6	3.4	6.5	3.2	2.4	3.5	4.5	3.2	6.0	4.4	0.6	3.0	3.7
	352	9.1	13.8	10.6	14.2	13.4	17.5	18.6	10.1	10.0	13.2	10.7	8.9	4.9	2.0	9.1	8.9
	353	7.8	8.3	10.9	21.5	21.1	20.6	14.8	25.2	21.2	10.1	15.9	7.8	10.6	15.7	9.6	3.8
	Total	33.2	34.9	40.3	53.4	50.3	59.1	44.5	48.0	43.4	41.3	42.5	35.6	34.3	26.5	32.8	27.2
93-183	329	1.6	1.4	4.4	4.7	3.9	1.9	1.4	1.8	3.1	2.3	-	2.8	3.4	2.2	4.5	3.5
	332	3.9	2.5	3.8	2.2	0.9	2.2	3.1	1.4	1.9	2.2	-	1.0	3.1	3.6	1.7	1.3
	337	4.6	1.9	3.2	2.7	1.5	1.2	1.4	1.4	1.6	2.5	-	0.7	2.5	1.1	0.4	0.4
	339	1.4	0.8	0.8	2.1	2.1	2.6	0.9	0.9	0.7	1.7	1.2	1.0	1.3	2.3	0.3	0.7
	354	1.6	1.1	5.0	9.0	1.3	1.6	6.4	5.3	8.1	1.9	-	2.7	6.9	5.1	1.0	4.3
	Total	13.1	7.8	17.2	20.7	9.7	9.5	13.2	10.9	15.3	10.7	1.2	8.2	17.2	14.3	8.1	10.2
184-274	333	+	0.3	0.1	0.1	+	+	0.3	+	+	0.2	-	0.1	+	+	+	0.0
	336	0.2	0.3	+	0.2	+	0.1	+	+	+	0.1	-	0.2	+	+	+	0.0
	355	0.5	0.3	0.1	0.1	0.1	0.4	0.4	0.6	0.3	0.2	-	0.2	+	0.2	+	0.1
	Total	0.7	0.9	0.2	0.4	0.1	0.5	0.7	0.6	0.3	0.5	0.0	0.5	0.0	0.2	0.0	0.1
275-366	334	0.2	0.8	0.0	0.1	+	+	0.2	0.2	+	+	-	0.1	+	+	0.0	0.0
	335	0.2	0.2	0.0	+	+	+	+	+	+	+	-	0.0	+	+	+	0.0
	356	0.1	+	+	0.1	+	+	+	0.4	+	+	-	0.1	+	0.1	+	0.0
	Total	0.5	1.0	+	0.2	+	+	0.2	0.5	+	0.1	0.0	0.1	0.0	0.1	0.0	0.0
367-549	717	0.2	1.7	+	0.1	0.0	+	0.4	0.2	0.0	0.1	-	0.0	0.0	0.0	+	0.0
	719	0.1	0.5	+	+	0.0	+	+	+	+	+	-	0.0	0.0	0.0	0.0	0.0
	721	0.2	0.1	+	0.1	+	0.2	+	0.1	0.0	+	-	0.0	0.0	+	0.0	0.0
	Total	0.5	2.2	+	0.2	+	0.2	0.4	0.3	0.0	0.1	-	0.0	0.0	0.0	0.0	0.0
550-731	718	+	0.1	+	+	0.0	+	+	0.3	0.0	0.0	-	0.0	0.0	+	0.0	0.0
	720	+	0.1	+	+	0.0	0.1	0.0	+	0.0	0.0	-	+	0.0	0.0	0.0	-
	722	1.0	4.2	0.0	0.2	0.1	0.2	0.1	0.2	0.0	0.0	-	+	0.0	0.0	0.0	0.0
	Total	1.0	4.4	+	0.2	0.1	0.2	0.1	0.2	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
732-914	764	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	768	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	772	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
											-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
											-	-	-	-	-	-	-
915-1097	765	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	769	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	773	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
											-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grand Total		49.0	51.2	57.7	75.1	60.2	69.5	59.1	60.5	59.0	52.6	43.7	44.4	51.5	41.0	40.9	37.5

Table 5. Abundance index at age (millions) for American plaice in NAFO Div. 3L from Canadian spring surveys from 1985 to 2011.

Age/Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.11	0.00	2.29	1.15	0.00	0.13	0.05	1.42	-	1.64	4.33	0.63	3.13	0.00
2	0.00	1.32	5.23	4.10	1.86	0.00	1.32	0.00	0.30	0.00	0.00	8.40	0.63	0.68	1.89	17.73	37.91	7.65	1.66	3.76	10.61	-	18.24	27.16	79.34	21.21	49.02
3	8.11	4.55	11.39	18.84	17.35	5.24	3.23	1.74	2.26	0.36	0.40	29.93	5.44	3.14	5.42	12.32	32.83	34.07	20.64	9.38	31.58	-	28.17	39.19	71.37	72.35	102.95
4	25.76	23.56	50.30	80.86	80.96	70.17	14.00	5.14	5.75	7.48	0.82	91.96	14.04	10.24	6.59	4.94	15.63	18.24	29.59	24.62	39.64	-	34.52	36.20	28.94	58.97	134.47
5	146.34	115.41	242.76	279.24	174.03	137.97	110.19	46.07	22.68	31.03	11.84	82.54	31.70	21.10	25.82	8.95	5.95	7.98	17.73	35.53	95.80	-	16.60	35.83	21.11	20.65	75.43
6	349.77	451.71	566.10	554.37	416.73	231.75	178.00	61.69	59.15	46.46	17.43	48.50	26.57	36.67	42.99	29.81	9.41	5.19	8.55	14.35	72.72	-	19.83	28.83	14.26	19.52	30.02
7	513.51	496.70	553.70	501.15	351.42	277.32	102.04	89.33	37.42	44.40	31.75	26.16	14.58	30.44	66.66	28.55	18.61	9.46	7.73	8.27	25.87	-	42.04	27.25	8.24	14.03	17.15
8	317.45	260.25	333.72	277.15	208.59	152.33	79.23	33.11	16.71	13.72	31.28	8.01	6.83	19.43	65.01	27.47	16.40	9.72	11.96	4.93	11.24	-	42.47	30.88	7.44	6.86	12.16
9	152.45	156.89	132.67	188.17	143.33	94.21	43.70	18.53	5.56	6.13	17.63	3.62	2.42	6.38	39.59	18.83	17.27	8.67	10.35	5.64	9.96	-	17.46	18.93	9.55	7.87	5.07
10	85.19	66.89	65.65	60.04	52.54	55.70	19.02	7.07	2.96	1.38	5.28	0.64	0.69	2.90	19.36	10.78	15.22	6.50	6.90	4.66	6.98	-	4.56	6.23	5.99	6.82	5.02
11	44.66	27.01	22.24	32.65	26.90	18.40	10.45	2.88	1.23	0.83	1.14	0.09	0.39	1.60	10.42	5.46	7.50	4.22	4.04	3.62	6.50	-	4.72	4.58	2.26	3.30	4.18
12	22.13	18.07	19.32	20.02	14.77	9.59	6.61	1.44	0.43	0.14	0.21	0.03	0.09	0.64	3.36	1.31	2.97	1.00	2.42	1.92	2.47	-	1.71	2.48	0.49	0.94	3.79
13	12.34	11.84	9.13	10.11	8.57	6.33	2.57	0.64	0.29	0.15	0.06	0.03	0.02	0.17	1.34	0.25	0.81	0.35	0.73	0.69	0.99	-	2.00	1.61	0.12	0.57	1.21
14	5.99	4.40	3.93	5.87	4.85	2.40	1.39	0.38	0.13	0.05	0.00	0.00	0.00	0.00	0.18	0.09	0.13	0.14	0.23	0.21	0.00	-	2.04	0.82	0.76	0.38	0.16
15	2.99	2.64	2.00	3.27	3.36	1.57	0.99	0.19	0.03	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.00	0.00	0.00	0.00	-	1.00	0.11	0.17	0.48	0.52
16	1.91	1.58	0.74	1.54	1.07	1.04	0.48	0.06	0.03	0.00	0.00	0.00	0.00	0.02	0.09	0.07	0.10	0.00	0.00	0.01	0.04	-	1.42	0.38	0.76	0.26	0.17
17	0.39	0.44	0.24	0.36	0.43	0.58	0.18	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	-	1.25	0.00	0.07	0.54	0.34
18	0.03	0.22	0.02	0.00	0.09	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.49	0.05	0.14	0.11	0.17
19	0.03	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	-	0.31	0.00	0.00	0.07	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.11	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.03
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.03
unk1	0.23	0.51	0.00	0.45	0.05	3.04	0.03	0.01	0.69	0.00	0.00	0.00	0.00	0.12	0.04	0.01	0.05	0.16	0.04	0.17	0.00	-	0.34	0.53	5.24	0.00	2.55
Ages 0+	1689.25	1643.96	2019.37	2038.19	1506.93	1067.63	573.54	268.29	155.67	152.11	117.84	300.15	103.40	133.65	288.81	168.87	182.03	113.35	122.68	117.81	315.90	-	240.92	265.38	256.87	238.06	444.46
Ages 6+	1508.82	1498.62	1709.47	1654.71	1232.68	851.22	444.78	215.33	123.99	113.25	104.78	87.08	51.60	98.26	249.04	122.63	88.51	45.24	52.90	44.30	136.84	-	141.41	122.14	50.24	61.76	80.04
Ages 9+	328.09	289.97	255.94	322.03	255.94	189.82	85.51	31.20	10.71	8.67	24.32	4.41	3.61	11.72	74.38	36.80	44.09	20.87	24.66	16.75	27.01	-	37.07	35.19	20.30	21.34	20.70
Ages 12+	45.79	39.19	35.39	41.18	33.17	21.50	12.34	2.72	0.95	0.33	0.27	0.06	0.11	0.84	5.01	1.72	4.10	1.48	3.38	2.83	3.57	-	10.32	5.45	2.51	3.35	6.42

Table 6. Abundance index at age (millions) for American plaice in NAFO Div. 3N from Canadian spring surveys from 1985 to 2011.

Age/Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00
1	0.26	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.71	0.46	1.31	0.00	0.00	3.34	0.44	-	6.23	1.52	1.79	0.00	0.00
2	2.33	2.52	17.27	3.67	4.37	4.30	0.43	0.41	0.78	0.00	0.00	2.06	0.15	0.24	17.60	12.74	16.04	3.61	1.02	2.68	24.36	-	0.38	24.59	2.74	27.44	8.03
3	33.52	13.39	72.32	45.69	49.06	29.60	2.54	3.15	3.84	1.24	0.74	6.01	1.51	0.24	6.98	44.81	155.19	15.10	10.97	2.76	46.38	-	8.33	6.41	18.24	23.92	47.17
4	109.11	46.72	113.73	87.97	312.98	165.10	30.46	24.50	74.10	4.10	4.08	6.01	4.28	3.00	1.78	20.53	47.80	34.75	18.51	11.47	6.71	-	197.39	14.21	5.50	45.73	30.51
5	60.97	106.13	84.60	62.94	106.44	282.87	117.51	38.48	75.44	29.51	14.99	15.58	5.46	3.99	4.19	3.95	4.18	14.76	75.91	25.09	18.09	-	122.05	112.44	26.39	28.25	45.37
6	60.72	72.84	57.12	27.63	38.68	35.98	75.70	51.69	68.23	12.91	13.29	26.37	16.84	6.12	12.40	6.59	7.98	7.29	28.56	67.31	47.79	-	43.72	62.05	43.70	74.73	53.31
7	30.06	41.09	32.02	17.23	17.28	11.61	12.85	22.66	54.04	12.31	8.39	20.45	24.42	11.92	12.19	17.71	22.99	7.95	16.07	18.39	78.87	-	76.16	27.65	18.94	97.08	53.59
8	25.11	17.90	18.64	13.31	18.09	8.03	5.62	5.58	30.27	7.68	4.62	6.89	15.66	19.74	17.65	15.26	21.47	16.35	16.26	7.18	32.98	-	55.78	59.84	12.71	23.37	39.38
9	20.17	14.53	16.04	11.16	14.71	8.86	5.64	2.67	9.35	4.18	2.45	3.88	5.92	12.52	27.81	21.08	23.17	10.66	18.41	6.61	15.60	-	47.84	32.54	10.67	11.32	9.30
10	20.35	13.21	11.42	8.69	6.77	5.09	5.47	1.25	4.18	1.30	0.81	0.84	1.70	4.96	24.97	16.79	17.00	6.91	6.86	6.80	6.62	-	6.47	28.47	12.21	7.43	5.46
11	15.38	7.30	6.89	4.90	5.23	4.00	3.41	1.04	2.68	1.02	0.28	0.54	0.86	2.07	11.01	9.95	18.15	8.76	6.04	3.22	4.81	-	3.81	8.98	10.68	6.21	4.61
12	9.12	6.11	5.35	3.57	4.34	2.64	1.97	0.72	1.41	0.22	0.05	0.87	0.52	0.80	5.01	4.75	7.67	6.70	6.37	4.48	4.48	-	1.60	3.94	4.49	6.82	3.38
13	4.80	4.16	4.46	2.95	3.70	2.24	1.77	0.27	0.51	0.45	0.00	0.14	0.20	0.45	2.59	2.08	2.28	1.82	2.15	2.57	3.81	-	1.14	1.49	1.16	2.18	1.63
14	2.93	2.17	3.36	2.00	2.69	2.21	1.16	0.33	0.52	0.60	0.00	0.07	0.04	0.18	0.78	0.33	1.17	1.39	1.04	1.93	3.69	-	1.17	2.00	1.02	0.57	0.73
15	2.39	2.13	3.00	1.92	2.96	2.34	1.18	0.45	0.16	0.34	0.00	0.11	0.04	0.06	0.38	0.59	0.82	0.13	0.54	0.50	3.47	-	0.93	1.54	1.59	0.74	0.34
16	0.71	1.27	1.67	0.91	1.11	1.43	0.67	0.30	0.25	0.17	0.00	0.00	0.00	0.06	0.19	0.37	0.35	0.26	0.21	0.12	1.71	-	0.39	1.34	1.64	1.53	0.73
17	0.19	0.98	0.66	0.79	0.96	0.79	0.53	0.03	0.18	0.00	0.00	0.00	0.00	0.00	0.19	0.10	0.34	0.04	0.08	0.00	0.25	-	0.21	0.44	1.29	0.65	0.82
18	0.00	0.18	0.38	0.29	0.43	0.37	0.23	0.03	0.05	0.00	0.00	0.00	0.00	0.00	0.17	0.05	0.22	0.00	0.04	0.11	0.92	-	0.26	0.00	0.87	0.30	0.34
19	0.00	0.05	0.05	0.06	0.11	0.09	0.09	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.04	0.00	0.00	0.12	-	0.00	0.19	0.28	0.37	0.41
20	0.00	0.00	0.03	0.00	0.00	0.10	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.04	0.00	0.00	-	0.07	0.00	0.12	0.00	0.26
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.05	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.15
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.08	0.00
unk1	0.26	0.23	0.88	0.07	0.03	0.46	0.00	0.32	0.14	0.00	0.00	0.11	0.00	0.00	0.04	0.00	0.08	0.08	0.54	0.52	0.33	-	0.22	0.05	0.06	0.02	0.00
Ages 0+	398.36	352.91	449.91	295.75	589.93	568.36	267.31	153.98	326.18	76.04	49.70	89.93	77.59	66.41	146.71	178.15	348.31	136.60	209.62	165.06	301.42	-	574.14	389.72	176.09	358.73	305.50
Ages 6+	191.92	183.91	161.11	95.41	117.04	85.75	116.37	87.12	171.87	41.19	29.89	60.16	66.19	58.88	115.41	95.66	123.71	68.30	102.68	119.20	205.11	-	239.53	230.46	121.37	233.37	174.43
Ages 9+	76.02	52.08	53.32	37.24	42.99	30.14	22.21	7.19	19.34	8.28	3.59	6.44	9.27	21.10	73.18	56.10	71.26	36.71	41.79	26.33	45.47	-	63.88	80.92	46.02	38.19	28.16
Ages 12+	20.13	17.05	18.97	12.49	16.29	12.21	7.69	2.23	3.14	1.78	0.05	1.19	0.79	1.56	9.38	8.28	12.93	10.38	10.49	9.70	18.45	-	5.76	10.93	12.46	13.23	8.78

Table 7. Abundance index at age (millions) for American plaice in NAFO Div. 3O from Canadian spring surveys from 1985 to 2011.

Age/Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.08	0.37	7.72	2.00	2.76	0.31	0.10	3.66	3.21	-	9.03	4.86	5.08	0.43	0.00
2	0.00	0.58	5.38	0.69	0.00	5.45	0.00	4.09	1.30	0.00	0.00	35.87	5.79	8.83	22.96	24.10	47.02	26.61	5.19	11.26	96.22	-	9.14	81.19	33.30	76.55	22.10
3	8.60	13.38	16.95	15.85	20.37	10.62	24.86	28.66	3.39	0.94	0.89	63.90	33.35	7.29	22.70	92.19	87.85	49.52	42.95	17.01	145.20	-	30.40	52.61	100.11	69.32	57.54
4	24.12	39.55	57.58	22.47	51.19	113.04	39.65	30.20	40.67	9.53	6.22	27.81	36.80	39.43	14.11	47.07	49.56	97.60	46.99	41.71	32.14	-	88.28	51.28	47.76	86.49	44.47
5	56.50	34.46	132.85	26.43	55.67	197.91	170.49	25.73	39.93	38.68	15.08	35.55	28.12	44.71	36.73	22.08	18.72	33.76	94.61	35.92	35.77	-	55.20	90.71	24.80	36.46	68.49
6	44.06	36.82	124.23	34.62	96.36	110.17	110.46	76.76	52.76	46.67	26.80	55.64	40.99	26.40	49.12	30.61	18.95	28.85	35.39	80.28	43.32	-	26.09	25.58	72.19	52.65	33.14
7	52.08	39.37	70.48	25.50	101.47	82.08	65.32	38.93	68.61	28.66	19.75	50.51	40.32	34.39	26.02	31.75	32.26	34.53	22.26	24.63	39.13	-	26.27	37.05	17.55	27.04	26.27
8	47.24	28.92	45.95	24.51	47.05	39.90	28.07	24.72	42.46	21.87	14.04	24.61	26.23	40.22	28.86	21.84	24.57	27.75	21.53	17.22	10.88	-	17.24	26.31	13.87	10.37	15.13
9	35.38	22.23	35.93	18.52	29.60	27.41	18.21	12.92	17.32	9.69	7.40	8.69	10.60	29.01	39.91	19.25	17.98	18.93	11.21	7.67	6.30	-	17.31	18.67	16.50	8.88	6.21
10	34.70	18.02	24.03	16.56	15.36	16.74	10.70	9.18	9.37	2.72	2.25	3.02	3.66	11.70	20.99	19.62	12.82	11.01	4.32	4.10	2.91	-	5.76	7.89	6.78	4.11	2.68
11	24.27	11.65	12.70	11.09	7.72	9.99	8.40	5.53	3.72	2.10	1.25	1.32	1.42	6.26	9.09	12.52	8.91	7.05	3.69	2.37	2.37	-	2.40	1.24	3.18	2.60	2.10
12	13.96	10.20	9.14	8.99	7.96	9.23	4.78	3.24	2.42	1.04	0.28	1.33	1.22	1.84	4.65	3.47	5.37	4.86	2.67	1.80	1.28	-	1.74	0.88	1.10	1.15	3.35
13	5.58	5.74	6.33	5.68	4.56	5.87	2.89	2.43	0.98	0.64	0.03	0.35	0.34	1.00	2.58	1.70	2.45	1.84	1.62	1.23	1.42	-	1.24	0.70	0.46	0.51	0.24
14	5.06	2.33	3.84	4.10	2.11	4.20	2.98	1.06	0.68	0.35	0.04	0.18	0.14	0.27	0.93	0.48	1.47	0.48	0.89	0.57	0.97	-	0.62	0.51	0.16	0.28	0.08
15	4.00	2.30	3.03	2.36	2.19	2.04	1.89	1.78	0.49	0.13	0.00	0.10	0.13	0.41	0.74	0.63	1.10	0.40	0.49	0.29	0.51	-	0.22	0.36	0.55	0.30	0.08
16	1.59	0.92	1.83	2.31	1.82	1.71	1.03	1.25	0.55	0.09	0.00	0.17	0.13	0.05	0.59	0.19	0.61	0.44	0.34	0.20	0.28	-	0.31	0.48	0.29	0.17	0.43
17	0.31	0.72	0.97	0.48	1.07	1.22	0.58	0.24	0.36	0.00	0.00	0.00	0.00	0.00	0.32	0.29	0.38	0.17	0.16	0.00	0.22	-	0.20	0.19	0.10	0.26	0.06
18	0.03	0.18	0.46	0.51	0.43	0.55	0.44	0.51	0.09	0.00	0.00	0.00	0.00	0.00	0.25	0.14	0.15	0.10	0.09	0.01	0.00	-	0.24	0.18	0.23	0.11	0.53
19	0.00	0.05	0.20	0.03	0.03	0.22	0.24	0.13	0.08	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.04	0.00	0.19	0.00	0.00	-	0.00	0.00	0.11	0.07	0.17
20	0.29	0.00	0.00	0.03	0.03	0.00	0.08	0.13	0.05	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.04	0.00	0.00	0.00	0.00	-	0.08	0.26	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.09
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.08
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.28
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.10
unk1	0.06	0.00	0.00	0.66	0.27	0.00	2.46	0.87	0.39	0.04	0.00	0.05	0.00	0.14	0.03	0.04	0.71	0.24	0.00	0.29	0.50	-	0.22	0.13	0.04	0.03	0.12
Ages 0+	357.82	267.40	552.13	221.37	445.23	638.34	493.54	268.34	285.62	163.15	94.01	309.22	229.31	252.31	288.54	330.07	333.74	344.45	294.69	250.21	422.62	-	292.02	401.08	344.18	377.78	283.73
Ages 6+	268.54	179.43	339.10	155.28	317.74	311.33	256.07	178.79	199.94	113.96	71.83	145.93	125.16	151.55	184.28	142.60	127.12	136.41	104.86	140.35	109.60	-	99.74	120.29	133.08	108.50	91.13
Ages 9+	125.16	74.34	98.45	70.65	72.87	79.17	52.23	38.39	36.10	16.76	11.24	15.17	17.63	50.53	80.28	58.40	51.34	45.28	25.68	18.23	16.26	-	30.14	31.35	29.47	18.43	16.59
Ages 12+	30.81	22.43	25.79	24.48	20.19	25.03	14.91	10.77	5.70	2.26	0.35	2.13	1.95	3.57	10.29	7.01	11.62	8.29	6.46	4.09	4.68	-	4.66	3.55	3.00	2.84	5.60

Table 8. Abundance index at age (millions) for American plaice in NAFO Div. 3LNO from Canadian spring surveys from 1985 to 2011.

Age/Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00
1	0.26	0.00	0.48	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.35	0.08	0.54	8.43	4.76	5.22	0.31	0.22	7.05	5.07	-	16.91	10.72	7.50	3.56	0.00
2	2.33	4.42	27.88	8.47	6.23	9.74	1.75	4.50	2.38	0.00	0.00	46.33	6.57	9.75	42.46	54.56	100.97	37.86	7.86	17.71	131.19	-	27.76	132.94	115.38	125.19	79.15
3	50.22	31.32	100.65	80.37	86.77	45.46	30.62	33.55	9.50	2.54	2.02	99.84	40.30	10.67	35.10	149.32	275.88	98.69	74.56	29.15	223.16	-	66.90	98.21	189.72	165.59	207.66
4	158.99	109.83	221.62	191.29	445.13	348.31	84.11	59.84	120.53	21.11	11.12	125.79	55.12	52.67	22.49	72.54	112.98	150.59	95.08	77.80	78.49	-	320.19	101.68	82.20	191.19	209.45
5	263.81	256.00	460.21	368.61	336.14	618.75	398.19	110.28	138.05	99.22	41.91	133.68	65.28	69.80	66.74	34.98	28.85	56.50	188.24	96.53	149.66	-	193.86	238.97	72.30	85.36	189.29
6	454.55	561.36	747.45	616.62	551.77	377.90	364.16	190.14	180.14	106.04	57.52	130.51	84.40	69.20	104.51	67.01	36.35	41.33	72.50	161.94	163.83	-	89.64	116.46	130.15	146.91	116.47
7	595.65	577.16	656.21	543.88	470.17	371.00	180.21	150.92	160.06	85.37	59.88	97.12	79.31	76.74	104.87	78.01	73.86	51.94	46.06	51.28	143.87	-	144.47	91.95	44.73	138.16	97.00
8	389.80	307.06	398.31	314.97	273.73	200.26	112.92	63.40	89.45	43.27	49.94	39.51	48.72	79.39	111.52	64.57	62.44	53.82	49.75	29.34	55.10	-	115.49	117.02	34.02	40.60	66.68
9	208.01	193.65	184.64	217.85	187.64	130.48	67.54	34.12	32.23	19.99	27.48	16.19	18.94	47.91	107.31	59.16	58.43	38.25	39.97	19.92	31.86	-	82.61	70.14	36.72	28.07	20.59
10	140.24	98.12	101.10	85.29	74.68	77.52	35.19	17.50	16.51	5.40	8.34	4.50	6.05	19.56	65.32	47.19	45.04	24.42	18.07	15.56	16.51	-	16.80	42.58	24.99	18.36	13.17
11	84.30	45.96	41.83	48.63	39.84	32.39	22.26	9.45	7.63	3.95	2.66	1.94	2.68	9.93	30.52	27.93	34.57	20.03	13.76	9.21	13.68	-	10.94	14.80	16.12	12.12	10.89
12	45.20	34.38	33.80	32.58	27.07	21.46	13.36	5.40	4.26	1.40	0.54	2.23	1.82	3.28	13.02	9.54	16.02	12.56	11.46	8.20	8.24	-	5.06	7.29	6.08	8.91	10.52
13	22.72	21.74	19.93	18.75	16.83	14.43	7.22	3.34	1.78	1.24	0.09	0.52	0.56	1.62	6.51	4.04	5.54	4.01	4.51	4.49	6.22	-	4.37	3.80	1.74	3.26	3.07
14	13.98	8.90	11.14	11.97	9.65	8.81	5.53	1.77	1.33	1.00	0.04	0.25	0.17	0.45	1.89	0.90	2.77	2.01	2.17	2.71	4.66	-	3.82	3.32	1.93	1.23	0.97
15	9.37	7.07	8.03	7.56	8.51	5.95	4.05	2.42	0.67	0.47	0.00	0.21	0.16	0.47	1.16	1.22	1.96	0.53	1.03	0.78	3.98	-	2.15	2.01	2.32	1.51	0.94
16	4.20	3.76	4.24	4.76	3.99	4.17	2.18	1.61	0.84	0.26	0.00	0.17	0.13	0.14	0.88	0.63	1.05	0.70	0.55	0.33	2.03	-	2.12	2.20	2.69	1.96	1.33
17	0.89	2.14	1.87	1.63	2.45	2.60	1.28	0.27	0.59	0.00	0.00	0.00	0.00	0.00	0.51	0.39	0.72	0.21	0.25	0.00	0.53	-	1.66	0.63	1.45	1.45	1.23
18	0.06	0.58	0.86	0.79	0.94	0.92	0.70	0.54	0.14	0.00	0.00	0.00	0.00	0.00	0.42	0.19	0.37	0.10	0.13	0.12	0.92	-	0.99	0.23	1.24	0.52	1.04
19	0.03	0.10	0.25	0.10	0.18	0.31	0.33	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.18	0.04	0.19	0.00	0.12	-	0.31	0.19	0.39	0.50	0.58
20	0.29	0.00	0.03	0.03	0.03	0.10	0.29	0.22	0.05	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.04	0.00	0.04	0.00	0.00	-	0.26	0.26	0.12	0.00	0.26
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.71	0.07	0.00	0.13
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.25
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.08	0.28
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.10
unk1	0.55	0.74	0.88	1.19	0.35	3.50	2.50	1.20	1.22	0.04	0.00	0.16	0.00	0.26	0.10	0.05	0.83	0.48	0.58	0.98	0.83	-	0.78	0.71	5.34	0.05	2.67
Ages 0+	2445.43	2264.27	3021.41	2555.32	2542.09	2274.33	1334.39	690.61	767.46	391.30	261.55	699.29	410.29	452.37	724.06	677.09	864.08	594.40	626.99	533.08	1039.95	-	1107.08	1056.84	777.21	974.57	1033.70
Ages 6+	1969.28	1861.97	2209.69	1905.39	1667.46	1248.30	817.22	481.25	495.80	268.39	206.50	293.16	242.94	308.69	548.73	360.89	339.33	249.95	260.44	303.86	451.55	-	480.68	472.89	304.69	403.63	345.59
Ages 9+	529.27	416.39	407.71	429.92	371.80	299.13	159.94	76.79	66.15	33.71	39.15	26.02	30.51	83.36	227.84	151.30	166.69	102.86	92.13	61.31	88.74	-	131.08	147.46	95.79	77.97	65.45
Ages 12+	96.73	78.67	80.14	78.15	69.64	58.74	34.95	15.72	9.79	4.37	0.67	3.38	2.84	5.96	24.69	17.02	28.65	20.16	20.33	16.63	26.70	-	20.74	19.94	17.97	19.34	20.81
proportion 0 to 5	0.19	0.18	0.27	0.25	0.34	0.45	0.39	0.30	0.35	0.31	0.21	0.58	0.41	0.32	0.24	0.47	0.61	0.58	0.58	0.43	0.56		0.57	0.55	0.60	0.59	0.66
proportion 9+	0.22	0.18	0.13	0.17	0.15	0.13	0.12	0.11	0.09	0.09	0.15	0.04	0.07	0.18	0.31	0.22	0.19	0.17	0.15	0.12	0.09		0.12	0.14	0.12	0.08	0.07

Table 9. Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian fall surveys in Div. 3L in 1995-2011 (Campelen). (+) indicates biomass <50 t, (-) means stratum not surveyed.

Biomass

Depth	Stratum	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
30-56	784	-	+	+	0.0	-	+	+	+	+	+	0.0	-	-	-	-	-	-
	Total	-	+	+	0.0	-	+	+	+	+	+	0.0	-	-	-	-	-	-
57-92	350	0.8	0.9	0.5	1.1	1.0	0.5	7.7	0.5	0.2	0.4	0.2	0.7	0.1	0.8	0.3	1.4	0.4
	363	3.1	2.0	1.4	2.1	1.9	2.3	3.7	0.7	0.3	0.5	0.6	2.3	1.1	0.7	1.5	2.2	1.5
	371	1.2	1.1	0.2	0.5	0.4	0.8	0.8	1.8	0.3	0.2	0.3	0.1	1.3	0.7	0.8	0.2	0.3
	372	1.4	1.6	1.5	0.3	1.7	0.6	2.5	0.9	1.1	0.4	0.3	0.9	0.5	0.6	0.6	1.2	0.7
	384	1.6	1.6	0.5	0.2	1.5	0.1	1.3	2.2	0.1	0.1	0.1	0.6	0.1	0.5	0.9	0.8	0.6
	785	-	+	+	+	-	+	0.1	0.1	0.1	+	0.3	-	-	-	-	-	-
	Total	8.1	7.2	4.0	4.2	6.5	4.3	16.1	6.2	2.2	1.5	1.8	4.6	3.1	3.2	4.2	5.7	3.5
93-183	328	3.0	1.6	0.9	0.5	2.0	0.8	1.6	7.3	0.7	1.1	2.5	2.9	0.3	0.6	0.8	4.1	1.0
	341	1.6	2.8	0.8	2.1	0.6	0.7	0.9	0.8	0.4	0.3	1.3	2.2	0.9	2.8	0.3	0.8	1.6
	342	0.6	+	0.4	0.2	-	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.1
	343	0.7	0.1	0.0	0.1	-	+	0.1	0.1	0.1	+	0.1	0.1	0.0	0.1	0.1	+	0.1
	348	3.1	1.8	1.3	1.5	1.4	0.4	0.6	1.0	0.6	1.0	1.9	2.0	2.3	2.3	0.9	2.4	4.7
	349	3.4	1.4	1.5	0.8	0.4	0.3	0.6	0.1	0.7	1.3	1.6	2.7	0.9	1.2	0.7	1.7	1.9
	364	2.8	3.6	2.8	5.2	1.2	1.8	2.9	2.1	1.0	0.7	2.1	5.1	3.8	6.3	0.8	3.9	3.8
	365	1.7	1.1	1.0	1.4	1.0	-	0.4	0.6	0.5	-	3.2	2.1	1.9	2.4	0.4	1.4	3.4
	370	2.0	6.3	1.3	4.6	3.9	1.1	2.2	3.7	0.8	-	0.8	2.4	2.4	2.0	0.8	4.8	5.1
	385	3.9	7.6	1.9	4.0	2.9	0.8	3.5	5.4	3.3	6.5	1.4	3.2	4.0	4.2	3.5	4.8	8.4
	390	1.7	1.6	2.2	3.3	2.1	0.7	3.1	1.0	0.5	0.6	0.5	0.7	0.5	1.4	2.2	2.6	3.6
	786	-	0.3	0.1	0.1	-	0.1	0.2	0.1	0.1	0.1	0.3	-	-	-	-	-	-
	787	-	0.4	0.5	0.1	-	0.1	0.1	0.1	0.1	0.1	0.2	0.2	-	-	-	-	-
	788	-	0.3	0.3	0.1	-	0.1	+	0.3	+	0.2	0.3	0.4	-	-	-	0.1	-
	790	-	0.2	0.2	+	-	+	+	+	+	0.1	0.0	-	-	-	-	+	-
	793	-	0.1	0.1	0.1	-	+	0.1	+	+	0.1	0.1	-	-	-	-	+	-
	794	-	+	0.1	+	-	-	+	+	+	+	0.1	0.1	-	-	-	+	-
	797	-	0.1	0.1	+	-	+	+	0.1	+	+	0.1	0.1	-	-	-	+	-
	799	-	0.1	0.1	+	-	+	+	0.4	+	+	0.1	0.1	-	-	-	+	-
	Total	24.5	29.4	15.6	24.1	15.5	7.1	16.4	23.2	9.1	12.1	16.9	24.4	17.2	23.3	10.5	26.6	33.9
184-274	344	1.0	1.1	0.1	0.5	0.5	0.4	0.6	0.7	0.3	0.8	1.8	1.2	1.6	2.3	0.7	0.7	1.6
	347	1.8	0.7	0.3	0.8	0.5	0.4	0.4	0.7	0.2	0.7	2.0	1.5	0.6	4.3	0.4	0.7	1.5
	366	1.6	1.2	0.5	0.8	1.7	0.5	0.3	0.4	0.7	-	2.9	5.7	5.4	7.6	0.5	2.6	2.8
	369	1.0	1.6	0.5	1.8	1.6	0.8	2.7	1.1	0.3	-	1.1	2.6	3.1	4.2	1.4	2.2	4.9
	386	1.8	2.6	1.0	0.9	1.2	0.4	1.3	2.3	0.9	-	0.8	2.5	1.1	2.6	1.1	2.0	0.9
	389	0.6	0.6	0.6	0.7	0.6	0.4	1.4	0.4	0.6	0.4	0.5	0.7	1.0	1.3	1.7	1.3	0.9
	391	0.4	0.2	0.2	0.2	0.3	+	0.1	0.1	0.4	0.1	0.2	0.2	0.4	0.3	0.2	0.3	0.1
	789	-	0.2	0.2	0.1	-	0.1	0.2	0.1	+	+	0.2	0.1	-	-	-	-	-
	791*	-	0.5	0.4	0.1	-	0.3	0.3	0.7	+	0.1	0.5	-	-	-	-	+	-
	795	-	+	0.2	0.4	-	+	+	0.1	0.2	0.2	0.2	+	-	-	-	+	-
	798	-	0.2	0.7	0.3	-	+	0.2	+	+	0.3	0.1	-	-	-	-	0.1	-
	Total	8.2	8.9	4.6	6.6	6.4	3.3	7.5	6.6	3.6	2.6	10.4	14.5	13.1	22.6	6.1	9.8	12.7
275-366	345	4.1	2.4	0.8	2.5	1.3	0.6	0.8	1.3	0.6	1.9	1.4	3.7	1.8	2.4	1.1	2.4	2.0
	346	2.8	1.1	2.2	1.7	1.7	0.4	0.9	0.8	0.5	1.4	2.1	2.1	4.6	2.4	1.1	1.1	2.2
	368	0.2	0.3	0.2	0.4	0.7	0.6	0.3	0.5	0.1	-	0.2	0.4	0.7	1.2	1.2	1.2	0.5
	387	0.4	0.7	0.7	0.2	1.8	1.0	0.4	0.2	0.5	-	0.3	0.8	2.4	0.9	0.8	0.7	1.1
	388	0.3	0.1	0.4	+	0.9	0.4	0.1	0.1	0.1	0.1	0.1	0.2	0.6	0.7	0.7	0.3	0.4
	392	+	+	0.2	0.1	0.5	0.2	0.1	0.1	0.1	+	0.1	0.3	0.1	0.3	+	0.1	0.1
	796	-	0.6	0.9	0.4	-	-	0.2	0.1	0.1	0.1	0.3	0.2	-	-	-	0.2	-
	800	-	-	-	0.2	-	0.2	0.3	0.3	0.2	0.2	0.2	-	-	-	0.1	0.1	-
	Total	7.8	5.2	5.5	5.5	6.9	3.4	3.1	3.4	2.2	3.8	4.6	7.6	10.2	7.9	4.9	6.1	6.4
367-549	729	+	+	0.2	0.1	0.7	1.6	0.4	+	0.1	0.1	+	0.2	0.2	0.6	0.4	0.1	0.1
	731	0.2	-	0.6	0.1	1.0	1.1	0.1	+	0.1	0.1	+	+	0.3	0.2	0.3	0.2	.
	733	0.2	0.2	0.5	0.6	0.3	1.0	0.6	0.3	0.4	0.2	0.4	0.6	2.6	0.3	0.4	+	1.1
	735	0.7	0.7	0.3	0.8	1.9	2.1	1.6	1.1	0.1	-	0.1	0.8	1.2	1.3	2.9	8.3	1.3
	792	-	0.2	1.9	0.3	-	0.2	0.6	0.1	0.2	0.1	0.1	-	-	-	-	0.1	-
	Total	1.1	1.1	3.6	1.9	3.9	6.0	3.3	1.5	0.9	0.5	0.5	1.7	4.2	2.4	3.9	8.7	2.6
550-731	730	+	0.0	0.5	0.1	0.2	0.4	0.9	0.1	+	0.5	+	2.1	2.1	1.0	1.8	0.2	0.1
	732	+	+	1.3	0.2	1.9	0.7	1.3	+	+	0.1	0.1	+	0.5	0.5	0.2	0.1	0.1
	734	0.0	0.2	0.3	0.1	0.1	0.1	+	+	0.0	-	0.0	0.1	0.1	0.0	0.6	0.0	1.2
	736	0.2	0.5	0.8	0.6	0.6	1.5	1.3	1.7	0.3	-	0.1	0.9	0.3	0.3	0.5	0.3	0.6
	Total	0.2	0.7	2.8	1.0	2.8	2.7	3.5	1.8	0.3	0.6	0.2	3.1	3.0	1.8	3.1	0.6	1.9
732-914	737	0.4	1.5	1.8	3.3	0.8	0.7	1.4	1.0	1.1	-	2.0	1.1	0.1	-	+	2.1	-
	741	-	1.0	2.3	1.7	0.1	0.0	0.0	0.6	0.1	-	-	0.0	0.0	-	0.8	0.0	-
	745	-	0.1	2.2	0.1	0.7	0.0	0.0	0.0	0.3	-	-	0.0	0.0	-	+	+	-
	748	-	1.4	0.7	0.0	1.1	0.0	0.0	+	1.1	-	-	0.5	0.0	-	+	0.4	-
	Total	0.4	4.0	7.0	5.1	2.7	0.7	1.4	1.6	2.6	-	2.0	1.6	0.1	-	0.8	2.5	-
915-1097	738	0.6	0.2	0.0	0.0	0.0	0.0	+	+	2.2	-	-	0.0	0.0	-	0.0	0.0	-
	742	-	0.1	0.0	0.0	+	0.0	0.0	0.0	3.5	-	-	0.0	0.0	-	0.0	0.0	-
	746	-	0.1	0.0	+	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	-
	749	-	+	0.2	0.0	-	0.0	0.0	0.0	+	-	-	-	0.0	-	0.0	0.0	-
	Total	0.6	0.4	0.2	+	+	0.0	+	+	5.7	-	-	0.0	0.0	-	0.0	0.0	-
1098-1280	739	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	+	-
	743	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	-
	747	-	0.0	0.0	0.1	+	0.0	0.0	0.0	0.0	-	-	0.1	0.0	-	0.0	0.0	-
	750	-	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	0.0	-	0.0	0.0	-
	Total	-	0.1	0.0	0.1	+	0.0	0.0	0.0	0.0	-	-	0.1	0.0	-	-	+	-
1281-1463	740	-	0.0	0.0	0.0	0.1	0.0	0.0	0.0	+	-	0.0	0.0	0.0	-	0.0	0.0	-
	744	-	0.5	0.0	0.1	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	-
	751	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	-	0.0	-	0.0	0.0	-
	Total	-	0.5	0.0	0.1	0.1	0.0	0.0	0.0	+	-	-	0.0	0.0	-	-	0.0	-
Grand Total		50.9	57.5	43.3	48.6	44.8	27.5	51.3	44.3	26.4	21.0	36.4	57.6	50.9	61.2	33.5	60.0	61.0

* in 1996 stratum 791 covered a depth range of 184-366 m

Table 10. Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian fall surveys in Div. 3N in 1995-2011 (Campelen). (+) indicates biomass <50 t, (-) means stratum not surveyed.

Biomass

Depth	Stratum	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
≤ 56	375	1.9	1.1	3.9	5.2	0.6	1.7	0.6	9.8	2.3	2.3	3.0	2.2	2.8	7.3	3.4	0.9	2.7
	376	4.7	2.4	7.7	4.4	4.3	35.8	15.4	34.1	6.4	11.1	20.3	16.0	11.0	9.0	1.8	14.0	14.7
	Total	6.6	3.5	11.6	9.6	4.9	37.5	16.0	43.9	8.7	13.4	23.4	18.2	13.8	16.3	5.2	14.9	17.4
57-92	360	22.3	7.4	28.4	39.2	43.4	96.4	46.0	67.4	99.9	105.5	80.6	67.6	65.4	118.5	105.7	118.8	110.7
	361	3.5	4.1	3.3	2.1	1.8	3.9	2.3	9.2	3.1	7.2	2.8	2.9	9.0	1.7	2.2	1.2	2.7
	362	5.0	1.1	5.1	2.9	2.9	2.6	5.3	6.1	2.6	2.2	6.2	3.1	2.4	3.4	2.5	3.8	4.1
	373	1.8	0.2	2.3	1.7	4.2	1.7	6.9	2.9	1.9	0.5	2.6	2.4	1.2	3.7	1.0	7.5	2.3
	374	2.4	0.4	1.8	1.3	2.7	1.7	3.7	0.5	0.6	0.6	4.4	4.0	3.3	9.9	7.6	3.8	18.9
	383	-	0.3	0.5	0.8	0.8	+	0.5	0.5	0.1	+	0.4	0.3	0.7	2.2	1.4	1.1	1.5
	Total	35.0	13.5	41.4	48.0	55.8	106.3	64.7	86.6	108.2	116.0	97.0	80.3	82.0	139.3	120.3	136.2	140.2
93-183	359	2.2	0.3	3.8	11.6	9.8	32.2	4.0	17.5	7.1	9.2	1.2	14.1	3.9	4.4	6.0	6.6	5.7
	377	0.5	0.4	2.3	1.1	0.9	0.7	3.0	6.1	1.9	1.4	3.8	5.0	6.1	2.6	2.3	2.0	0.9
	382	0.3	0.3	0.8	6.1	2.7	1.0	3.5	2.2	0.0	0.2	0.9	0.5	7.8	3.3	4.5	1.9	7.6
	Total	3.0	1.0	6.9	18.8	13.4	33.9	10.5	25.8	9.0	10.9	6.0	19.7	17.8	10.2	12.9	10.6	14.2
184-274	358	0.8	0.2	0.4	0.3	0.3	0.6	1.0	0.2	0.0	0.4	+	0.1	0.5	0.4	1.2	0.1	0.0
	378	0.1	0.2	0.1	0.1	0.4	0.2	0.1	0.4	0.5	0.3	0.2	0.4	0.9	0.5	0.6	-	0.3
	381	0.1	0.4	0.2	0.1	0.3	0.3	0.3	0.1	0.5	0.6	0.6	0.6	4.6	0.5	0.3	0.1	0.1
	Total	1.0	0.8	0.7	0.5	1.0	1.1	1.4	0.7	1.0	1.3	0.8	1.1	6.0	1.4	2.1	0.2	0.4
275-366	357	0.1	0.1	0.0	+	-	+	+	+	0.0	+	0.2	+	0.1	+	+	0.0	0.0
	379	+	0.2	0.1	+	0.3	+	0.1	+	0.0	0.5	+	0.0	+	0.4	+	0.0	0.0
	380	0.1	0.2	0.1	0.1	0.7	0.3	0.1	+	0.1	0.1	0.1	0.2	4.2	+	0.2	0.0	0.1
	Total	0.2	0.5	0.2	0.1	1.0	0.3	0.2	+	0.1	0.6	0.1	0.2	4.2	0.4	0.2	0.0	0.1
367-549	723	+	+	0.0	0.1	+	+	+	0.0	+	+	+	0.0	+	0.1	0.0	0.0	0.0
	725	0.1	0.1	0.0	+	0.1	0.2	+	0.0	+	-	0.1	+	0.0	0.1	0.0	-	0.0
	727	+	0.1	0.1	0.1	1.5	0.4	0.1	0.3	0.3	0.2	0.2	0.1	0.1	+	+	0.0	0.1
	Total	0.1	0.2	0.2	0.2	1.6	0.6	0.1	0.3	0.3	0.2	0.4	0.1	0.1	0.2	0.0	0.0	0.1
550-731	724	0.1	0.3	0.0	0.0	0.1	0.0	0.0	0.0	-	+	+	0.0	0.0	0.0	0.0	0.0	0.0
	726	+	0.3	0.1	+	+	+	+	0.0	+	+	0.0	0.0	0.0	0.0	+	0.0	0.0
	728	+	0.8	0.1	0.1	0.3	0.6	+	0.1	+	1.1	0.2	+	1.7	1.2	0.5	0.1	0.1
	Total	0.1	1.4	0.2	0.1	0.4	0.6	+	0.1	0.0	1.1	0.2	0.0	1.7	1.2	0.5	0.1	0.1
732-914	752	-	-	-	1.5	-	0.0	0.0	0.0	-	-	-	-	0.0	-	-	-	-
	756	-	-	-	0.1	-	-	0.0	0.0	-	-	0.0	-	0.0	-	-	-	-
	760	-	-	-	0.0	-	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	Total				0.0	-	0.0	0.0	0.0	-	-	-	-	0.0	-	-	-	-
915-1097	753	-	-	-	+	-	0.0	0.0	0.0	-	-	-	-	0.0	-	-	-	-
	757	-	-	-	0.0	-	-	0.0	0.0	-	-	0.0	-	0.0	-	-	-	-
	761	-	-	-	0.0	-	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	Total	-	-	-	+	-	0.0	0.0	0.0	-	-	-	-	0.0	-	-	-	-
1098-1280	754	-	-	-	0.0	-	0.0	0.0	0.0	-	-	-	-	0.0	-	-	-	-
	758	-	-	-	0.0	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	-	-
	762	-	-	-	-	-	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	Total	-	-	-	0.0	-	0.0	0.0	0.0	-	-	-	-	0.0	-	0.0	-	-
1281-1463	755	-	-	-	0.0	-	0.0	0.0	0.0	-	-	-	-	0.0	-	-	-	-
	759	-	-	-	0.0	-	-	0.0	0.0	-	-	0.0	-	0.0	-	-	-	-
	763	-	-	-	-	-	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	Total	-	-	-	0.0	-	0.0	0.0	0.0	-	-	-	-	0.0	-	0.0	-	-
Grand Total		46.0	20.9	61.0	77.3	78.1	180.3	92.9	157.4	127.3	143.4	127.8	119.5	125.6	169.0	141.2	162.1	172.6

Table 11. Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian fall surveys in Div. 3O in 1995-2011 (Campelen). (+) indicates biomass <50 t, (-) means stratum not surveyed.

Biomass

Depth	Stratum	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
57-92	330	7.7	0.8	5.5	5.9	5.4	5.3	5.9	4.5	4.0	5.6	4.5	6.6	4.2	8.4	9.2	6.3	10.3
	331	1.2	0.3	0.9	1.8	1.0	1.0	1.1	1.2	1.5	1.0	1.6	1.0	2.0	0.6	1.2	1.7	1.3
	338	6.6	3.3	6.4	3.4	3.8	2.1	4.4	-	6.7	5.3	5.4	2.8	2.8	10.6	6.5	3.4	2.6
	340	7.2	0.4	3.2	1.1	2.8	2.2	1.7	3.7	0.9	2.6	2.6	1.7	5.5	11.1	6.3	2.1	1.4
	351	1.7	0.9	5.2	3.3	2.9	6.4	4.3	2.9	3.7	3.9	2.2	3.5	6.2	4.2	1.9	3.8	2.2
	352	4.6	9.1	6.9	8.4	3.2	8.4	8.0	6.7	7.7	10.9	11.3	6.9	3.6	11.2	10.2	3.1	4.9
	353	5.6	14.4	14.8	19.3	10.3	14.5	13.9	11.2	14.4	24.6	15.6	21.0	27.9	29.1	29.3	11.6	12.3
	Total	34.6	29.2	42.9	43.2	29.4	39.9	39.3	30.2	38.8	54.0	43.2	43.4	52.2	75.2	64.5	32.1	35.0
93-183	329	3.2	1.5	2.7	5.0	6.6	8.0	7.6	3.7	1.6	5.2	3.6	2.5	2.0	9.3	4.3	15.4	3.7
	332	3.5	3.9	1.6	3.9	1.9	2.8	1.3	2.5	3.0	3.7	4.1	4.7	2.1	5.2	0.8	2.1	0.7
	337	2.4	25.3	2.5	1.5	1.4	1.8	0.5	1.3	0.6	1.1	2.2	1.7	2.2	6.6	1.3	1.9	0.8
	339	6.5	0.9	5.1	1.4	-	3.8	2.4	3.2	3.3	2.2	4.9	1.2	2.9	3.8	2.7	4.0	2.4
	354	4.5	8.0	2.4	3.7	27.0	3.8	2.7	3.0	21.1	1.9	0.8	2.1	3.4	2.6	5.8	4.0	1.1
	Total	20.1	39.6	14.4	15.5	36.9	20.2	14.5	13.7	29.6	14.1	15.6	12.0	12.6	27.6	14.8	27.3	8.7
184-274	333	+	-	+	+	0.1	+	0.0	0.1	+	+	+	+	+	+	+	+	0.0
	336	+	0.1	0.1	+	0.1	0.1	+	0.1	+	+	+	0.1	0.3	0.1	-	+	0.0
	355	0.2	5.4	0.1	+	0.3	+	0.1	0.1	+	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.0
	Total	0.2	5.5	0.2	+	0.5	0.1	0.1	0.3	+	0.1	0.1	0.2	0.5	0.4	0.1	0.1	0.1
275-366	334	0.0	-	+	+	+	0.0	0.0	0.0	0.0	+	+	+	+	+	0.0	+	0.0
	335	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0.0
	356	0.0	0.1	+	+	+	+	0.0	0.0	+	+	+	+	+	+	+	+	0.0
	Total	+	0.1	0.1	+	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367-549	717	0.0	-	+	0.0	+	+	+	0.0	0.0	0.0	0.0	+	+	+	0.0	0.0	0.0
	719	+	0.2	0.0	+	+	+	0.0	0.0	+	+	+	+	+	0.0	+	0.0	0.0
	721	+	0.6	0.0	0.0	+	+	0.0	0.0	0.0	0.0	0.0	+	+	0.0	+	+	0.0
	Total	+	0.8	+	+	+	+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
550-731	718	0.0	-	0.0	+	0.0	0.0	0.0	0.0	0.0	0.0	+	-	0.0	+	0.0	0.0	0.0
	720	0.0	+	-	+	+	+	0.0	0.0	0.0	0.0	0.0	+	0.0	0.0	+	0.0	0.0
	722	0.0	+	0.0	0.0	+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+	0.0
	Total	0.0	+	0.0	+	+	+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
732-914	764	-	-	-	0.0	-	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	768	-	-	-	0.0	-	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	772	-	-	-	0.0	-	-	-	0.0	0.0	-	0.0	-	0.0	-	0.0	-	-
	Total	-	-	-	0.0	-	-	0.0	0.0	0.0	-	0.0	-	0.0	-	0.0	-	-
915-1097	765	-	-	-	0.0	-	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	769	-	-	-	0.0	-	-	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	773	-	-	-	0.0	-	-	0.0	0.0	0.0	-	0.0	-	0.0	-	0.0	-	-
	Total	-	-	-	0.0	-	-	0.0	0.0	0.0	-	0.0	-	0.0	-	0.0	-	-
1098-1280	766	-	-	-	-	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	770	-	-	-	-	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	774	-	-	-	-	-	0.0	0.0	0.0	0.0	-	0.0	-	0.0	-	0.0	-	-
	Total	-	-	-	-	-	0.0	0.0	0.0	0.0	-	0.0	-	0.0	-	0.0	-	-
1281-1463	767	-	-	-	-	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	771	-	-	-	-	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-
	775	-	-	-	-	-	0.0	0.0	0.0	0.0	-	0.0	-	0.0	-	0.0	-	-
	Total	-	-	-	-	-	0.0	0.0	0.0	0.0	-	0.0	-	0.0	-	0.0	-	-
Grand Total		54.9	75.2	57.5	58.7	66.9	60.2	53.9	44.2	68.4	68.1	58.8	55.6	65.3	103.1	79.4	59.5	43.8

Table 12. Abundance index (millions) at age for A. plaice in Div. 3L from Canadian fall surveys from 1990 to 2011.

Age/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.34	0.00	0.00	0.00	0.00	0.00	0.51	0.05	0.04	0.72	2.09	0.48	0.00
1	0.78	0.12	0.00	0.00	0.00	0.45	1.12	0.17	2.71	14.04	16.17	8.93	3.06	1.22	3.53	11.78	11.44	22.61	41.78	20.02	61.15	2.42
2	2.39	2.09	0.75	3.10	0.00	11.05	16.62	1.52	3.84	19.86	31.38	102.85	66.37	18.37	9.68	27.80	34.76	60.08	107.63	133.02	115.33	176.28
3	26.07	14.38	12.54	21.10	0.00	25.11	57.94	21.44	6.89	10.52	26.11	70.83	119.40	78.66	30.78	33.21	42.72	61.53	73.96	96.84	183.52	141.10
4	309.25	91.21	52.65	71.20	14.48	59.35	170.16	63.91	28.35	7.92	8.33	34.69	35.23	77.90	72.68	54.99	31.70	52.93	51.83	50.36	149.36	146.44
5	597.38	295.78	171.91	123.36	25.75	198.76	149.44	105.70	64.67	29.39	27.69	20.68	16.94	26.20	42.61	73.01	35.44	31.14	61.54	30.54	62.07	107.89
6	548.02	372.37	269.73	218.20	42.96	187.22	84.67	84.48	90.34	50.01	34.64	21.12	14.52	9.13	11.30	55.65	72.86	31.96	35.06	30.19	48.11	43.99
7	303.10	164.87	102.93	138.57	54.51	101.25	31.85	35.87	57.37	46.36	22.80	34.07	21.47	7.27	4.65	21.36	68.18	45.03	32.66	10.55	22.63	28.56
8	145.95	77.59	32.27	27.74	28.54	36.23	6.04	10.59	25.21	37.97	12.56	31.22	25.94	8.56	3.82	10.80	27.59	35.87	41.08	8.49	12.50	12.54
9	95.12	43.16	10.42	7.96	8.82	19.26	2.46	5.73	14.46	24.81	8.54	25.12	18.13	5.09	3.95	3.94	5.26	10.21	28.36	8.67	8.15	5.90
10	36.73	18.31	5.51	2.65	1.88	3.65	0.83	1.27	3.74	8.91	2.73	10.85	10.36	4.51	0.88	4.49	3.53	5.10	7.15	4.05	15.21	6.32
11	17.48	8.27	1.87	1.13	0.29	0.36	0.14	0.82	1.26	4.64	1.77	8.38	7.94	2.73	0.75	1.52	1.81	1.94	1.91	1.60	4.37	4.99
12	9.06	5.12	1.63	0.29	0.06	0.10	0.06	0.19	0.41	2.10	0.33	3.24	2.04	0.87	0.12	2.35	3.66	1.43	1.33	1.06	1.67	3.37
13	5.46	1.95	0.46	0.09	0.02	0.00	0.05	0.14	0.06	0.63	0.12	0.55	0.25	0.33	0.11	1.64	1.47	0.43	0.93	0.73	1.12	1.20
14	3.94	1.51	0.26	0.07	0.07	0.00	0.00	0.00	0.00	0.22	0.00	0.32	0.05	0.04	0.00	0.72	1.22	1.13	0.44	0.41	1.27	0.25
15	1.52	0.88	0.12	0.24	0.00	0.00	0.00	0.01	0.00	0.03	0.05	0.07	0.00	0.00	0.00	0.93	1.73	0.43	0.52	0.23	0.37	0.20
16	0.51	0.23	0.04	0.06	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.00	0.00	0.00	0.00	0.30	1.13	0.50	0.32	0.09	0.59	0.18
17	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.15	0.52	0.13	0.15	0.38	0.03
18	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.01	0.44	0.43	0.02	0.41	0.19
19	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.06	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
unk	0.31	0.01	0.00	0.00	0.00	1.69	0.00	0.50	0.27	0.08	0.17	0.46	0.22	0.02	0.05	0.04	0.18	1.04	0.24	2.17	0.32	0.46
Ages 0+	2103.06	1098.06	663.07	615.76	177.38	644.47	521.37	332.31	299.68	257.85	193.46	373.37	341.93	240.92	184.91	305.20	344.85	364.91	488.08	401.29	689.00	682.31
Ages 6+	1166.89	694.48	425.23	397.01	137.15	348.06	126.10	139.08	192.86	175.70	83.59	134.94	100.71	38.54	25.57	103.85	188.58	135.55	150.38	66.25	116.77	108.16
Ages 9+	169.82	79.65	20.29	12.50	11.14	23.36	3.54	8.15	19.94	41.36	13.59	48.53	38.79	13.57	5.81	16.05	19.96	22.69	41.58	17.02	33.53	23.08
Ages 12+	20.50	9.90	2.49	0.75	0.15	0.10	0.11	0.33	0.48	3.00	0.56	4.17	2.35	1.24	0.23	6.10	9.36	5.44	4.15	2.70	5.81	5.88

Table 13. Abundance index (millions) at age for A. plaice in Div. 3N from Canadian fall surveys from 1990 to 2011.

Age/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.12	0.00	0.00	0.00	0.07	0.00	0.00
1	2.34	0.82	5.84	0.00	0.00	1.97	0.11	1.81	1.93	46.35	20.47	8.24	1.79	7.76	102.60	5.35	1.04	30.08	28.54	59.96	3.89	3.46
2	40.24	84.64	78.12	1.90	0.00	17.53	1.70	1.34	1.38	69.91	158.97	19.95	25.17	6.13	16.43	257.10	4.64	14.88	135.89	64.49	118.38	28.81
3	134.78	193.91	161.07	52.32	16.51	15.09	4.08	8.06	0.86	11.42	264.89	130.79	50.82	41.45	13.52	61.80	47.24	27.72	37.39	92.21	94.09	112.38
4	295.80	284.75	130.72	283.60	65.29	16.40	3.31	14.95	11.62	2.61	53.91	42.75	190.06	95.11	100.92	12.17	21.36	128.44	137.17	68.40	217.26	111.09
5	169.59	288.82	130.17	135.26	96.33	27.70	9.34	8.33	18.51	7.83	22.80	5.07	63.36	196.95	127.87	47.15	14.79	31.08	260.68	112.38	94.18	125.59
6	30.73	72.35	131.01	67.76	43.86	62.43	13.60	29.97	11.44	12.62	38.99	17.05	11.46	39.70	118.56	85.32	31.63	14.95	62.42	109.10	165.54	112.97
7	9.34	19.55	53.35	74.65	23.60	15.42	12.65	41.44	25.97	12.16	59.27	27.83	26.02	19.89	34.00	76.49	35.33	31.80	41.76	40.02	93.85	98.15
8	3.83	10.86	12.33	23.64	14.33	9.03	4.55	24.91	35.67	29.10	53.08	22.08	29.25	13.36	10.03	18.79	63.03	42.04	34.70	20.98	27.14	61.05
9	6.62	10.35	8.02	8.78	7.29	6.09	1.82	8.00	37.85	25.04	39.83	12.52	17.22	7.71	8.34	5.66	16.67	45.05	28.03	14.02	14.25	18.21
10	3.31	7.24	3.71	4.70	1.97	2.21	0.79	3.60	8.76	18.08	39.29	9.91	13.31	6.11	6.79	5.71	3.76	17.24	14.65	12.14	14.20	7.40
11	2.53	5.98	2.20	2.20	0.78	0.72	0.36	1.64	3.54	9.46	19.14	13.06	16.11	5.38	2.41	4.17	6.70	5.82	5.22	8.03	3.88	7.31
12	1.71	3.26	1.74	1.65	1.00	0.71	0.27	0.43	1.21	7.39	5.20	6.16	11.43	4.00	2.72	1.50	4.16	5.75	2.64	2.21	1.42	4.91
13	1.60	4.31	1.45	0.88	0.42	0.25	0.00	0.49	0.61	2.75	2.49	1.39	6.35	1.25	0.74	2.23	3.01	0.32	1.10	1.59	1.23	1.89
14	1.53	2.50	1.23	0.78	0.69	0.02	0.00	0.34	0.52	0.58	0.68	0.58	0.54	0.33	0.94	2.10	1.83	3.12	1.77	1.67	0.94	0.95
15	1.49	1.45	0.33	0.66	0.29	0.00	0.06	0.15	0.08	0.06	0.34	0.27	1.05	0.27	0.17	0.77	2.22	3.72	1.13	1.40	0.34	1.05
16	1.59	1.05	0.46	0.34	0.00	0.00	0.00	0.04	0.24	0.36	0.00	0.11	1.06	0.18	0.14	0.29	0.74	2.32	0.46	2.07	0.91	0.94
17	0.47	0.48	0.29	0.10	0.00	0.00	0.00	0.00	0.13	0.30	0.34	0.12	0.00	0.00	0.00	0.15	0.70	1.34	0.44	0.55	0.58	0.37
18	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.40	0.26	0.55	0.19	0.88
19	0.00	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.23	0.00	0.00	0.94
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.05	0.00	0.06	0.00	0.29	0.07
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00
unk	0.16	0.06	1.73	0.21	0.09	0.07	0.00	0.19	0.12	0.00	0.00	0.18	0.08	0.23	12.11	0.17	0.32	0.43	1.15	3.20	0.03	0.59
Ages 0+	707.78	992.55	723.78	659.44	272.46	175.66	52.65	145.70	160.43	256.19	779.70	318.07	465.09	445.89	558.28	587.03	259.45	406.83	795.75	615.03	852.60	699.00
Ages 6+	64.87	139.55	216.12	186.17	94.24	96.89	34.10	111.02	126.02	118.06	258.66	111.09	133.81	98.22	184.84	203.17	170.05	174.18	194.94	214.32	324.76	317.68
Ages 9+	20.97	36.80	19.43	20.11	12.44	10.01	3.30	14.70	52.93	64.19	107.32	44.12	67.08	25.27	22.25	22.57	40.07	85.39	56.06	44.22	38.24	45.51
Ages 12+	8.51	13.22	5.50	4.43	2.40	0.98	0.33	1.45	2.79	11.60	9.07	8.63	20.44	6.08	4.72	7.03	12.94	17.28	8.16	10.03	5.91	12.59

Table 14. Abundance index (millions) at age for A. plaice in Div. 3O from Canadian fall surveys from 1990 to 2011.

Age/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	1.38	0.00	0.00	0.08	0.05	0.15	0.27	0.10	0.00	0.00	0.00	0.00	0.00
1	8.24	0.63	0.00	0.00	0.00	35.77	2.28	1.32	17.60	93.19	54.15	28.67	5.95	8.76	411.47	52.52	5.38	151.39	99.68	139.86	20.11	3.72
2	10.51	12.10	2.58	5.10	0.00	97.32	80.15	16.68	21.30	80.38	139.26	61.24	58.23	22.83	101.14	200.34	97.71	66.49	375.72	122.36	204.61	67.13
3	25.25	56.20	44.10	42.54	3.02	20.35	74.47	71.61	9.03	49.89	124.51	100.89	53.27	56.51	50.20	70.54	175.59	88.31	81.82	274.80	115.28	82.33
4	100.36	73.88	74.88	143.08	23.98	35.12	54.27	67.87	77.71	13.19	60.63	39.78	70.08	101.12	77.66	46.91	53.84	147.13	167.21	54.22	158.28	51.30
5	86.13	139.80	65.85	101.84	68.22	69.48	49.52	39.82	37.99	55.24	23.18	28.22	25.26	101.92	80.72	50.30	24.05	55.84	193.42	86.29	44.19	53.06
6	64.11	134.09	98.45	86.11	64.26	86.70	75.81	45.40	27.31	30.79	58.38	29.01	16.41	36.55	44.02	55.96	36.64	21.07	48.93	91.38	41.13	27.82
7	57.19	64.96	69.79	103.34	56.80	35.29	37.70	42.67	29.30	21.05	33.52	35.87	25.42	21.92	17.32	34.11	34.80	51.60	43.09	27.79	18.97	18.35
8	41.89	27.82	32.12	52.74	46.38	16.19	10.77	17.73	22.54	31.85	18.15	10.36	20.70	13.07	11.28	8.45	18.15	43.26	27.88	22.71	6.81	17.67
9	22.78	28.33	17.21	16.26	12.54	14.17	4.54	9.60	16.11	22.84	13.45	11.07	5.70	6.15	7.17	4.21	4.39	18.84	12.73	18.88	5.80	5.15
10	15.16	18.75	8.47	7.97	3.97	4.89	1.46	2.43	5.45	6.67	6.91	6.58	3.13	1.72	2.18	3.02	1.91	2.07	6.41	5.12	6.28	3.26
11	9.19	11.66	4.38	3.47	1.60	0.80	1.29	0.76	2.14	4.75	4.47	4.91	2.93	2.89	2.78	1.58	1.95	1.29	1.14	4.78	2.95	2.03
12	6.66	5.48	3.48	3.15	0.67	0.50	0.26	0.59	2.01	2.82	1.53	2.29	2.28	1.45	1.32	1.25	2.11	1.45	0.69	0.47	1.28	1.86
13	4.99	5.96	1.43	2.11	0.48	0.20	0.05	0.22	1.37	1.51	0.48	0.90	1.24	0.21	1.30	0.96	1.11	1.98	0.56	0.75	0.98	0.58
14	3.85	2.96	1.67	1.53	0.41	0.28	0.12	0.26	0.32	0.27	0.16	0.23	0.40	0.47	0.28	0.50	0.57	0.62	0.48	0.27	0.64	0.03
15	2.41	2.12	0.70	0.79	0.10	0.05	0.28	0.31	0.10	0.08	0.13	0.16	0.31	0.30	0.11	0.62	0.81	0.69	0.73	0.31	1.13	0.08
16	2.36	1.05	0.67	0.96	0.00	0.00	0.00	0.03	0.14	0.32	0.19	0.27	0.27	0.34	0.20	0.05	0.55	0.25	0.77	0.54	0.00	0.14
17	1.17	0.33	0.24	0.18	0.00	0.00	0.00	0.00	0.31	0.28	0.37	0.11	0.18	0.00	0.00	0.00	0.27	0.18	0.08	0.53	0.00	0.12
18	0.08	0.28	0.27	0.31	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.16	0.00	0.13	0.00	0.00	0.24	0.14	0.00	0.16	0.49	0.05
19	0.00	0.11	0.06	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.13	0.03	0.00	0.09	0.51	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.03	0.04	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.08	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
unk	0.17	1.31	0.13	1.45	0.00	0.00	0.00	0.37	0.81	1.20	0.09	0.10	0.00	0.25	0.92	0.20	1.51	0.54	1.76	4.46	0.77	2.61
Ages 0+	462.49	587.83	426.46	573.11	282.41	417.10	392.95	317.68	273.20	417.77	539.57	360.85	291.88	376.63	810.23	531.80	461.96	653.20	1063.15	855.87	630.21	337.26
Ages 6+	231.82	303.91	238.92	279.10	187.20	159.07	132.27	120.01	107.15	123.29	137.74	101.94	79.02	85.20	87.97	110.71	103.78	143.51	143.53	173.87	86.96	79.73
Ages 9+	68.64	77.04	38.57	36.91	19.77	20.90	7.99	14.21	28.00	39.59	27.69	26.69	16.48	13.65	15.34	12.19	14.18	27.58	23.63	31.99	20.05	15.88
Ages 12+	21.51	18.30	8.51	9.22	1.65	1.04	0.71	1.42	4.31	5.33	2.86	4.12	4.73	2.89	3.21	3.38	5.94	5.38	3.35	3.21	5.02	5.45

Table 15. Abundance index (millions) at age for A. plaice in Div. 3LNO from Canadian fall surveys from 1990 to 2011.

Age/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70	1.72	0.00	0.00	0.08	0.10	0.15	0.91	0.14	0.04	0.72	2.16	0.48	0.00
1	11.36	1.56	5.84	0.00	0.00	38.19	3.52	3.30	22.23	153.58	90.79	45.83	10.80	17.74	517.61	69.65	17.86	204.09	170.00	219.84	85.16	9.60
2	53.13	98.83	81.45	10.10	0.00	125.90	98.46	19.54	26.52	170.15	329.62	184.04	149.76	47.32	127.24	485.24	137.11	141.45	619.24	319.87	438.33	272.22
3	186.10	264.49	217.71	115.95	19.53	60.55	136.49	101.12	16.78	71.84	415.51	302.51	223.50	176.62	94.50	165.55	265.55	177.56	193.18	463.85	392.88	335.80
4	705.41	449.84	258.26	497.88	103.74	110.88	227.74	146.72	117.67	23.72	122.87	117.22	295.37	274.14	251.26	114.07	106.89	328.50	356.21	172.98	524.90	308.84
5	853.10	724.40	367.93	360.45	190.30	295.94	208.29	153.85	121.17	92.46	73.67	53.98	105.56	325.07	251.20	170.46	74.28	118.06	515.63	229.21	200.45	286.53
6	642.86	578.81	499.19	372.08	151.09	336.35	174.08	159.85	129.09	93.43	132.01	67.18	42.39	85.38	173.88	196.94	141.13	67.98	146.42	230.66	254.78	184.78
7	369.63	249.38	226.08	316.57	134.91	151.96	82.20	119.98	112.64	79.57	115.59	97.77	72.91	49.09	55.97	131.95	138.30	128.43	117.52	78.37	135.45	145.06
8	191.67	116.27	76.71	104.12	89.25	61.45	21.37	53.22	83.42	98.92	83.79	63.67	75.89	34.99	25.13	38.04	108.77	121.17	103.65	52.18	46.45	91.25
9	124.52	81.84	35.65	33.00	28.65	39.52	8.82	23.33	68.42	72.70	61.82	48.71	41.05	18.96	19.45	13.81	26.31	74.10	69.11	41.57	28.20	29.25
10	55.20	44.30	17.68	15.32	7.82	10.75	3.08	7.30	17.95	33.66	48.92	27.34	26.80	12.33	9.85	13.23	9.19	24.41	28.22	21.31	35.69	16.98
11	29.20	25.92	8.45	6.80	2.67	1.88	1.78	3.22	6.94	18.85	25.38	26.36	26.98	11.00	5.94	7.26	10.46	9.05	8.28	14.41	11.20	14.32
12	17.43	13.86	6.85	5.10	1.72	1.31	0.59	1.21	3.63	12.31	7.07	11.69	15.76	6.32	4.16	5.10	9.92	8.62	4.66	3.75	4.37	10.14
13	12.05	12.21	3.33	3.08	0.92	0.45	0.10	0.85	2.04	4.89	3.09	2.83	7.85	1.79	2.16	4.83	5.59	2.72	2.59	3.08	3.33	3.66
14	9.32	6.98	3.15	2.38	1.17	0.31	0.12	0.60	0.84	1.08	0.84	1.13	0.99	0.83	1.21	3.32	3.62	4.87	2.69	2.35	2.85	1.22
15	5.42	4.45	1.15	1.68	0.40	0.05	0.35	0.48	0.18	0.16	0.53	0.50	1.36	0.57	0.28	2.31	4.76	4.84	2.38	1.93	1.83	1.33
16	4.45	2.34	1.17	1.36	0.00	0.00	0.00	0.08	0.38	0.71	0.24	0.38	1.33	0.52	0.33	0.64	2.42	3.07	1.55	2.71	1.51	1.27
17	1.64	1.00	0.52	0.27	0.00	0.00	0.00	0.00	0.45	0.58	0.71	0.23	0.18	0.00	0.00	0.20	1.11	2.04	0.65	1.23	0.96	0.52
18	0.21	0.42	0.27	0.31	0.00	0.00	0.00	0.00	0.05	0.12	0.00	0.16	0.00	0.13	0.00	0.11	0.48	0.98	0.70	0.73	1.08	1.11
19	0.00	0.17	0.06	0.22	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.04	0.00	0.00	0.00	0.13	0.67	0.23	0.09	0.51	0.94
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.28	0.16	0.00	0.29	0.07
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.07	0.00	0.00	0.08	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.06	0.00	0.00	0.00
unk	0.64	1.38	1.86	1.65	0.09	1.77	0.00	1.05	1.20	1.28	0.27	0.74	0.30	0.49	13.08	0.42	2.02	2.01	3.15	9.83	1.11	3.65
Ages 0+	3273.32	2678.44	1813.31	1848.32	732.25	1237.23	966.97	795.69	733.31	931.81	1512.72	1052.28	1098.91	1063.43	1553.42	1424.03	1066.26	1424.94	2346.98	1871.71	2171.80	1718.56
Ages 6+	1463.58	1137.94	880.27	862.28	418.59	604.02	292.47	370.11	426.03	417.05	479.99	347.97	313.54	221.95	298.38	417.74	462.41	453.23	488.86	454.44	529.61	505.57
Ages 9+	259.43	193.48	78.29	69.52	43.34	54.26	14.83	37.06	100.88	145.14	148.60	119.34	122.35	52.50	43.40	50.81	74.21	135.66	121.27	93.23	92.94	84.47
Ages 12+	50.51	41.42	16.50	14.40	4.21	2.12	1.15	3.20	7.57	19.93	12.49	16.93	27.51	10.21	8.16	16.51	28.25	28.10	15.66	15.95	17.85	23.91
proportion 0 to 5	0.55	0.57	0.51	0.53	0.43	0.51	0.70	0.53	0.42	0.55	0.68	0.67	0.71	0.79	0.80	0.71	0.56	0.68	0.79	0.75	0.69	0.69
proportion 9+	0.08	0.07	0.04	0.04	0.06	0.04	0.02	0.05	0.14	0.16	0.10	0.11	0.11	0.05	0.03	0.04	0.07	0.10	0.05	0.05	0.05	0.05

Table 16. American plaice age numbers (MNPT) from the EU-Spain Survey of NAFO 3NO: 1997-2011.
ALK used: Canadian Spring survey in 3N

Age/Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1	0.00	0.00	0.00	0.00	1.80	0.05	0.65	56.59	1.71	0.10	4.94	3.81	2.61	0.32	0.08
2	0.10	0.15	21.79	50.52	25.51	10.78	4.19	20.50	76.18	13.80	1.20	65.15	3.55	41.96	6.42
3	1.96	0.45	14.37	189.34	256.81	25.04	35.35	13.07	130.08	161.73	10.55	10.66	30.98	28.13	84.24
4	4.80	5.87	4.14	67.85	78.07	165.33	57.98	35.03	17.07	217.72	158.79	33.75	6.74	67.85	70.92
5	6.14	8.58	12.89	11.00	4.81	38.40	235.17	76.80	40.63	105.85	97.64	282.61	50.51	43.50	116.78
6	19.92	14.25	37.92	19.64	11.44	11.40	56.43	204.71	91.46	85.84	33.62	121.99	97.16	108.88	137.16
7	25.74	29.99	32.15	49.71	30.59	10.04	22.53	47.14	121.13	92.85	61.14	36.95	35.08	141.00	128.10
8	13.68	48.49	42.53	39.49	28.50	18.84	16.91	12.83	42.37	78.66	45.09	75.11	19.65	29.71	82.41
9	4.55	33.83	60.52	51.90	27.17	14.28	19.43	11.17	17.82	57.88	56.80	38.91	17.17	13.66	14.83
10	1.26	13.68	50.12	46.98	20.44	8.86	8.11	11.95	6.11	25.60	10.92	32.57	23.13	9.56	9.97
11	0.48	5.39	20.46	29.09	21.20	10.67	8.50	6.44	4.39	11.87	3.75	8.91	20.54	9.44	8.76
12	0.40	1.97	9.19	13.56	8.26	7.45	10.41	7.90	4.29	6.46	3.07	4.69	8.02	11.11	6.36
13	0.12	0.95	5.00	6.38	2.27	1.84	3.88	4.39	3.30	3.47	2.24	1.69	1.50	3.50	2.18
14	0.11	1.03	1.87	0.97	0.96	1.03	1.73	3.80	2.38	2.28	2.27	2.44	1.11	1.34	0.90
15	0.03	0.19	1.20	3.32	0.76	0.09	0.78	0.66	1.76	1.48	1.92	2.36	2.31	1.39	0.35
16	0.04	0.09	0.48	1.59	0.22	0.27	0.48	0.21	0.82	0.75	0.79	2.46	1.95	2.58	0.76
17	0.00	0.00	0.39	0.48	0.20	0.05	0.11	0.00	0.09	0.31	0.41	0.73	1.62	1.55	0.91
18	0.01	0.05	0.35	0.00	0.17	0.00	0.04	0.08	0.63	0.22	0.66	0.02	0.86	0.52	0.29
19	0.01	0.05	0.00	0.00	0.02	0.01	0.00	0.02	0.08	0.04	0.00	0.24	0.37	0.49	0.56
20	0.00	0.00	0.05	0.10	0.01	0.00	0.00	0.00	0.00	0.03	0.23	0.01	0.20	0.01	0.16
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ages 0+	79.33	165.01	315.43	581.93	519.24	324.45	482.68	513.30	562.29	866.94	496.03	725.34	325.04	516.65	672.20
Ages 6+	66.33	149.96	262.23	263.21	152.23	84.84	149.34	311.31	296.62	367.74	222.91	329.37	230.65	334.88	393.77
Ages 9+	6.99	57.23	149.63	154.37	81.70	44.55	53.47	46.63	41.66	110.39	83.05	95.32	78.76	55.29	46.10
Ages 12+	0.71	4.33	18.54	26.39	12.88	10.74	17.43	17.06	13.35	15.05	11.59	14.94	17.93	22.63	12.53
Proportion 0-5	0.16	0.09	0.17	0.55	0.71	0.74	0.69	0.39	0.47	0.58	0.55	0.55	0.29	0.35	0.41
Proportion 9+	0.09	0.35	0.47	0.27	0.16	0.14	0.11	0.09	0.07	0.13	0.17	0.13	0.24	0.11	0.07

Table 17. American plaice in Div. 3LNO: Results of stochastic projections under various fishing mortality options. Labels p5, p50 and p95 refer to 5th, 50th and 95th percentiles of each quantity.

	F = 0		
	SSB ('000 t)		
	p5	p50	p95
2011	29	33	38
2012	36	41	47
2013	42	48	56
2014	46	53	64

	F_{2010} = 0.11					
	SSB ('000 t)			Yield ('000 t)		
	p5	p50	p95	p5	p50	p95
2011	29	33	37	3.2	3.6	4.1
2012	33	37	43	3.7	4.1	4.7
2013	36	41	47	3.9	4.3	4.9
2014	37	42	49			

	$F_{0.1}$ = 0.16					
	SSB ('000 t)			Yield ('000 t)		
	p5	p50	p95	p5	p50	p95
2011	29	33	37	4.5	5.1	5.8
2012	32	36	42	5.0	5.7	6.5
2013	33	38	44	5.1	5.7	6.5
2014	33	38	45			

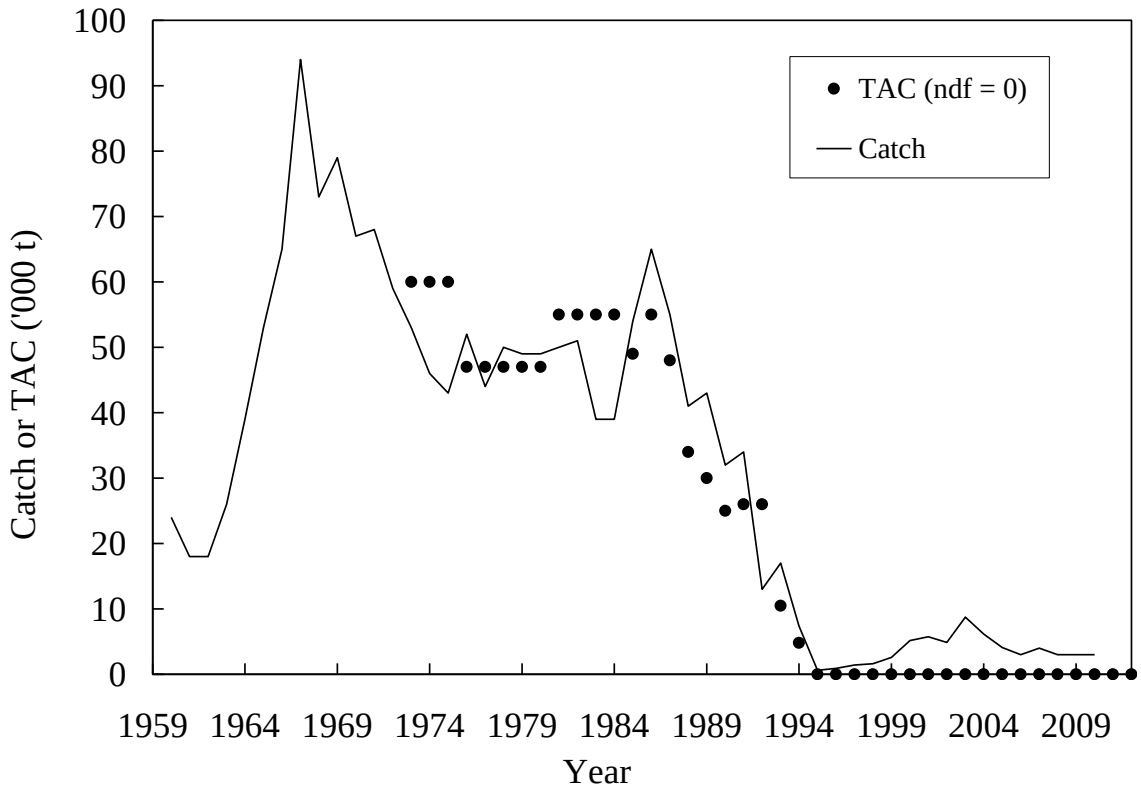

Figure 1. American plaice catches (‘000 t) from 1960-2010 (no catch agreed for 2011) and total allowable catch (TAC) from 1973-2012.

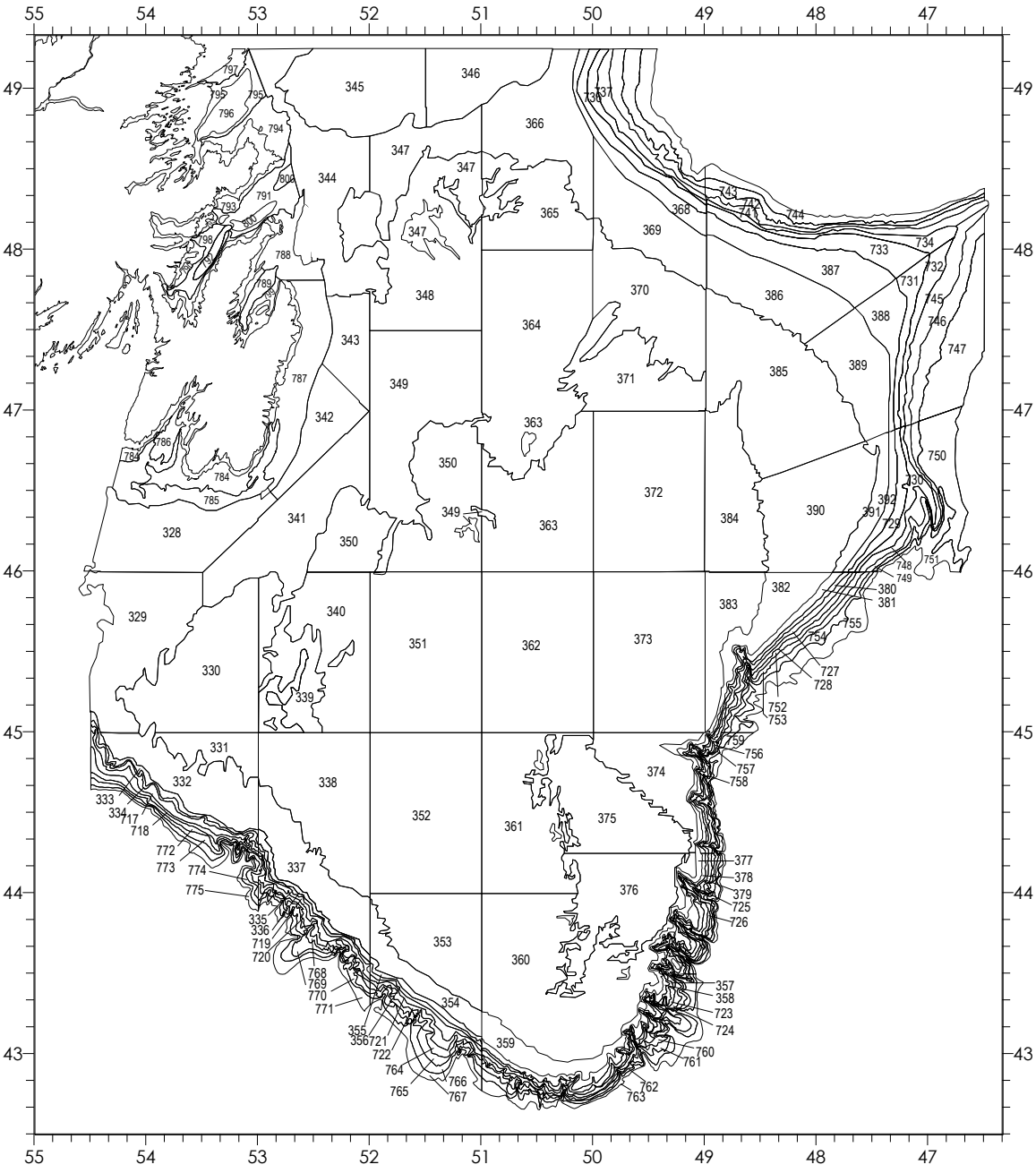

Figure 2. Stratification scheme used in Canadian research vessel surveys of Div. 3LNO.

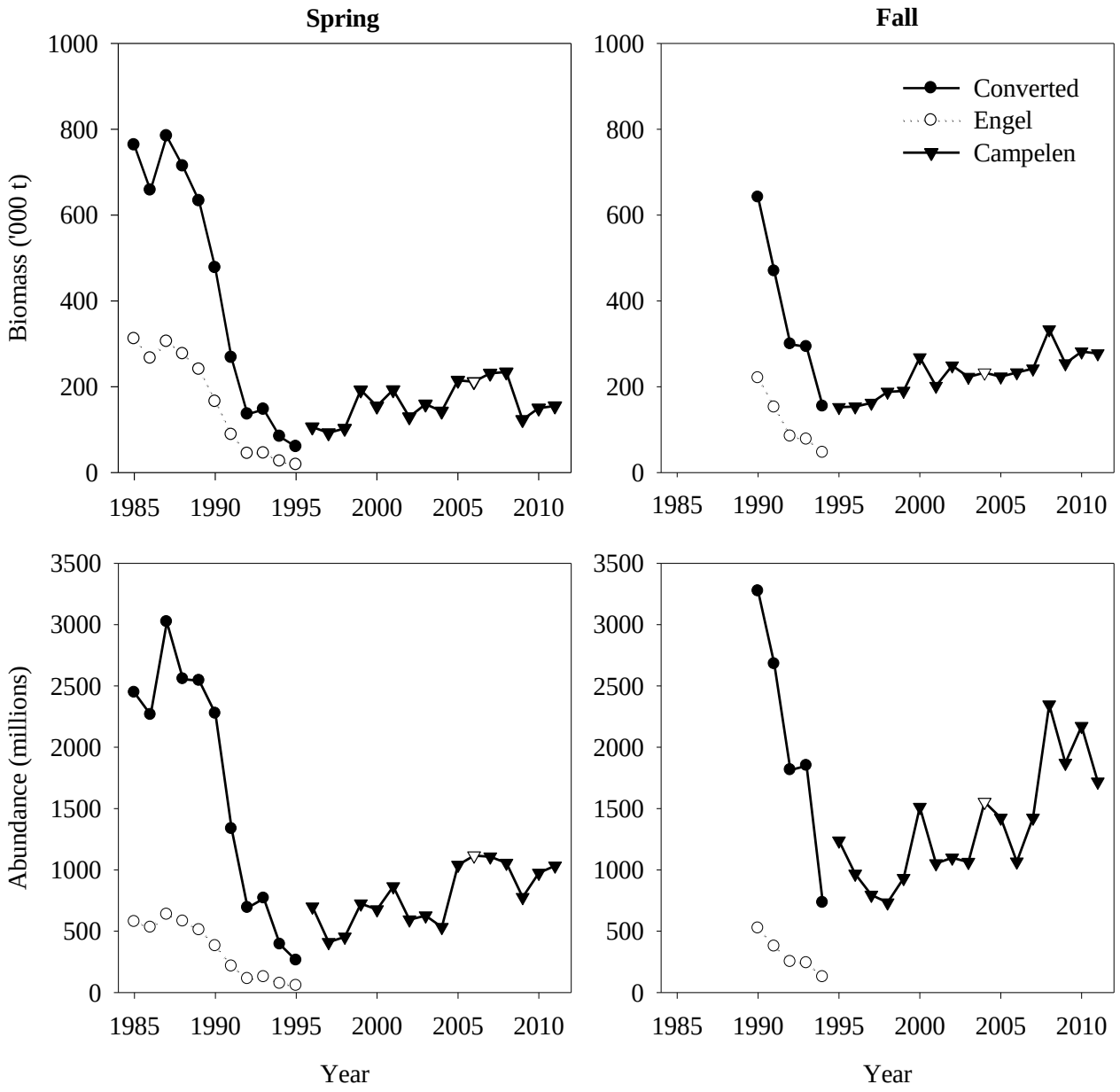

Figure 3. Biomass (top) and abundance (bottom) of American plaice from spring (left) and fall (right) Canadian surveys in Div. 3LNO combined. Note that open symbol represents years when survey coverage was poor.

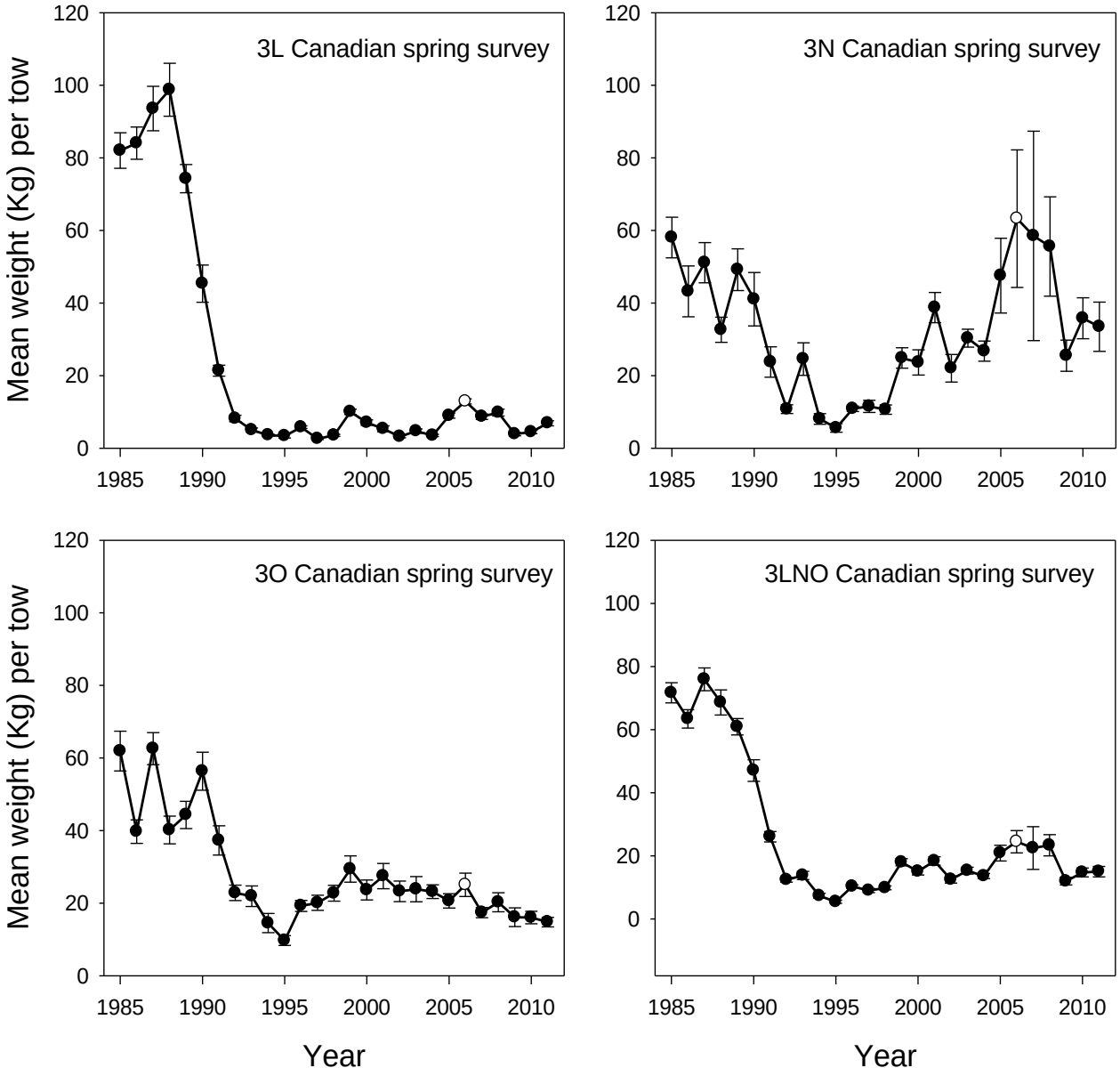

Figure 4. Mean (± 1 Std. dev.) weight per tow (Kg) of American plaice from Canadian spring surveys in Div. 3L, 3N, 3O and 3LNO combined. Note that open symbol represents years when survey coverage was poor.

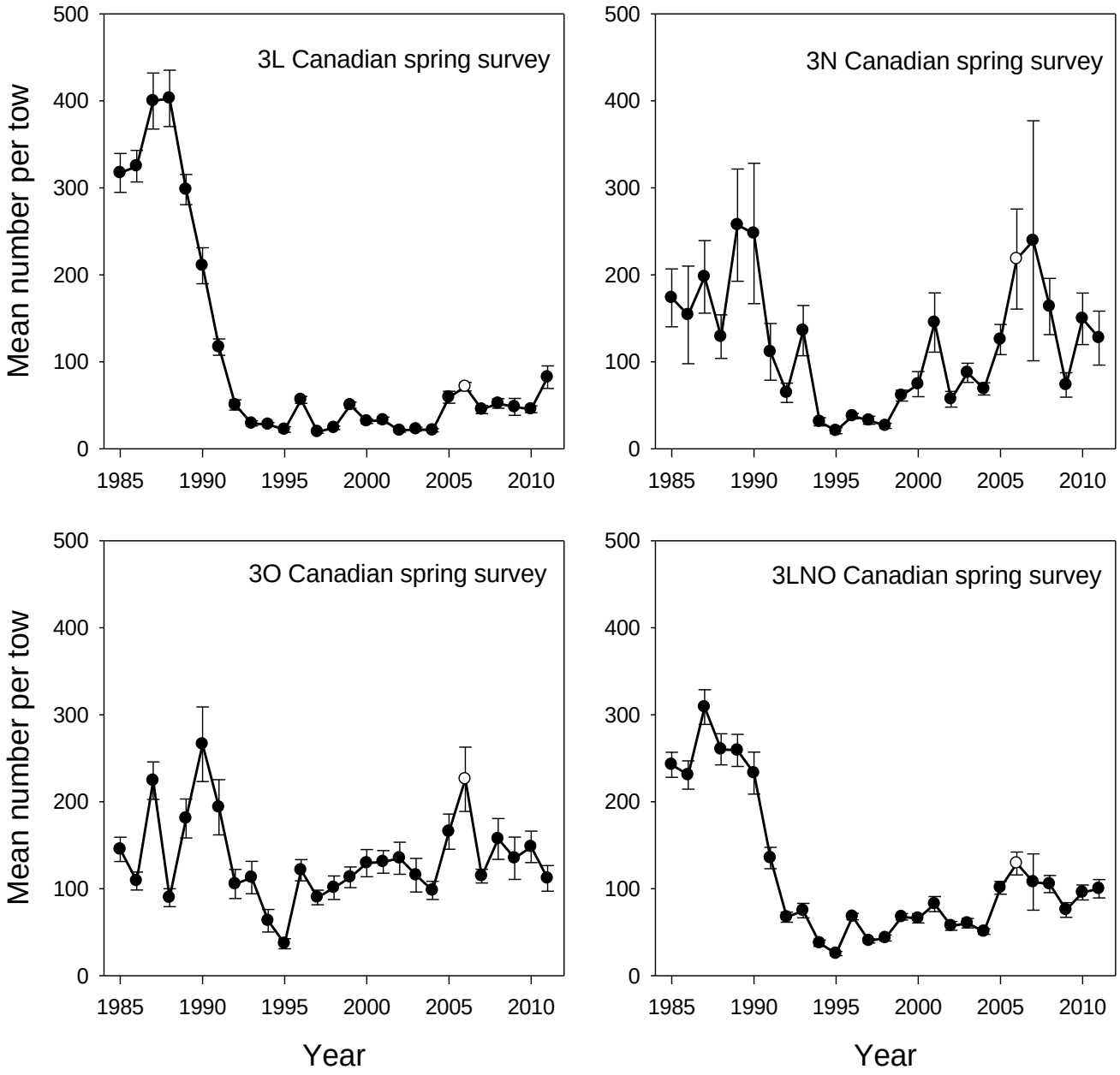

Figure 5. Mean (± 1 Std. Dev.) number per tow of American plaice from Canadian spring surveys of Div. 3L, 3N, 3O and 3LNO combined. Note that open symbol represents years when survey coverage was poor.

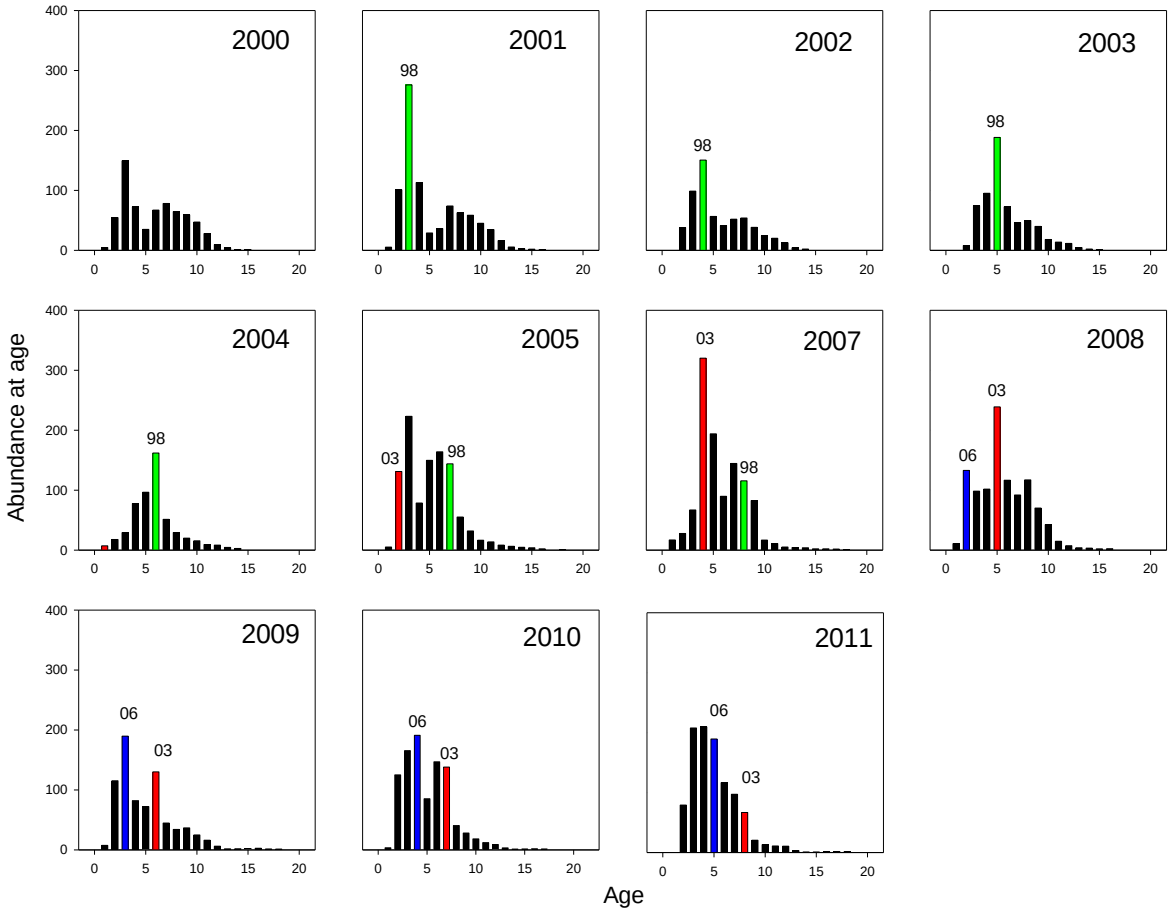

Figure 6. Abundance at age (millions of fish) from 2000 – 2011 in the Canadian spring surveys. Note the survey from 2006 is not present. The 1998, 2003 and 2006 year classes are labelled.

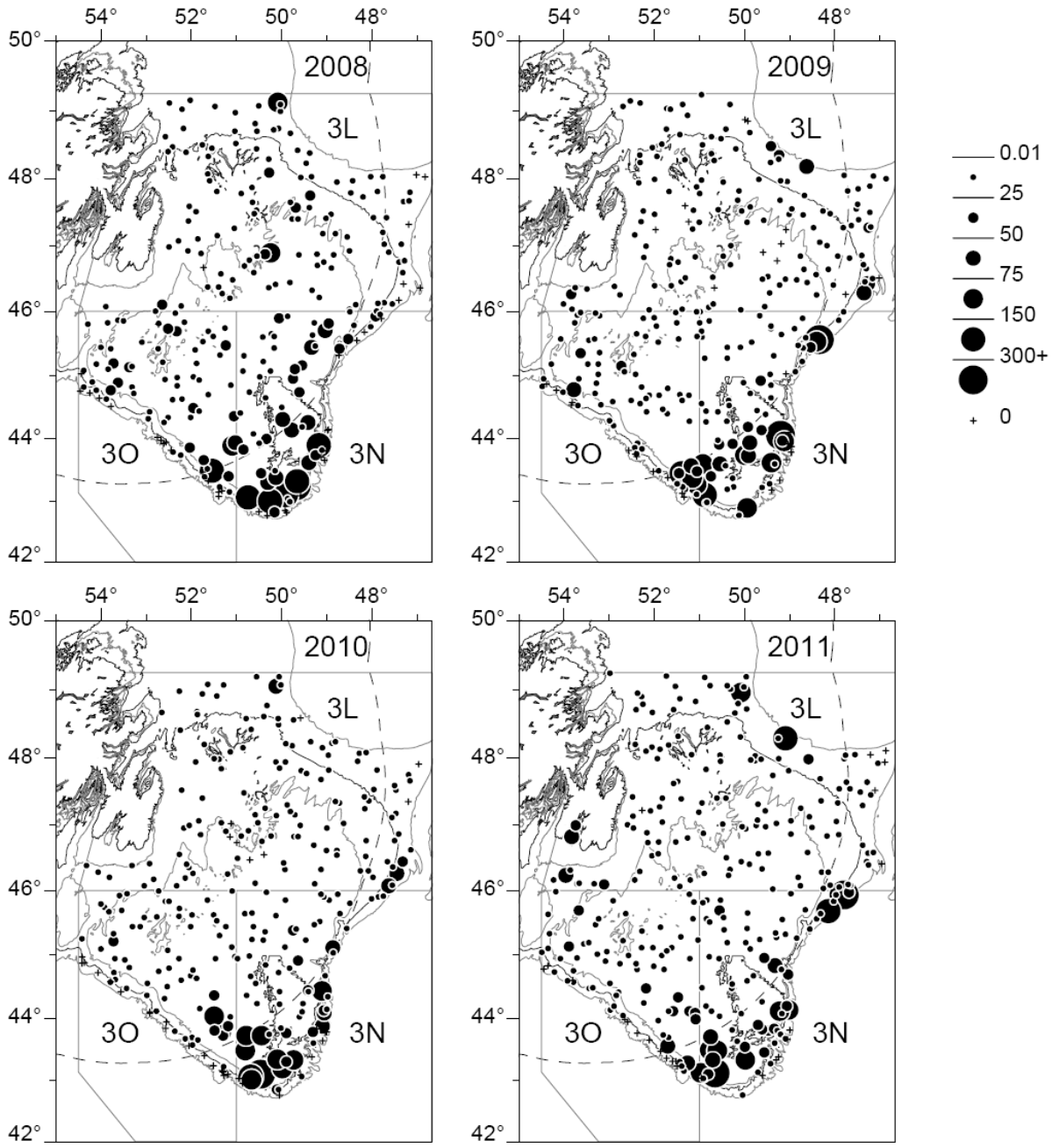

Figure 7. Distribution of American plaice (kg per tow) from Canadian spring surveys in NAFO Divisions 3LNO from 2008-2011.

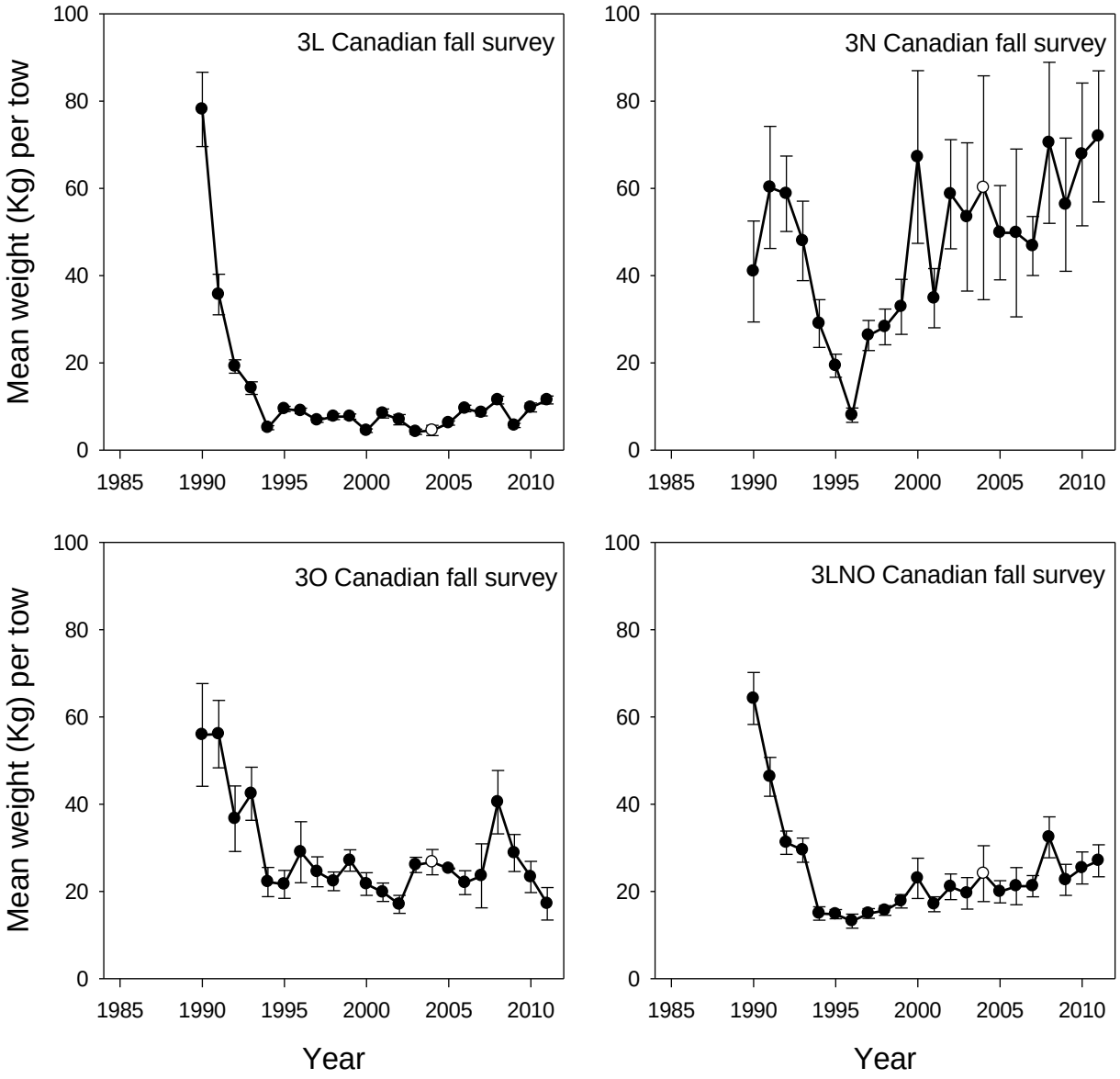

Figure 8. Mean (± 1 Std. Dev.) weight (Kg) per tow of American plaice from Canadian fall surveys in Div. 3L, 3N, 3O and 3LNO combined. Note that open symbol represents years when survey coverage was poor.

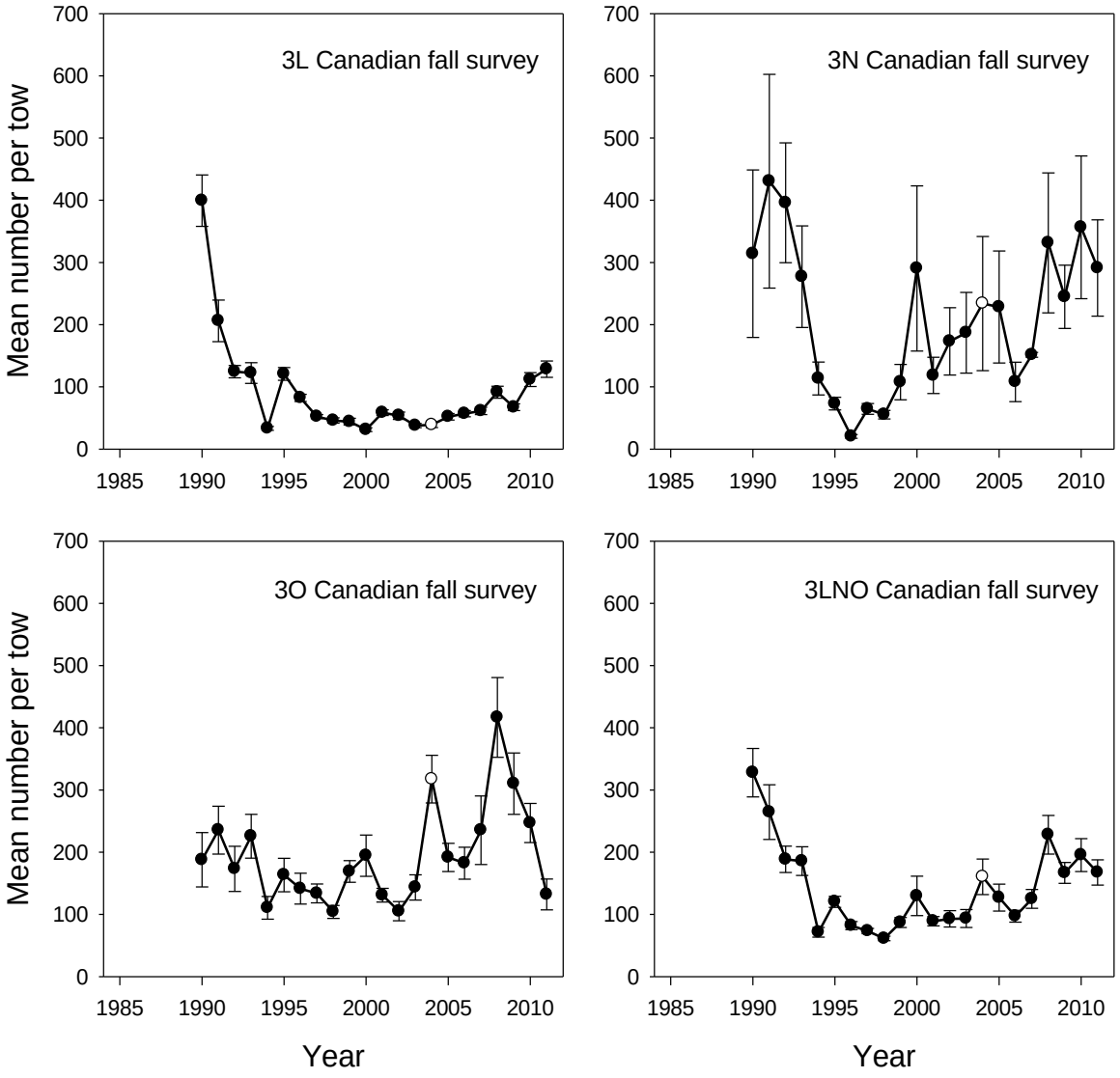

Figure 9. Mean (± 1 Std. Dev.) number per tow of American plaice from Canadian fall surveys of Div. 3L, 3N, 3O and 3LNO combined. Note that open symbol represents years when survey coverage was poor.

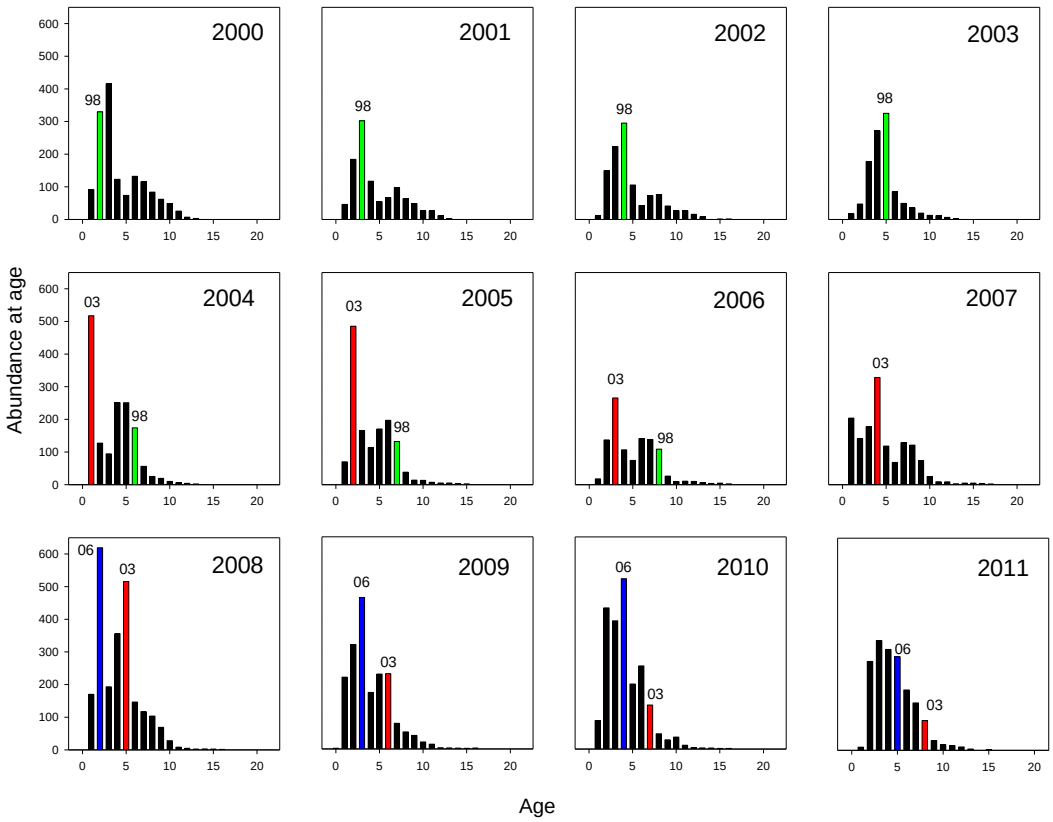

Figure 10. Abundance at age (millions of fish) from 2000 – 2011 in the Canadian fall surveys. The 1998, 2003 and 2006 year classes are labelled.

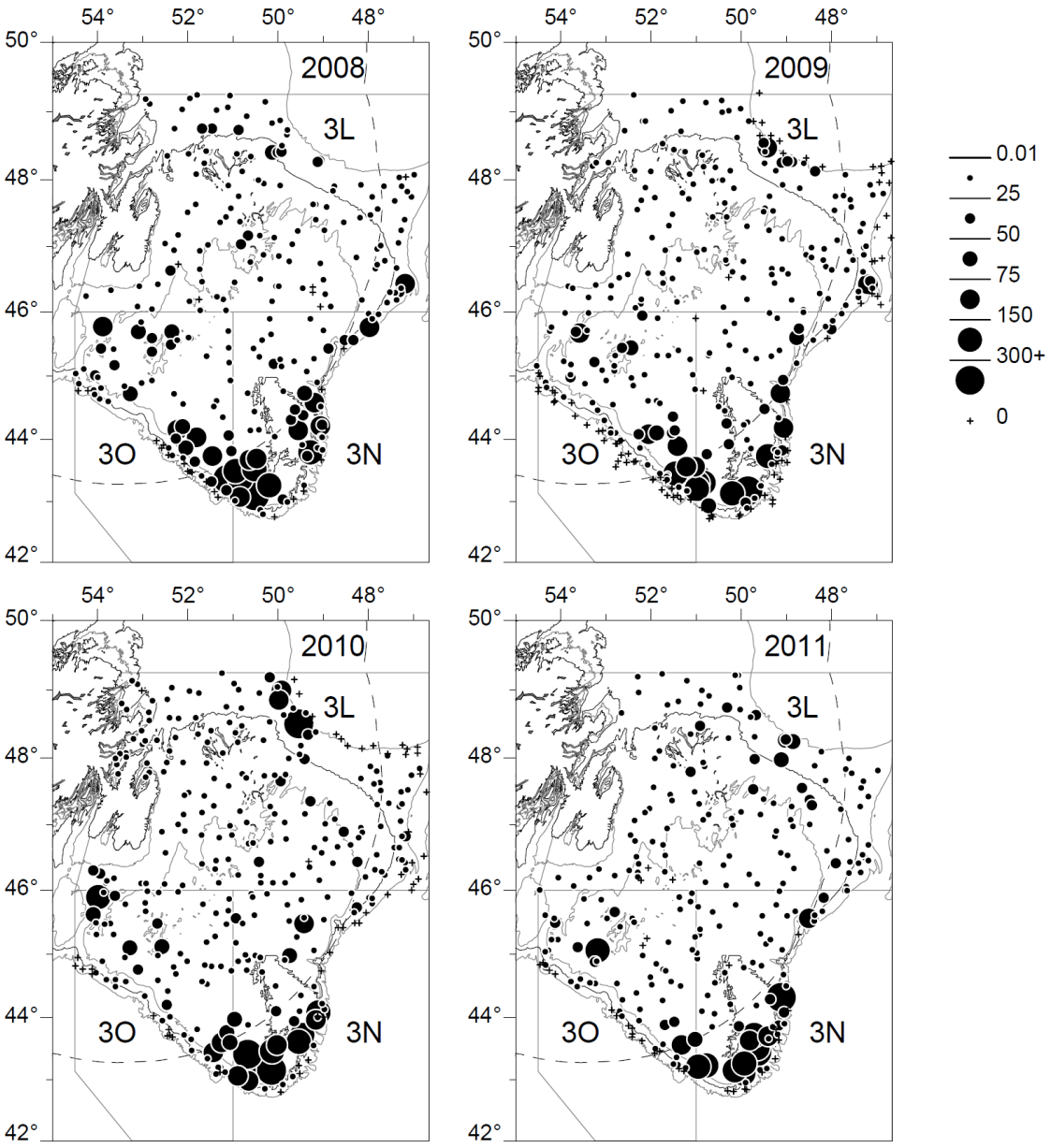

Figure 11. Distribution of American plaice (kg per tow) from Canadian fall surveys in NAFO Divisions 3LNO from 2008-2011.

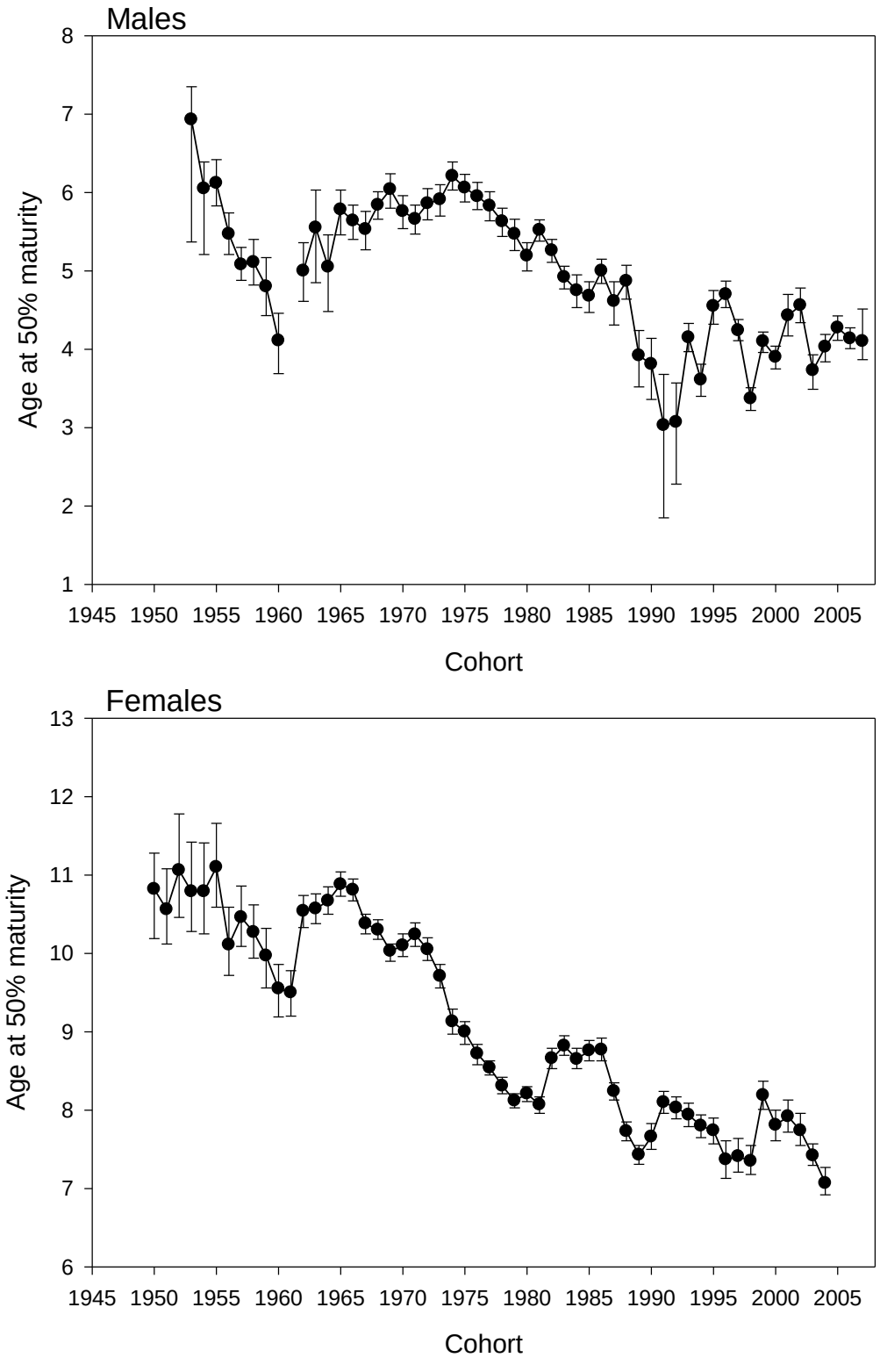

Figure 12. Age at 50% maturity (± 95% fiducial limits) by cohort for male and female American plaice in NAFO Div. 3LNO.

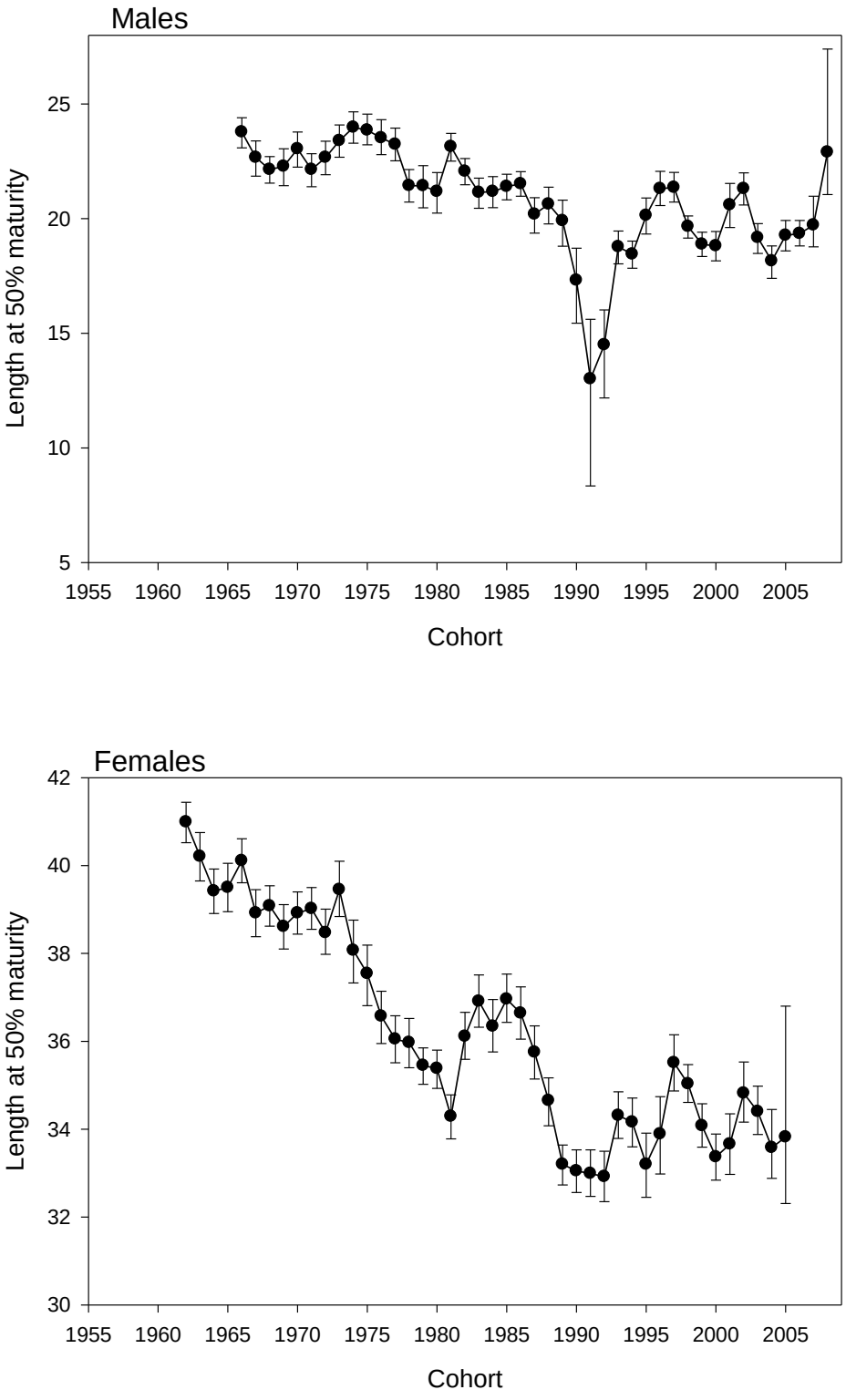

Figure 13. Length at 50% maturity (± 95% fiducial limits) by cohort for male and female American plaice in NAFO Div. 3LNO.

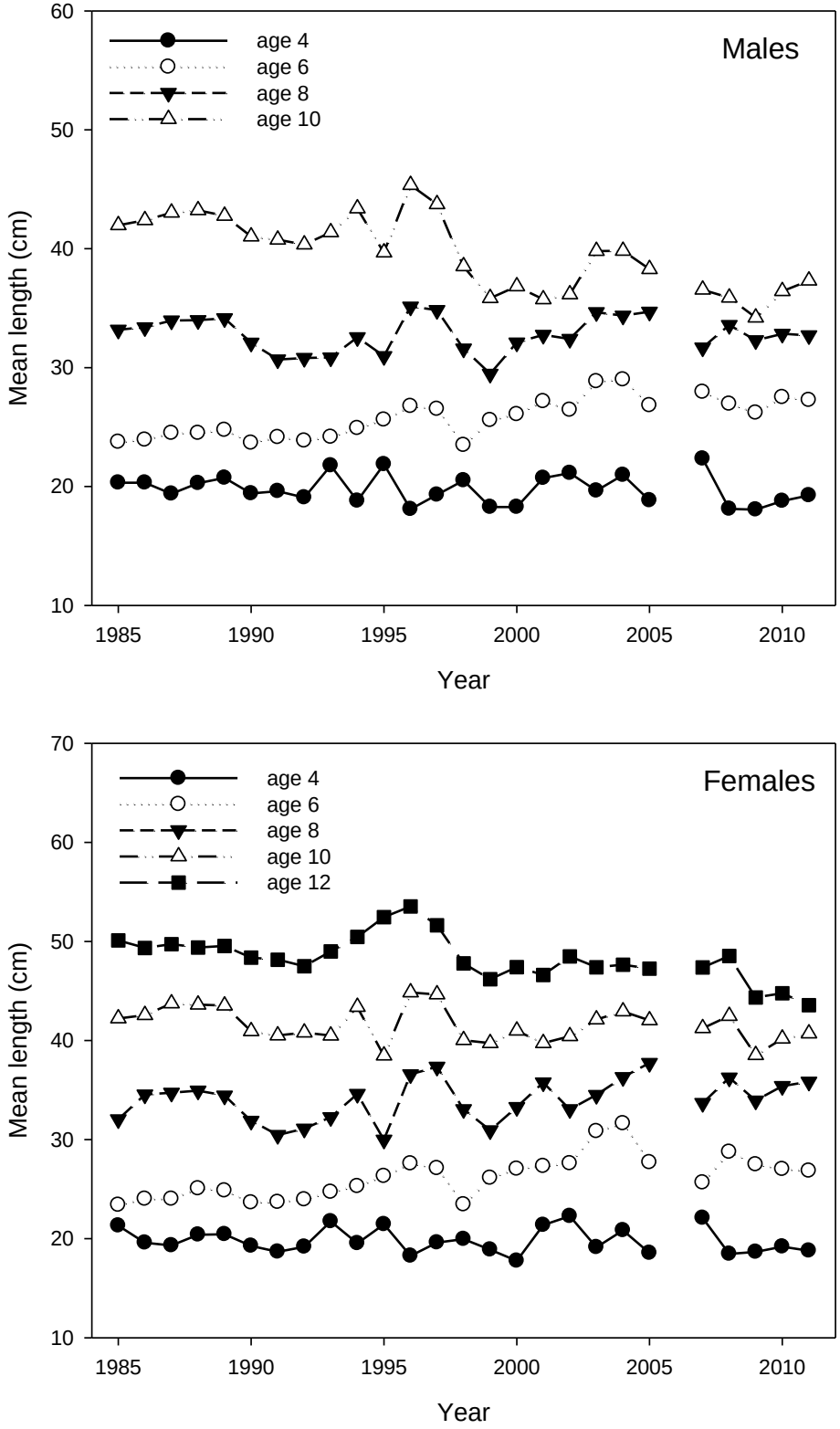

Figure 14. Mean length-at-age for selected ages of Div. 3LNO American plaice from Canadian spring RV surveys.

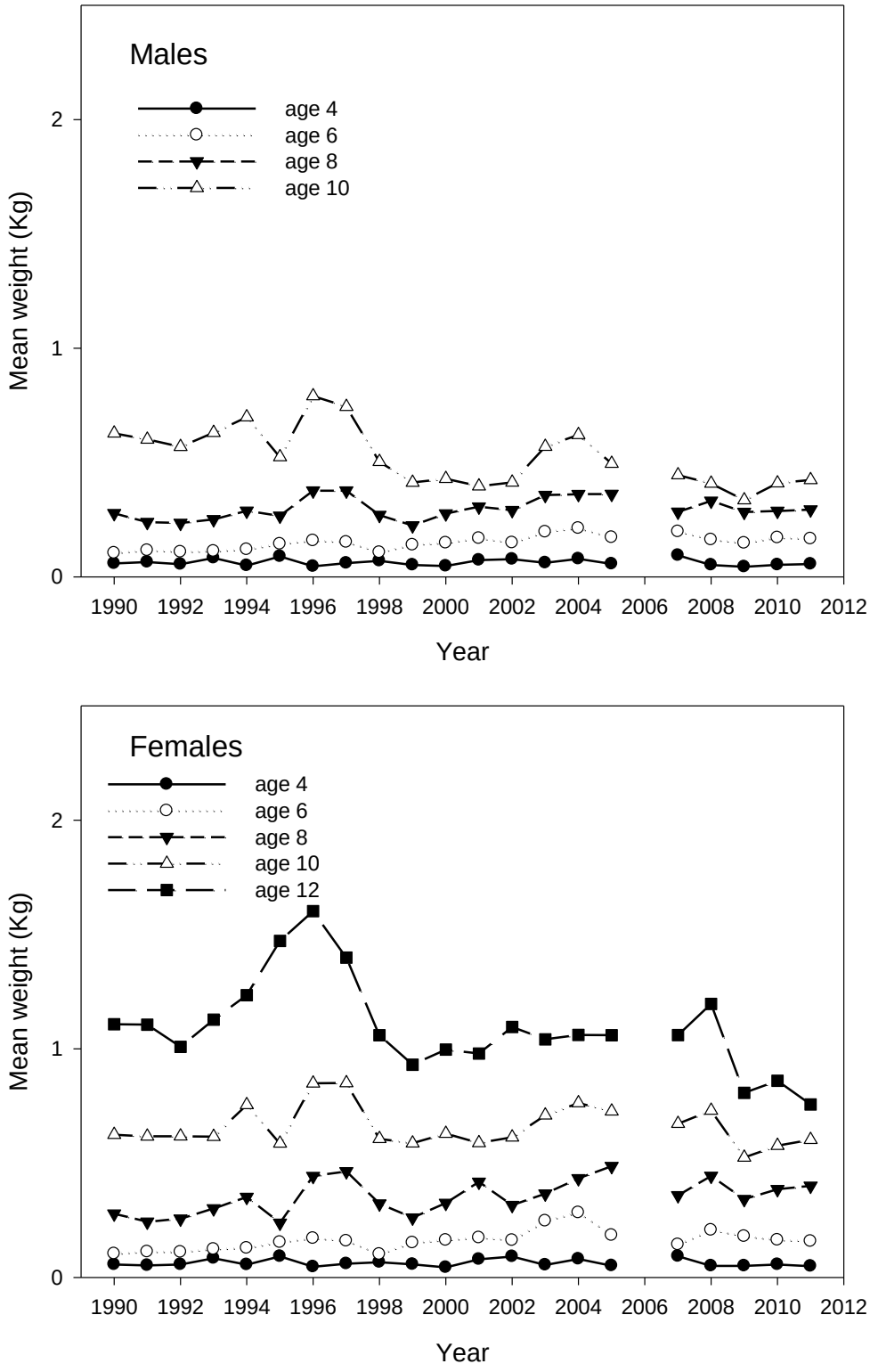

Figure 15. Mean weight-at-age for selected ages of Div. 3LNO American plaice from Canadian spring RV surveys.

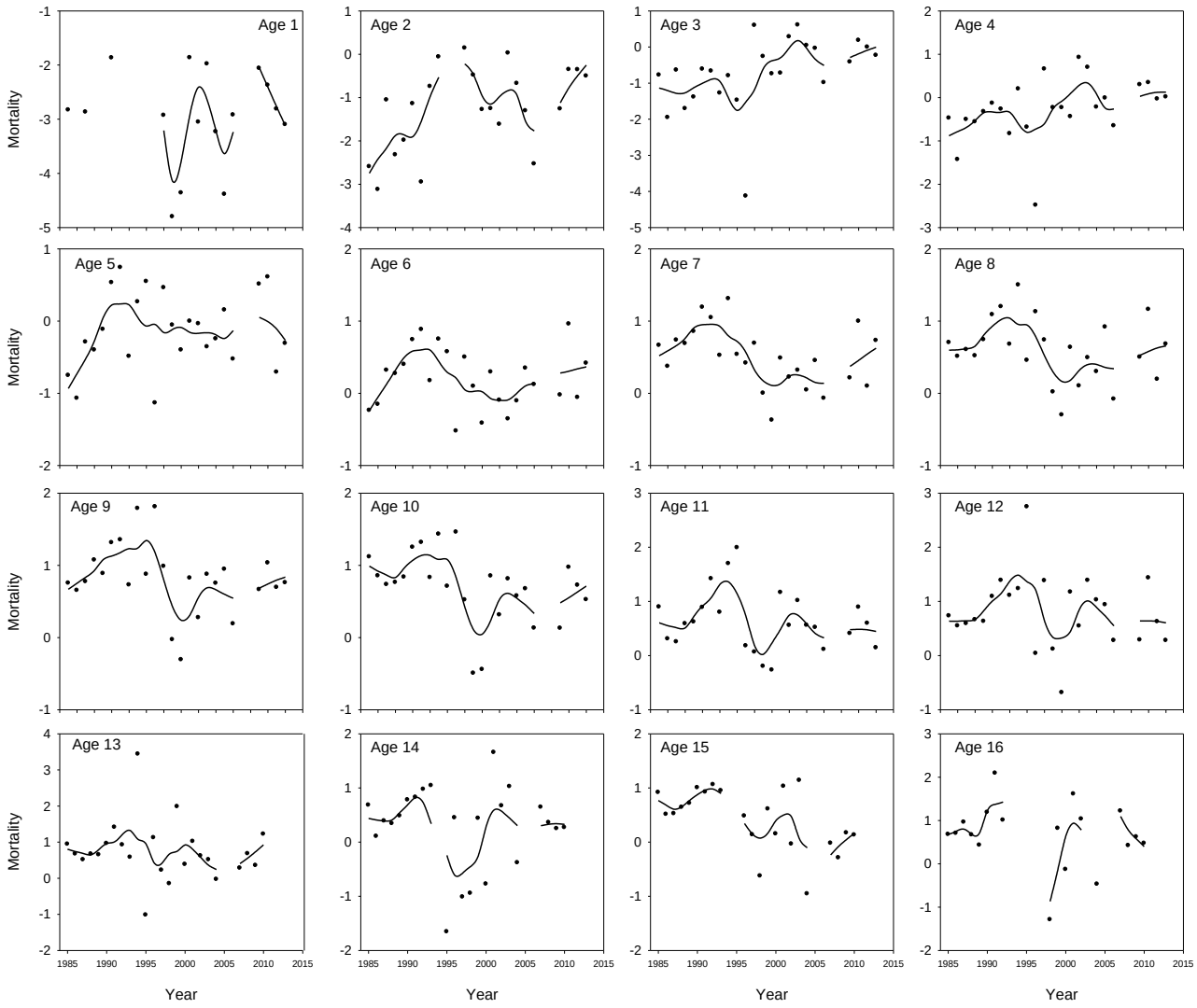

Figure 16. Estimates of mortality for ages 1 to 16 from Canadian spring surveys from 1985 to 2011.

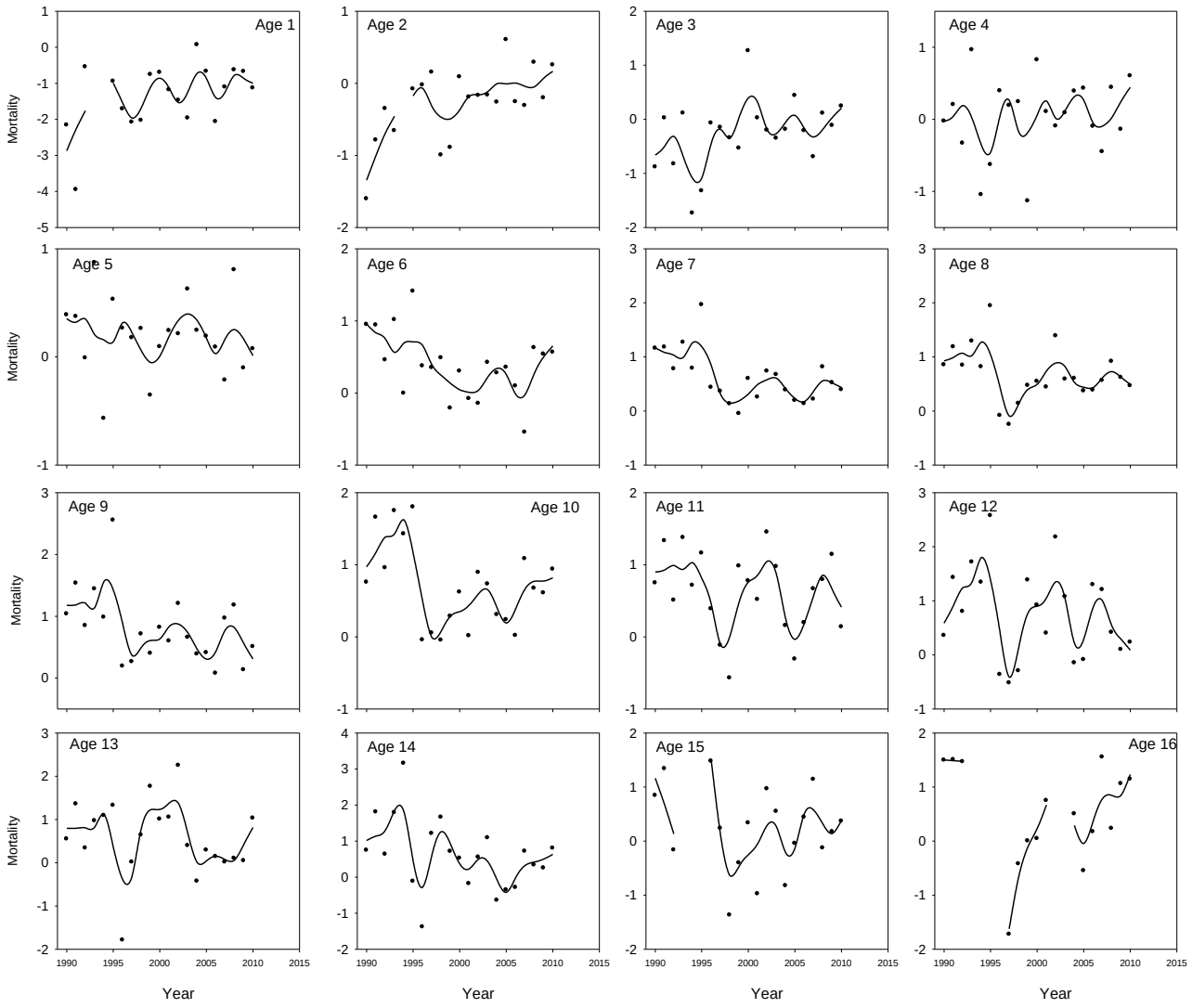

Figure 17. Estimates of mortality for ages 1 to 16 from Canadian fall surveys from 1990 to 2011.

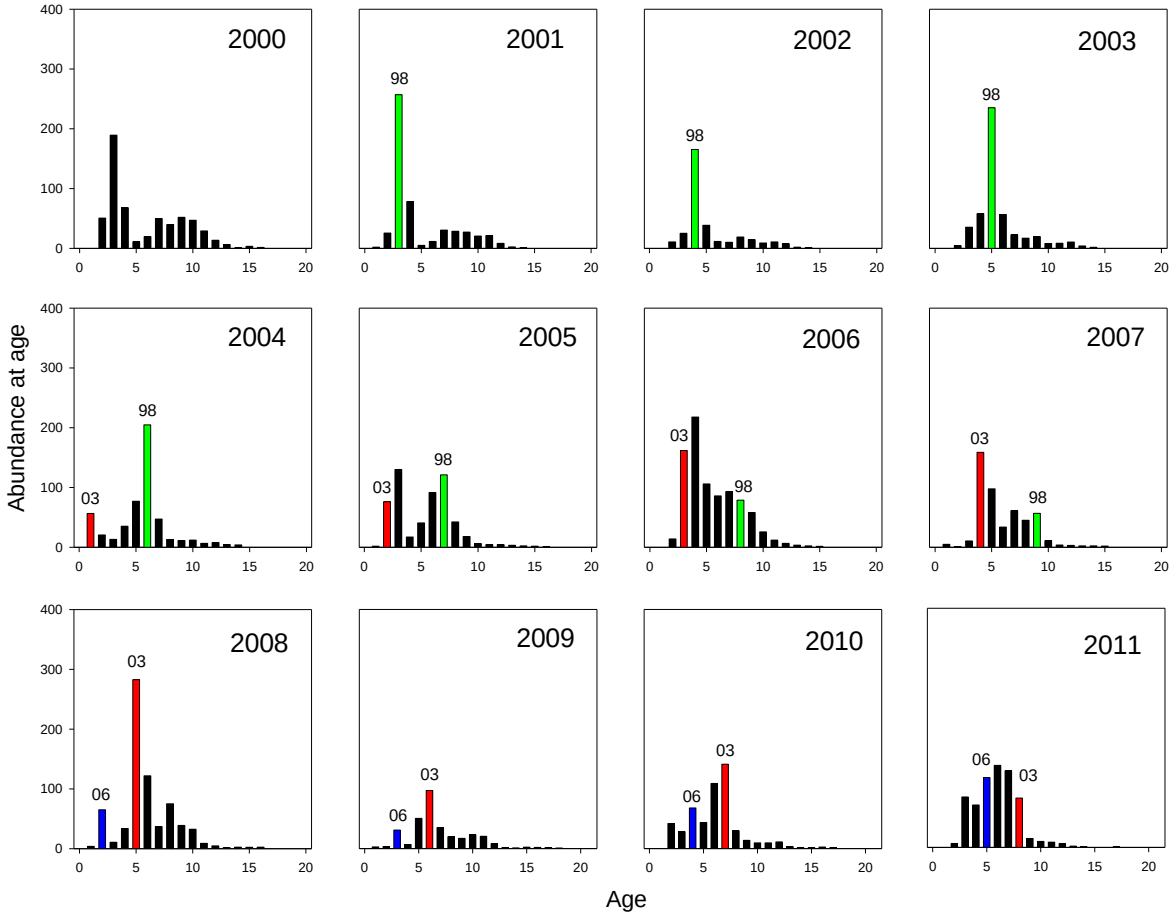

Figure 18. Abundance at age (millions of fish) from 2000 – 2011 in the EU-Spain Div. 3NO spring surveys. The 1998, 2003 and 2006 year classes are labelled.

Appendix A – Analysis of surveys used to calibrate data

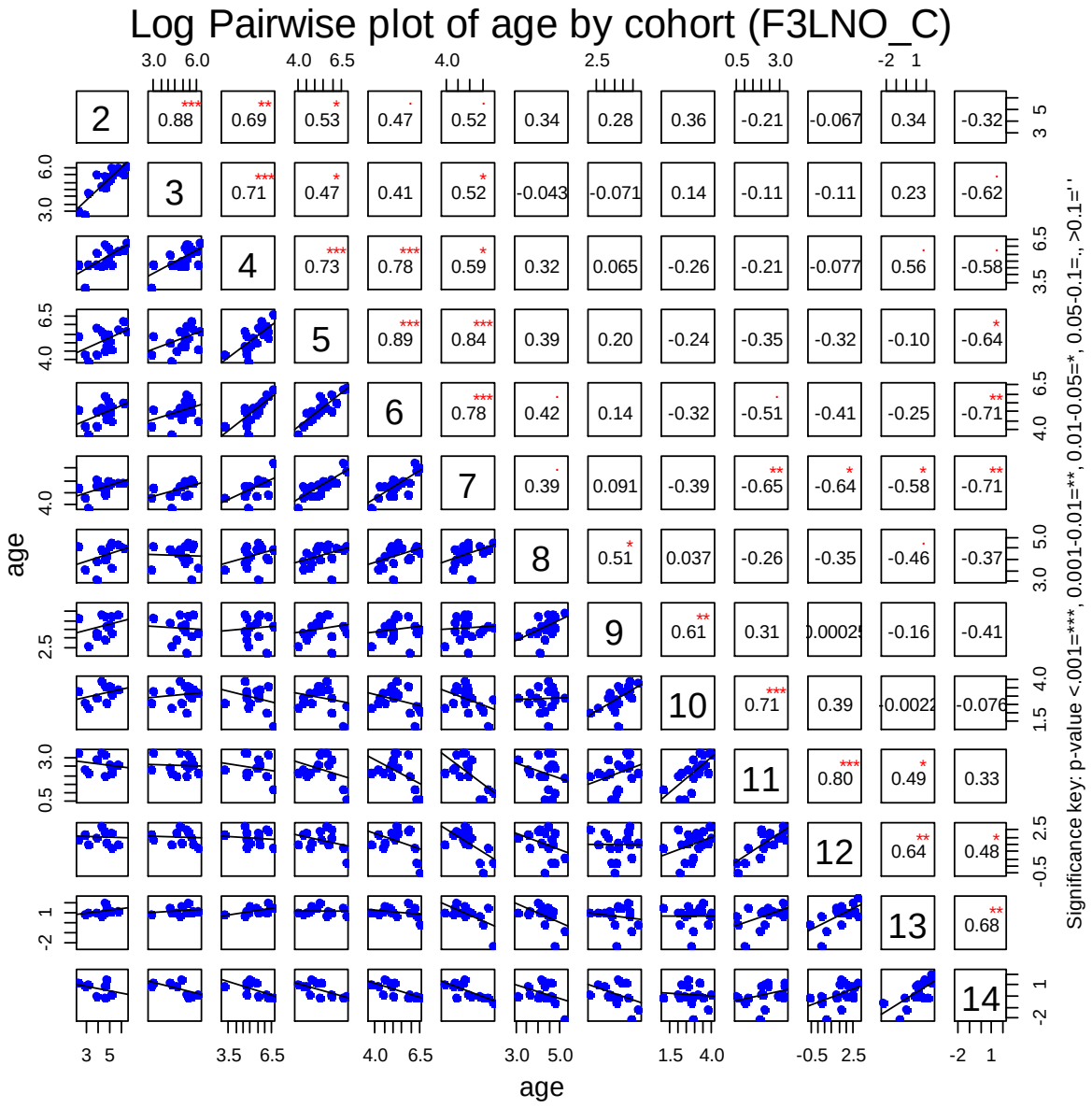

Figure A.1 Pairwise plots of each of the survey indices (Canadian fall survey) by cohort on the log scale.

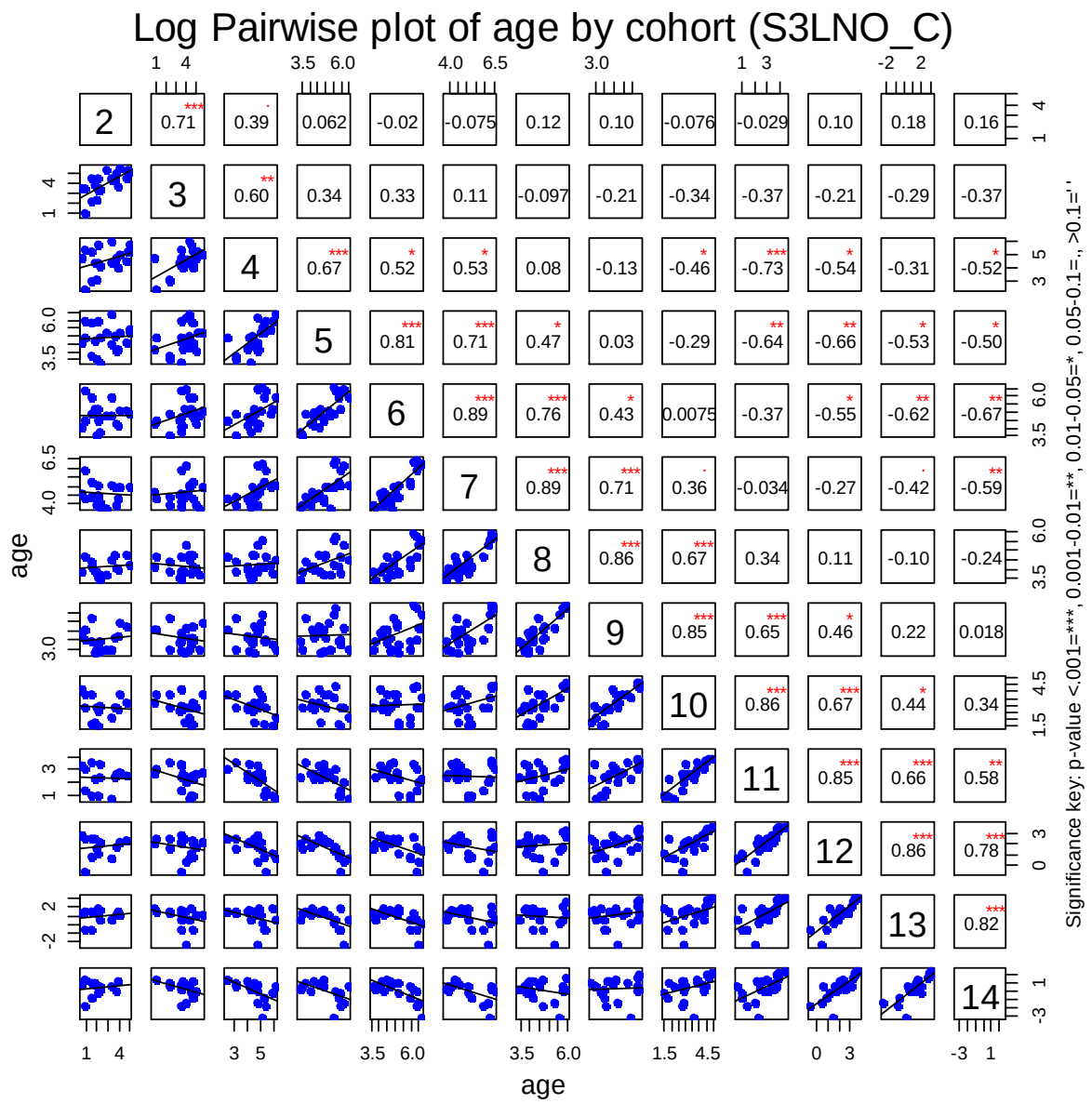

Figure A.2 Pairwise plots of each of the survey indices (Canadian spring survey) by cohort on the log scale.

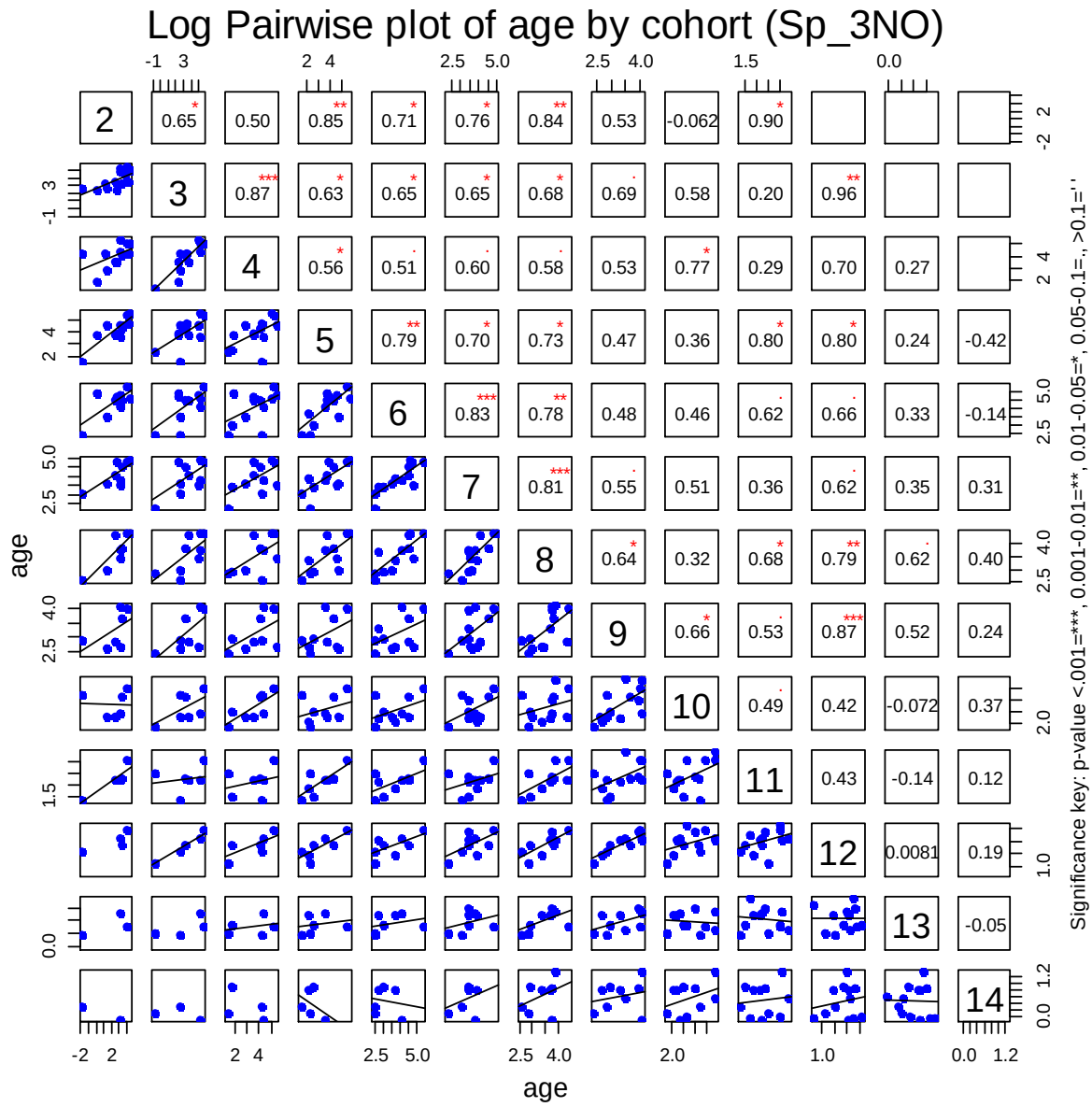

Figure A.3 Pairwise plots of each of the survey indices (EU-Spain survey) by cohort on the log scale.

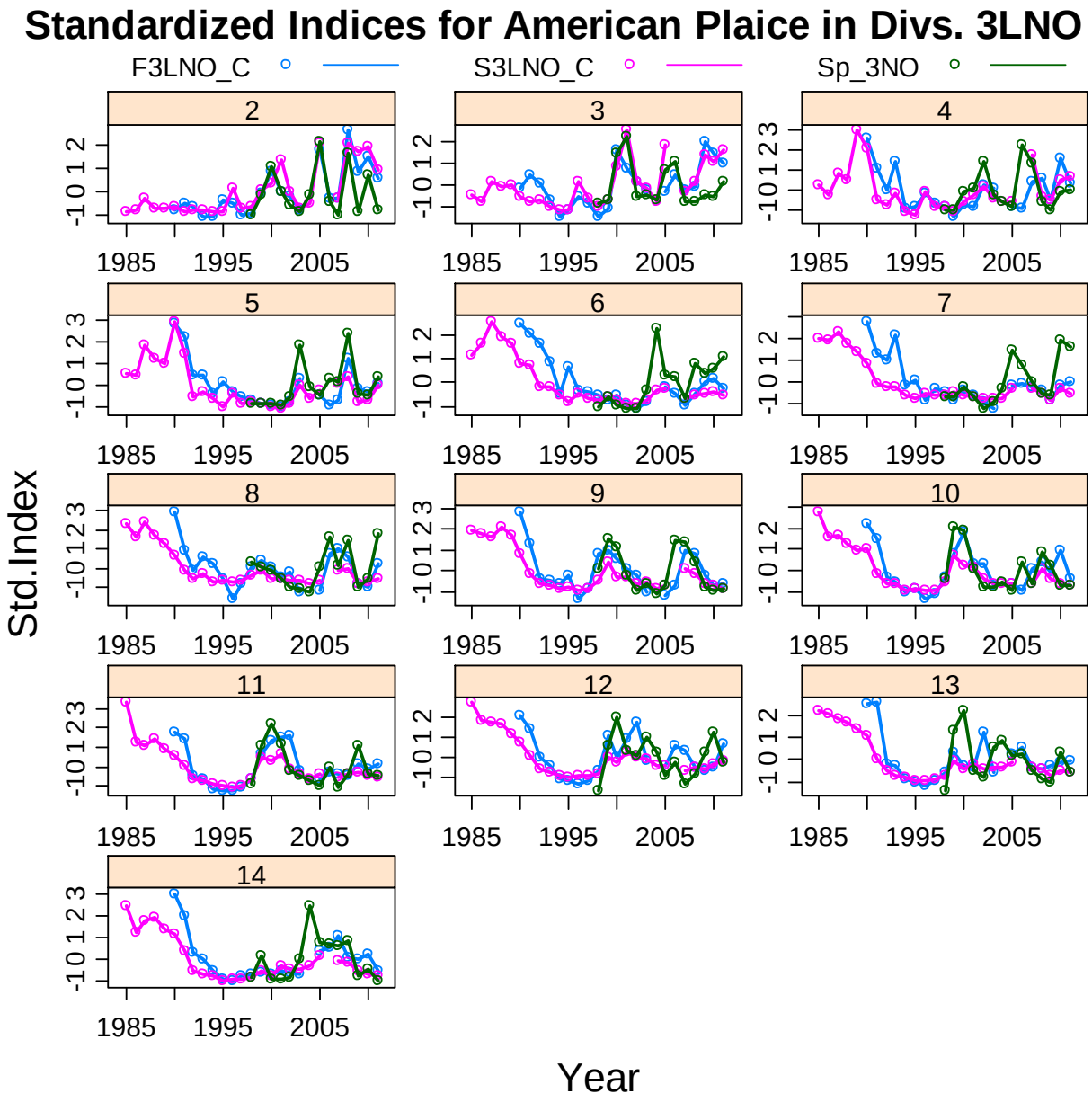

Figure A.4 Standardized age by age abundance between surveys. Only the surveys used to calibrate the VPA are included.

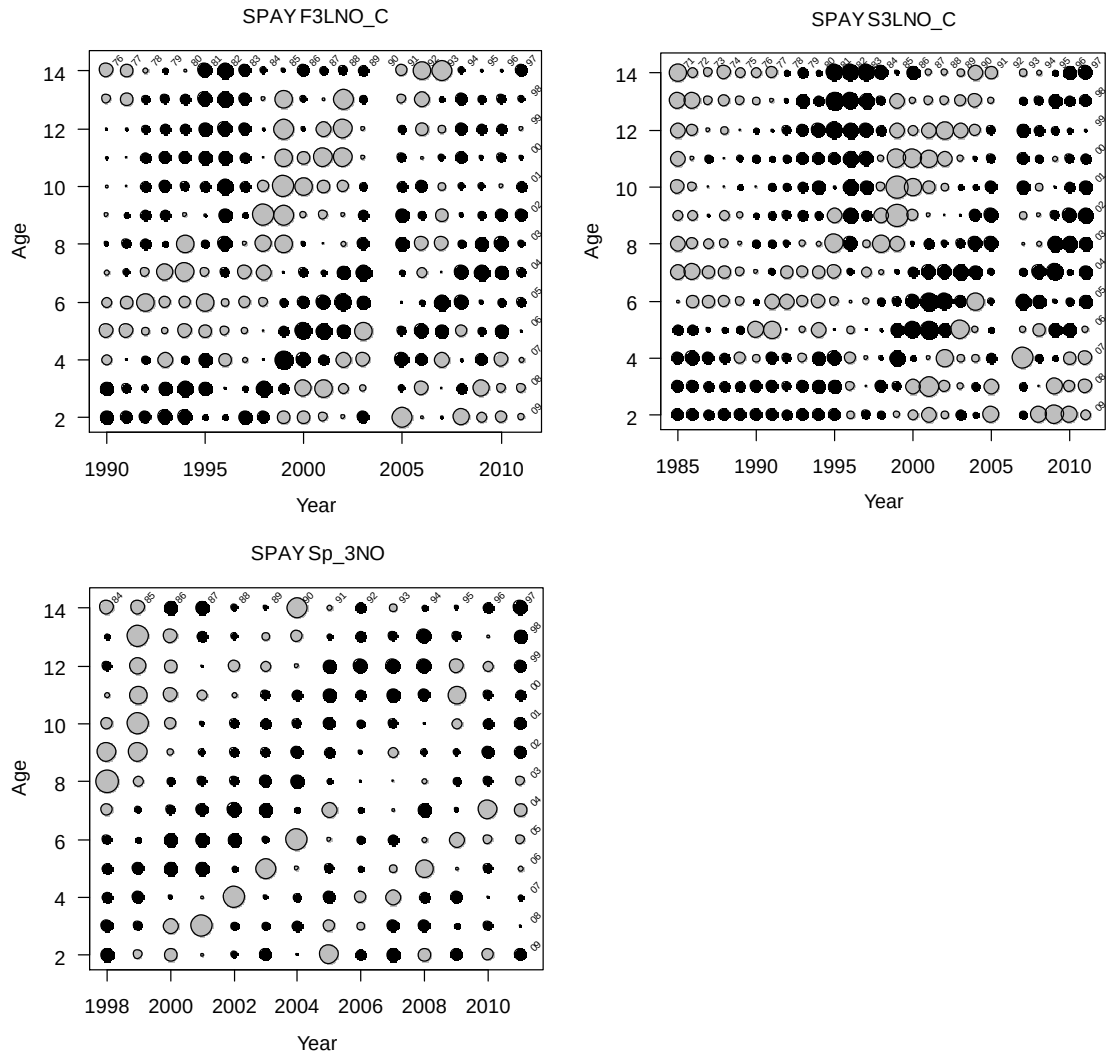

Figure A.5 Plots of standardized proportions by age across years (SPAY) for Can. Fall, Can. Spring and EU-Spain surveys.