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Assessment of American Plaice in 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 American plaice has been generally less than 3500 t since 2007. Since the moratorium, the majority of by-catch is taken in the Canadian yellowtail fishery within Canada's 200-mile limit and in the skate, redfish and Greenland halibut fisheries in the NAFO regulatory area (NRA). Catch for this stock is not known precisely. Both the Canadian spring and autumn surveys show a large decline in abundance and biomass from the mid to late-1980s to the mid-1990s but an increasing trend since that time. Although abundance is increasing in both surveys, the increase is mainly small fish (less than age 5) which are not included in the assessment model. There are indications of increasing numbers of pre-recruits in recent Canadian surveys. The assessment model used is a Virtual Population Analysis (VPA) which is carried out using the ADAPTive framework. Spawning stock biomass has been gradually increasing since the mid-1990s and in 2016 was 30, 000 t, still below the B*lim* of 50, 000 t set for this stock (60% of B_{lim}). Stock weights at age have declined over the last six years (values used in previous assessment revised for 2013 and 2014). Estimated recruitment at age 5 indicates there have been no year classes above the long term average since the mid-1980s. SSB projected during the 2014 assessment was larger than that estimated during the current assessment. The factors which contribute to this difference include: the population retrospective pattern (revised downwards), and a decrease in the weights and proportion mature at age. There is a retrospective pattern present in this assessment which indicates that abundance and SSB has generally been overestimated (average of 11% over four years) and F has been underestimated (average of 10% over four years).

Introduction

Fishery

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 (STACFIS and STATLANT)

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) declined for a couple of years but then began to increase. Agreed estimates of catches by STACFIS indicate that in years where there was sufficient information, misreporting of American plaice bycatch has been occurring. Since 2010, STACFIS has been unable to get a precise estimate of catch.

By-catch levels as estimated by STATLANT 21A have been relatively steady at or less than 2000 t for the past ten years. STATLANT 21A data gave an estimate of about 1400 t in 2014 and Daily Catch Records (DCR) gave an estimate of about 1100 t in 2015 (Table 1) 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 2011-2014, when STACFIS was unable to get a precise estimate of catch, it was decided to estimate catch using the ratio of total effort (where effort was available) in Division 3N in the current year to the previous year and multiply by the agreed catch in the previous year (starting with 2010). This was carried through for three years.

Therefore:

$Catch_y = (Effort_y/Effort_{2010})*Catch_{2010}$
Where y = 2011, 2012, 2013 and 2014.

In 2014, this estimate was 2265 t.

In 2015, SC agreed that estimates of catch from Daily Catch Records (DCR) were to be used for American plaice in Div. 3LNO and that these would be used for catch in 2015. Estimate was 1149 t (including 34 t of discards) in 2015.

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 usually available, and are believed to be substantial during some periods.

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).

There were 41 t of discards estimated from the US yellowtail fishery in the NRA in 2014, and 25 t of discards estimated in 2015 (Sosebee, 2014, 2015).

Canadian research vessel surveys

Survey coverage

A stratification scheme is presented of the survey area in Figure 2. 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; Healey *et al*., 2012) 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 Power *et al*. (2015). For 2014 fall, several strata in Div 3L were not surveyed and these, on average, contain 35% of the American Plaice biomass in Div 3L over the Campelen time series (range 17-85%). Up to 10% of the abundance at age included in the model is also contained in these strata. Therefore this data point is not used in the model.

For 2015 spring, both Divs. 3N and 3O were not covered; therefore this data point is also not used in the assessment model.

Spring

Depth 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 2015, with the exception of 1983. 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 1996-2015 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 2013. 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 2015 are given in Tables 2-4. Please note the shaded columns which represent years that survey coverage was inadequate. In Div. 3L, the biomass index increased consecutively from 2009 to 2013. In 2014, this declined slightly to 65, 800 t. The 2015 value cannot be considered a representative index of the population. 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 double the biomass estimate from Div. 3O. Biomass in 3N increased to the highest point in the Campelen time series in 2007 and has been lower since then. 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, but has been slowly increasing since then but the 2014 value is only 34% 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. 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 somewhat.

Total abundance for Div. 3LNO combined has fluctuated since 1996, but has generally increased (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 historically but has been increasing since 2010 (Figure 5). Mean numbers per tow in Div. 3N and Div. 3O generally increased from the mid-nineties, and has plateaued.

Abundance for Div. 3LNO in the sping has shown an increasing trend since the mid-nineties after the rapid decline over 1990-1994 (Figure 3). The mean numbers per tow increased since the low period in the mid-nineties in all three Divisions but mainly in Div. 3L (Figure 5).

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 generally been greater than 50% since 2001 (except 2006), with 2015 at 71%, the highest value in the time series.

Expanding symbol distribution plots of catch of American plaice from the Canadian Spring RV Survey (kg/tow standardized to tow length) indicate that A. plaice are distributed over the entire Grand Banks, catches of American plaice on the shelf of the Grand Bank appear similar in recent years, with a few larger tows in Div. 3N in 2013 (Figure 7). Estimates of biomass by strata indicate which strata are important in the distribution of American plaice. In Figure 8, it can be seen that in the mid-1980s, many strata were important for American plaice but especially Strata 348 and 364 in Div. 3L. In the 1990s most of the biomass contained in these strata (and many others) had disappeared. In the spring survey, in 2015, these plots indicate that stratum 360 in Division 3N is important (Figure 8).

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 2015, fall surveys were also carried out in Div. 3NO (with exceptions listed above). 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. Biomass estimates from the fall survey increased from 2011 – 2015 in all three Divisions (with the exception of 2014). Biomass estimates from 2015 for these Divisions were 92,600, 107, 600, and 42, 100 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 has been declining since the highest point in the survey in 2008. During 1995 to 1997, Div. 3N constituted on average 40% of the Div. 3NO total while the average since 2010 has been about 76% of the Div. 3NO

total. Over time, the proportion of the biomass found in the three Divisions has changed, with Div. 3O ~20% in recent years.

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 2015 index representing about 40% of that of 1990 (Figure 9). Mean weight per tow has shown the largest decline in Div. 3L (Figure 9). Mean weight per tow estimates from Div. 3N are at or above levels seen in the early 1990s, while the three most recent data points of mean weight per tow in Div. 3O are amongst the lowest in the time series (Figure 9).

Abundance for Div. 3LNO combined (Figure 3) showed a substantial decline from 1990 to 1998 but has been generally increasing since 1998. Mean numbers per tow show the same pattern (Figure 10). By Division, the largest decline in the time series was once again in Div. 3L (Figure 9). However, mean numbers per tow is generally higher in the current period compared to the mid-1990s, with a large increase especially in Div. 3L (Figure 10).

Tables 12-15 and Figure 11 show the abundance by age for the fall survey. 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 83% in 2015 (Table 15). This large value is due in part to a substantial estimate of age 3s (2012 year class) in the most recent year.

Plots of distribution by weight per tow (Figure 12) for 2007-2015 show that American plaice are distributed throughout the Div. 3LNO area in the fall. However the area of highest concentration is the most recent two years is on the shelf of Div. 3L (Figure 12). An examination of the distribution of numbers at age indicates that this concentration is mainly of young fish (<5 years old) (Figure 12). Biomass estimates by strata when plotted (Figure 13) show that both Stratum 360 and 374 are important in the fall survey in recent years.

Plots of numbers per tow by age (Figure 14) indicate that young fish are found mainly in Div. 3L on the shelf of the Grand Banks; whereas larger fish are found outside the 200-mile limit in Div. 3N.

Maturities

Age and length at 50% maturity were produced from spring RV data. Maturity data were collected during research vessel surveys from 1960-2014. Stratified random surveys were used where possible (1971-2014, 2006 and 2015 surveys were not used because 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 15). For females, estimates of A_{50} have shown a large, almost continuous

decline, from the beginning of the time series to about 1990. Cohorts since then females have had a fairly constant A_{50} of 7.5 to 8 years compared to 11 years for cohorts at the beginning of the time series (Figure 15).

Estimates of maturity at length were produced using the data described above and are presented by cohort in Figure 16. L_{50} declined for both sexes but recovered somewhat 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 L_{50} of most recent cohorts for females is in the range of 34-35 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 2014, except for 2006 when survey coverage was too poor to be considered representative. Coverage in 2015 was also considered too poor to be representative of the population. 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 17 and 18). However, both weight and length was lower in 2014 (no 2015 value) for most ages for both males and females.

EU-Spain Div. 3NO survey (SCR 16/10)

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 (NRA). 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. Estimates of both indices from the EU-Spain survey varied without trend over the time series (González-Troncoso *et al*., 2016).

Numbers at Age

Numbers at age (1997 to present) are used in the assessment model. Annual 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) to get numbers at age except in 2006 where there were problems with the Canadian spring survey and the combined 1997-2005 age length keys were applied to the 2006 data This resulting mean numbers per tow at age data is found in Table 16 (and Figure 19) and is used as input into the analytical assessment.

EU-Spain Div. 3L survey (SCR 16/15)

There is also a survey carried out in the NRA of Div. 3L which indicates a general increase in biomass and abundance indices for American plaice since 2010, similar to the Canadian surveys in this area (Roman *et al*., 2016). In addition, in 2015, there is a peak in length frequencies at 14 cm, which coincides with high numbers of young fish in the Canadian fall survey. This index is not included in the analytical assessment for this stock.

Comparison of Surveys

Comparison of Canadian Spring, Fall and EU-Spain Div. 3NO Surveys

Overall, abundance and biomass estimated from Canadian 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 on the Grand Banks in Div. 3L in the fall in the most recent years (2013, 2015) as well as some larger catches on the tail of the Grand Banks in southern Div. 3N (Figures 7, 8, 12, 13, 14).

A comparison of standardized indices illustrating the consistency of dataset currently used to calibrate the analytical assessment is presented in Figure 20. In these figures each survey-age time-series is standardized to have mean 0 and variance 1 and are directly comparable. Figures 20 and 21 show standardized age by age abundance of surveys and standardized proportion by ages across years (SPAY plots). These are useful for comparing surveys' age trends. For the past 3-4 years, the age composition for the EU-Spain Div 3NO survey is showing different trends than the Canadian RV surveys, especially at the earliest and oldest ages (Figure 20).

Plots of the standardized proportions by age across years (SPAY) provide additional perspective on the cohort consistency within each of the survey indices (Figure 21). 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. Most relatively strong year classes do not make it into the model (age 5) (Figure 21).

The abundance of fish <5 years old has increased in both the Canadian spring and fall surveys in recent years, and the proportion of the annual total they comprise has also been increasing (Figure 22). This indicates above-average pre-recruitment. In addition, there are some inconsistencies among surveys, with the high number of pre-recruits observed in the Canadian surveys not being seen in the EU-Spain survey, probably due to differences in survey coverage and/or design (Figure 22).

Catch at age

Catch at age from Canadian fisheries in 2013-15

Results of the catch at age calculations for American plaice catches from 2010-2013 are given in detail in Dwyer *et al*. (2014), and for earlier catch at age in earlier documents by Rideout *et al*. (2011) and Dwyer *et al*. (2005, 2007, 2009, 2010) and Morgan *et al*. (1999a,b; 2001; 2002, 2003). In 2013, catch at age was calculated even though all the sampling hadn't been carried out to that point. Therefore the catch at age was updated in the current assessment (Table 17). When sampling was complete, there was a clear trend toward a younger catch at age (Figure 23).

In 2014-15, sampling data collected by observers were available from by-catch of A. plaice in Canadian fisheries targeting yellowtail in Div. 3NO and from Greenland halibut fisheries in Div.

3L. In 2014, the Canadian catch of A. plaice in Div. 3LNO was 748 tons, slightly more than the average of 586 t, from 2011-2013 (Table 18). In 2015, the bycatch was 436 t. Most (84%) of the 2014-15 by-catch came from the directed fishery for yellowtail flounder. This percentage is lower than it has been in most recent years (>96% for most years) and is due to more fishing of Greenland Halibut and a shift of effort away from the NRA in the major Canadian yellowtail fishing company towards Div. 3O where plaice bycatch is less problematic. The ratio of A. plaice by-catch to the directed catch of yellowtail (not to the total catch of all species in the yellowtail fishery, which is how the by-catch regulation is applied) was 13% in 2012, 12% in 2013, 9.5% in 2014, and 4.1% in 2015.

The fishery for yellowtail on the Grand Bank reopened in 1998, and since the beginning of 2000, fishing for this species has been permitted in Div. 3L, resulting in some by-catch of American plaice there, although from 2011-2013, 62% of the bycatch on average was from Div 3N and in 2014 74% of the total bycatch is in Div. 3N. In 2015, however, only 30% was in Div. 3N, and more (53%) was in Div. 3O. This is coincident with the main yellowtail fishing company changing their fishing pattern to move more into Div. 3O to avoid bycatch of A. plaice (Tables 17-19).

There were also seasonal differences in the by-catch of A. plaice in the last two years, compared to the previous few years: in 2011 and 2012 catches were distributed mainly in the first half of the year, but from 2013 onward, catch was distributed evenly throughout the year (Table 17). In 2014 and 2015, catches were highest in the second and fourth quarters (Tables 18 and 19). Generally there is less catch in the first quarter and the third quarter is when there is usually a closure of the Canadian yellowtail fishery intended to cover the main spawning period for yellowtail flounder.

Sampling levels of the Canadian catch of A. plaice in Div. 3LNO in 2013, 2014 and 2015 were improved over the previous three years (2010-2012) but sampling efforts are not always proportional to catch levels. For example, in 2014, 40% of the catch is from the fourth quarter of the year and yet there were no length sampling or otoliths collected for that time period. There are other such circumstances where the sampling is not adequately carried out. The last full year where 100% observer coverage existed in the Canadian yellowtail fishery was 2004.

The same weight-length relationship was used as in recent years (log weight = 3.3247 log length – 5.553) and the sum of products check in 2013-2015 was within 2% of the catch. The Canadian catch in 2013-15 consisted of about 1.7, 1.2 and 0.5 million A. plaice, respectively, compared to between 0.79 and 0.48 million fish per year in 2011 and 2012. Ages in the 2013 catch ranged from 4 to 26, and catch was comprised mainly of fish aged 8 to 10 years old, with the peak being the 2002 year class (age 9) (Table 20). Ages in the 2014 catch ranged from 4 to 23, and catch was comprised mainly of fish aged 7 and 8 years old, with the peak being the 2006 year class (age 8) (Table 21). The catch at age in 2015 looks different than in the two previous years, with a range from 5-27 and a bimodal distribution with one peak at age 8 and another at age 11/12 (Table 22). In addition, the proportion of fish > 11 years was higher in 2015, with 56% of the catch in this age range, compared to 23 and 15%, respectively, in 2013 and 2014.

The mean fish weight in the 2013 catch was 0.62 kg per fish, in 2014 was 0.64 kg per fish, and in 2015, it was 0.79 kg/fish. The most recent year indicates a slight increase in mean fish weight as there had been a trend in declining weight from 2009 (0.802 kg/fish) until 2012. The 2009 value was the highest in the recent period, and the 2012 value the lowest. Reasons for the annual fluctuations are likely due to the considerable seasonal and temporal differences in the catches, as noted above. In particular the 2011 and 2012 fisheries occurred mostly in the first half of the year, and had a lower

percentage of catch in Div. 3N, unlike most recent years. Both these factors would be expected to contribute to lower overall weights at age. However, the lower sampling levels in recent years, particularly 2009-12, add uncertainty to comparisons of the age compositions and weights at age.

Catch at age from other countries

For 2014 and 2015, length frequency data were available from EU-Portugal and EU-Spain (in addition to the Canadian data above). There was some sampling from Russia and Estonia, but very little, and the catch is bumped up accordingly. Details on the sampling levels and descriptions of the fisheries are contained in Vargas *et al.* (2015; 2016), González-Costas *et al*. (2015, 2016), Fomin and Pochtar (2016) and Fomin *et al*. (2015). In all cases, age-length keys from the Canadian spring surveys in Div. 3LNO were used to derive age compositions, which were then combined and adjusted to the total catch to account for all non-sampled catches. Catch at age, weight at age (using the weight-length relationship used above) and sum of products (SOP) for 2014 and 2015 are given in Tables 21 and 22.

In 2014 and 2015, American plaice were mainly 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 (see above). Length frequency sampling came from all Divisions in the 130 mm mesh fisheries from Portugal, and from Div 3N in the 280 mm mesh from the skate fishery. Peak catches ranged between 28-36 cm for the 130 mm mesh size in Divs. 3LNO and slightly larger at 44 cm in Div. 3N (280 cm mesh size). Length frequency sampling was mainly from Divs 3NO in the 280 mm sector, and Div. 3LNO in the 130 mm sector. Spanish frequencies indicated a peak at 33 cm in 2014 in the 280 mm fishery; the peak length in the 130 mm fishery was slightly smaller at 29 cm. In 2015, these were 37 and 32 cm, respectively. The small amount of sampling data available for Russia indicated a peak at 37 cm in Divs. 3LO in 2015. In 2014, there was more sampling, with a peak at 39 cm in Div 3L, at 40 cm in Div 3N and a peak at 46 cm in Div. 3O (but with very little sampling in this Division). In the Russian fishery, mainly the bycatch of A. plaice is taken from the yellowtail flounder fishery.

Mean lengths and weights at age in the Canadian fishery were slightly higher at younger ages than in international catches (Tables 20-22), likely a result of larger mesh size used in the Canadian fishery and also the use of research vessel age-length keys for the catches of non-Canadian fleets.

Virtual Population Analysis (VPA)

A formulation of ADAPT using the same base structure that was used in the accepted VPA from the 2014 assessment (Dwyer *et al*., 2014) was run. Formulations were similar to previous assessments (Morgan et al., 1999a; 1999b; 2001; 2002; 2003; Dwyer *et al*., 2007a, 2008, 2009, 2010; Rideout *et al*., 2011). The ADAPT used catch–at-age for ages 5 to 14 with an age 15 plus group which included all catch from ages 15 to 22 (Table 23). The ratio of F on the plus group to F on the last true age was set at 1.0. M was set at 0.2 except at 0.53 for all ages from 1989 to 1996 (Morgan and Brodie, 2001; Dwyer *et al*., 2007b; 2008). Beginning of the year weights-at-age and maturities-at-age are given in Tables 24 and 25. The calibration matrix consisted of the following input data (see Table 26):

- Catch at age (1960-2015) (ages 5-15+);

- Canadian spring RV survey (1985-2014) (no 2006 or 2015 value) (ages 5-14);
- Canadian autumn RV survey (1990-2015) (no 2004 or 2014 value) (ages 5-14); and
- EU-Spanish Div. 3NO survey (1998-2015) (ages 5-14).

The results of an ADAPT run using the formulation described above are given in Table 27 and Figures 24-27. The model provides a reasonable fit to the data. The mean square of the residuals was 0.33. Relative errors on the population estimates ranged from 0.11 to 0.42. The relative errors on the catchabilities (q) were all less than 0.2. The residuals from the Canadian spring survey showed a general increasing trend until around 2008 and no real discernable pattern thereafter. Residuals from the Canadian fall survey show a decreasing trend from 2009 onwards. The residuals from the EU-Spain Div. 3NO survey showed mostly negative residuals in the past two years (Figure 24). In all surveys, there is some evidence of auto-correlation in the residuals. The fit of the predicted and observed survey estimates indicates that there are periods where the model either over- or under-estimates what is observed for all surveys, but especially the EU-Spain survey (Figure 25). Residuals are larger for the older ages in the fall survey but are fairly low overall (Figure 26). The value for age 5s in the EU-Spain Div. 3NO survey is also high. Survey qs show little variability, perhaps with some tendency for lower qs for the youngest fish for spring and EU-Spain Div. 3NO surveys (Figure 27). Fall surveys catch more small fish than spring surveys. Qsfrom the EU-Spain Div. 3NO survey show a different pattern than the other surveys.

Population numbers and F from this run are shown in Tables 28 and 29. Biomass was calculated by multiplying the population numbers at age by the beginning of the year weights (stock weights) at age. The VPA analyses showed that population abundance and biomass declined fairly steadily from the mid 1970's. Biomass has been relatively stable since 1995 (Figure 28) increasing over the last number of years. Average F on ages 9 to 14 showed an increasing trend from about 1965 to 1985. There was a large peak in F in 1993, which may be an artifact of extremely low catches during the moratorium. F since 1995 has been generally lower than in the earlier period but increased fairly steadily from 1995 to 2000. F has been decreasing since then. Average F on ages 9-14 in 2015 was 0.08 (Table 29; Figure 28).

Spawning stock biomass was calculated by multiplying the biomass at age by the female maturity ogive (Table 30). SSB has shown 2 peaks, one in the mid-1960s and another in the early to mid-1980s. It declined to a very low level (less than 10 000 t) in 1994 and 1995 but has been increasing slowly since that time (Table 30; Figure 29). Stock weights have declined over the last six years (values used in previous assessment have been revised for 2013 and 2014) (Figure 30). Recruitment has been generally poor since the 1986 year class, although numbers of recruits from 2010-2013 cohorts are higher than those from the early- to mid-2000s (Figure 29). An examination of the stock recruit scatter shows that above 155 000 t only good recruitment has been observed and no good recruitment observed at SSB below 50 000 tons (B_{lim}) (Figure 31). The most recent (2012) year class is in the lower left of the plot. The estimate of SSB at the beginning of 2016 was 30, 000 t, 40% below the B*lim* of 50 000t.

Changes since last assessment

Spawning stock biomass projected during the 2014 assessment was larger than estimated in the current (2016) assessment (Figure 30). The factors which contribute to this difference include: the population retrospective pattern (revised downwards), and a decrease in the weights and proportion mature at age (the values assumed in the 2014 projections were higher than those based on recent data). The 2013 catch at age was updated to include Canadian length frequencies that had not been available last time the stock was assessed. The new length frequencies resulted in an increase in the proportion of young fish in the catch at age. Catch weights at age have been declining for a number of years. Issues have been reported regarding the quality and coverage of Canadian commercial sampling in recent years (SC report June 2015).

Retrospective Analysis

Retrospective analyses were conducted by sequentially removing one year of data from the most recent year for a comparison of 5 years. There is a retrospective pattern present (example of abundance in Table 30 and abundance, biomass, SSB and recruits in Figure 32) indicating that abundance and SSB has generally been overestimated (average 11% over four years) and F has been underestimated (average of 10% over four years).

Reference Points

The SSB for this stock is estimated to be 30, 000t, 40% below B_{lim} (50 000 t) and fishing mortality in 2015 was below F_{lim} (0.31).

Catch sensitivity runs

As stated above, STACFIS determined that STATLANT 21 could not provide a reliable estimate of catch in 2014, and decided to estimate catch for 2014 using the same method employed for 2011-2013. STACFIS recommended the use of STATLANT 21 catch for Canadian fisheries and Daily Catch Records for fisheries in the NRA to estimate catch from 2015.

A sensitivity analysis was run to examine the impact of using catch estimates in 2014 and 2015 from the 'effort method' (used from 2011-2013) and daily catch records (DCR). Two alternate analyses from the above, using different catch estimates, were carried out: 1) effort method in 2014 and 2015 and 2) DCR in 2014 and 2015 and compared with the agreed catch estimates outlined above. There were no major differences in either model fit or model output estimates. The agreed catch scenario above was used to describe stock trends (including projections). However STACFIS emphasized that if biases in catch exist over longer periods, the differences in outcomes would not be inconsequential and would very likely alter the perception of the stock.

Stochastic Projections

Simulations were carried out to examine the trajectory of the stock under 2 scenarios of fishing mortality: $F = 0$ and $F = F_{2013\text{-}2015}$ (0.08). The three year average was chosen rather than the value for

2015 because of the retrospective pattern. 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 2016 population numbers ('000)	CV on population estimate	Weight-at-age mid-year (avg. 2013-2015)	Weight-at-age beginning of year (avg. 2013-2015)	Maturity-at-age (avg. 2013-2015)	Rescaled PR relative to ages 9-14 (avg. 2013-2015)
5			0.133	0.102	0.013	0.085
6	10289	0.423	0.216	0.177	0.048	0.213
7	13113	0.301	0.287	0.246	0.155	0.403
8	22862	0.230	0.389	0.335	0.426	0.690
9	14141	0.201	0.463	0.431	0.740	0.858
10	11882	0.184	0.575	0.534	0.916	0.943
11	5890	0.180	0.687	0.639	0.978	0.967
12	4157	0.175	0.860	0.790	0.996	1.046
13	3390	0.166	1.014	0.945	0.997	1.108
14	1236	0.176	1.163	1.089	0.999	1.077
15	3078	0.111	1.809	1.491	1.000	1.077

Simulations were limited to a 3-year period. Recruitment was resampled from all historical recruitments produced from SSB<B_{lim}. The simulations contained a plus group at age 15.
SSB was projected to have a probability of >0.95 of being less than B_{lim} by the start of 2019 under both fishing mortality scenarios (Table 32 and Figure 33). However under each scenario there is a >0.95 probability that SSB in 2019 will be greater than in 2016.

Under status quo fishing mortality ($F_{2013-2015}$), projected removals increase slightly in each year.

Conclusion

Bycatch of American plaice in Div. 3LNO comes mainly from the yellowtail fishery inside Canada's Exclusive Economic Zone and in the skate, redfish and Greenland halibut fisheries in the NRA. Canadian spring and fall RV surveys generally show an increase in biomass and abundance since the moratorium. Historically the largest decline was in Div. 3L, but in the past three years, this Division has shown the largest increases since the early 1990s, especially in the number of young fish (<5 years old). Division 3O, however, has shown some declines. The EU–Spain survey in Div. 3NO varied without trend since 2000. The stock is widely distributed throughout the survey area with larger catches occurring on the shelf of Division 3L (young fish) and outside Canada's 200-mile limit in Div. 3N. There appear to be large numbers of pre-recruits (fish less than age 5) in the two most recent surveys but it remains to be seen whether these will enter the fishery. Age at 50% maturity has declined over time. The current VPA indicates that the stock is increasing in size but slowly, and the SSB in 2016 is still below B_{lim}. However, this model shows there is a retrospective pattern and some indication that there is inconsistency between the Canadian surveys and the EU-Spain survey. Short term projections indicate that SSB will not reach Blim in the next three years under either fishing scenario (F=0 or $F_{2013-2015}$).

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Table 1. Nominal catches (t) of American plaice for NAFO Divisions 3LNO, 1960-2015 and TACs from 1973 to 2015.

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	450	797	1,247	2363[f]	0
2012	266	1,042	1,311	2148[f]	0
2013	1,041	1,079	2,177	3016[f]	0
2014	747	642	1,389	2265[f]	0
2015	442	665	1,107	1149[g]/1842[f]	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.

[f] Estimated catch based on ratio of effort in Div. 3N (ex. $Catch_{2011}=(Effort_{2011}/Effort_{2010})*Catch_{2010}$) (see text for details).

[g]From Daily Catch Records (DCR)

Table 2 . Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian spring surveys in Div. 3L in 1996-2015 (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	2012	2013	2014	2015
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	4.1	2.4	3.2	-
	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	8.0	3.4	6.0	-
	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	1.8	1.4	1.3	-
	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	2.0	2.5	2.1	-
	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	1.8	3.9	5.1	3.0
	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	17.7	13.7	17.7	3.0
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	3.4	7.2	3.4	-
	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	6.1	3.8	6.6	-
	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	0.8	1.3	0.4	0.1
	343	0.3	0.0	+	0.6	0.2	+	+	0.1	+	0.1	0.3	0.1	0.0	0.2	-	0.4	0.5	0.1	0.1	0.1
	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	2.5	4.9	3.8	1.1
	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	2.1	2.3	3.3	-
	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	5.2	4.7	3.7	1.1
	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	4.8	1.7	2.2	4.3
	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	2.3	5.0	2.3	1.6
	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	2.0	9.5	2.9	4.7
	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	0.5	3.9	2.3	1.1
	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	30.4	44.3	30.9	14.1
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	0.4	2.8	0.7	0.9
	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	0.3	2.2	1.0	2.2
	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	-	3.1	1.8	3.0
	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	0.9	5.4	1.5	2.1
	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	0.7	4.8	1.7	-
	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	0.8	3.8	1.3	-
	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	0.7	0.2	1.7	0.2
	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	3.8	22.2	9.7	8.5
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	0.5	2.2	1.9	1.2
	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	0.9	0.9	0.9	0.3
	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	0.7	0.6	0.3	0.7
	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	3.3	1.1	1.1	0.0
	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	0.5	1.0	2.4	0.0
	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	0.6	0.3	0.1	0.5
	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	6.5	6.2	6.8	2.7
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	0.4	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	0.1	+	0.1	0.0
	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	1.5	0.0	0.1	0.0
	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	2.0	0.2	0.6	0.3
	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	4.0	0.5	0.7	0.3
550-731	730	+	0.0	0.2	+	0.1	0.1	0.3	+	+	0.0	-	0.0	0.0	+	0.0	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	-	0.0	0.0	+	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	0.0	0.0	0.0	0.0
	736	+	0.1	0.0	+	+	+	0.5	0.1	+	+	-	0.0	0.1	0.5	0.1	0.0	0.1	0.0	0.0	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	0.1	0.0	0.0	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	62.4	86.9	65.8	28.7

Table 3. Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian spring surveys in Div. 3N in 1996-2015 (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	2012	2013	2014	2015
≤ 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	2.1	1.9	1.2	2.7
	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	4.0	6.1	4.1	11.4
	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	6.1	8.0	5.3	14.1
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	35.2	46.4	34.6	49.3
	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	0.4	3.6	1.5	0.1
	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	1.8	5.4	6.3	1.8
	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	5.8	5.3	4.4	2.7
	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	2.8	5.6	8.8	8.0
	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	6.4	2.6	9.4	1.8
	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	52.3	68.8	65.0	63.7
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	4.9	6.3	0.2	0.1
	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	1.2	9.6	0.1	0.0
	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	0.5	6.4	1.6	3.3
	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	6.6	22.4	1.9	3.4
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	0.0	0.8	0.0	0.0
	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	0.2	3.8	0.0	0.0
	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	2.1	0.2	0.0	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	2.3	4.8	0.1	0.1
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	0.0	0.0	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	0.0	0.0	0.0	0.0
	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	0.1	0.7	0.0	0.0
	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	0.1	0.7	0.0	0.0
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	0.0	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	0.0	0.0	0.0	0.0
	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	0.3	2.3	0.0	0.0
	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	0.3	2.3	0.0	0.0
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	-	0.0	-	-
	726	+	0.1	+	+	0.1	+	+	+	+	0.0	-	0.0	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	0.2	0.0	-	-
	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	0.2	0.0	0.0	0.0
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	67.9	106.9	72.2	81.3

Table 4. Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian spring surveys in Div. 3O in 1996-2015 (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	2012	2013	2014	2015
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	3.5	4.2	5.4	1.1
	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	1.5	0.9	1.6	0.7
	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	4.2	3.2	1.6	1.8
	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	3.7	3.2	4.1	2.7
	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	4.8	4.6	7.0	2.5
	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	6.6	4.5	1.7	2.8
	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	3.4	8.9	5.5	3.4
	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	27.7	29.5	26.7	15.2
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	2.8	2.4	10.0	3.4
	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	0.8	1.1	3.0	1.0
	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	4.3	1.8	0.9	0.8
	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	2.7	1.3	2.7	1.4
	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	0.6	2.7	0.8	2.8
	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	11.1	9.4	17.5	9.4
184-274	333	+	0.3	0.1	0.1	+	+	0.3	+	+	0.2	-	0.1	+	+	+	0.0	0.0	0.0	0.0	0.0
	336	0.2	0.3	+	0.2	+	0.1	+	+	+	0.1	-	0.2	+	+	+	0.0	0.0	0.0	0.0	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	0.1	0.1	0.1	0.0
	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	0.1	0.1	0.1	0.0
275-366	334	0.2	0.8	0.0	0.1	+	+	0.2	0.2	+	+	-	0.1	+	+	0.0	0.0	0.0	0.0	0.0	0.0
	335	0.2	0.2	0.0	+	+	+	+	+	+	+	-	0.0	+	+	+	0.0	0.0	0.0	0.0	0.0
	356	0.1	+	+	0.1	+	+	+	0.4	+	+	-	0.1	+	0.1	+	0.0	0.0	0.0	0.0	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	0.0	0.0	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	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	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	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	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	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	-	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	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	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	38.9	38.9	44.3	24.6

Table 5. Abundance index at age (millions) for American plaice in NAFO Div. 3L from Canadian spring surveys from 1985 to 2015.

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	2012	2013	2014	2015
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	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	2.04	10.88	6.24	0.59
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	16.62	114.76	233.28	131.35
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	124.06	77.27	148.66	303.56
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	104.66	217.47	61.39	76.53
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	76.09	118.18	116.70	44.55
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	79.95	73.93	73.67	20.96
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	39.32	50.53	48.47	16.28
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	21.34	29.65	28.85	6.88
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	16.81	13.77	14.22	2.75
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	8.43	10.27	10.12	4.63
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	5.26	7.64	5.49	2.87
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	3.75	5.52	4.30	1.13
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	2.31	1.82	3.13	0.20
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	0.51	0.56	2.54	0.07
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	0.26	0.36	0.68	0.00
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	0.09	0.10	0.21	0.00
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	0.23	0.05	0.12	0.00
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	0.24	0.00	0.16	0.05
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	0.13	0.05	0.08	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	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	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	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00
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	0.75	0.52	0.08	0.01
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	502.86	733.32	758.38	612.42
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	178.64	194.23	192.03	55.82
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	38.02	40.13	41.04	11.69
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	7.52	8.45	11.22	1.44

Table 6. Abundance index at age (millions) for American plaice in NAFO Div. 3N from Canadian spring surveys from 1985 to 2015.

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	2012	2013	2014	2015
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	0.461	1.88	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	0.455	2.67	2.26	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	0.537	1.71	14.40	8.48
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	1.701	5.44	32.68	59.20
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	45.74	30.51	21.592	7.81	12.82	20.77
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	23.036	51.41	11.95	7.14
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	52.775	64.95	60.48	35.68
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	43.896	87.44	60.67	95.32
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	36.696	42.55	70.22	33.64
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	23.923	30.16	39.69	28.03
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	10.189	17.23	23.60	11.49
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	3.880	7.54	18.90	7.29
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	2.720	5.68	6.83	1.74
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	1.716	2.70	3.66	0.59
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	1.392	2.00	4.67	0.39
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	0.360	0.86	2.63	0.12
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	0.949	1.08	0.94	0.12
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	1.044	0.57	1.07	0.36
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	0.436	0.75	0.56	0.05
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	0.132	0.25	0.37	0.20
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	0.113	0.13	0.07	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	0.05	0.00	0.00	0.00	0.025	0.09	0.17	0.54
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	0.000	0.00	0.00	0.19
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	0.09	0.00	0.000	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
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	0.242	1.12	0.01	0.19
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	358.74	305.51	227.81	334.16	368.65	311.66
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	180.49	264.00	294.52	215.82
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	46.88	69.06	103.16	51.18
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	8.89	14.12	20.97	4.37

Table 7. Abundance index at age (millions) for American plaice in NAFO Div. 3O from Canadian spring surveys from 1985 to 2015.

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	2012	2013	2014	2015
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	5.70	0.96	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	4.63	0.43	0.00	30.78	5.37	0.00	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	28.88	76.55	22.10	26.94	47.86	55.31	14.09
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	98.35	69.32	57.54	68.05	44.19	211.40	72.13
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	44.94	86.49	44.47	107.83	41.85	52.77	60.79
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	27.66	36.46	68.49	59.95	50.06	47.27	21.13
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	71.85	52.65	33.14	40.59	48.14	62.65	16.32
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	18.53	27.04	26.27	31.29	44.68	31.33	12.21
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	14.80	10.37	15.13	13.41	26.04	22.40	14.25
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	18.72	8.88	6.21	6.20	9.47	13.21	6.40
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	8.33	4.11	2.68	4.21	5.63	3.86	4.62
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	3.85	2.60	2.10	2.88	2.39	2.73	1.41
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	1.39	1.15	3.35	0.61	0.89	1.02	0.82
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	0.47	0.51	0.24	0.45	0.57	1.24	0.13
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	0.27	0.28	0.08	0.15	0.58	0.00	0.20
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	0.70	0.30	0.08	0.17	0.50	0.11	0.16
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	0.34	0.17	0.43	0.34	0.15	0.30	0.10
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	0.07	0.26	0.06	0.12	0.26	0.10	0.09
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	0.25	0.10	0.29	0.07
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	0.12	0.07	0.17	0.01	0.00	0.15	0.00
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	0.10	0.11	0.11	0.03
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	0.07	0.00	0.09	0.00	0.00	0.06	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	0.04	0.00	0.08	0.00	0.00	0.00	0.00
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	0.09	0.00	0.28	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00
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	2.28	1.50	0.17	2.29
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	344.38	377.77	283.74	402.33	331.31	506.49	227.27
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	103.07	141.01	139.74	59.14
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	17.77	22.15	23.35	16.36
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	4.49	4.67	3.55	3.94

Table 8. Abundance index at age (millions) for American plaice in NAFO Div. 3LNO from Canadian spring surveys from 1985 to 2015.

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	2012	2013	2014	2015
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	6.16	2.85	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	7.04	3.56	0.00	33.28	18.93	8.50	0.59
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	110.97	125.19	79.15	44.10	164.34	302.99	153.91
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	187.96	165.59	207.66	193.81	126.91	392.74	434.88
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	79.38	191.20	209.45	234.09	267.13	126.99	158.09
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	75.16	85.36	189.29	159.08	219.65	175.92	72.82
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	129.80	146.90	116.47	173.32	187.01	196.79	72.97
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	45.72	138.16	97.00	114.51	182.65	140.46	123.81
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	34.95	40.60	66.68	71.45	98.24	121.48	54.77
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	38.94	28.07	20.59	46.93	53.39	67.11	37.18
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	26.53	18.36	13.17	22.83	33.13	37.58	20.73
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	16.79	12.12	10.89	12.02	17.57	27.12	11.57
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	6.36	8.91	10.52	7.08	12.09	12.16	3.69
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	1.75	3.26	3.07	4.48	5.10	8.03	0.92
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	2.04	1.23	0.97	2.06	3.14	7.21	0.66
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	2.46	1.51	0.94	0.80	1.71	3.43	0.28
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	2.74	1.96	1.33	1.38	1.33	1.45	0.22
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	1.43	1.45	1.23	1.40	0.88	1.29	0.45
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	0.92	0.86	1.00	0.17
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	0.40	0.50	0.58	0.27	0.30	0.60	0.20
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	0.21	0.25	0.17	0.11
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	0.02	0.09	0.23	0.57
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	0.04	0.00	0.25	0.00	0.00	0.00	0.19
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	0.09	0.09	0.28	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.07
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	3.27	3.14	0.26	2.49
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	777.34	974.58	1033.61	1133.46	1400.78	1633.52	1151.33
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	462.95	600.97	626.37	331.04
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	103.67	133.07	167.64	79.49
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	21.89	28.97	35.83	10.01
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	0.59	0.57	0.62	0.71
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	0.09	0.09	0.10	0.07

Table 9. Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian fall surveys in Div. 3L in 1995-2015 (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	2012	2013	2014	2015
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	3.1	1.6	0.4	0.2
	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	0.5	2.4	0.1	1.3
	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	0.7	3.0	0.7	2.0
	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	1.2	1.0	0.8	0.6
	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	1.5	5.4	0.6	1.5
	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	6.9	13.3	2.6	5.7
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	5.0	1.9	1.0	2.4
	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	5.1	9.7	0.3	2.2
	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	0.5	0.7	0.0	1.2
	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	0.3	0.5	0.0	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	3.3	12.9	0.5	3.9
	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	3.1	5.5	0.4	1.4
	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	7.7	5.8	0.8	9.6
	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	2.5	8.6	4.7	8.8
	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	5.5	5.1	1.6	5.8
	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	11.9	10.9	10.2	8.3
	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	2.6	4.7	2.5	3.4
	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	47.4	66.4	22.2	47.1
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	4.9	4.5	2.7	1.7
	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	2.8	5.9	10.6	2.3
	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	2.8	6.6	4.8	5.1
	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	4.8	3.8	7.5	4.0
	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	4.4	2.0	5.3	7.8
	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	2.2	2.1	5.0	6.1
	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	0.0	0.4	5.4	0.7
	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	21.9	25.3	41.3	27.6
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	1.6	2.9	6.1	3.7
	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	2.1	1.5	2.3	3.8
	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	0.2	0.1	1.6	0.3
	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	0.5	0.6	2.8	3.0
	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	0.4	0.5	1.0	0.2
	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	0.0	0.0	0.2	0.0
	796	-	0.6	0.9	0.4	-	-	0.2	0.1	0.1	0.1	0.3	0.2	-	-	-	0.2	-	-	0.6	-	-
	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	4.9	6.2	13.9	11.1
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	0.1	0.0	0.9	0.0
	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	.	0.1	0.0	0.1	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	0.0	0.1	+	+
	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	0.7	0.1	0.1	0.8
	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	0.9	0.2	1.1	0.9
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	0.0	0.0	0.0	0.0
	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	0.0	0.0	0.2	0.0
	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	0.0	0.0	0.0	0.0
	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	0.2	0.0	0.1	0.1
	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	0.2	0.0	0.3	0.1
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	-	-	-	0.6	-
	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	-	-	-	0.1	-
	745	-	0.1	2.2	0.1	0.7	0.0	0.0	0.0	0.3	-	-	0.0	0.0	-	+	+	-	-	-	0.1	-
	748	-	1.4	0.7	0.0	1.1	0.0	0.0	+	1.1	-	-	0.5	0.0	-	+	0.4	-	-	-	0.0	-
	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	-	-	-	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	-	-	-	0.0	-
	749	-	+	0.2	0.0	-	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	+	-	-	-	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	-	-	-	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	-	-	-	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	-	-	-	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	-	-	-	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	-	-	-	0.0	-
	751	-	0.0	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	82.2	111.3	81.3	92.6

Table 10. Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian fall surveys in Div. 3N in 1995-2015 (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	2012	2013	2014	2015
≤ 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	4.0	1.3		0.8
	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	3.3	11.9		8.7
	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	7.3	13.2		9.5
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	54.6	63.2		34.4
	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	2.3	2.3		0.7
	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	7.7	5.6		7.0
	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	3.7	9.2		3.0
	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	12.2	57.9		31.4
	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	3.6	2.2		2.7
	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	84.1	140.5		79.3
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	2.3	4.4		0.7
	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	1.9	3.2		7.8
	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	2.3	32.4		8.9
	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	6.5	40.0		17.4
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	0.1	0.0		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	0.2	1.4		0.9
	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	0.9	0.3		0.2
	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	1.1	1.8		1.1
275-366	357	0.1	0.1	0.0	+	-	+	+	+	0.0	+	0.2	+	0.1	+	+	0.0	0.0	0.0	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	0.0	0.0		0.1
	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	0.0	0.0		0.2
	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	0.0	0.0		0.3
367-549	723	+	+	0.0	0.1	+	+	+	0.0	+	+	+	0.0	+	0.1	0.0	0.0	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	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	0.0	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	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	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	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	0.0	0.0		0.0
	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	0.0	0.0		0.0
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	99.0	195.5		107.6

Table 11. Biomass estimates ('000t) of A.plaice, by stratum and depth zone (m), from Canadian fall surveys in Div. 3O in 1995-2015 (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	2012	2013	2014	2015
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	5.2	4.4		4.2
	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	0.6	1.7		1.6
	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	2.3	2.1		5.4
	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	5.1	3.7		2.0
	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	5.2	1.1		3.8
	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	5.7	6.2		3.7
	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	6.5	8.2		8.6
	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	30.6	27.3		29.2
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	1.5	6.2		4.4
	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	1.7	1.0		1.6
	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	2.1	1.0		2.3
	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	4.7	8.6		3.7
	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	1.3	2.6		0.9
	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	11.4	19.4		12.8
184-274	333	+	-	+	+	0.1	+	0.0	0.1	+	+	+	+	+	+	+	+	0.0	0.0	0.0		+
	336	+	0.1	0.1	+	0.1	0.1	+	0.1	+	+	+	0.1	0.3	0.1	-	+	0.0	0.0	0.0		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	0.1	0.1		+
	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	0.1	0.2		0.0
275-366	334	0.0	-	+	+	+	0.0	0.0	0.0	0.0	+	+	+	+	+	0.0	+	0.0	0.0	0.0		+
	335	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0.0	0.0	0.0		+
	356	0.0	0.1	+	+	+	+	0.0	0.0	+	+	+	+	+	+	+	+	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	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	0.0	0.0		+
	719	+	0.2	0.0	+	+	+	0.0	0.0	+	+	+	+	+	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	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	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	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	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	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	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	42.1	46.8		42.1

Table 12. Abundance index (millions) at age for A. plaice in Div. 3L from Canadian fall surveys from 1990 to 2015.

Age/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
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	0.43	0.00	1.70	5.89		7.50
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	63.88	2.42	56.02	325.85		38.56
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	110.83	176.28	26.80	252.62		425.37
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	185.24	141.10	224.38	189.41		881.38
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	147.92	146.45	174.70	325.82		209.01
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	61.46	107.89	180.60	165.00		109.82
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	48.44	43.99	92.81	119.37		89.87
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	22.25	28.56	37.13	45.49		48.28
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	12.74	12.54	19.68	21.32		28.79
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	8.17	5.90	8.95	11.44		13.54
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	16.15	6.32	4.60	6.23		6.23
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	4.83	4.99	3.99	4.54		3.55
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	1.92	3.37	2.95	3.67		2.04
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	1.20	1.20	1.56	2.08		1.18
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	1.39	0.25	0.21	0.77		0.53
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	0.36	0.20	0.12	0.22		0.18
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	0.73	0.18	0.25	0.51		0.07
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	0.37	0.03	0.06	0.00		0.00
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	0.38	0.19	0.00	0.13		0.20
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	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	0.00	0.08		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	0.08		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
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	0.51	4.22		0.07
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	688.99	682.31	837.03	1484.75		1866.31
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	118.92	108.17	172.82	220.15		194.53
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	35.49	23.08	23.20	33.97		27.59
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	6.34	5.88	5.65	11.76		4.26

Table 13. Abundance index (millions) at age for A. plaice in Div. 3N from Canadian fall surveys from 1990 to 2015.

Age/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
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	0.00	0.73		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	3.86	54.58		8.81
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	4.17	22.26		57.64
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	112.37	20.53	20.11		79.25
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	60.17	70.48		17.56
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	50.85	141.33		32.08
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	77.02	180.98		54.19
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	59.96	86.58		57.96
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	30.57	53.52		35.77
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	31.30	25.25		22.85
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	11.19	11.67		12.21
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	7.30	4.59	7.37		10.03
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	3.58	6.32		4.99
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	2.15	3.96		2.50
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	1.15	1.16		0.55
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	1.16	0.16		0.55
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	0.53	1.05		0.20
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	0.00	0.76		0.15
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	0.52	0.41		1.19
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	0.32	0.00		0.04
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	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		0.15
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	0.00	0.13		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	0.78	0.05		0.83
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	364.41	688.84		399.50
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	317.67	224.05	379.36		204.15
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	56.51	58.27		56.23
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	9.42	13.99		11.14

Table 14. Abundance index (millions) at age for A. plaice in Div. 3O from Canadian fall surveys from 1990 to 2015.

Age/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
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	1.93	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	34.25	135.71		15.30
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	34.78	145.50		139.02
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	51.23	76.64		190.85
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	51.80	55.02		60.19
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	54.42	75.54		36.90
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	65.24	48.51		28.12
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	15.19	26.19		24.00
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	16.94	10.48		14.11
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	9.35	5.39		5.96
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	4.08	2.36		4.04
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	4.79	2.95	2.03	2.33	1.52		1.40
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	1.22	0.76		0.67
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	0.68	0.34		0.11
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	0.18	0.41		0.36
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	0.09	0.17		0.07
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	0.10	0.16		0.00
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	0.05	0.09		0.05
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	0.32	0.27		0.00
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	0.04	0.08		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	0.05	0.17		0.15
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	0.00	0.06		0.05
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	0.00	0.12		0.00
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
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		0.04
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	0.22	0.27		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	630.20	337.26	344.48	585.75		524.01
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	460.54	97.35		81.75
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	363.18	12.17		15.53
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	347.42	2.89		4.13

Table 15. Abundance index (millions) at age for A. plaice in Div. 3LNO from Canadian fall surveys from 1990 to 2015.

Age/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
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	0.43	0.00	3.62	6.62		7.50
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	87.89	9.60	94.13	516.14		62.66
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	433.82	272.22	65.76	420.38		622.04
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	463.84	394.60	335.80	296.14	286.16		1151.48
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	523.46	308.84	286.68	451.32		286.76
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	199.83	286.53	285.87	381.87		178.81
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	255.12	184.78	235.07	348.87		172.18
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	135.07	145.07	112.28	158.25		130.24
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	46.69	91.25	67.19	85.32		78.67
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	28.22	29.25	49.60	42.09		42.35
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	36.63	16.98	19.88	20.27		22.48
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	11.66	14.32	10.91	13.43		14.98
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	4.62	10.14	7.75	10.75		7.70
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	3.41	3.66	4.39	6.38		3.79
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	2.96	1.22	1.54	2.34		1.44
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	1.37	0.54		0.80
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	1.64	1.27	0.88	1.72		0.27
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	0.95	0.52	0.10	0.85		0.20
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	1.06	1.11	0.84	0.81		1.39
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	0.36	0.08		0.04
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	0.05	0.25		0.15
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	0.00	0.14		0.20
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	0.00	0.25		0.00
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
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		0.04
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	1.12	3.65	1.51	4.54		3.50
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	1872.18	2171.79	1718.57	1545.92	2759.34		2789.81
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	531.76	505.57	2059.63	696.86		480.43
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	94.89	84.47	1645.10	104.41		99.34
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	18.38	23.91	1564.71	28.64		19.53
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	0.71	0.67	0.75		0.83
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	0.01	0.01	0.01		0.01

Table 16. American plaice age numbers from the EU-Spain Survey of NAFO 3NO: 1997-2015.
ALK used: Canadian Spring survey in 3N

Age/Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
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	0.68	2.52	0.32	0.43
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	0.32	0.72	2.73	6.45
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	3.96	1.07	14.10	60.61
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	58.35	12.15	9.61	19.64
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	71.40	132.64	9.69	13.86
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	167.96	160.50	60.94	77.09
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	125.20	182.84	67.50	157.46
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	84.46	64.82	74.63	39.00
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	49.52	41.94	42.27	27.75
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	17.64	21.77	22.41	10.99
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	6.98	8.17	14.86	6.05
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	5.10	5.23	3.64	2.10
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	2.67	2.62	1.71	0.71
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	1.65	1.31	1.88	0.38
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	0.39	0.61	1.12	0.23
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	0.79	0.52	0.38	0.10
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	0.64	0.32	0.53	0.37
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	0.20	0.48	0.23	0.07
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	0.07	0.13	0.11	0.16
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	0.08	0.11	0.04	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	0.29	0.00	0.00	0.00	0.01	0.19	0.02	0.24
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	0.00	0.00	0.00	0.06
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	0.00	0.00	0.00	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	0.00	0.00	0.00	0.08
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	598.08	640.66	328.71	423.89
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	463.38	624.19	301.95	336.77
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	85.75	148.21	163.82	88.36
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	11.60	19.67	24.51	10.62
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	0.23	0.03	0.08	0.21
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	0.14	0.23	0.50	0.21

Table 17. Canadian catches of American plaice by Division, month and gear during 2013 (revised in 2016 assessment).

	3L		3N	3O		3LNO
	Gillnet	OT	OT	Gillnet	OT	Total
Jan		10	16		0	26
Feb		2	27		7	36
Mar		4	137		0	141
Apr		8	35		0	43
May		28	130		15	174
Jun		8	119		4	132
Jul						
Aug	0		12	0	24	37
Sept	0	1	41		43	85
Oct		0	114		40	155
Nov		0	61		54	116
Dec		39	43		15	97
Total	0	101	737	0	203	1041

Table 18. Canadian catches of American plaice by Division, month and gear during 2014.

	3L		3N	3O	3LNO
	OT	GN	OT	OT	Total
Jan	28		6	10	43
Feb	75		30	0	105
Mar			45		45
Apr			36	0	36
May	0		62	26	88
Jun			85	1	86
Jul		0	57		57
Aug		0			0
Sept					
Oct				31	31
Nov			74	3	77
Dec	1		161	17	180
Grand Total	104	0	556	88	748

Table 19. Canadian catches of American plaice by Division, month and gear during 2015.

	3L		3N	3O	3LNO
	OT	GN	OT	OT	Total
Jan			0	0	0
Feb	5				5
Mar			24	2	26
Apr	50		2	4	55
May	19		9	7	35
Jun	0		43	38	82
Jul					
Aug	0		0	30	31
Sept		0	1	21	22
Oct			6	49	55
Nov			26	25	52
Dec			19	55	73
Grand Total	75	0	129	231	436

Table 20. Catch at age American plaice by Country in 2013.

	2013																			
	Portugal				Spain				Canada				Overall (LF data available)				Russia	Estonia	USA	
	3LNO	Mean len	Mean wgt	S.O.P.	3LNO	Mean len	Mean wgt	S.O.P.	3LNO	Mean len	Mean wgt	S.O.P.	3LNO	Mean len	Mean wgt	S.O.P.				Total (000s)
1	0	0.0	0.000		0	0.0	0.000	0	0				0	0.0	0.000	0				0
2	456	16.4	0.031	14	0	0.0	0.000	0	0				456	16.4	0.031	14				1
3	2407	18.7	0.047	114	40	20.5	0.064	3	0				2447	18.7	0.048	116				3
4	23341	21.5	0.076	1771	6275	23.6	0.103	648	1341	26.721	0.16	215	30957	22.3	0.085	2633				37
5	188032	25.5	0.133	25099	78208	25.9	0.140	10975	15753	29.18	0.214	3371	281993	25.9	0.140	39445				333
6	313568	28.6	0.194	60725	135199	28.4	0.189	25578	89677	32.01	0.289	25917	538444	29.2	0.208	112220				635
7	529145	31.7	0.275	145639	191855	31.5	0.269	51668	244414	35.08	0.391	95566	965414	32.7	0.303	292872				1139
8	421310	35.1	0.384	161584	164500	35.8	0.411	67583	320352	37.64	0.494	158254	906162	36.2	0.428	387421				1069
9	288168	37.7	0.485	139868	150233	38.8	0.536	80462	344101	39.48	0.58	199579	782501	38.8	0.537	419908				924
10	186583	39.8	0.586	109337	124639	41.1	0.649	80921	300007	40.72	0.646	193805	611230	40.7	0.628	384062				721
11	86350	41.1	0.652	56276	60926	42.8	0.742	45213	154230	42.80	0.758	116906	301507	42.5	0.724	218395				356
12	53006	45.1	0.887	46994	55523	46.2	0.958	53204	97664	44.31	0.86	83991	206193	45.2	0.893	184189				243
13	24455	46.7	0.995	24339	28361	47.2	1.029	29186	66025	45.50	0.936	61799	118841	46.4	0.970	115324				140
14	15153	50.6	1.299	19680	27423	52.9	1.500	41134	34227	47.35	1.068	36554	76803	50.3	1.268	97369				91
15	5854	49.2	1.182	6920	13130	54.2	1.628	21373	18647	49.07	1.223	22805	37631	51.3	1.358	51099				44
16	7645	53.1	1.524	11654	17085	56.6	1.881	32138	11177	52.41	1.496	16721	35907	54.8	1.685	60513				42
17	1462	53.0	1.511	2208	11238	59.4	2.213	24870	7260	54.84	1.733	12582	19960	57.5	1.987	39660				24
18	5080	55.0	1.710	8684	19976	58.8	2.133	42616	4574	56.47	1.928	8819	29630	57.9	2.029	60118				35
19	2467	55.2	1.731	4270	5634	57.8	2.021	11386	3741	59.23	2.226	8327	11843	57.9	2.025	23984				14
20	445	60.5	2.349	1046	7363	65.6	3.078	22662	2903	60.05	2.351	6825	10712	64.1	2.850	30533				13
21	282	62.5	2.618	738	7365	64.9	2.959	21797	1247	57.95	2.098	2616	8894	64.0	2.828	25151				10
22	0	0.0	0.000	0	0	0.0	0.000	0	936	60.21	2.37	2218	936	60.7	2.370	2218				1
23	0	0.0	0.000	0	0	0.0	0.000	0	250	58.48	2.14	535	250	58.8	2.140	535				0
24	0	0.0	0.000		5763	71.7	4.127	23786	655	66.62	3.242	2124	6418	71.2	4.037	25910				8
25									235	60.50	2.351	552	235	60.5	2.351	552				0
26									233	65.86	3.129	729	233	66.0	3.129	729				0
UNK	24	54.5	1.660	40	0	0.0	0.000	0					24	54.5	1.660	40				0
Total SOP				827000				687200				1060810				2575010				1.18
Catch				827000				687200				1041000					240000	111000	113000	

Table 21. Catch at age American plaice by Country in 2014.

	2014																			
	Portugal				Spain				Canada				Overall (LF data available)				Russia	Estonia	France	USA
	3LNO	Mean len	Mean wgt	S.O.P.	3LNO	Mean len	Mean wgt	S.O.P.	3LNO	Mean len	Mean wgt	S.O.P.	3LNO	Mean len	Mean wgt	S.O.P.				
1	0	0.0	0.000		0	0.0	0.000	0	0				0	0.0	0.000	0				
2	28	16.5	0.031	1	0	0.0	0.000	0	0				28	16.5	0.031	1				
3	7815	19.2	0.052	406	30	21.9	0.080	2	0				7845	19.2	0.052	409				
4	17520	22.5	0.087	1532	615	24.4	0.115	71	340	28.5	0.192	65	18475	22.7	0.090	1668				
5	42005	24.9	0.123	5165	12459	26.7	0.154	1917	10516	31.03	0.258	2713	64980	26.5	0.151	9795				
6	149973	28.8	0.199	29849	62225	28.2	0.186	11555	120887	33.15	0.327	39530	333085	30.6	0.243	80934				
7	176138	31.5	0.267	47059	239547	29.7	0.220	52708	265605	35.62	0.41	108898	681290	32.8	0.306	208665				
8	249855	34.7	0.370	92472	277098	31.4	0.266	73691	313234	38.30	0.525	164448	840187	35.4	0.393	330611				
9	159646	36.2	0.427	68204	321045	33.7	0.337	108086	140290	40.52	0.638	89505	620981	36.3	0.428	265795				
10	118558	40.0	0.593	70308	204288	35.6	0.402	82191	142951	42.85	0.759	108500	465797	39.3	0.560	260999				
11	92507	41.3	0.661	61154	103198	39.2	0.553	57110	60087	44.89	0.898	53958	255792	41.5	0.673	172222				
12	45126	45.7	0.923	41649	85715	42.0	0.700	59961	27229	48.18	1.137	30959	158069	44.4	0.839	132569				
13	27889	45.5	0.913	25464	46410	45.8	0.931	43223	34829	49.97	1.267	44128	109128	47.3	1.034	112816				
14	24253	49.3	1.186	28762	38553	46.9	1.006	38772	18541	51.26	1.39	25772	81347	48.8	1.147	93306				
15	14023	50.3	1.275	17883	29466	51.1	1.341	39528	6793	57.23	1.974	13409	50282	51.9	1.408	70820				
16	6498	53.3	1.537	9989	17351	52.3	1.450	25154	7380	57.39	1.991	14694	31229	53.9	1.596	49836				
17	3776	59.5	2.219	8379	13399	56.9	1.913	25625	9240	59.58	2.249	20781	26415	58.3	2.074	54785				
18	2561	56.5	1.871	4791	19096	58.5	2.104	40175	7717	59.53	2.257	17417	29374	58.7	2.124	62383				
19	3225	61.4	2.464	7945	12564	57.8	2.022	25406	3449	60.36	2.35	8105	19238	59.0	2.155	41457				
20	760	62.5	2.618	1989	16112	60.4	2.339	37683	3147	61.25	2.463	7751	20019	60.7	2.369	47423				
21	0	0.0	0.000	0	1791	64.3	2.871	5142	929	63.73	2.797	2598	2720	64.1	2.846	7740				
22	0	0.0	0.000	0	0	0.0	0.000	0	584	62.39	2.618	1529	584	62.5	2.618	1529				
23	0	0.0	0.000	0	0	0.0	0.000	0	41	70.50	3.91	160	41	70.5	3.910	160				
24	0	0.0	0.000		0	0.0	0.000	0					0	0.0	0.000	0				
25													0	0.0	0.000	0				
26													0	0.0	0.000	0				
UNK	0	0.0	0.000	0	0	0.0	0.000	0					0	0.0	0.000	0				
Total SOP				523000				728000				754922				2005922				
Catch				523000				728000				748300					96000	36000	1000	98000

Total (000s)
0
0
9
21
72
371
760
937
692
519
285
176
122
91
56
35
29
33
21
22
3
1
0
0
0
0
0
1.12

Table 22. Catch at age American plaice by Country in 2015.

	2015																				
	Portugal				Spain				Canada				Overall (LF data available)				Other Portugal	Russia	Estonia	USA	
	3LNO	Mean len	Mean wgt	S.O.P.	3LNO	Mean len	Mean wgt	S.O.P.	3LNO	Mean len	Mean wgt	S.O.P.	3LNO	Mean len	Mean wgt	S.O.P.					Total (000s)
1	0	0.0	0.000		0	0.0	0.000	0	0				0	0.0	0.000	0					0
2	0	0.0	0.000	0	16	15.9	0.028	0	0				16	15.9	0.028	0					0
3	1289	19.4	0.053	69	757	16.7	0.032	24	0				2046	18.5	0.045	93					3
4	7832	21.5	0.075	590	4474	20.0	0.059	263	0	0	0	0	12306	21.0	0.069	853					16
5	28600	24.6	0.119	3389	16247	22.5	0.088	1423	3372	24.64	0.121	408	48219	24.0	0.108	5220					62
6	78031	28.3	0.187	14614	44329	29.2	0.209	9266	11952	28.47	0.197	2355	134311	28.6	0.195	26234					172
7	82269	30.6	0.244	20096	91393	30.4	0.238	21788	37585	32.03	0.293	11012	211247	30.9	0.250	52896					270
8	103260	33.9	0.343	35412	113943	33.2	0.319	36351	71860	35.06	0.39	28025	289062	34.0	0.345	99788					369
9	76687	36.2	0.427	32730	118993	35.1	0.385	45824	48738	38.31	0.519	25295	244418	36.2	0.425	103849					312
10	44347	39.6	0.576	25528	76465	36.9	0.454	34699	55495	40.21	0.614	34074	176307	38.8	0.535	94301					225
11	34578	41.6	0.679	23467	42750	39.0	0.546	23354	79173	42.09	0.719	56925	156502	41.4	0.663	103746					200
12	16669	44.4	0.840	13995	28467	41.1	0.650	18497	68323	45.52	0.933	63745	113459	44.5	0.848	96238					145
13	16450	45.4	0.905	14887	11172	46.1	0.948	10597	41310	47.83	1.116	46102	68932	47.3	1.038	71585					88
14	6624	48.4	1.120	7418	8133	46.9	1.007	8189	34265	47.43	1.082	37075	49022	47.8	1.075	52681					63
15	4372	50.9	1.322	5779	8145	51.2	1.351	11006	8186	46.33	0.986	8071	20703	49.4	1.201	24856					26
16	761	54.0	1.614	1228	5792	52.9	1.501	8692	5729	48.85	1.188	6806	12282	51.4	1.362	16726					16
17	2005	57.6	1.992	3994	3411	56.9	1.914	6530	15943	53.02	1.551	24728	21359	54.4	1.650	35251					27
18	1168	56.7	1.894	2211	4106	58.5	2.103	8635	4825	52.43	1.515	7310	10099	55.8	1.798	18156					13
19	1097	59.6	2.232	2449	2898	58.6	2.109	6112	12855	50.62	1.321	16981	16850	53.0	1.516	25542					22
20	16	62.5	2.618	42	1630	60.5	2.350	3830	10749	54.80	1.714	18424	12395	55.8	1.799	22296					16
21	12	66.5	3.217	37	241	64.6	2.923	705	5125	53.94	1.633	8369	5378	54.8	1.694	9111					7
22	0	0.0	0.000	0	406	65.1	2.990	1215	2812	58.10	2.096	5894	3218	59.4	2.209	7109					4
23	0	0.0	0.000	0	0	0.0	0.000	0	2266	61.10	2.45	5552	2266	61.3	2.450	5552					3
24	0	0.0	0.000		0	0.0	0.000	0	186	66.50	3.22	599	186	66.5	3.220	599					0
25									258	67.62	3.413	881	258	67.7	3.413	881					0
26									92	68.50	3.554	327	92	68.5	3.554	327					0
27									72	70.50	3.91	282	72	70.5	3.910	282					0
UNK	0	0.0	0.000	0	0	0.0	0.000	0					0	0.0	0.000	0					0
Total SOP				207935				257000				409240				874174					1.28
Catch				207935				257000				436000					11729	113000	75000	43000	

Table 23. Numbers at age of American plaice from the (a) Canadian fall RV survey (1985-2015; no 2006 or 2014), (b) Canadian spring RV survey (1990-2014; no 2004 or 2015) and (c) EU-Spain Div. 3NO survey (1998-2015).

Fall	5	6	7	8	9	10	11	12	13	14
1990.9	853.098	642.862	369.626	191.668	124.519	55.198	29.201	17.430	12.054	9.316
1991.9	724.397	578.812	249.380	116.271	81.837	44.303	25.916	13.857	12.207	6.977
1992.9	367.927	499.192	226.077	76.712	35.653	17.680	8.451	6.848	3.333	3.151
1993.9	360.452	372.076	316.567	104.116	33.000	15.316	6.798	5.095	3.077	2.383
1994.9	190.297	151.085	134.913	89.251	28.649	7.822	2.667	1.723	0.919	1.168
1995.9	295.940	336.345	151.960	61.447	39.520	10.745	1.880	1.308	0.452	0.307
1996.9	208.293	174.079	82.201	21.365	8.820	3.077	1.781	0.587	0.098	0.116
1997.9	153.853	159.848	119.979	53.224	23.331	7.304	3.217	1.208	0.849	0.595
1998.9	121.174	129.090	112.639	83.420	68.417	17.949	6.944	3.630	2.041	0.844
1999.9	92.461	93.426	79.565	98.916	72.701	33.661	18.853	12.311	4.889	1.076
2000.9	73.671	132.006	115.595	83.788	61.816	48.924	25.380	7.069	3.091	0.843
2001.9	53.977	67.182	97.770	63.670	48.712	27.344	26.360	11.691	2.834	1.128
2002.9	105.561	42.394	72.913	75.893	41.055	26.800	26.982	15.759	7.846	0.989
2003.9	325.025	85.303	49.333	35.469	19.314	12.574	11.135	6.373	1.987	0.857
2005.9	170.458	196.940	131.951	38.038	13.807	13.226	7.264	5.099	4.833	3.319
2006.9	74.278	141.128	138.301	108.766	26.315	9.192	10.458	9.922	5.594	3.616
2007.9	118.060	67.983	128.426	121.169	74.096	24.413	9.052	8.624	2.724	4.867
2008.9	515.631	146.418	117.517	103.649	69.111	28.220	8.278	4.662	2.591	2.692
2009.9	229.210	230.664	78.367	52.175	41.569	21.308	14.411	3.746	3.075	2.354
2010.9	199.835	255.117	135.066	46.686	28.221	36.627	11.657	4.620	3.412	2.958
2011.9	286.533	184.782	145.066	91.254	29.255	16.977	14.320	10.137	3.661	1.222
2012.9	285.869	235.071	112.276	67.188	49.599	19.879	10.906	7.745	4.388	1.539
2013.9	381.866	348.866	158.255	85.324	42.086	20.265	13.427	10.748	6.377	2.342
2015.9	178.805	172.180	130.237	78.668	42.352	22.481	14.980	7.703	3.788	1.440

Spring	5	6	7	8	9	10	11	12	13	14
1985.5	263.811	454.551	595.652	389.798	208.007	140.238	84.297	45.199	22.716	13.977
1986.5	256.002	561.361	577.156	307.058	193.651	98.117	45.955	34.378	21.735	8.903
1987.5	460.214	747.454	656.206	398.314	184.639	101.101	41.829	33.798	19.928	11.136
1988.5	368.612	616.621	543.875	314.972	217.849	85.292	48.628	32.575	18.745	11.969
1989.5	336.143	551.765	470.169	273.725	187.637	74.679	39.843	27.071	16.825	9.650
1990.5	618.749	377.901	371.001	200.264	130.479	77.524	32.385	21.463	14.428	8.809
1991.5	398.190	364.155	180.205	112.916	67.544	35.190	22.260	13.356	7.224	5.529
1992.5	110.276	190.141	150.915	63.403	34.120	17.503	9.447	5.402	3.343	1.767
1993.5	138.054	180.137	160.064	89.449	32.226	16.510	7.626	4.264	1.783	1.325
1994.5	99.220	106.040	85.372	43.270	19.992	5.397	3.952	1.396	1.241	0.996
1995.5	41.914	57.524	59.883	49.937	27.484	8.339	2.664	0.539	0.093	0.035
1996.5	133.678	130.513	97.122	39.511	16.189	4.502	1.942	2.233	0.518	0.250
1997.5	65.278	84.402	79.311	48.718	18.944	6.047	2.678	1.819	0.562	0.174
1998.5	69.797	69.196	76.743	79.391	47.909	19.560	9.928	3.281	1.624	0.445
1999.5	66.741	104.510	104.869	111.518	107.309	65.322	30.521	13.021	6.508	1.894
2000.5	34.977	67.015	78.009	64.565	59.164	47.188	27.929	9.536	4.042	0.900
2001.5	28.853	36.351	73.856	62.438	58.427	45.042	34.569	16.018	5.541	2.771
2002.5	56.503	41.334	51.938	53.824	38.253	24.420	20.028	12.561	4.006	2.010
2003.5	188.242	72.503	46.058	49.745	39.965	18.074	13.764	11.463	4.506	2.168
2004.5	96.532	161.935	51.282	29.336	19.920	15.555	9.207	8.200	4.490	2.707
2005.5	149.659	163.831	143.874	55.103	31.863	16.505	13.679	8.236	6.219	4.662
2007.5	193.863	89.640	144.469	115.486	82.606	16.796	10.938	5.057	4.373	3.821
2008.5	238.975	116.455	91.953	117.024	70.142	42.584	14.799	7.295	3.804	3.320
2009.5	72.302	130.149	44.734	34.017	36.716	24.987	16.124	6.078	1.739	1.933
2010.5	85.360	146.905	138.156	40.600	28.066	18.356	12.121	8.913	3.263	1.226
2011.5	189.294	116.466	97.005	66.677	20.587	13.165	10.890	10.524	3.073	0.965
2012.5	159.077	173.322	114.512	71.450	46.929	22.829	12.022	7.077	4.479	2.055
2013.5	219.654	187.014	182.652	98.236	53.393	33.133	17.571	12.086	5.101	3.142
2014.5	175.924	196.794	140.458	121.475	67.114	37.581	27.119	12.161	8.025	7.210

Span	5	6	7	8	9	10	11	12	13	14
1998.5	8.58	14.25	29.99	48.49	33.83	13.68	5.39	1.97	0.95	1.03
1999.5	12.89	37.92	32.15	42.53	60.52	50.12	20.46	9.19	5.00	1.87
2000.5	11.00	19.64	49.71	39.49	51.90	46.98	29.09	13.56	6.38	0.97
2001.5	4.81	11.44	30.59	28.50	27.17	20.44	21.20	8.26	2.27	0.96
2002.5	38.40	11.40	10.04	18.84	14.28	8.86	10.67	7.45	1.84	1.03
2003.5	235.17	56.43	22.53	16.91	19.43	8.11	8.50	10.41	3.88	1.73
2004.5	76.80	204.71	47.14	12.83	11.17	11.95	6.44	7.90	4.39	3.80
2005.5	40.63	91.46	121.13	42.37	17.82	6.11	4.39	4.29	3.30	2.38
2006.5	105.85	85.84	92.85	78.66	57.88	25.60	11.87	6.46	3.47	2.28
2007.5	97.64	33.62	61.14	45.09	56.80	10.92	3.75	3.07	2.24	2.27
2008.5	282.61	121.99	36.95	75.11	38.91	32.57	8.91	4.69	1.69	2.44
2009.5	50.51	97.16	35.08	19.65	17.17	23.13	20.54	8.02	1.50	1.11
2010.5	43.50	108.88	141.00	29.71	13.66	9.56	9.44	11.11	3.50	1.34
2011.5	116.78	137.16	128.10	82.41	14.83	9.97	8.76	6.36	2.18	0.90
2012.5	71.40	167.96	125.20	84.46	49.52	17.64	6.98	5.10	2.67	1.65
2013.5	132.64	160.50	182.84	64.82	41.94	21.77	8.17	5.23	2.62	1.31
2014.5	9.69	60.94	67.50	74.63	42.27	22.41	14.86	3.64	1.71	1.88
2015.5	13.86	77.09	157.46	39.00	27.75	10.99	6.05	2.10	0.71	0.38

Table 24. . Catch at age used in the virtual population analyses, with effort method for catch in 2014 and DCRs in 2015. Age 15 is a plus group.

Catch	5	6	7	8	9	10	11	12	13	14	15
1960	44.7	318.8	841.8	1365.9	1738.3	2280.0	2540.0	3473.6	2752.5	2564.7	4588.8
1961	28.1	200.4	531.2	1230.9	2463.9	3174.2	2467.1	2272.0	3894.1	2579.4	5102.7
1962	62.4	445.1	657.2	1096.1	1184.5	1669.1	2432.4	2697.6	2409.5	3276.8	5958.8
1963	144.3	1029.7	1866.4	1434.1	1546.8	2237.6	3104.3	4174.8	3896.9	3851.9	5622.8
1964	268.6	1916.7	4997.5	3253.4	6174.5	8768.6	6960.2	6149.8	3245.9	3033.6	5552.8
1965	475.5	3157.0	7234.8	9305.9	7048.0	7562.9	5731.6	5790.8	5214.6	4333.2	6510.2
1966	1759.8	6271.7	10036.6	11132.5	9516.7	7266.3	7106.4	5667.6	5731.0	5009.8	8475.7
1967	433.9	3345.3	10834.8	7647.2	9504.5	13713.2	13672.7	14564.6	9495.5	6572.1	13247.8
1968	275.8	2342.3	4139.2	9785.9	11210.5	11631.0	7735.4	13842.2	8778.0	6339.2	8419.3
1969	690.3	2453.1	7875.0	14186.6	18181.9	12778.9	12735.3	10396.6	7053.8	5305.1	7666.2
1970	115.9	2172.2	2554.1	10006.8	13536.7	11286.1	11179.1	8248.5	5556.4	4661.3	9285.0
1971	1135.9	1749.6	8411.7	10457.6	15504.1	14164.8	10993.1	9026.5	5195.2	3720.6	7130.5
1972	578.2	2573.8	2367.8	7696.8	11301.7	12765.9	12718.0	10706.0	6783.8	4354.0	7033.1
1973	46.4	1079.1	6329.1	10518.1	13016.7	10042.3	9980.4	6762.3	6589.6	3733.8	7013.8
1974	354.0	5955.0	10475.0	10069.0	7768.0	9004.0	7086.0	4596.0	3809.0	2278.0	2164.0
1975	883.0	3128.0	7220.0	9433.0	9234.0	7903.0	5701.0	4732.0	3788.0	2617.0	2933.0
1976	837.0	3907.0	8781.0	19363.0	16597.0	12338.0	8323.0	5156.0	3024.0	2309.0	2241.0
1977	974.0	6723.0	8743.0	11730.0	13559.0	11157.0	6520.0	4257.0	2369.0	1493.0	1625.0
1978	1558.0	4467.0	9195.0	10397.0	12743.0	13881.0	9938.0	6823.0	3655.0	2239.0	2440.0
1979	1257.0	6551.0	13532.0	18747.0	14977.0	12506.0	8791.0	3775.0	1843.0	714.0	580.0
1980	263.0	2977.0	9531.0	12578.0	14111.0	14212.0	11288.0	8088.0	3732.0	1565.0	1022.0
1981	154.0	554.0	2248.0	4786.0	7921.0	11425.0	13565.0	11872.0	8693.0	5591.0	4697.0
1982	27.0	314.0	1814.0	4799.0	8946.0	12836.0	15801.0	14489.0	7942.0	4224.0	2943.0
1983	119.0	991.0	3053.0	5797.0	8343.0	7707.0	8493.0	7517.0	4588.0	2480.0	1771.0
1984	48.0	397.0	1516.0	3311.0	5853.0	9958.0	12887.0	8964.0	5072.0	2515.0	1602.0
1985	296.0	788.0	2362.0	5652.0	10694.0	15741.0	14528.0	9233.0	4108.0	1969.0	1792.0
1986	4407.0	9707.0	12556.0	12530.0	13372.0	13874.0	14246.0	10376.0	5947.0	2637.0	2155.0
1987	2237.0	4941.0	7691.0	10893.0	15867.0	17640.0	11404.0	6986.0	3076.0	1303.0	1046.0
1988	2908.0	3213.0	4853.0	7269.0	10123.0	10325.0	9260.0	6040.0	2692.0	1156.0	962.0
1989	12745.0	11553.0	11432.0	9652.0	14180.0	12387.0	8405.0	4972.0	2029.0	1027.0	715.0
1990	15134.0	7694.0	4489.0	4604.0	8666.0	8666.0	6452.0	3633.0	1702.0	945.0	548.0
1991	6103.0	12152.0	7846.0	9331.0	7856.0	6589.0	4394.0	2294.0	811.0	364.0	484.0
1992	148.0	1023.0	2591.0	3395.0	3618.0	2154.0	1507.0	875.0	576.0	513.0	579.0
1993	1172.4	3712.9	8820.9	11590.5	5720.0	3376.9	1853.1	1002.5	526.9	354.7	526.8
1994	4316.3	3837.1	5426.1	4459.7	2777.0	736.9	475.6	162.8	120.9	54.7	27.7
1995	99.2	313.9	453.2	333.0	203.3	65.5	13.6	4.1	0.1	0.1	0.4
1996	180.9	742.8	975.0	452.7	211.1	51.9	10.4	8.1	2.3	1.0	1.3
1997	19.4	134.9	543.7	719.4	409.4	149.3	93.5	56.8	26.2	1.4	1.4
1998	10.6	54.8	272.7	767.1	804.9	455.5	278.5	117.3	69.0	49.2	18.3
1999	26.0	174.5	268.4	579.2	1029.9	1079.4	627.4	278.1	125.6	39.6	38.3
2000	15.2	226.3	726.8	915.1	1442.7	1532.7	979.1	429.1	195.2	43.9	116.6
2001	111.0	331.5	1139.1	1413.3	1583.8	1595.5	1403.9	665.1	232.4	86.1	109.1
2002	312.2	308.3	609.9	1488.3	1431.7	1082.1	1059.3	605.2	203.5	62.4	60.6
2003	1212.4	983.0	1104.7	1707.9	1993.6	1201.8	999.9	879.7	358.2	156.5	131.8
2004	346.2	1898.8	1215.9	967.5	1086.1	1013.6	739.9	591.1	320.1	201.4	124.4
2005	58.6	289.0	999.0	842.9	778.7	579.7	536.2	341.9	260.0	178.0	250.4
2006	76.1	228.4	637.2	558.5	469.0	354.4	311.7	252.7	210.7	154.5	238.8
2007	53.9	73.3	375.1	627.6	738.8	366.3	283.3	249.6	247.8	247.3	564.6
2008	82.3	136.2	292.8	722.4	736.4	511.0	226.9	198.8	111.5	101.3	227.8
2009	189.3	689.5	544.6	691.0	787.2	645.5	472.2	214.3	88.4	87.3	356.0
2010	126.1	687.0	882.4	555.1	483.1	579.1	408.6	295.5	155.7	88.7	289.9
2011	724.1	795.2	1003.7	963.5	439.2	369.0	272.0	254.1	79.6	31.9	111.5
2012	285.4	762.7	841.6	710.9	732.8	369.9	239.1	221.4	143.3	70.5	115.0
2013	332.8	635.5	1139.4	1069.4	923.5	721.4	355.8	243.3	140.3	90.6	192.0
2014	72.5	371.4	759.7	936.9	692.5	519.4	285.2	176.3	121.7	90.7	200.6
2015	61.6	171.6	269.9	369.3	312.3	225.3	200.0	145.0	88.1	62.6	134.4
2016											

Table 25. Stock weights (kg) for American plaice as calculated by Rivard's (REFERENCE) method (January 1).

beg of year	5	6	7	8	9	10	11	12	13	14	15+
1960	0.227	0.198	0.232	0.320	0.423	0.539	0.663	0.775	0.872	1.041	1.274
1961	0.227	0.198	0.232	0.320	0.423	0.539	0.663	0.775	0.872	1.041	1.274
1962	0.201	0.192	0.227	0.326	0.441	0.549	0.663	0.810	0.885	1.035	1.281
1963	0.179	0.218	0.229	0.326	0.447	0.569	0.668	0.790	0.876	1.021	1.357
1964	0.178	0.244	0.293	0.382	0.458	0.579	0.687	0.789	0.882	1.023	1.352
1965	0.182	0.246	0.323	0.434	0.554	0.620	0.727	0.813	0.891	1.076	1.420
1966	0.178	0.241	0.327	0.427	0.565	0.702	0.828	0.904	0.925	1.095	1.444
1967	0.182	0.245	0.326	0.416	0.552	0.710	0.817	1.003	1.025	1.161	1.563
1968	0.177	0.240	0.316	0.415	0.531	0.652	0.819	0.916	1.052	1.219	1.612
1969	0.182	0.246	0.303	0.379	0.504	0.635	0.740	0.914	1.020	1.227	1.623
1970	0.188	0.240	0.309	0.363	0.470	0.619	0.730	0.813	1.012	1.106	1.495
1971	0.181	0.233	0.302	0.365	0.443	0.573	0.725	0.850	0.933	1.087	1.354
1972	0.193	0.241	0.310	0.400	0.461	0.557	0.679	0.818	0.922	1.102	1.365
1973	0.190	0.226	0.285	0.376	0.501	0.576	0.716	0.885	1.038	1.117	1.466
1974	0.191	0.229	0.288	0.349	0.465	0.600	0.759	0.951	1.190	1.396	1.705
1975	0.192	0.231	0.296	0.376	0.484	0.627	0.789	0.994	1.208	1.439	1.817
1976	0.183	0.236	0.296	0.380	0.482	0.610	0.757	0.955	1.109	1.332	1.683
1977	0.187	0.234	0.305	0.386	0.504	0.612	0.761	0.919	1.119	1.271	1.631
1978	0.152	0.233	0.305	0.384	0.469	0.614	0.718	0.897	1.098	1.303	1.626
1979	0.167	0.251	0.312	0.400	0.476	0.558	0.657	0.847	1.061	1.414	1.681
1980	0.155	0.262	0.362	0.425	0.495	0.560	0.629	0.720	0.958	1.290	1.757
1981	0.175	0.281	0.365	0.430	0.484	0.538	0.560	0.663	0.765	0.993	1.446
1982	0.210	0.250	0.369	0.416	0.469	0.509	0.565	0.638	0.812	1.005	1.336
1983	0.290	0.313	0.375	0.447	0.530	0.582	0.610	0.671	0.842	1.091	1.502
1984	0.245	0.306	0.382	0.466	0.553	0.609	0.676	0.771	0.923	1.177	1.638
1985	0.222	0.298	0.367	0.425	0.503	0.601	0.679	0.849	1.120	1.463	1.921
1986	0.079	0.203	0.302	0.420	0.509	0.605	0.713	0.901	1.195	1.570	2.082
1987	0.219	0.189	0.278	0.349	0.452	0.599	0.749	0.925	1.175	1.500	2.017
1988	0.163	0.242	0.317	0.421	0.463	0.547	0.712	0.934	1.229	1.560	2.062
1989	0.065	0.178	0.257	0.365	0.467	0.545	0.696	0.909	1.223	1.572	2.070
1990	0.103	0.158	0.253	0.341	0.464	0.586	0.745	0.986	1.317	1.697	2.049
1991	0.168	0.215	0.321	0.408	0.520	0.661	0.845	1.104	1.478	1.880	2.224
1992	0.234	0.238	0.330	0.415	0.514	0.667	0.861	1.096	1.412	1.806	2.327
1993	0.088	0.228	0.279	0.358	0.453	0.568	0.730	0.926	1.205	1.466	2.008
1994	0.084	0.148	0.244	0.320	0.441	0.613	0.727	0.906	1.163	1.444	1.792
1995	0.166	0.168	0.252	0.341	0.515	0.742	1.102	1.226	1.313	1.849	1.776
1996	0.116	0.194	0.265	0.386	0.537	0.807	1.058	1.457	1.625	2.109	2.353
1997	0.162	0.189	0.266	0.379	0.542	0.745	0.953	1.187	1.531	1.924	2.613
1998	0.136	0.165	0.255	0.350	0.495	0.633	0.806	0.985	1.260	1.732	2.014
1999	0.153	0.212	0.227	0.316	0.411	0.553	0.673	0.860	1.064	1.356	1.809
2000	0.119	0.238	0.313	0.360	0.445	0.566	0.716	0.896	1.147	1.356	1.756
2001	0.185	0.231	0.345	0.426	0.468	0.584	0.750	0.932	1.164	1.391	1.789
2002	0.185	0.268	0.356	0.435	0.510	0.581	0.723	0.940	1.128	1.404	1.742
2003	0.209	0.273	0.369	0.444	0.541	0.637	0.760	0.943	1.201	1.407	1.883
2004	0.177	0.280	0.373	0.468	0.570	0.709	0.838	0.976	1.204	1.535	1.978
2005	0.167	0.276	0.386	0.486	0.581	0.709	0.857	1.012	1.220	1.461	1.931
2006	0.123	0.228	0.377	0.498	0.587	0.687	0.876	0.996	1.208	1.516	1.862
2007	0.215	0.225	0.336	0.469	0.580	0.679	0.813	1.111	1.211	1.382	1.708
2008	0.171	0.260	0.344	0.476	0.587	0.718	0.841	1.097	1.315	1.476	1.629
2009	0.140	0.218	0.306	0.411	0.528	0.658	0.804	0.964	1.332	1.452	1.713
2010	0.196	0.242	0.308	0.392	0.494	0.598	0.712	0.868	1.057	1.358	1.654
2011	0.106	0.240	0.319	0.426	0.536	0.658	0.786	0.976	1.235	1.429	1.665
2012	0.088	0.234	0.311	0.410	0.519	0.638	0.767	0.936	1.208	1.413	1.678
2013	0.082	0.239	0.313	0.409	0.516	0.632	0.755	0.927	1.166	1.400	1.666
2014	0.092	0.237	0.314	0.415	0.524	0.643	0.769	0.946	1.203	1.414	1.670
2015	0.088	0.237	0.313	0.411	0.520	0.637	0.764	0.936	1.192	1.409	1.671
2016	0.087	0.238	0.313	0.412	0.520	0.637	0.763	0.936	1.187	1.407	1.669

Table 26. Estimated proportion mature-at-age for Div. 3LNO American plaice.

	5	6	7	8	9	10	11	12	13	14	15
1960	0.00	0.00	0.02	0.04	0.13	0.23	0.56	0.81	0.93	0.98	0.99
1961	0.00	0.00	0.01	0.05	0.11	0.33	0.56	0.81	0.93	0.98	0.99
1962	0.00	0.01	0.01	0.04	0.13	0.25	0.63	0.85	0.93	0.98	0.99
1963	0.00	0.01	0.03	0.04	0.12	0.30	0.49	0.86	0.96	0.98	0.99
1964	0.00	0.00	0.02	0.08	0.10	0.29	0.56	0.73	0.95	0.99	0.99
1965	0.01	0.00	0.01	0.06	0.22	0.24	0.56	0.79	0.88	0.99	1.00
1966	0.01	0.02	0.02	0.04	0.16	0.47	0.47	0.80	0.92	0.96	1.00
1967	0.00	0.03	0.05	0.06	0.14	0.37	0.73	0.72	0.92	0.97	0.98
1968	0.00	0.01	0.08	0.14	0.21	0.40	0.65	0.90	0.88	0.97	0.99
1969	0.00	0.01	0.03	0.19	0.35	0.51	0.74	0.85	0.96	0.95	0.99
1970	0.00	0.01	0.02	0.08	0.38	0.63	0.80	0.92	0.95	0.99	0.98
1971	0.00	0.00	0.02	0.06	0.18	0.62	0.84	0.94	0.98	0.98	1.00
1972	0.00	0.00	0.01	0.06	0.16	0.37	0.81	0.94	0.98	0.99	0.99
1973	0.00	0.00	0.01	0.03	0.16	0.35	0.61	0.92	0.98	1.00	1.00
1974	0.00	0.00	0.01	0.02	0.09	0.34	0.61	0.81	0.97	0.99	1.00
1975	0.00	0.01	0.01	0.03	0.09	0.25	0.58	0.82	0.92	0.99	1.00
1976	0.00	0.01	0.02	0.03	0.11	0.26	0.54	0.79	0.93	0.97	1.00
1977	0.00	0.01	0.02	0.07	0.12	0.36	0.56	0.80	0.91	0.97	0.99
1978	0.00	0.00	0.02	0.07	0.21	0.39	0.72	0.83	0.93	0.97	0.99
1979	0.00	0.00	0.02	0.07	0.21	0.49	0.74	0.92	0.95	0.98	0.99
1980	0.00	0.00	0.01	0.06	0.19	0.47	0.78	0.93	0.98	0.99	0.99
1981	0.00	0.01	0.02	0.05	0.19	0.43	0.75	0.93	0.98	1.00	1.00
1982	0.00	0.01	0.03	0.12	0.22	0.48	0.71	0.91	0.98	1.00	1.00
1983	0.00	0.00	0.05	0.15	0.44	0.63	0.79	0.88	0.97	0.99	1.00
1984	0.00	0.01	0.03	0.23	0.50	0.82	0.91	0.94	0.96	0.99	1.00
1985	0.00	0.00	0.06	0.23	0.62	0.85	0.96	0.98	0.98	0.99	1.00
1986	0.01	0.02	0.05	0.35	0.74	0.90	0.97	0.99	1.00	1.00	1.00
1987	0.00	0.04	0.11	0.42	0.80	0.96	0.98	0.99	1.00	1.00	1.00
1988	0.00	0.02	0.15	0.41	0.90	0.97	1.00	1.00	1.00	1.00	1.00
1989	0.00	0.01	0.08	0.47	0.80	0.99	1.00	1.00	1.00	1.00	1.00
1990	0.00	0.01	0.05	0.27	0.82	0.96	1.00	1.00	1.00	1.00	1.00
1991	0.01	0.01	0.05	0.21	0.63	0.96	0.99	1.00	1.00	1.00	1.00
1992	0.00	0.02	0.06	0.24	0.57	0.88	0.99	1.00	1.00	1.00	1.00
1993	0.01	0.01	0.08	0.23	0.65	0.87	0.97	1.00	1.00	1.00	1.00
1994	0.03	0.03	0.07	0.26	0.59	0.91	0.97	0.99	1.00	1.00	1.00
1995	0.08	0.11	0.19	0.38	0.58	0.88	0.98	0.99	1.00	1.00	1.00
1996	0.01	0.17	0.35	0.63	0.84	0.84	0.97	1.00	1.00	1.00	1.00
1997	0.00	0.04	0.35	0.70	0.92	0.98	0.95	0.99	1.00	1.00	1.00
1998	0.02	0.03	0.16	0.58	0.91	0.99	1.00	0.99	1.00	1.00	1.00
1999	0.02	0.07	0.14	0.46	0.78	0.98	1.00	1.00	1.00	1.00	1.00
2000	0.01	0.07	0.22	0.49	0.80	0.90	1.00	1.00	1.00	1.00	1.00
2001	0.04	0.04	0.24	0.52	0.85	0.95	0.96	1.00	1.00	1.00	1.00
2002	0.05	0.15	0.21	0.57	0.81	0.97	0.99	0.98	1.00	1.00	1.00
2003	0.08	0.16	0.38	0.61	0.84	0.94	1.00	1.00	0.99	1.00	1.00
2004	0.02	0.20	0.38	0.69	0.90	0.96	0.98	1.00	1.00	1.00	1.00
2005	0.06	0.06	0.41	0.67	0.89	0.98	0.99	1.00	1.00	1.00	1.00
2006	0.02	0.14	0.19	0.66	0.87	0.97	1.00	1.00	1.00	1.00	1.00
2007	0.02	0.06	0.30	0.44	0.85	0.96	0.99	1.00	1.00	1.00	1.00
2008	0.03	0.07	0.21	0.54	0.73	0.94	0.99	1.00	1.00	1.00	1.00
2009	0.04	0.10	0.22	0.51	0.76	0.90	0.98	1.00	1.00	1.00	1.00
2010	0.02	0.10	0.28	0.52	0.80	0.90	0.97	0.99	1.00	1.00	1.00
2011	0.01	0.06	0.26	0.60	0.80	0.94	0.96	0.99	1.00	1.00	1.00
2012	0.01	0.04	0.18	0.51	0.85	0.94	0.98	0.98	1.00	1.00	1.00
2013	0.01	0.05	0.14	0.43	0.76	0.95	0.98	1.00	0.99	1.00	1.00
2014	0.01	0.05	0.16	0.41	0.71	0.90	0.99	1.00	1.00	1.00	1.00
2015	0.01	0.05	0.16	0.44	0.75	0.89	0.97	1.00	1.00	1.00	1.00
2016	0.01	0.05	0.16	0.43	0.76	0.93	0.96	0.99	1.00	1.00	1.00

Table 27. ADAPT parameter estimates for Div. 3LNO American plaice using Canadian Div. 3LNO spring and fall surveys and EU-Spain Div. 3NO survey.

Parameter	Estimate	Standard Error	Bias	Rel. Err.	Rel.Bias
N[2016 6]	1.029E+04	4.351E+03	9.274E+02	0.423	0.090
N[2016 7]	1.311E+04	3.951E+03	6.009E+02	0.301	0.046
N[2016 8]	2.286E+04	5.258E+03	6.121E+02	0.230	0.027
N[2016 9]	1.414E+04	2.839E+03	2.797E+02	0.201	0.020
N[2016 10]	1.188E+04	2.186E+03	1.910E+02	0.184	0.016
N[2016 11]	5.890E+03	1.061E+03	8.502E+01	0.180	0.014
N[2016 12]	4.157E+03	7.293E+02	5.452E+01	0.175	0.013
N[2016 13]	3.390E+03	5.636E+02	3.964E+01	0.166	0.012
N[2016 14]	1.236E+03	2.173E+02	1.488E+01	0.176	0.012
N[2016 15]	3.078E+03	3.421E+02	1.337E+01	0.111	0.004
q ID#[1]	9.211E-03	1.127E-03	6.214E-05	0.122	0.007
q ID#[2]	1.063E-02	1.289E-03	7.134E-05	0.121	0.007
q ID#[3]	1.021E-02	1.234E-03	6.906E-05	0.121	0.007
q ID#[4]	9.068E-03	1.095E-03	6.237E-05	0.121	0.007
q ID#[5]	7.660E-03	9.261E-04	5.355E-05	0.121	0.007
q ID#[6]	6.176E-03	7.483E-04	4.401E-05	0.121	0.007
q ID#[7]	5.809E-03	7.066E-04	4.203E-05	0.122	0.007
q ID#[8]	5.766E-03	7.050E-04	4.218E-05	0.122	0.007
q ID#[9]	5.145E-03	6.300E-04	3.801E-05	0.122	0.007
q ID#[10]	4.965E-03	6.112E-04	3.676E-05	0.123	0.007
q ID#[11]	3.925E-03	4.323E-04	2.131E-05	0.110	0.005
q ID#[12]	5.707E-03	6.256E-04	3.110E-05	0.110	0.005
q ID#[13]	6.804E-03	7.443E-04	3.750E-05	0.109	0.006
q ID#[14]	6.444E-03	7.042E-04	3.606E-05	0.109	0.006
q ID#[15]	5.909E-03	6.463E-04	3.363E-05	0.109	0.006
q ID#[16]	4.738E-03	5.190E-04	2.734E-05	0.110	0.006
q ID#[17]	4.548E-03	4.996E-04	2.657E-05	0.110	0.006
q ID#[18]	4.776E-03	5.266E-04	2.826E-05	0.110	0.006
q ID#[19]	4.104E-03	4.547E-04	2.447E-05	0.111	0.006
q ID#[20]	4.012E-03	4.447E-04	2.394E-05	0.111	0.006
q ID#[21]	2.250E-03	3.240E-04	2.100E-05	0.144	0.009
q ID#[22]	3.853E-03	5.468E-04	3.526E-05	0.142	0.009
q ID#[23]	4.735E-03	6.676E-04	4.339E-05	0.141	0.009
q ID#[24]	4.458E-03	6.271E-04	4.145E-05	0.141	0.009
q ID#[25]	4.526E-03	6.371E-04	4.289E-05	0.141	0.009
q ID#[26]	3.924E-03	5.538E-04	3.799E-05	0.141	0.010
q ID#[27]	3.669E-03	5.199E-04	3.614E-05	0.142	0.010
q ID#[28]	3.642E-03	5.193E-04	3.651E-05	0.143	0.010
q ID#[29]	2.518E-03	3.620E-04	2.575E-05	0.144	0.010
q ID#[30]	2.314E-03	3.352E-04	2.387E-05	0.145	0.010

Table 28. Bias adjusted population numbers (000 t) from 2016 VPA.

Pop #s Bias Adj(a	5	6	7	8	9	10	11	12	13	14	15
1960	299711	215972	141212	120313	90754	59599	48429	34426	21984	16264	29100
1961	283342	245342	176535	114854	97270	72734	46737	37358	25054	15519	30700
1962	265661	231955	200688	144055	92923	77414	56684	36039	28536	17006	30925
1963	270974	217448	189507	163716	116952	75009	61874	44214	27073	21190	30932
1964	260403	221724	177102	153470	132744	94355	59392	47856	32435	18655	34147
1965	288220	212957	179802	140486	122713	103109	69345	42353	33640	23629	35500
1966	250042	235545	171504	140679	106625	94109	77596	51606	29459	22846	38652
1967	223369	203128	187185	131359	105137	78715	70496	57122	37142	18963	38224
1968	176502	182487	163286	143478	100647	77508	52103	45415	33683	21879	29058
1969	174804	144258	147292	129950	108641	72298	52983	35691	24763	19692	28456
1970	164081	142494	115893	113486	93606	72579	47691	31933	19890	13941	27770
1971	204824	134234	114703	92579	83891	64445	49259	28997	18734	11295	21647
1972	242725	166670	108321	86323	66372	54731	40026	30446	15643	10674	17241
1973	292802	198204	134134	86548	63734	44166	33335	21363	15334	6744	12668
1974	280066	239684	161301	104107	61381	40472	27132	18336	11425	6663	6330
1975	293988	228979	190860	122612	76157	43255	25040	15849	10883	5939	6656
1976	276670	239899	184647	149745	91877	54031	28301	15376	8729	5515	5353
1977	232208	225762	192885	143252	105155	60285	33145	15701	7966	4437	4829
1978	218534	189236	178769	150030	106705	73876	39317	21271	9032	4396	4791
1979	200746	177513	150900	138065	113454	75878	47994	23261	11295	4125	3351
1980	193539	163222	139422	111344	96149	79395	50864	31382	15646	7589	4956
1981	188525	158219	130946	105551	79824	66011	52211	31495	18428	9455	7943
1982	191312	154212	129038	105180	82098	58213	43761	30561	15155	7327	5105
1983	189910	156608	125975	104010	81783	59152	36118	21673	12089	5332	3808
1984	191540	155378	127325	100383	79925	59436	41485	21937	11007	5790	3688
1985	187577	156777	126854	102876	79197	60157	39697	22404	9942	4483	4080
1986	159689	153308	127646	101726	79127	55207	35113	19488	10085	4465	3649
1987	142155	126763	116760	93187	71995	52746	32734	16003	6715	2973	2387
1988	162289	114367	99325	88656	66478	44677	27370	16580	6858	2750	2289
1989	190462	130245	90735	76940	66029	45311	27297	14107	8164	3206	2232
1990	185689	102481	67949	44804	38024	28261	17449	9829	4628	3292	1909
1991	92454	97877	54512	36604	22902	15907	10202	5508	3104	1467	1951
1992	63231	49809	48466	26189	14589	7667	4521	2781	1557	1222	1380
1993	55011	37106	28543	26568	12861	5888	2911	1545	988	491	730
1994	61740	31492	19042	10254	7141	3381	1033	392	196	200	101
1995	57866	33081	15648	7173	2765	2157	1439	260	111	29	116
1996	38458	33985	19234	8867	3970	1474	1220	837	150	65	85
1997	25703	22500	19441	10584	4877	2177	828	710	486	87	87
1998	23579	21027	18299	15426	8016	3624	1648	594	530	375	139
1999	23731	19295	17166	14736	11938	5838	2556	1098	381	372	360
2000	15737	19406	15640	13812	11542	8845	3808	1529	650	199	529
2001	13510	12871	15684	12149	10482	8150	5862	2238	867	357	452
2002	13487	10961	10238	11813	8673	7156	5237	3538	1236	501	486
2003	20344	10761	8695	7832	8331	5812	4884	3335	2352	828	698
2004	16733	15562	7924	6124	4877	5029	3677	3099	1940	1603	990
2005	15669	13387	11030	5392	4143	3016	3205	2345	2006	1300	1829
2006	14579	12776	10699	8130	3656	2691	1948	2142	1612	1408	2176
2007	14396	11868	10254	8185	6152	2571	1884	1314	1526	1130	2580
2008	26649	11738	9650	8056	6135	4371	1775	1287	851	1026	2307
2009	25400	21744	9487	7637	5945	4359	3118	1249	875	596	2432
2010	26387	20625	17180	7276	5629	4158	2988	2128	829	637	2080
2011	38129	21490	16266	13269	5456	4173	2882	2078	1476	539	1883
2012	34011	30563	16877	12412	9995	4071	3084	2115	1472	1136	1854
2013	41854	27588	24334	13058	9520	7522	3000	2309	1532	1076	2281
2014	18977	33967	22013	18895	9726	6962	5508	2135	1671	1128	2494
2015	11502	15472	27474	17337	14624	7339	5231	4252	1589	1259	2702
2016	20905	9361	12512	22250	13861	11691	5805	4103	3351	1222	3065

Table 29. Bias adjusted fishing mortalities from 2016 VPA.

F Bias Adj(analyt	5	6	7	8	9	10	11	12	13	14	15
1960	0.000	0.002	0.007	0.013	0.021	0.043	0.060	0.118	0.148	0.190	0.190
1961	0.000	0.001	0.003	0.012	0.028	0.049	0.060	0.069	0.187	0.202	0.202
1962	0.000	0.002	0.004	0.008	0.014	0.024	0.048	0.086	0.098	0.238	0.238
1963	0.001	0.005	0.011	0.010	0.015	0.033	0.057	0.110	0.172	0.223	0.223
1964	0.001	0.010	0.032	0.024	0.053	0.108	0.138	0.152	0.117	0.197	0.197
1965	0.002	0.016	0.045	0.076	0.065	0.084	0.095	0.163	0.187	0.225	0.225
1966	0.008	0.030	0.067	0.091	0.103	0.089	0.106	0.129	0.241	0.276	0.276
1967	0.002	0.018	0.066	0.066	0.105	0.213	0.240	0.328	0.329	0.477	0.477
1968	0.002	0.014	0.028	0.078	0.131	0.180	0.178	0.407	0.337	0.382	0.382
1969	0.004	0.019	0.061	0.128	0.203	0.216	0.306	0.385	0.374	0.350	0.350
1970	0.001	0.017	0.025	0.102	0.173	0.188	0.298	0.333	0.366	0.456	0.456
1971	0.006	0.014	0.084	0.133	0.227	0.276	0.281	0.417	0.363	0.447	0.447
1972	0.003	0.017	0.024	0.103	0.207	0.296	0.428	0.486	0.641	0.590	0.590
1973	0.000	0.006	0.053	0.144	0.254	0.287	0.398	0.426	0.633	0.921	0.921
1974	0.001	0.028	0.074	0.113	0.150	0.280	0.338	0.322	0.454	0.469	0.469
1975	0.003	0.015	0.043	0.089	0.143	0.224	0.288	0.396	0.480	0.656	0.656
1976	0.003	0.018	0.054	0.154	0.221	0.289	0.389	0.458	0.477	0.611	0.611
1977	0.005	0.033	0.051	0.095	0.153	0.227	0.244	0.353	0.394	0.460	0.460
1978	0.008	0.026	0.058	0.079	0.141	0.231	0.325	0.433	0.584	0.809	0.809
1979	0.007	0.042	0.104	0.162	0.157	0.200	0.225	0.197	0.198	0.211	0.211
1980	0.002	0.020	0.078	0.133	0.176	0.219	0.279	0.332	0.304	0.257	0.257
1981	0.001	0.004	0.019	0.051	0.116	0.211	0.336	0.531	0.722	1.026	1.026
1982	0.000	0.002	0.016	0.052	0.128	0.277	0.503	0.727	0.845	0.983	0.983
1983	0.001	0.007	0.027	0.063	0.119	0.155	0.299	0.477	0.536	0.708	0.708
1984	0.000	0.003	0.013	0.037	0.084	0.204	0.416	0.591	0.698	0.643	0.643
1985	0.002	0.006	0.021	0.062	0.161	0.338	0.511	0.598	0.600	0.653	0.653
1986	0.031	0.072	0.115	0.146	0.206	0.323	0.586	0.866	1.021	1.024	1.024
1987	0.018	0.044	0.075	0.138	0.277	0.456	0.480	0.647	0.693	0.651	0.651
1988	0.020	0.031	0.055	0.095	0.183	0.293	0.463	0.508	0.561	0.614	0.614
1989	0.090	0.121	0.176	0.175	0.319	0.424	0.491	0.585	0.378	0.517	0.517
1990	0.110	0.101	0.089	0.141	0.341	0.489	0.623	0.623	0.619	0.450	0.450
1991	0.089	0.173	0.203	0.390	0.564	0.728	0.770	0.734	0.402	0.377	0.377
1992	0.003	0.027	0.071	0.181	0.377	0.439	0.544	0.505	0.623	0.742	0.742
1993	0.028	0.137	0.494	0.784	0.806	1.211	1.475	1.534	1.068	1.960	1.960
1994	0.094	0.169	0.446	0.780	0.667	0.324	0.848	0.731	1.383	0.425	0.425
1995	0.002	0.012	0.038	0.061	0.099	0.040	0.012	0.020	0.001	0.004	0.004
1996	0.006	0.029	0.067	0.068	0.071	0.046	0.011	0.013	0.020	0.020	0.020
1997	0.001	0.007	0.031	0.078	0.097	0.079	0.133	0.092	0.061	0.018	0.018
1998	0.000	0.003	0.017	0.056	0.117	0.149	0.206	0.245	0.155	0.156	0.156
1999	0.001	0.010	0.017	0.044	0.100	0.227	0.314	0.325	0.448	0.125	0.125
2000	0.001	0.013	0.053	0.076	0.148	0.211	0.331	0.368	0.400	0.277	0.277
2001	0.009	0.029	0.083	0.137	0.182	0.242	0.305	0.394	0.348	0.308	0.308
2002	0.026	0.032	0.068	0.149	0.200	0.182	0.251	0.208	0.200	0.147	0.147
2003	0.068	0.106	0.151	0.274	0.305	0.258	0.255	0.342	0.183	0.233	0.233
2004	0.023	0.144	0.185	0.191	0.280	0.250	0.250	0.235	0.200	0.149	0.149
2005	0.004	0.024	0.105	0.189	0.231	0.237	0.203	0.175	0.154	0.163	0.163
2006	0.006	0.020	0.068	0.079	0.152	0.157	0.194	0.139	0.155	0.129	0.129
2007	0.004	0.007	0.041	0.088	0.142	0.171	0.181	0.234	0.197	0.275	0.275
2008	0.003	0.013	0.034	0.104	0.142	0.138	0.152	0.186	0.156	0.115	0.115
2009	0.008	0.036	0.065	0.105	0.158	0.178	0.182	0.209	0.118	0.176	0.176
2010	0.005	0.037	0.058	0.088	0.099	0.166	0.163	0.166	0.231	0.166	0.166
2011	0.021	0.042	0.070	0.083	0.093	0.102	0.110	0.145	0.061	0.067	0.067
2012	0.009	0.028	0.057	0.065	0.084	0.105	0.089	0.122	0.113	0.071	0.071
2013	0.009	0.026	0.053	0.095	0.113	0.112	0.140	0.123	0.106	0.097	0.097
2014	0.004	0.012	0.039	0.056	0.082	0.086	0.059	0.095	0.084	0.093	0.093
2015	0.006	0.012	0.011	0.024	0.024	0.034	0.043	0.038	0.063	0.056	0.056

Table 30. Spawning stock biomass from 2016 VPA output.

	5	6	7	8	9	10	11	12	13	14	15
1960	114	190	532	1528	4864	7455	18016	21629	17877	16539	36787
1961	183	230	558	1707	4321	13049	17502	23471	20374	15781	38809
1962	103	396	611	1923	5158	10610	23763	24732	23535	17199	39328
1963	27	286	1191	1991	6105	12732	20081	29864	22759	21145	41669
1964	51	125	971	4777	6068	15880	22698	27483	27258	18906	45816
1965	274	228	550	3442	14844	15363	28181	27097	26474	25062	50291
1966	569	929	945	2286	9515	30903	30497	37174	24957	23912	55593
1967	184	1632	3058	3445	8164	20721	42310	41263	35185	21347	58774
1968	87	521	4221	8537	11165	20415	27685	37325	31202	25983	46357
1969	110	283	1377	9330	18961	23351	28888	27827	24371	23068	45793
1970	19	317	808	3207	16744	28173	27925	23887	19080	15249	40849
1971	18	67	859	2100	6786	22793	30045	23193	17114	12062	29198
1972	12	73	254	2234	4894	11342	21987	23514	14194	11706	23411
1973	18	53	257	847	5050	8983	14578	17356	15626	7501	18545
1974	87	79	257	890	2448	8205	12583	14049	13145	9245	10779
1975	119	307	371	1164	3151	6724	11469	12889	12054	8438	12074
1976	120	397	1122	1665	4765	8492	11502	11597	8986	7104	8962
1977	43	394	1360	3855	6423	13259	14210	11577	8119	5492	7777
1978	8	170	1270	4216	10607	17528	20426	15790	9267	5531	7718
1979	25	64	708	3880	11304	20790	23382	18204	11349	5717	5560
1980	30	183	423	2685	9205	20879	24815	21005	14724	9643	8659
1981	59	250	1140	2137	7416	15355	21864	19316	13867	9358	11440
1982	14	373	1467	5345	8631	14329	17485	17710	12039	7337	6815
1983	63	158	2416	7049	19146	21630	17314	12866	9878	5782	5713
1984	17	417	1460	10699	22164	29599	25457	15815	9763	6752	6029
1985	168	211	2982	9972	24662	30715	25959	18697	10942	6475	7814
1986	95	689	2107	14767	29739	30031	24272	17431	12016	6979	7566
1987	128	864	3630	13793	26122	30469	24039	14723	7878	4456	4808
1988	54	502	4880	15391	27839	23664	19412	15423	8419	4290	4719
1989	20	236	1793	13292	24516	24502	18920	12821	9976	5038	4619
1990	51	152	854	4151	14372	15835	12992	9681	6095	5587	3912
1991	91	268	911	3125	7463	10046	8549	6079	4586	2759	4340
1992	15	267	941	2623	4297	4516	3857	3043	2198	2208	3211
1993	24	71	658	2211	3767	2915	2065	1429	1190	720	1465
1994	134	157	311	854	1871	1893	729	353	228	289	181
1995	721	588	769	923	824	1404	1561	317	146	54	206
1996	41	1139	1761	2145	1783	1002	1255	1215	244	138	200
1997	18	171	1802	2816	2434	1585	754	838	744	167	226
1998	57	89	745	3127	3621	2266	1324	578	668	649	281
1999	71	270	532	2157	3824	3159	1717	944	404	504	651
2000	15	343	1064	2426	4090	4504	2714	1369	745	270	929
2001	111	131	1324	2693	4173	4506	4217	2084	1009	496	808
2002	131	426	777	2914	3578	4043	3738	3271	1393	703	848
2003	343	456	1224	2132	3792	3490	3694	3137	2805	1166	1313
2004	56	861	1120	1981	2509	3407	3034	3024	2334	2453	1958
2005	147	230	1744	1753	2144	2100	2715	2363	2446	1899	3529
2006	32	404	752	2674	1867	1789	1702	2127	1945	2134	4051
2007	63	173	1047	1697	3019	1671	1517	1459	1846	1562	4406
2008	127	219	699	2079	2639	2947	1473	1408	1120	1514	3757
2009	130	458	649	1592	2394	2594	2452	1198	1165	866	4167
2010	115	513	1505	1477	2220	2232	2064	1832	875	864	3441
2011	47	293	1348	3238	2160	2451	2044	1704	1579	668	3116
2012	49	186	732	2256	4045	2125	2240	1772	1436	1403	2958
2013	60	223	801	1864	3289	4121	1934	1921	1431	1246	3612
2014	34	303	909	2690	2959	3447	3536	1656	1604	1187	3837
2015	10	129	1096	2480	4504	3128	3078	3202	1481	1326	3641
2016	29	80	497	3178	4539	5805	3576	3204	3162	1330	4568

Table 31. Retrospective comparison of population numbers at age estimated from ADAPT. Table entries provide the ratio of the estimated numbers from the current assessment to those estimated from last year's assessment (model formulation unchanged). Shaded entries highlight changes in excess of ± 10%.

Pop #s Bias	5	6	7	8	9	10	11	12	13	14	15
1960	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1961	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1962	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1963	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1964	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1965	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1966	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1967	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1968	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1969	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1970	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1971	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1972	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1973	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1974	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1975	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1976	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1977	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1978	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1979	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1980	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1981	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1982	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1983	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1984	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1985	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1986	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1987	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1988	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1989	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1990	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1991	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1992	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1993	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1994	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	0.99	0.99
1995	0.99	0.99	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99
1996	0.99	0.99	0.99	0.99	1.00	1.00	0.99	0.99	0.99	0.99	0.99
1997	0.99	0.99	0.99	0.99	0.99	0.99	1.00	0.99	0.99	0.99	0.99
1998	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
1999	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
2000	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
2001	0.98	0.99	0.98	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
2002	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.98	0.98	0.98	0.98
2003	0.97	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
2004	0.96	0.97	0.98	0.97	0.98	0.97	0.98	0.97	0.97	0.97	0.97
2005	0.95	0.96	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
2006	1.06	0.95	0.96	0.96	0.96	0.96	0.97	0.96	0.96	0.96	0.96
2007	0.87	1.06	0.95	0.96	0.95	0.96	0.95	0.96	0.95	0.96	0.96
2008	0.82	0.87	1.06	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
2009	0.87	0.82	0.87	1.06	0.94	0.95	0.94	0.94	0.94	0.94	0.94
2010	0.86	0.87	0.82	0.86	1.07	0.94	0.94	0.93	0.93	0.93	0.93
2011	0.82	0.86	0.87	0.81	0.85	1.07	0.92	0.93	0.92	0.92	0.92
2012	0.82	0.82	0.86	0.86	0.79	0.84	1.08	0.92	0.91	0.91	0.91
2013	0.89	0.82	0.81	0.85	0.85	0.78	0.82	1.09	0.91	0.91	0.91
2014	1.30	0.89	0.81	0.80	0.84	0.83	0.76	0.80	1.10	0.90	0.90
2015		1.30	0.89	0.81	0.79	0.82	0.82	0.75	0.79	1.11	0.89

Table 32. Results of stochastic projections under various fishing mortality options. Labels p10, p50 and p90 refer to 10th, 50th and 90th percentiles of each quantity.

	F = 0		
	SSB ('000 t)		
	p10	p50	p90
2016	27	30	33
2017	32	35	39
2018	35	38	43
2019	37	41	46

	$F_{2013\text{-}15}$ = 0.08					
	SSB ('000 t)			Yield ('000 t)		
	p10	p50	p90	p10	p50	p90
2016	27	30	33	2.5	2.7	3.0
2017	29	32	36	2.6	2.8	3.1
2018	30	33	37	2.6	2.9	3.2
2019	30	33	37			

Table 33. American plaice in Div. 3LNO: Risk assessment under F =0 and $F_{2013\text{-}2015}$ of the probability of being below B_{lim}. Yield is median projected value.

Fishing Mortality	Yield			P(SSB>B_{lim})			P(SSB_{2019}>SSB_{2016})
	2016	2017	2018	2017	2018	2019	
F = 0	-	-	-	<5%	<5%	<5%	>95%
$F_{2013\text{-}2015}$= 0.08	2744	2835	2906	<5%	<5%	<5%	>95%

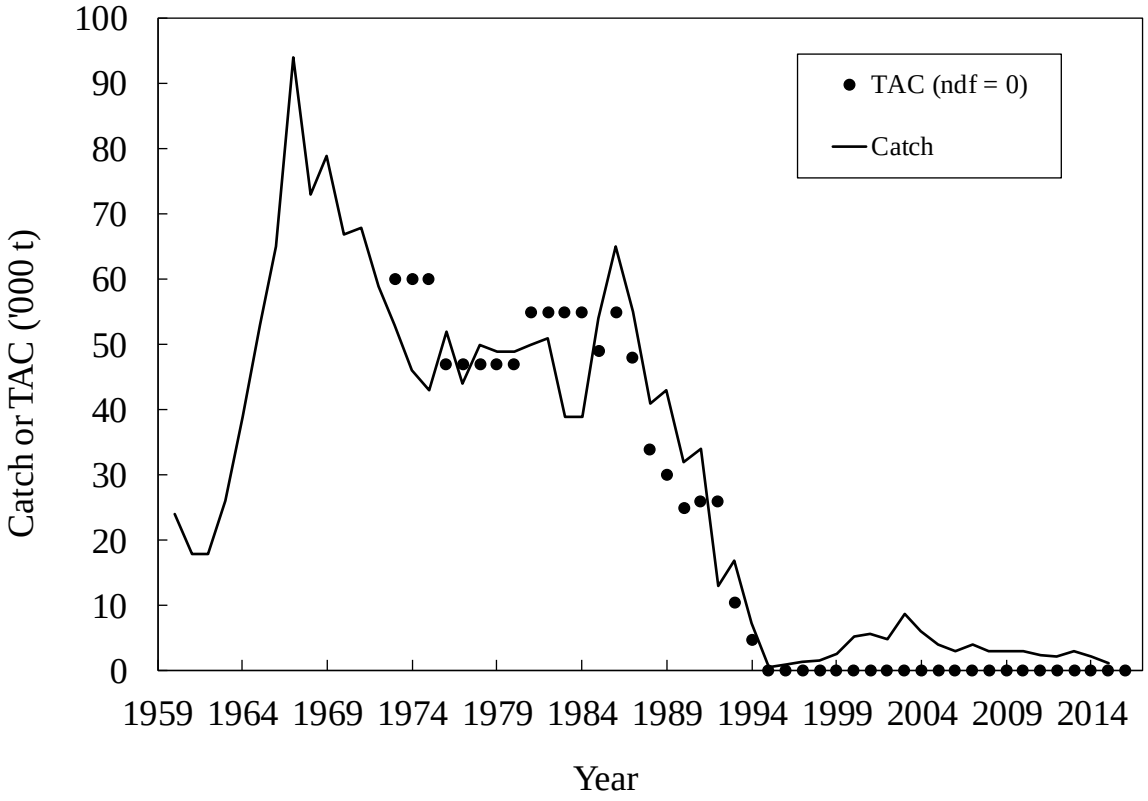

Fig. 1. American plaice catches ('000 t) from 1960-2013 and total allowable catch (TAC) from 1973-2013.

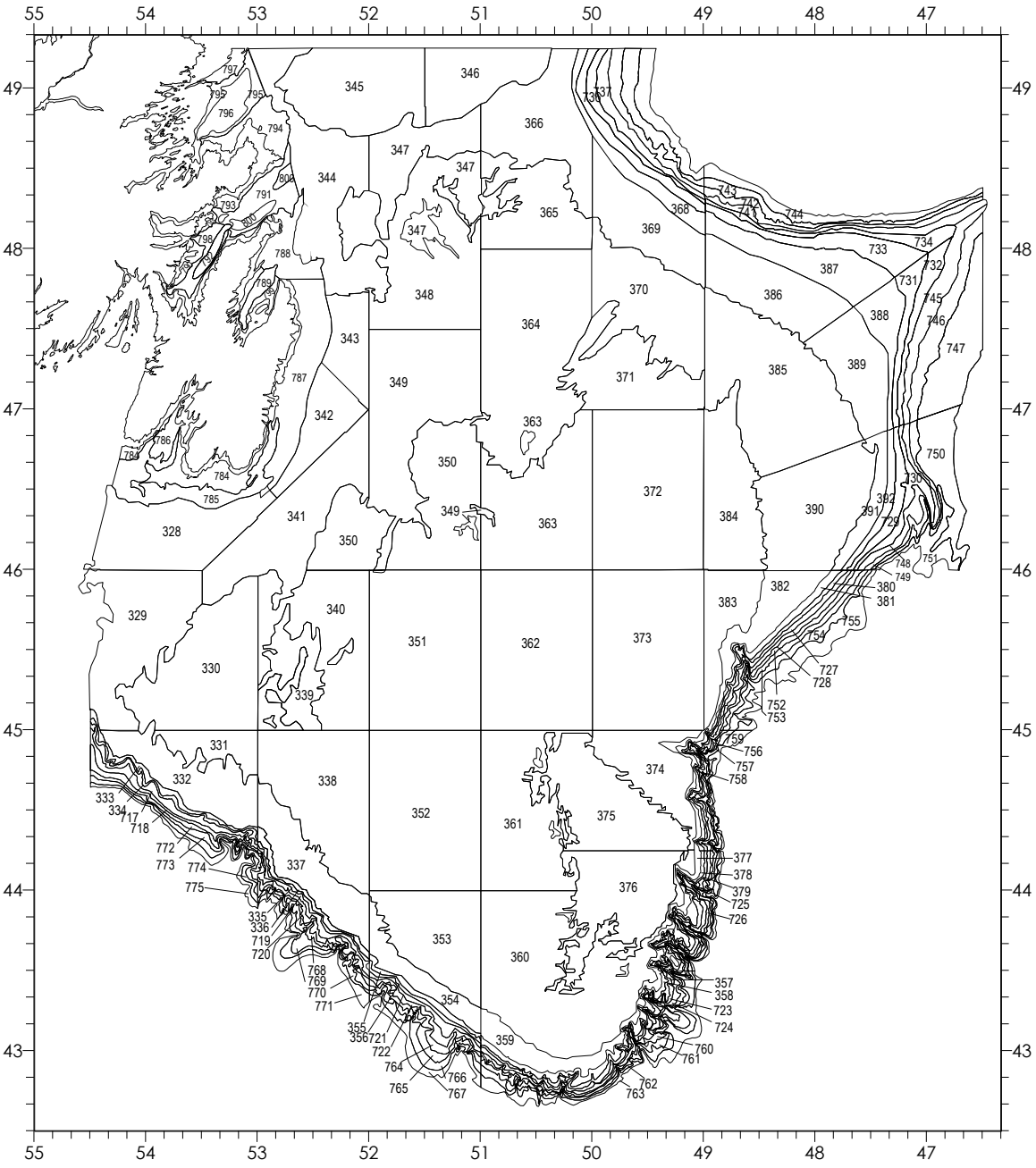

Fig. 2. Stratification scheme used in Canadian research vessel surveys of Div. 3LNO.

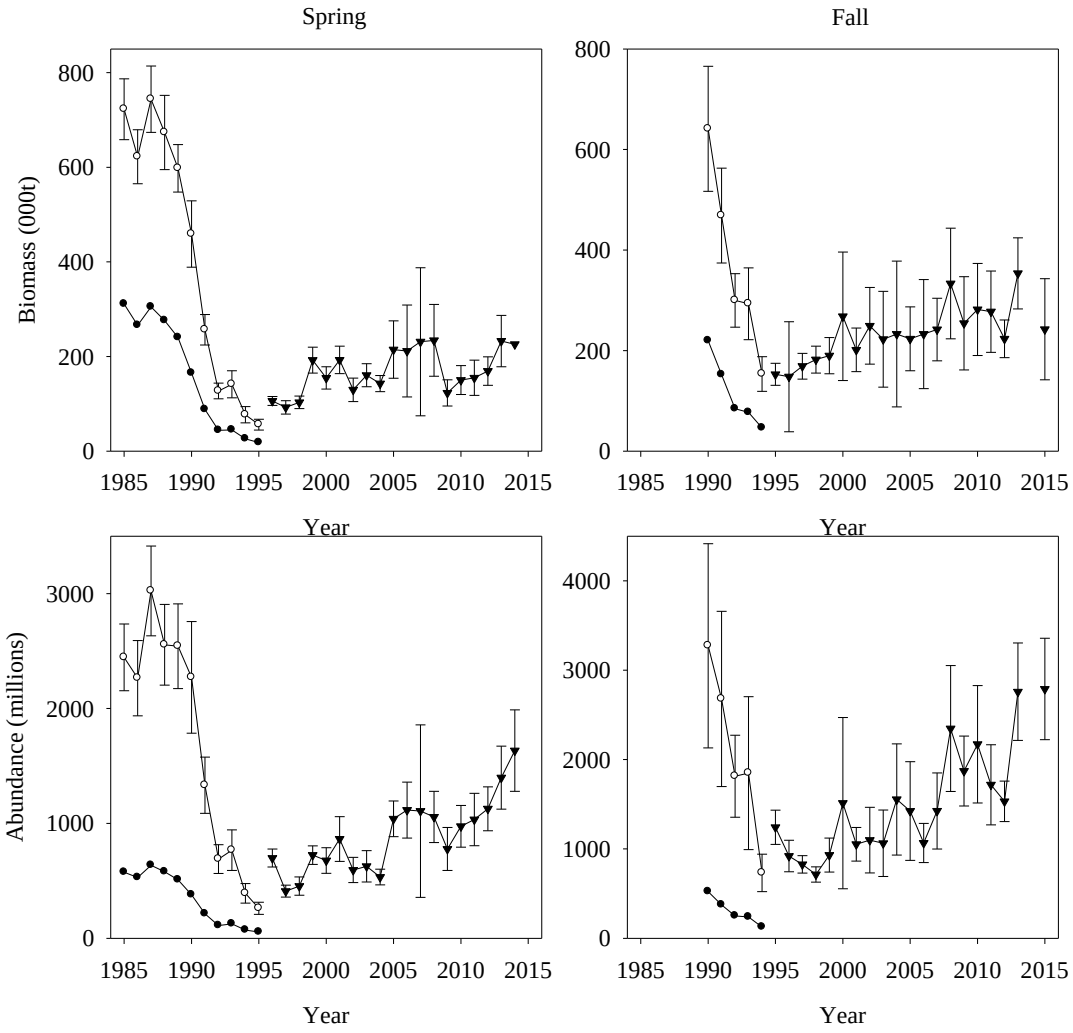

Fig. 3. Total biomass (000 t) and abundance (millions) for American plaice in Divs. 3LNO, for spring (left) and fall (right) from Canadian RV surveys.

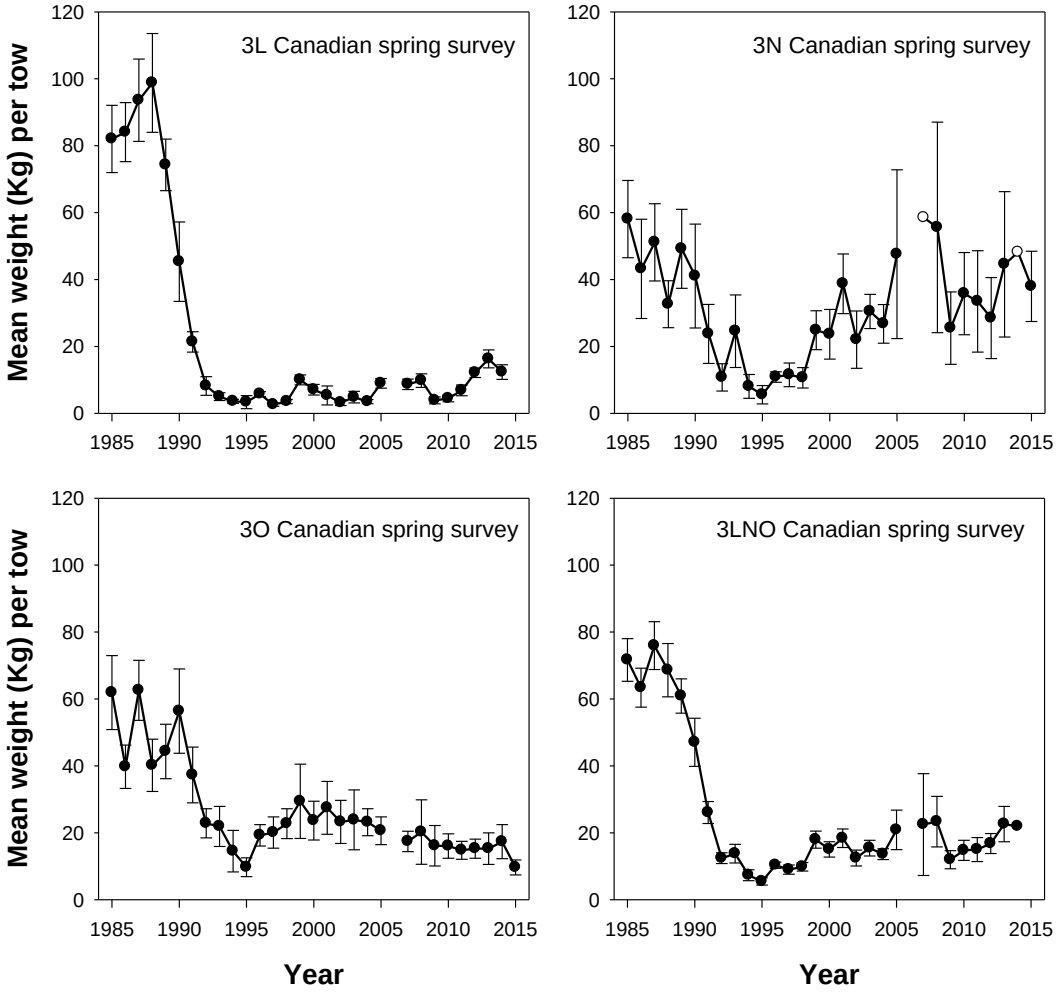

Fig. 4. Mean weight per tow (kg) (with associated 95% confidence intervals) of American plaice from Canadian spring surveys in Div. 3L, 3N, 3O and 3LNO combined. Note that open symbols represent negative 95% confidence intervals. Please note that survey converage was poor in 2006 and 2015 (for Div 3L and Div. 3LNO) and are therefore not plotted.

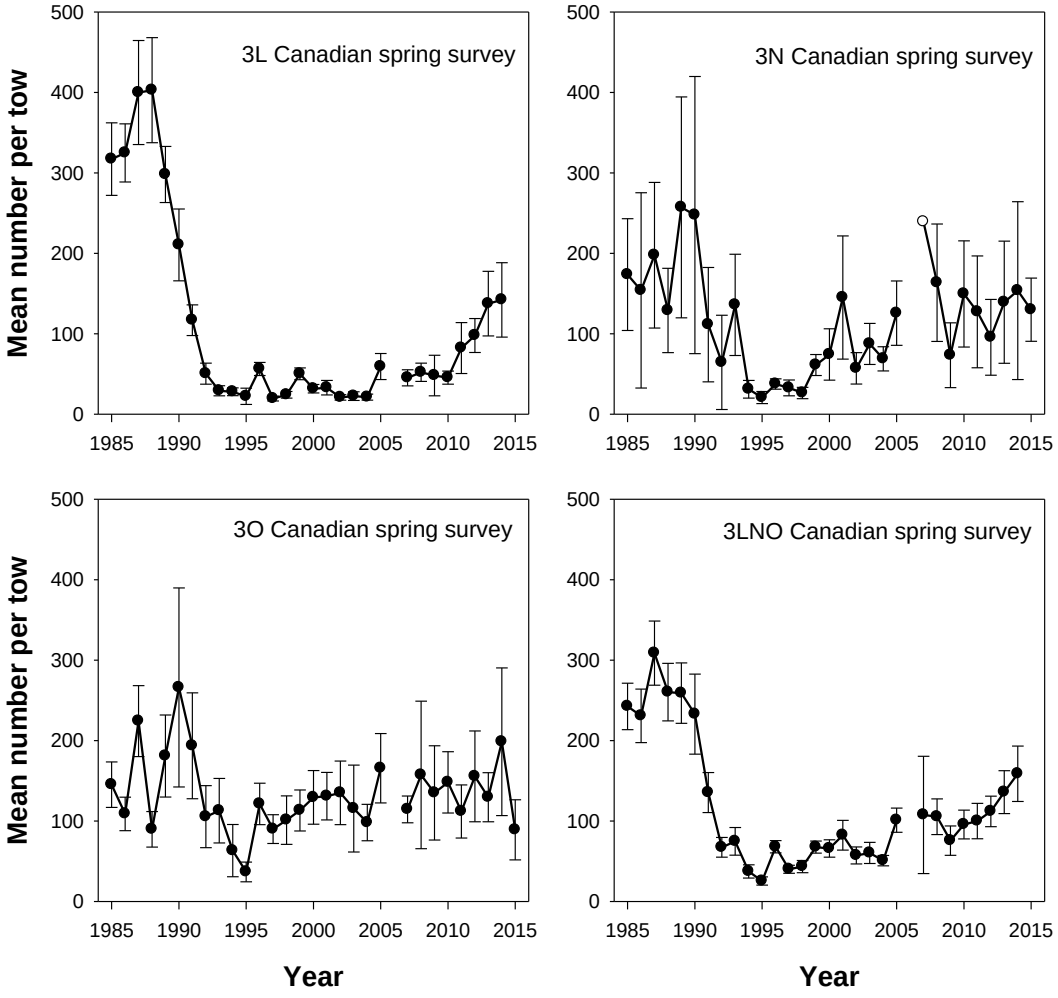

Fig. 5. Mean number per tow (with associated 95% confidence intervals) of American plaice from Canadian spring surveys in Div. 3L, 3N, 3O and 3LNO combined. Note that open symbols represent negative 95% confidence intervals. Please note that survey converage was poor in 2006 and 2015 (for Div 3L and Div. 3LNO) and are therefore not plotted.

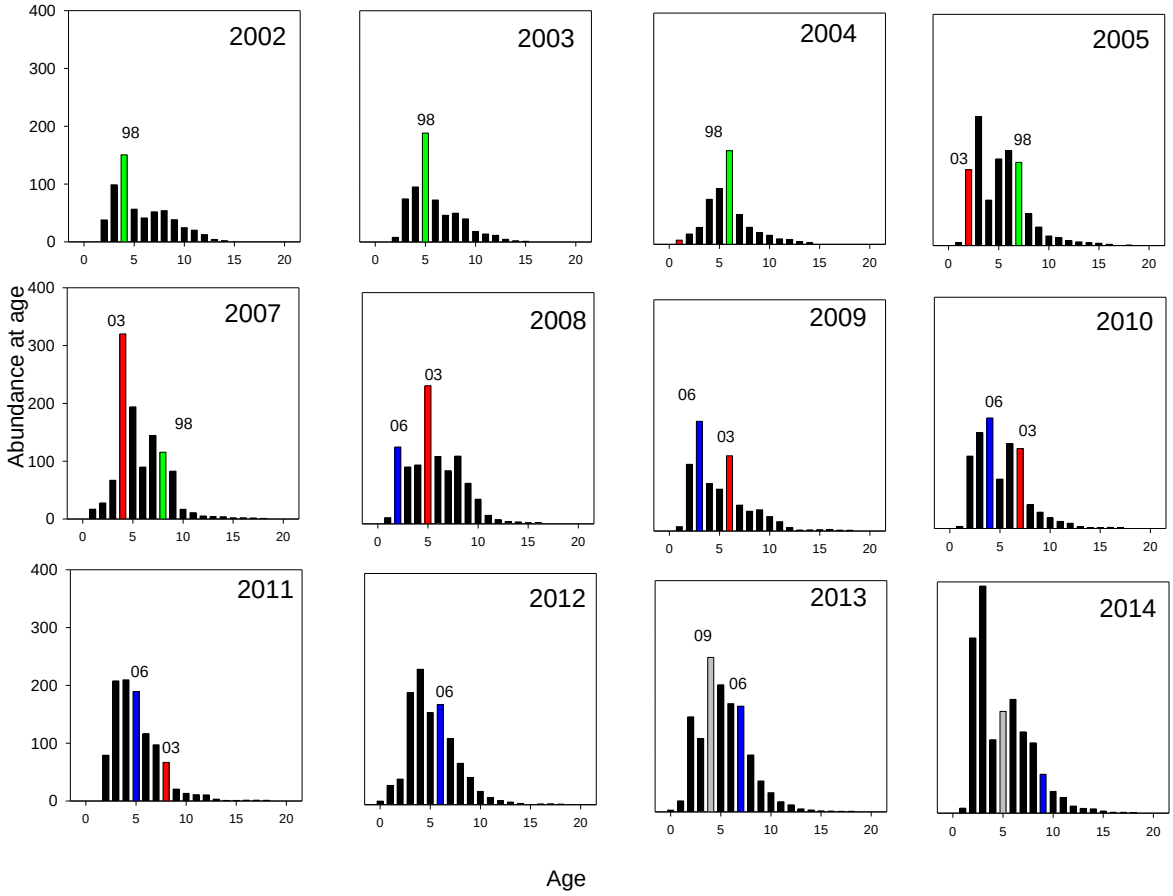

Fig. 6. Abundance at age (millions of fish) from 2000 – 2014 in the Canadian spring surveys. Note surveys from 2006 and 2015 are not present. The 1998, 2003, 2006 and 2009 year classes are labelled.

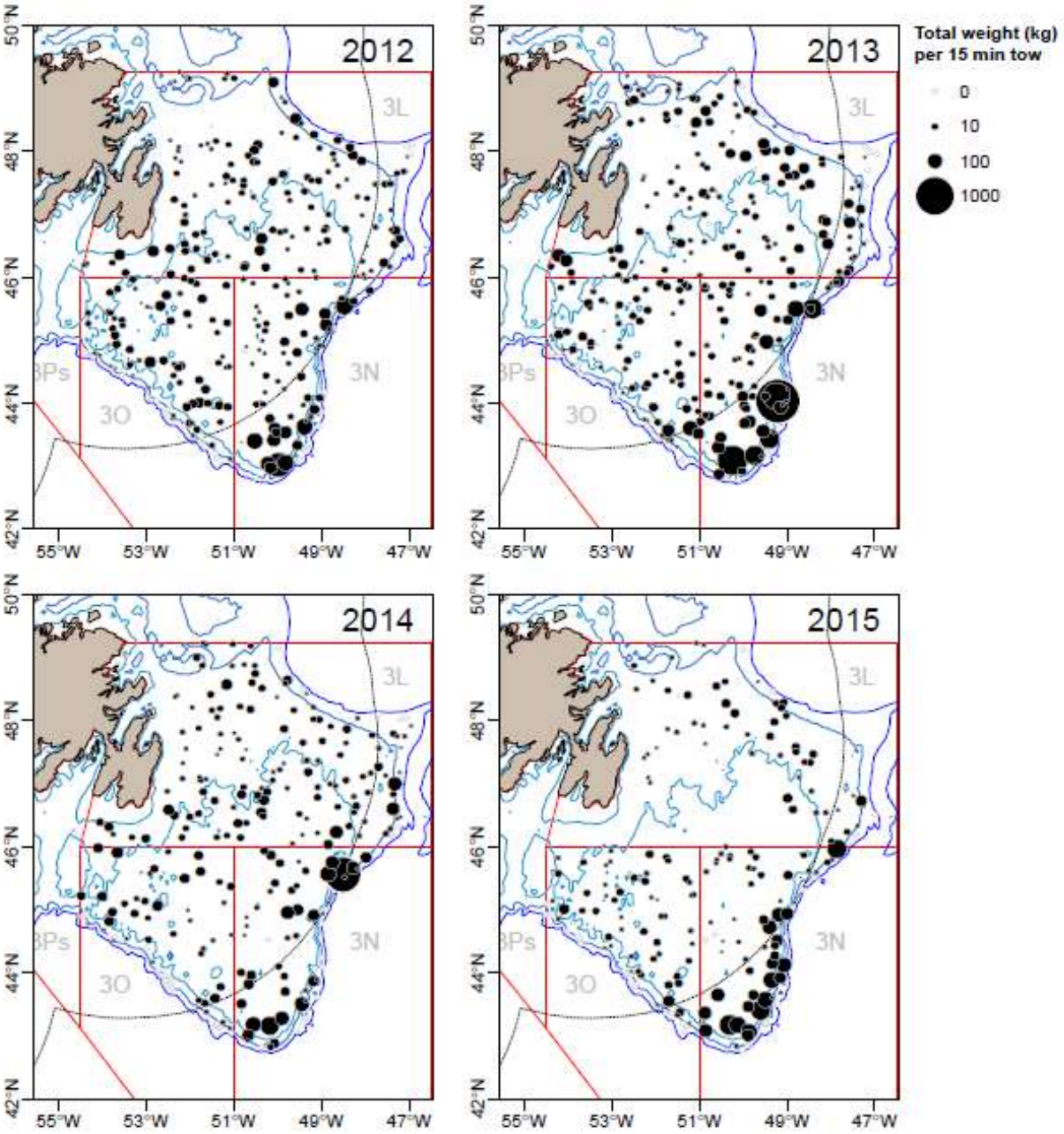

Fig. 7. Distribution of American plaice (kg per tow) from Canadian spring surveys in NAFO Divisions 3LNO from 2012-2015. A large portion of the survey in Div. 3L in 2015 is missing.

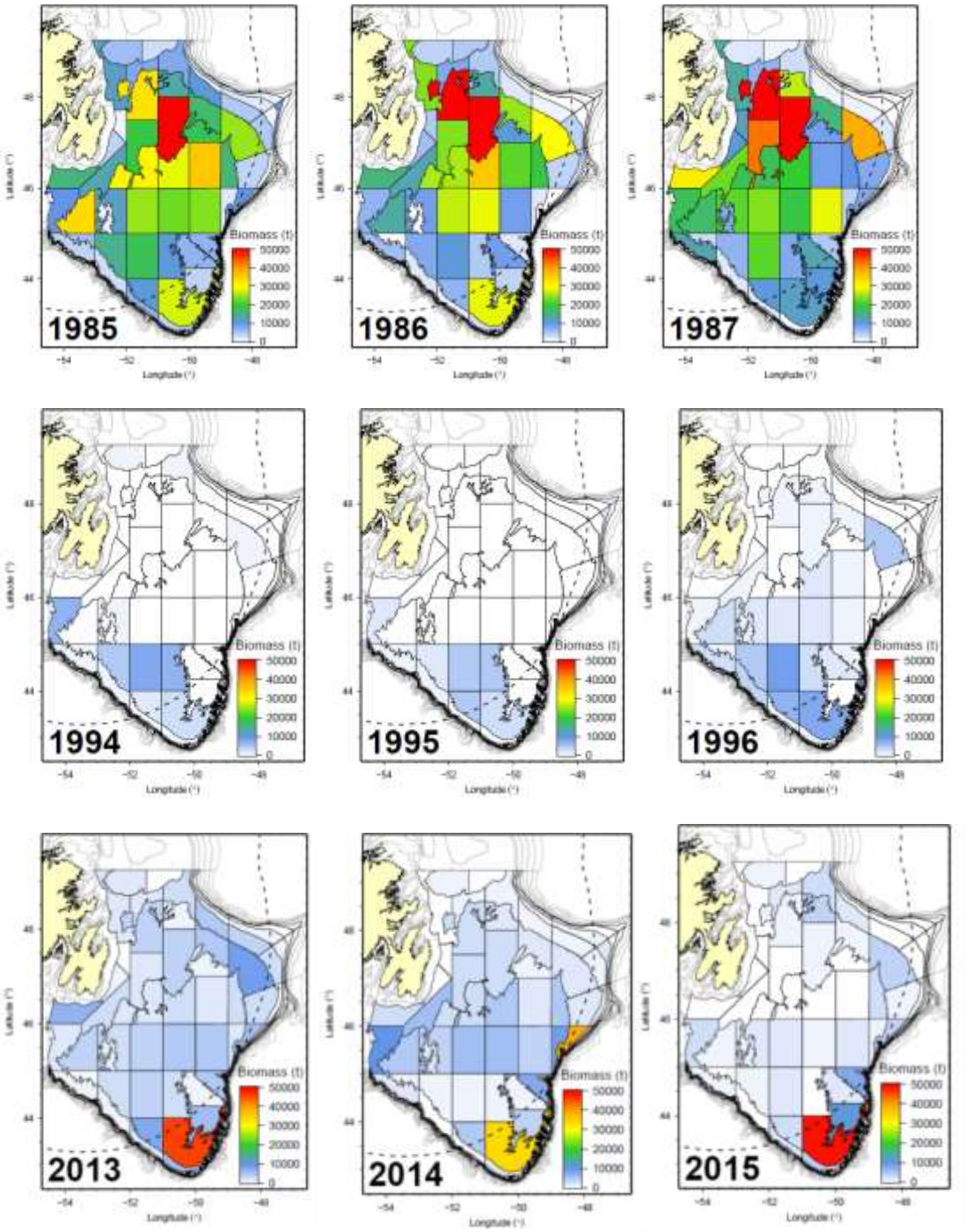

Fig. 8. Plot of biomass color-coded based on the estimate for each stratum for the time periods 1985-1987, 1994-1996 and the three most recent years (2012-2015) from the spring survey. Please note that some strata in Div. 3L were not fully covered in 2015.

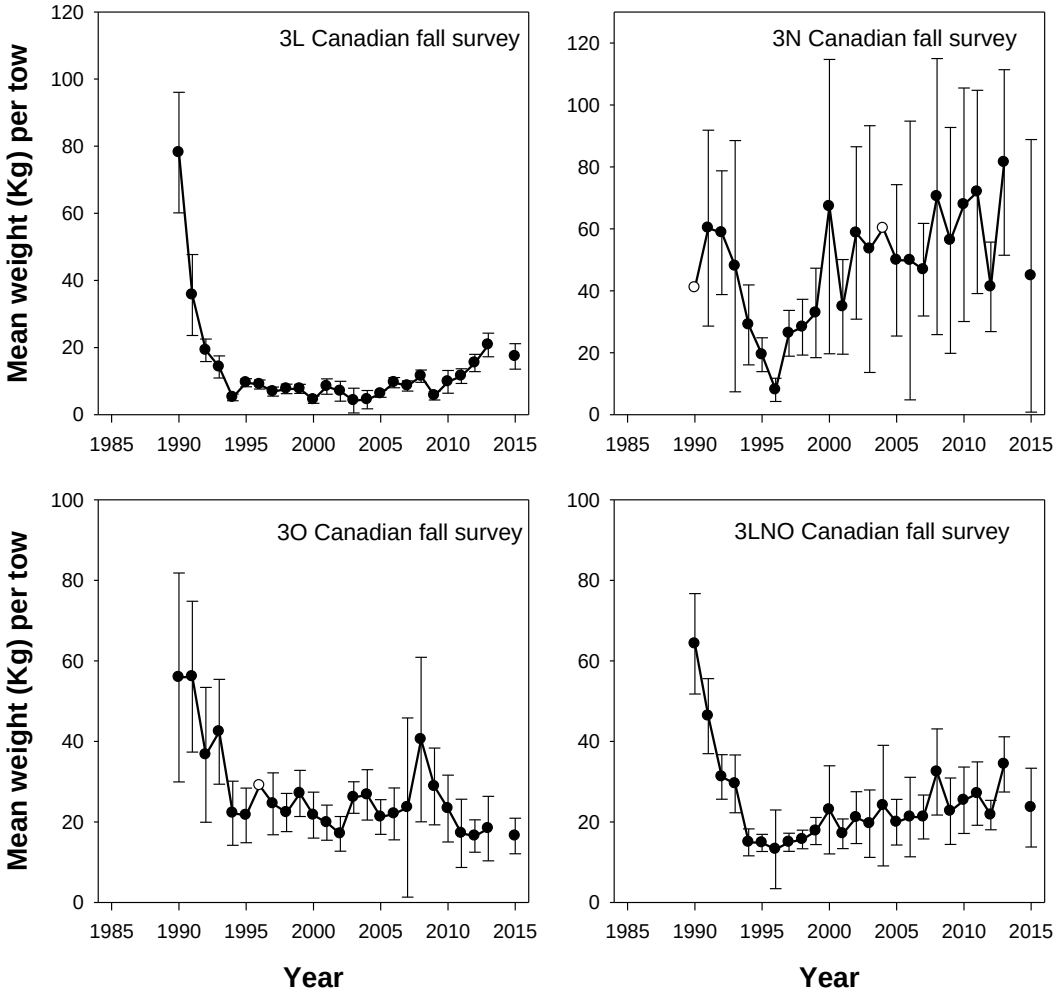

Fig. 9. Mean weight (kg) per tow (with associated 95% confidence intervals) of American plaice from Canadian fall surveys in Div. 3L, 3N, 3O and 3LNO combined. Note that open symbol represents years when survey coverage was poor. In 2014, Div. 3NO was not covered at all.

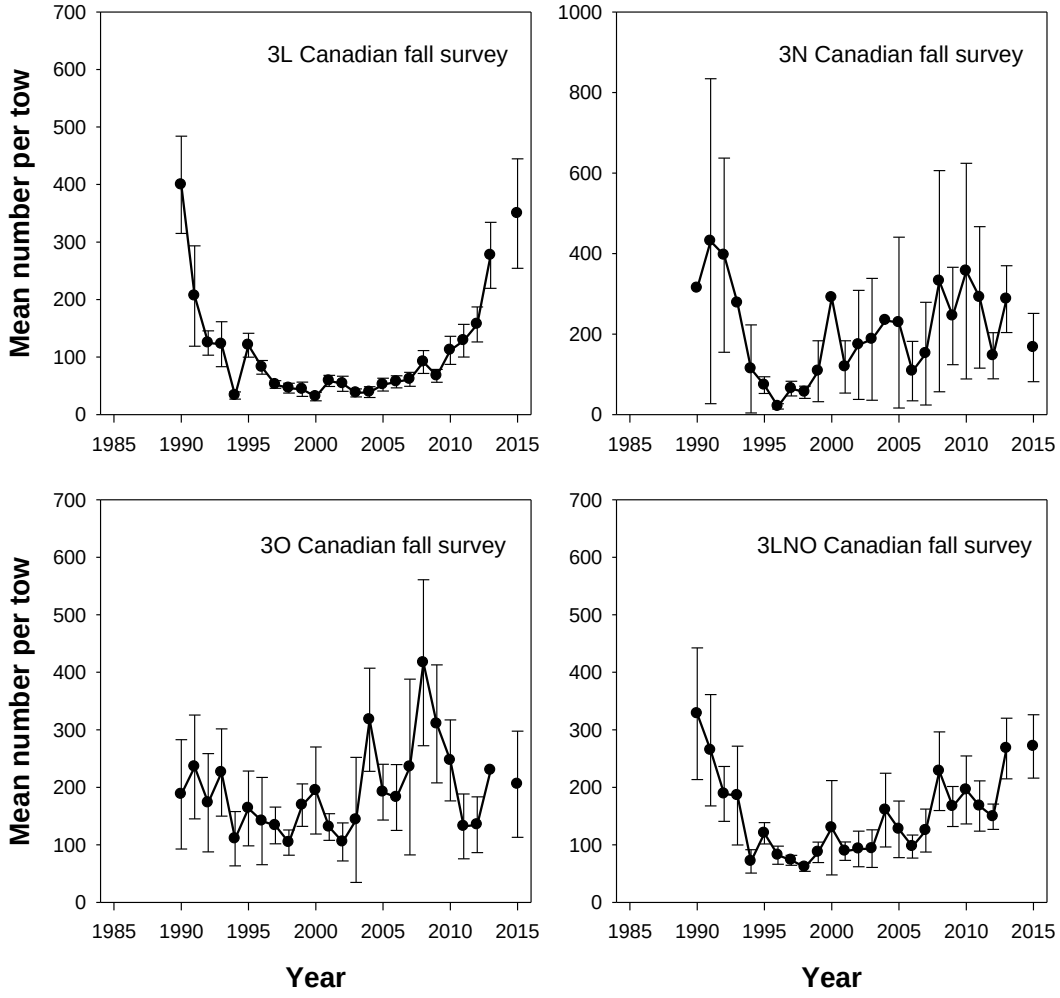

Fig.10. Mean number per tow with associated 95% confidence intervals of American plaice from Canadian fall surveys in Div. 3L, 3N, 3O and 3LNO combined. Note that open symbol represents years when survey coverage was poor. In 2014, Div. 3NO was not covered at all.

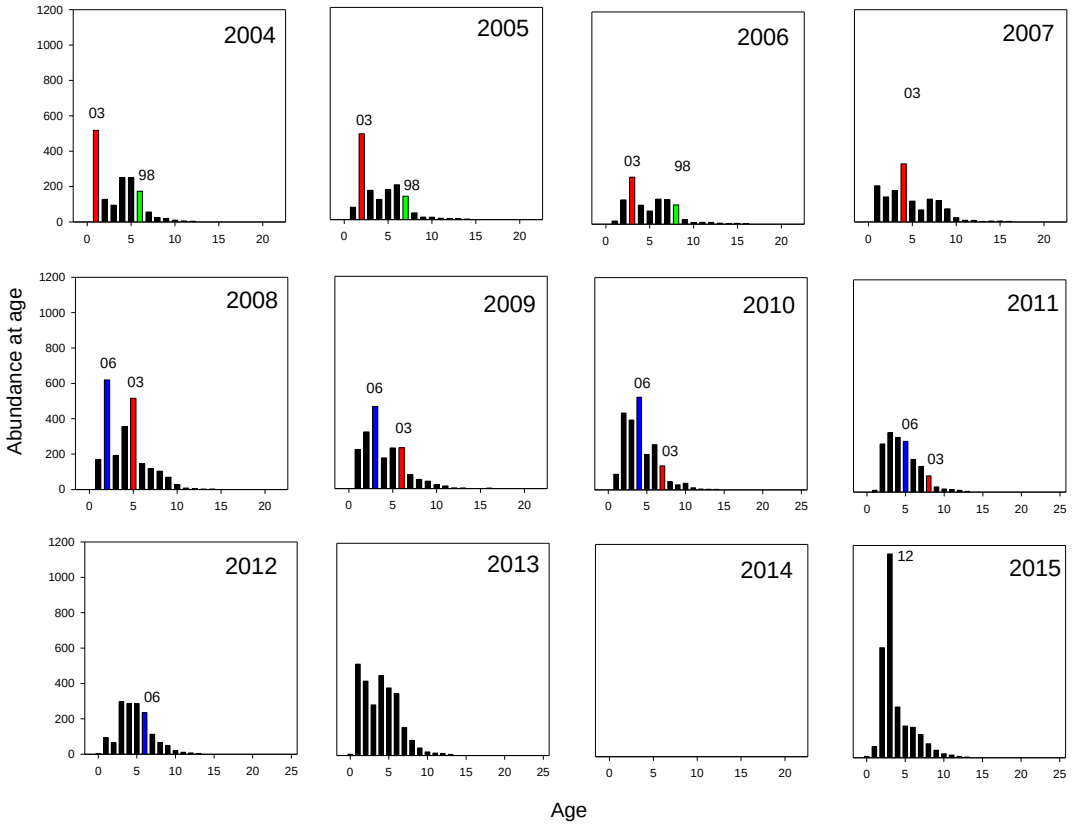

Fig. 11. Abundance at age (millions of fish) from 2004 – 2015 in the Canadian fall surveys. The 1998, 2003, 2006 and 2012 year classes are labelled.

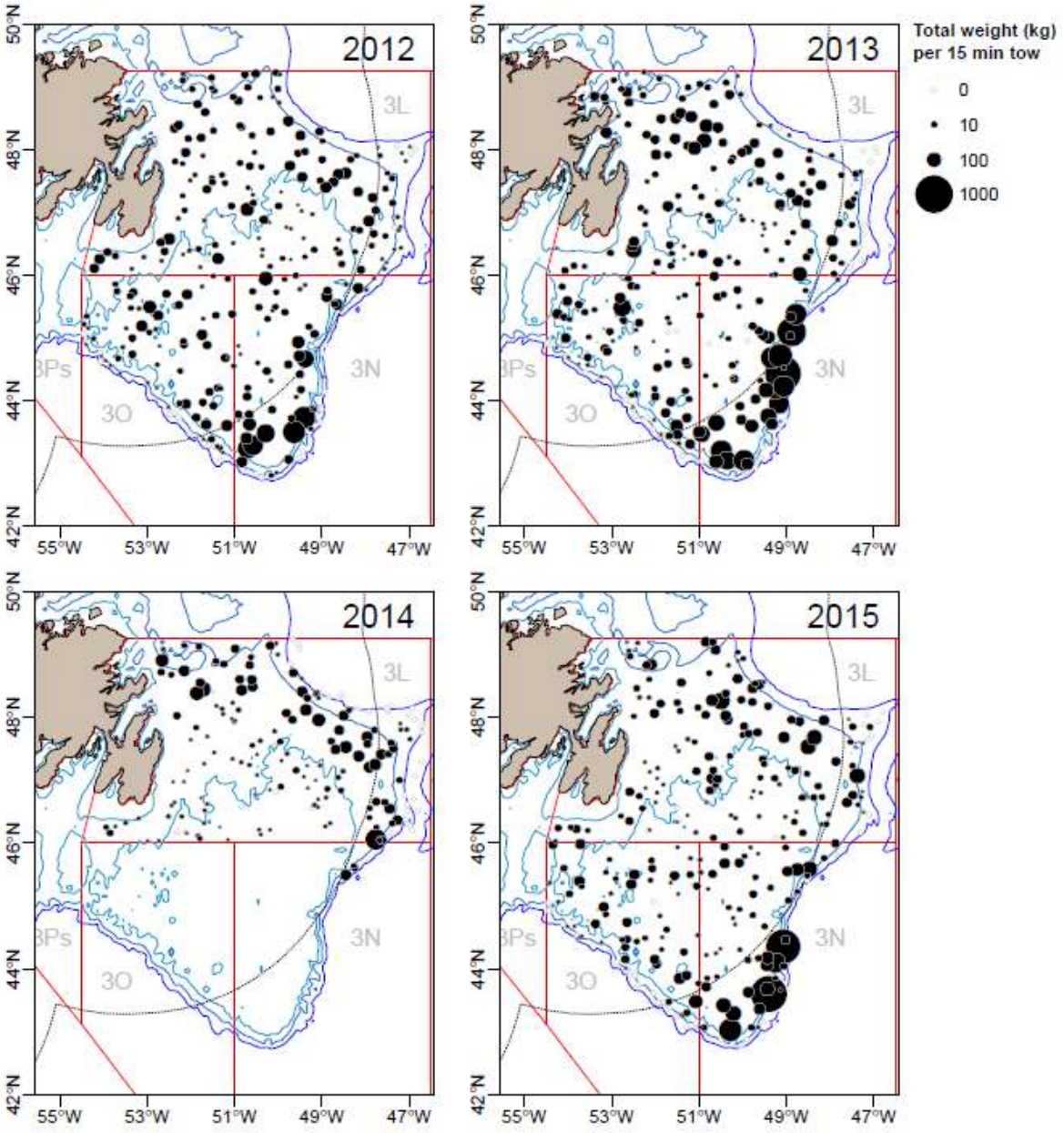

Fig.12. Distribution of American plaice (kg per tow) from Canadian fall surveys in NAFO Divisions 3LNO from 2012-2015. Most of Div. 3NO was not surveyed in 2014.

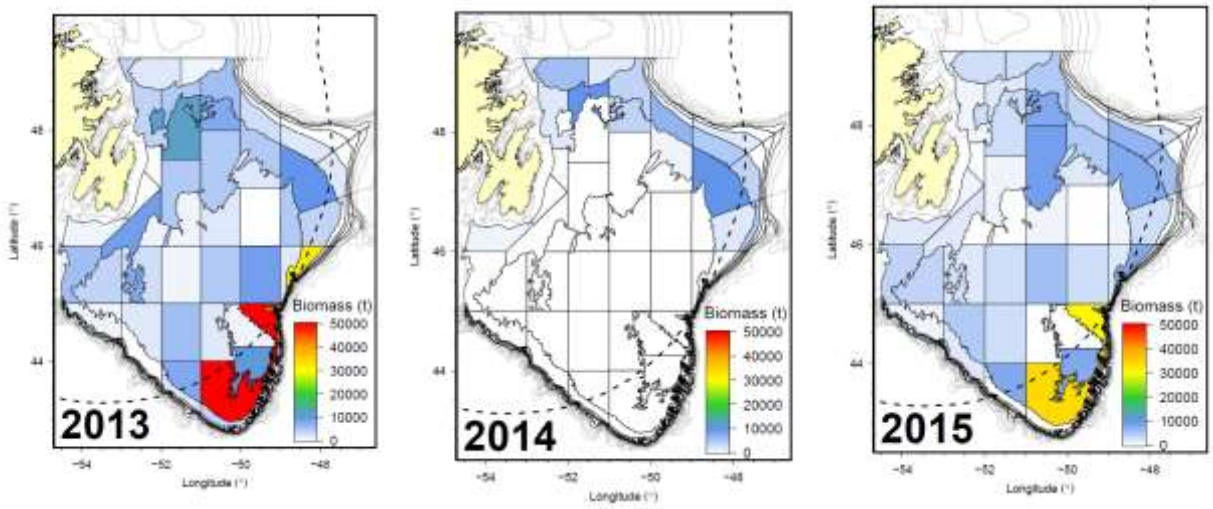

Fig. 13. Plot of biomass color-coded based on the estimate for each stratum for the three most recent years (2012-2015) of the fall survey. Please note that in 2014, Div. 3NO was not covered at all.

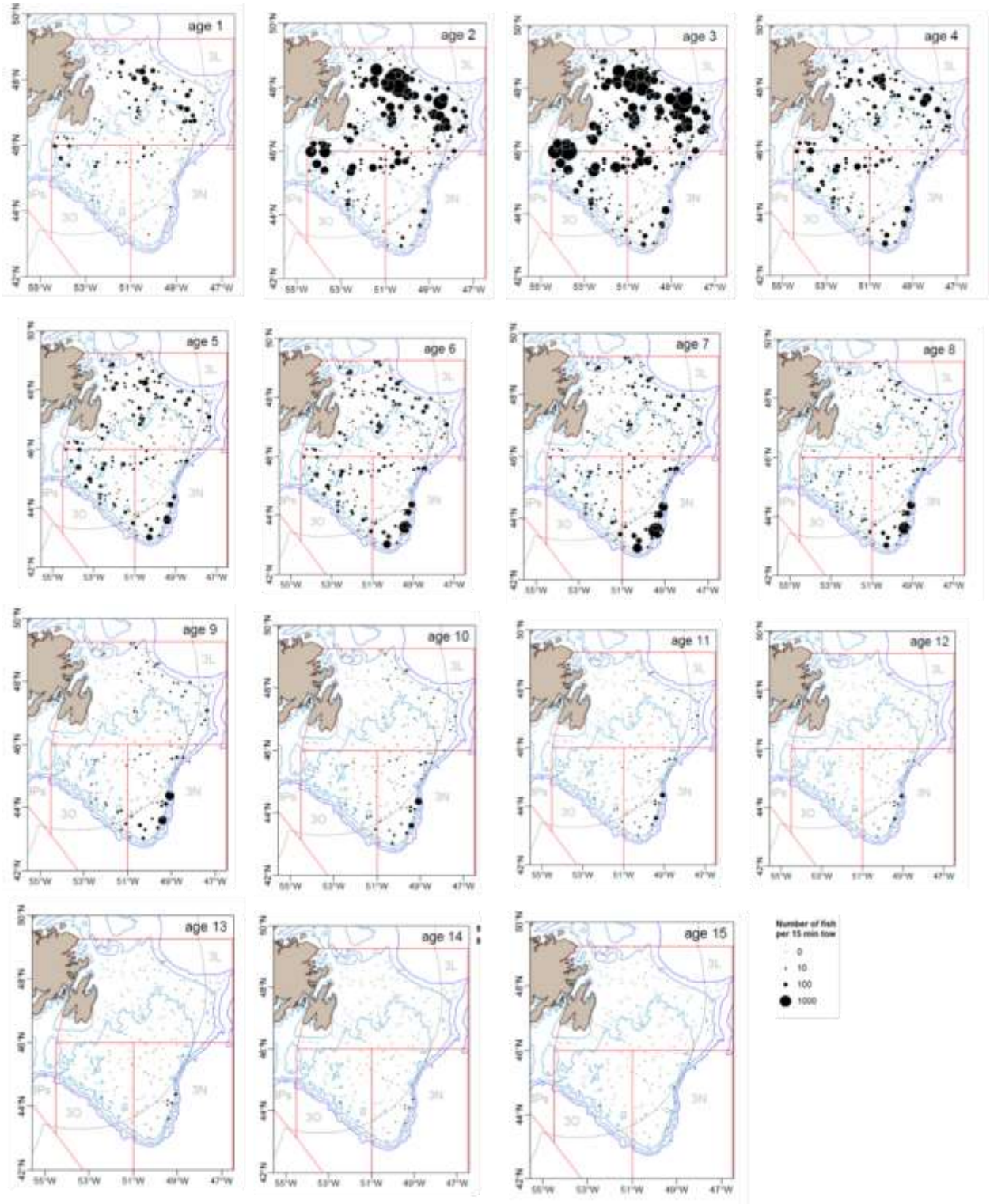

Fig. 14. Distribution of American plaice (number per tow) from Canadian fall surveys in NAFO Divisions 3LNO by age for 2015.

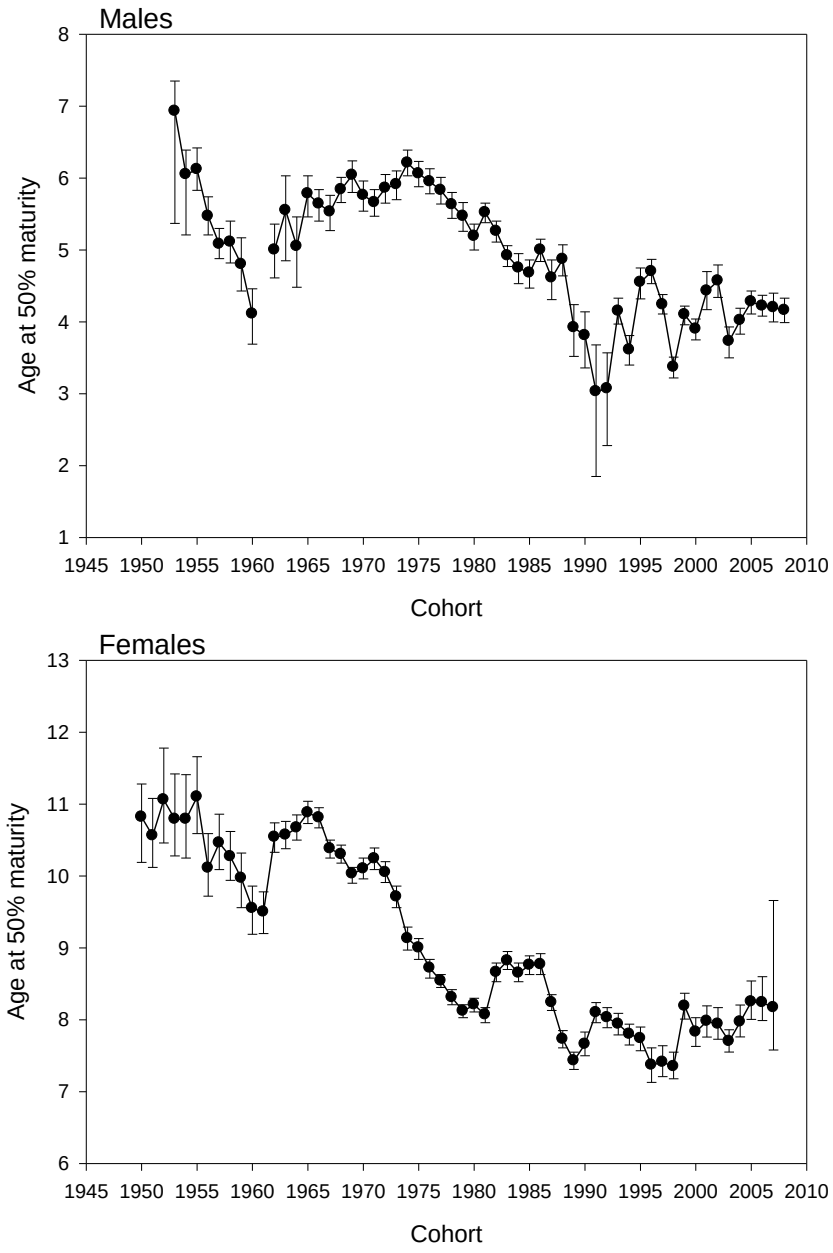

Fig. 15. Age at 50% maturity (± 95% fiducial limits) by cohort for male and female American plaice in NAFO Div. 3LNO.

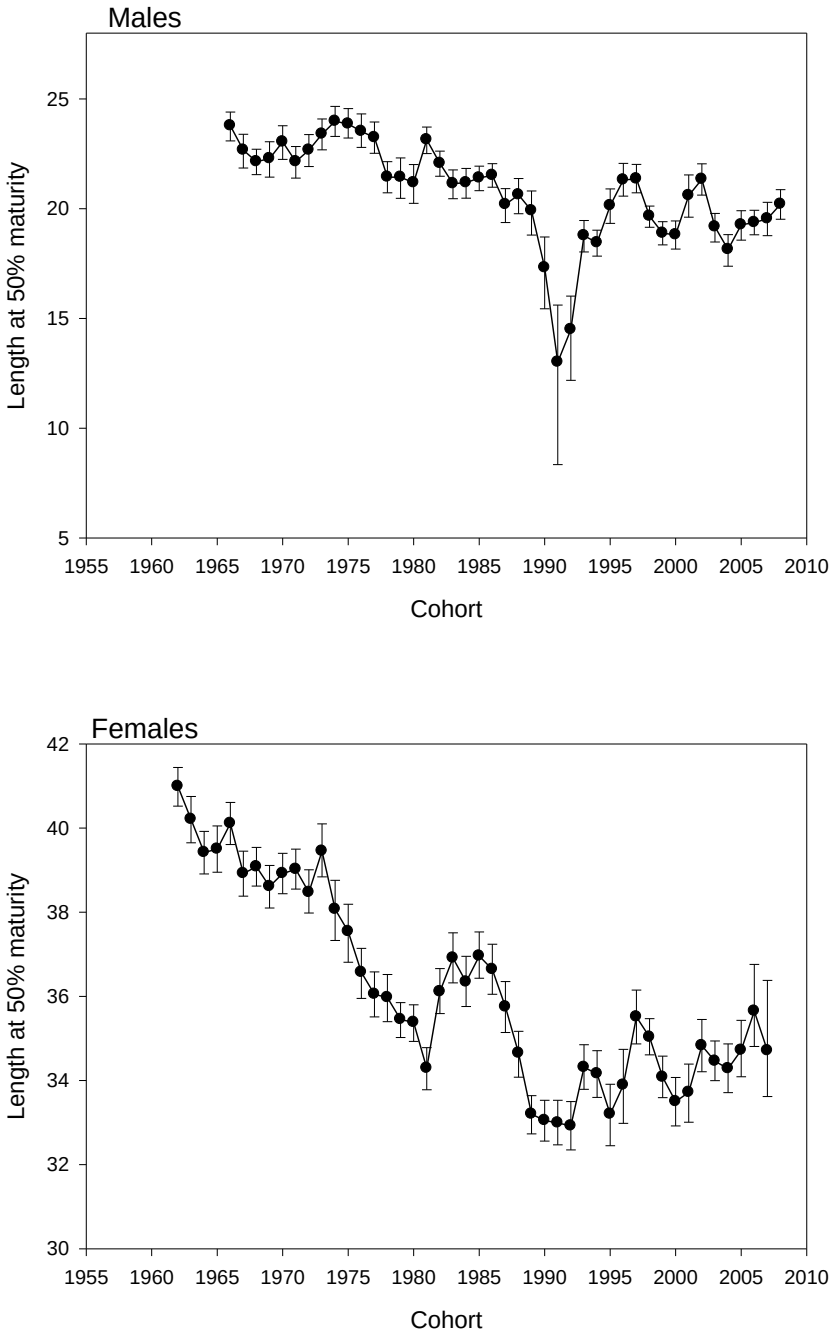

Fig. 16. Length at 50% maturity (± 95% fiducial limits) by cohort for male and female American plaice in NAFO Div. 3LNO.

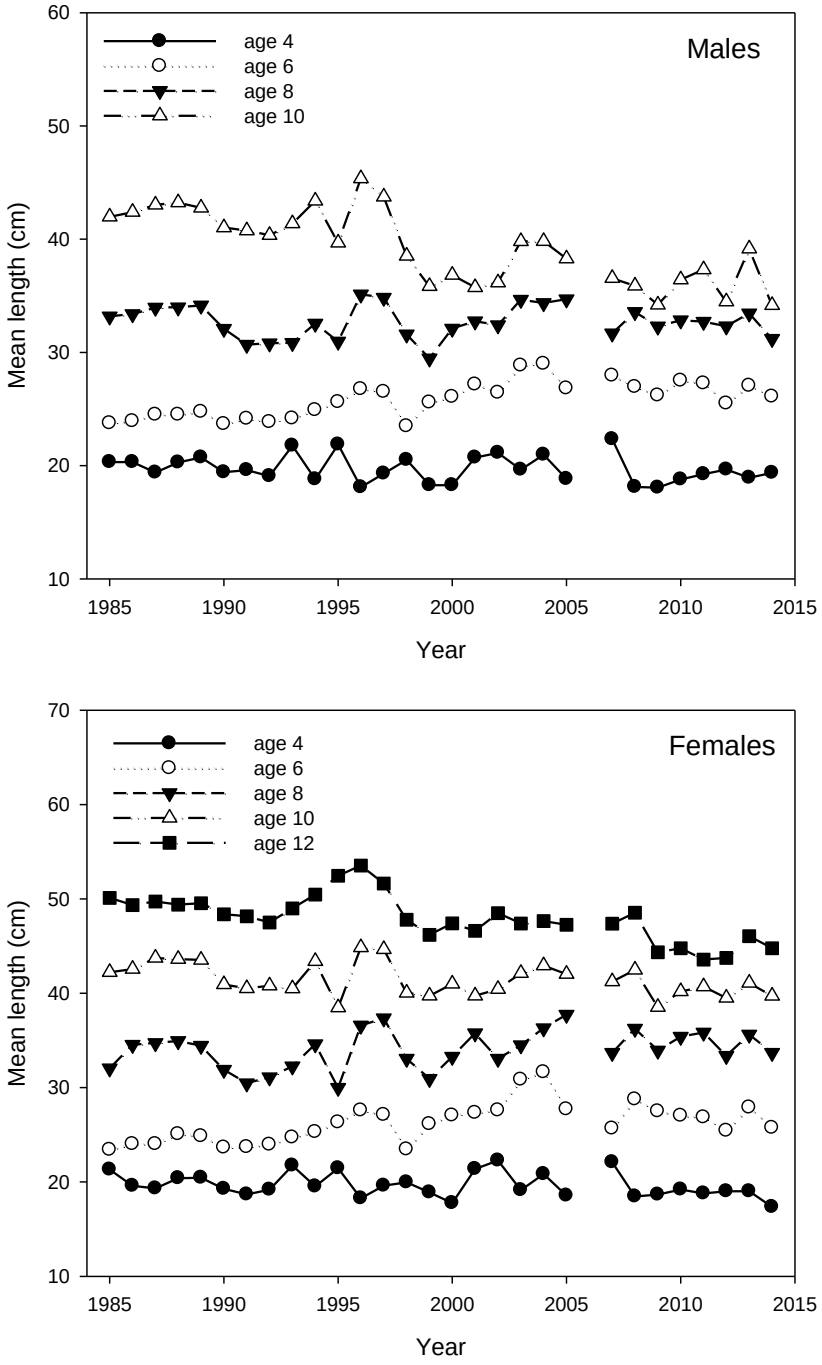

Fig. 17. Mean length-at-age for selected ages of Div. 3LNO American plaice from Canadian spring RV surveys.

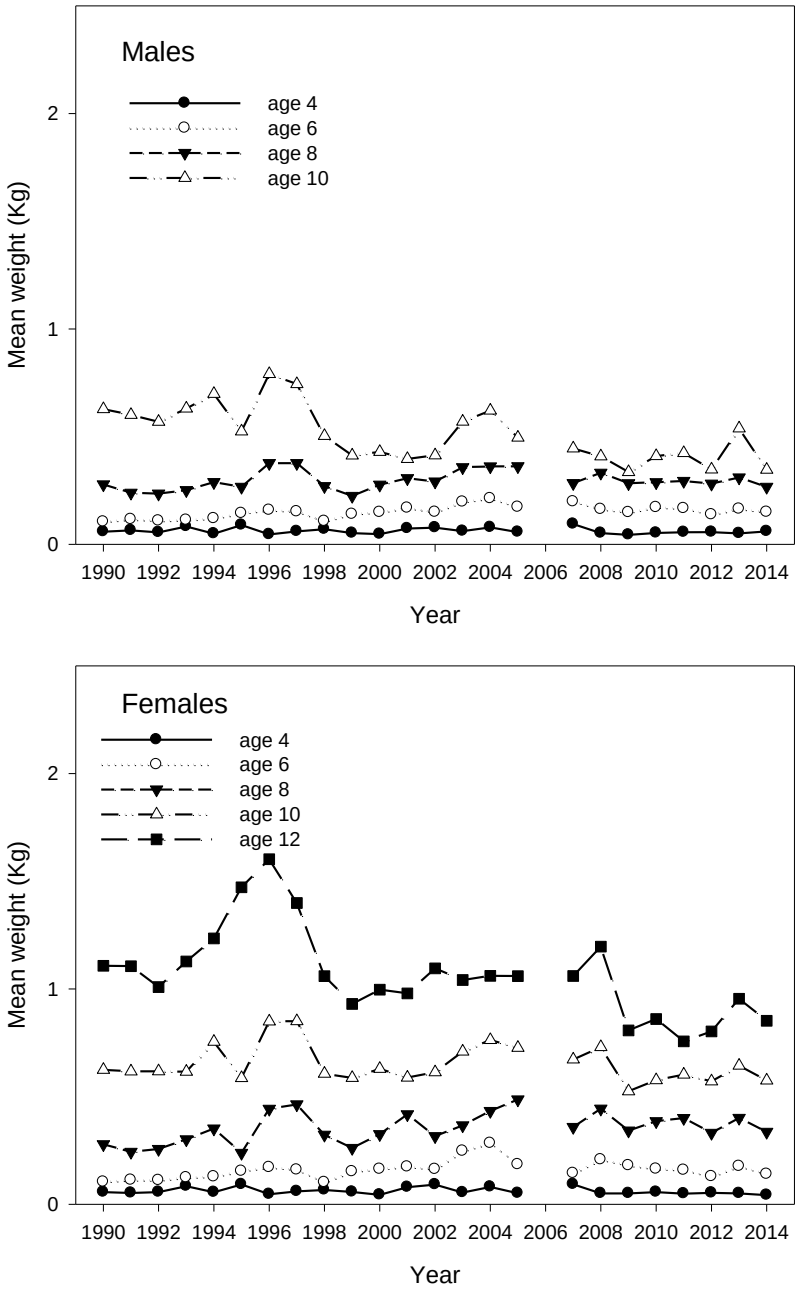

Fig. 18. Mean weight-at-age for selected ages of Div. 3LNO American plaice from Canadian spring RV surveys.

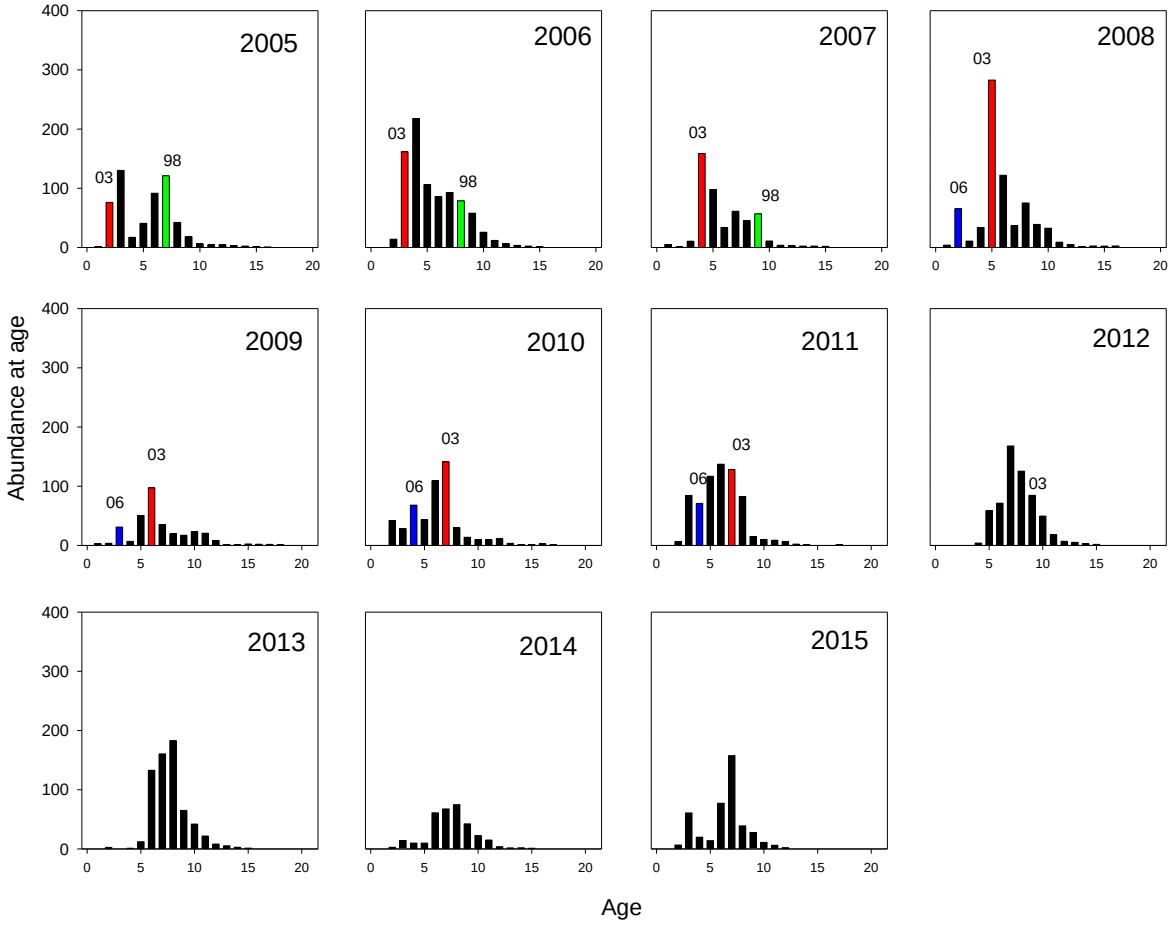

Fig. 19. Abundance at age (millions of fish) from 2000-2015 in the EU-Spain Div. 3NO spring surveys. The 1998, 2003 and 2006 year classes are labelled.

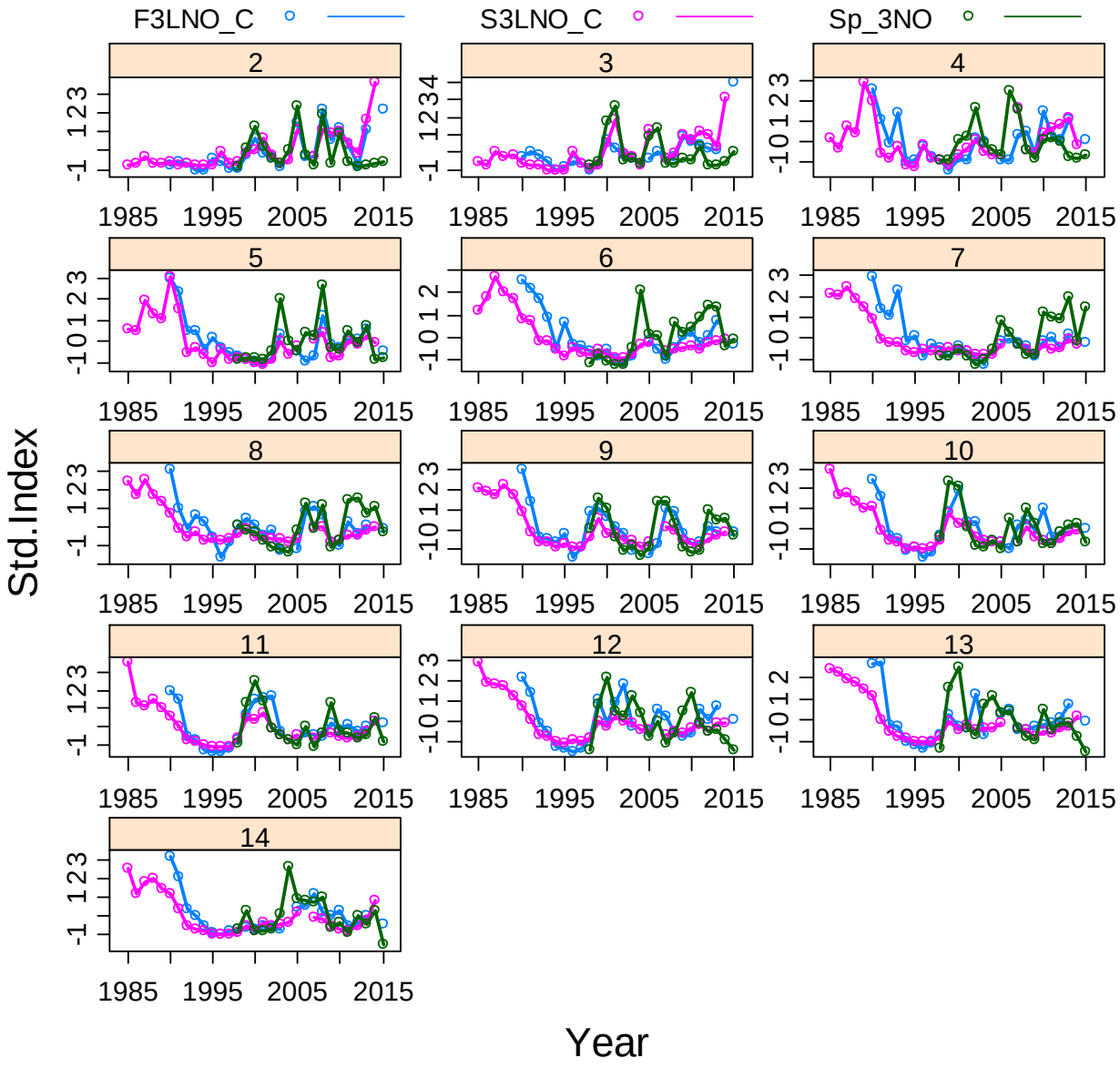

Fig. 20. Standardized age by age abundance between Canadian spring (S3LNO_C), fall (F3LNO_C) and EU-Spain (Sp_3NO) surveys.

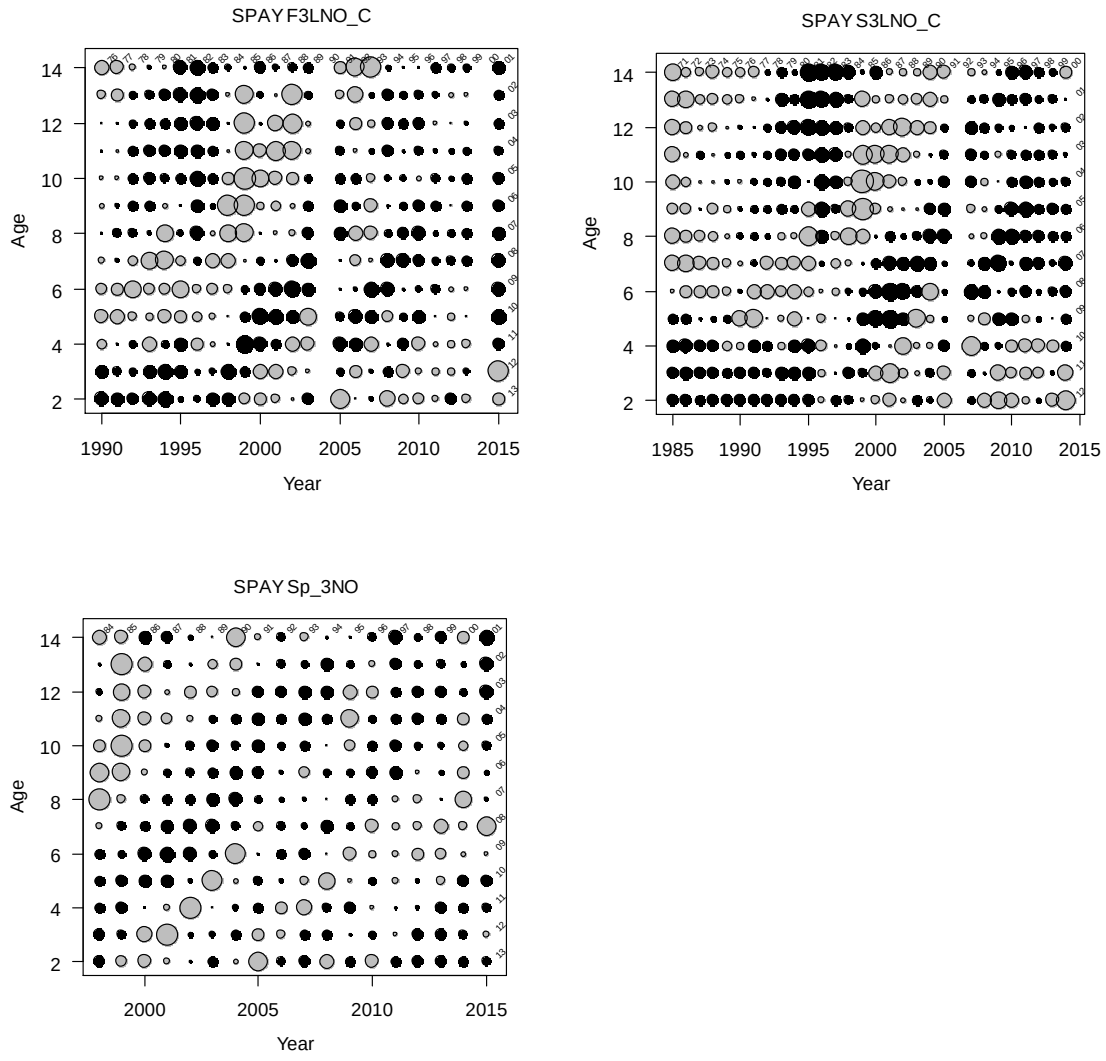

Fig. 21. Plots of standardized proportions by age across years (SPAY) for Can. Fall, Can. Spring and EU-Spain surveys.

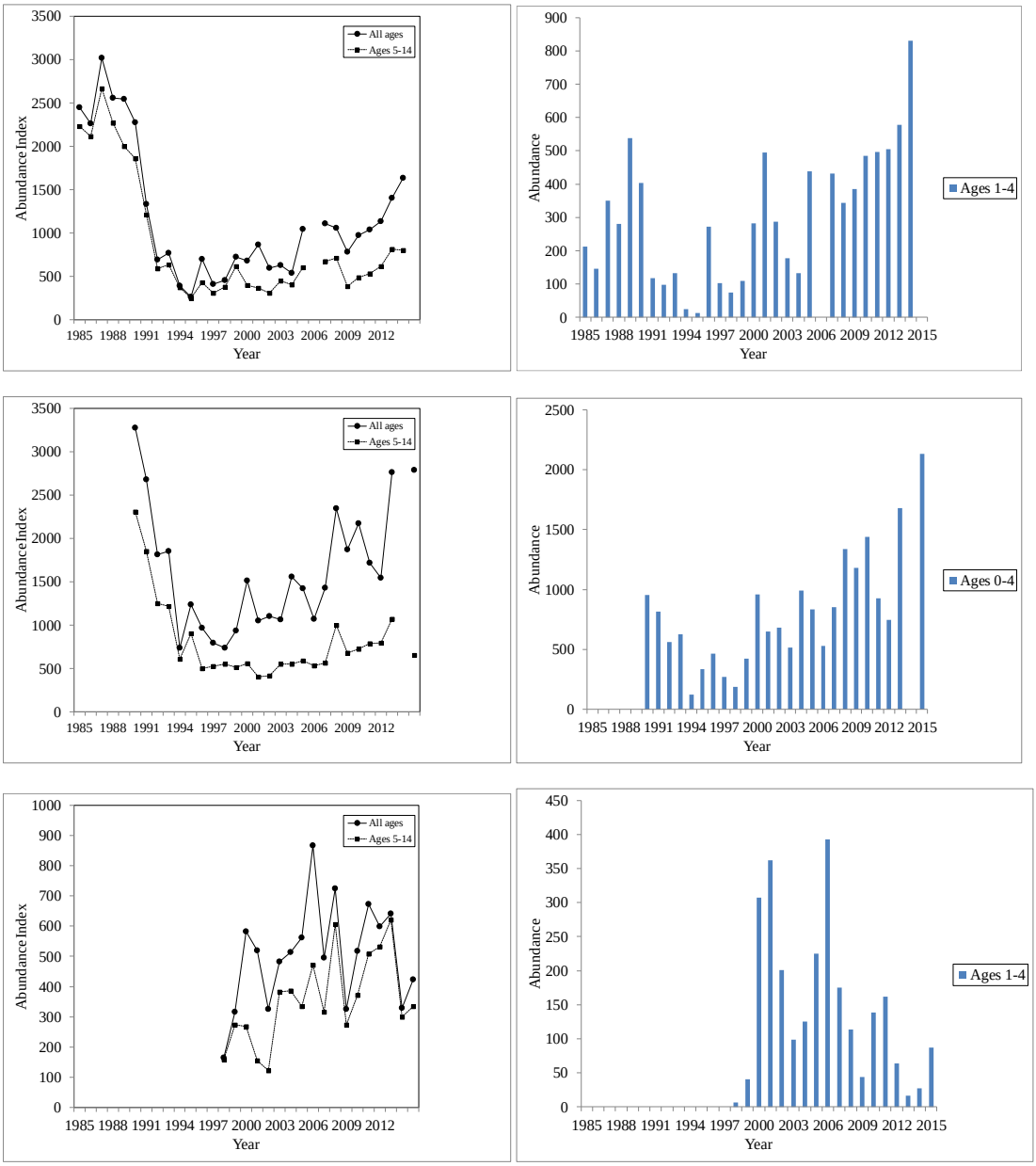

Fig. 22. Comparison of total abundance indices from Canadian spring, fall and EU-Spain surveys with abundance from ages 5-14 (left) and abundance of fish less than five years old on right (Data prior to 1996 are Campelen equivalents and since then are Campelen).

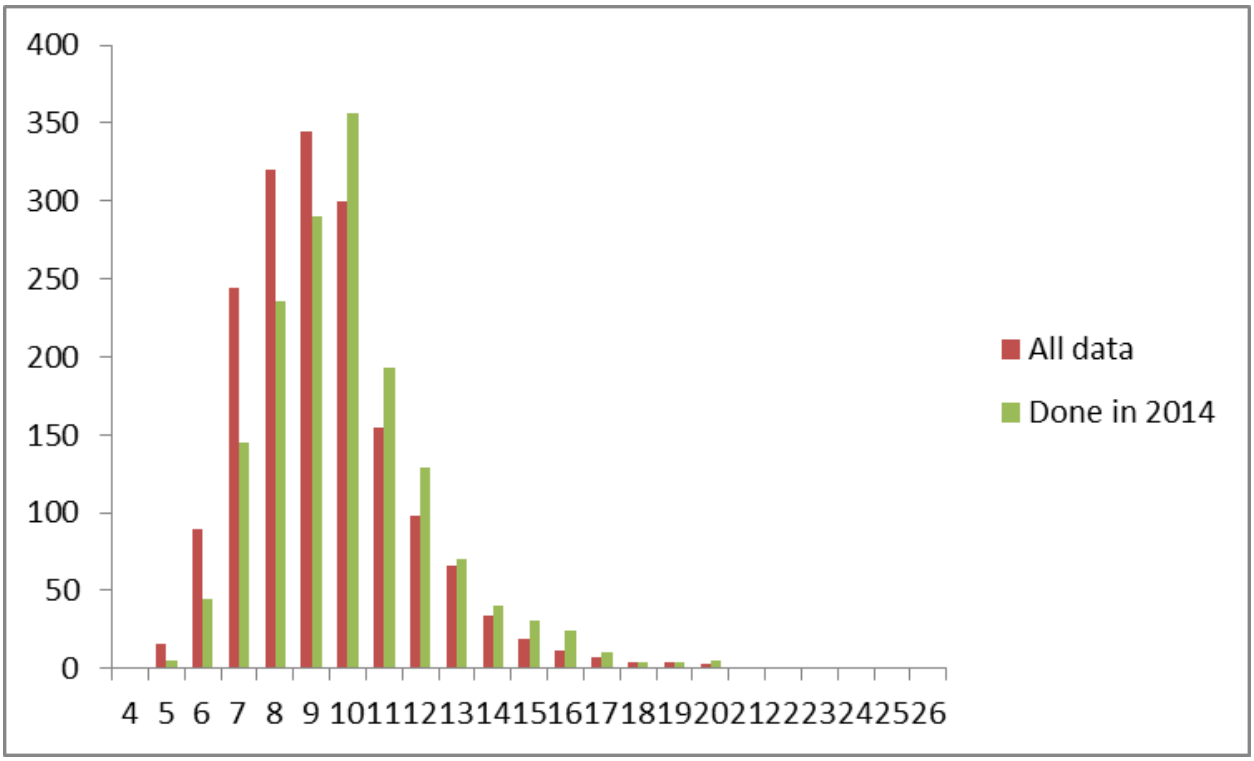

Fig. 23. Canadian catch at age for 2013 that was carried out in 2014 (interim) compared to the catch at age once all data had been added.

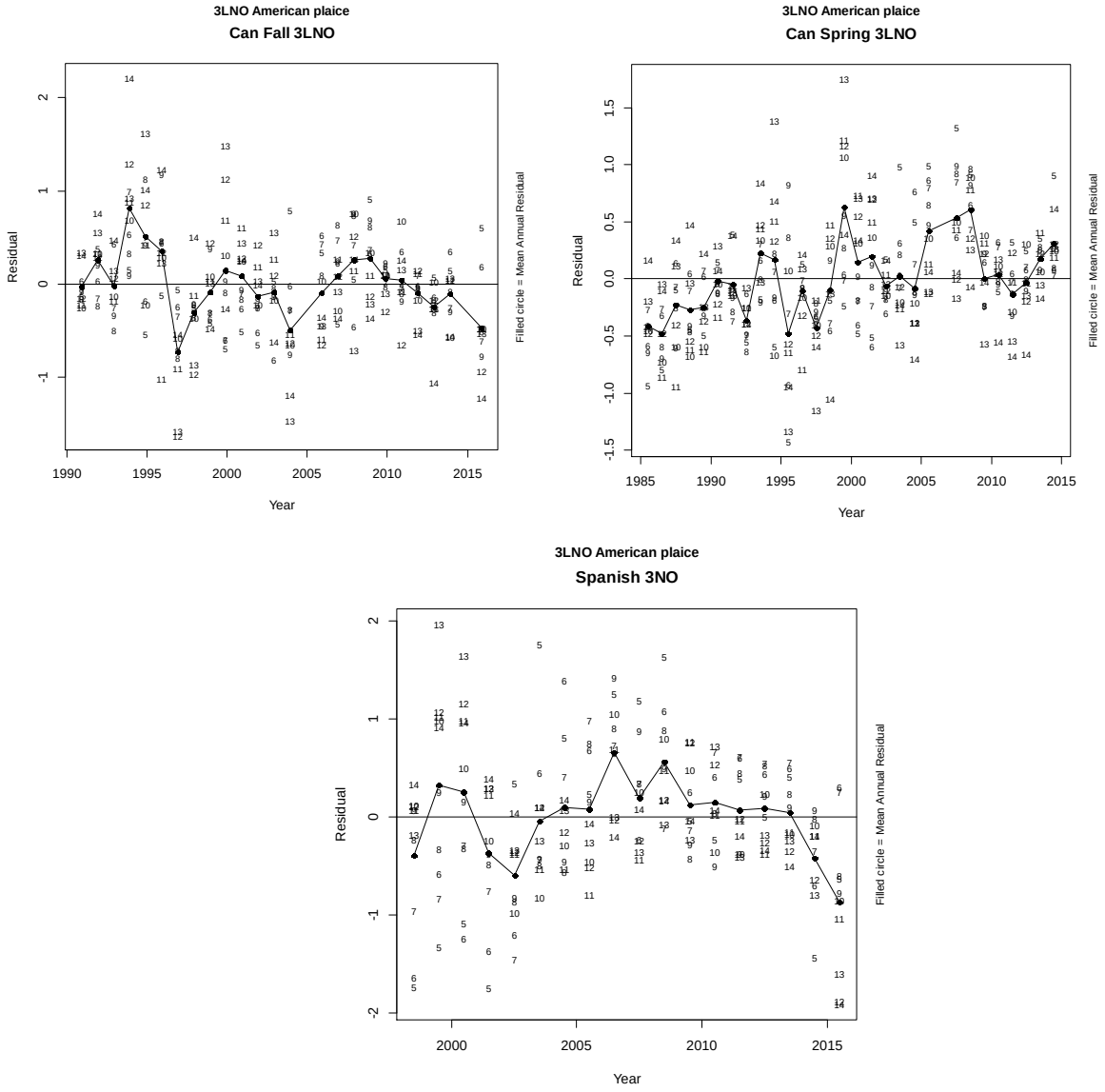

Fig. 24. Residuals by year and month (numbers represent ages) for Canadian fall survey (top left), spring survey (middle) and EU-Spain Div. 3NO survey (right). Filled circle is the mean annual residual. Note the scales are different for each plot.

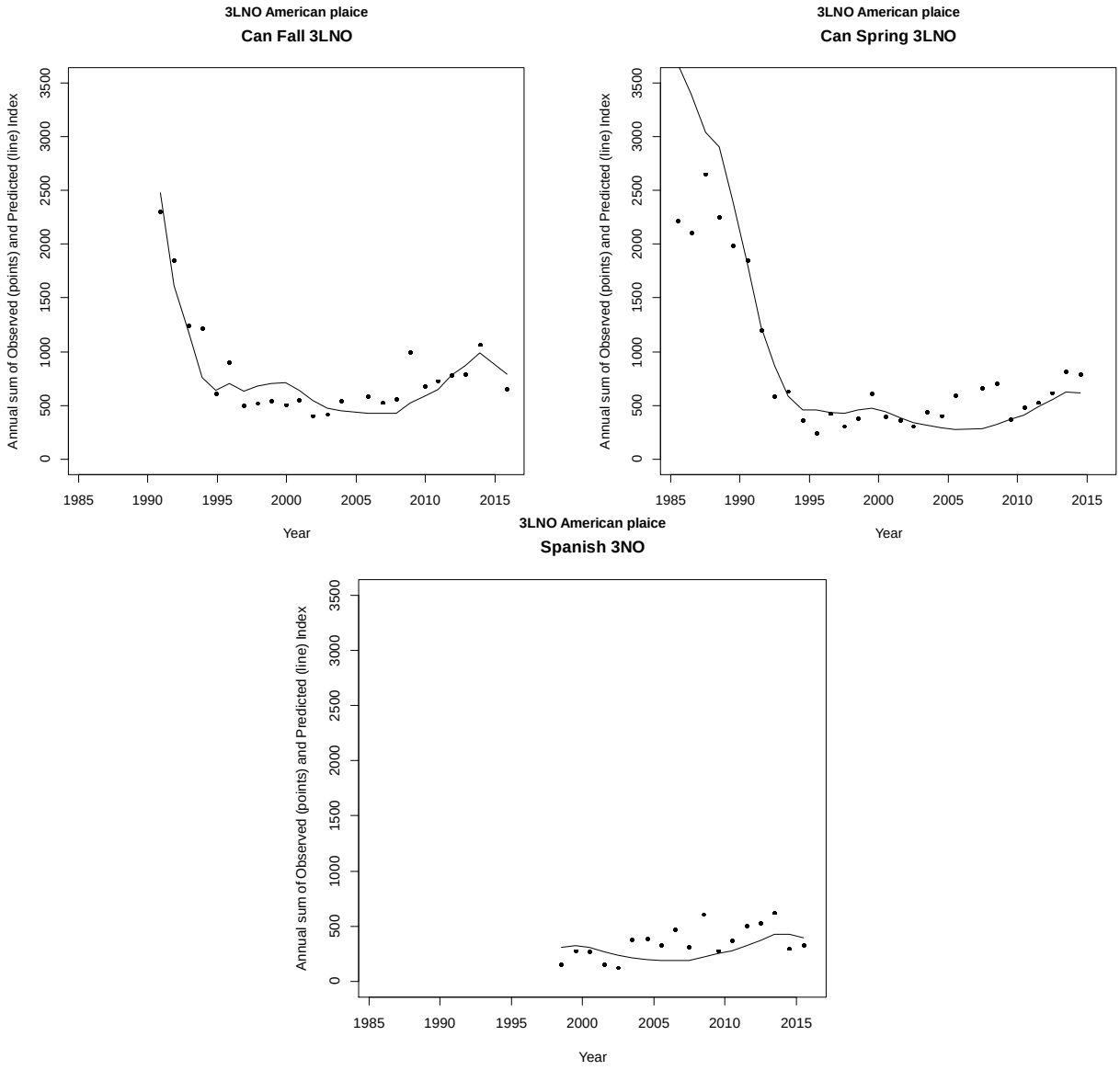

Fig. 25. Observed versus predicted abundance for Canadian Div. 3LNO spring and fall and EU-Spain Div. 3NO indices over time.

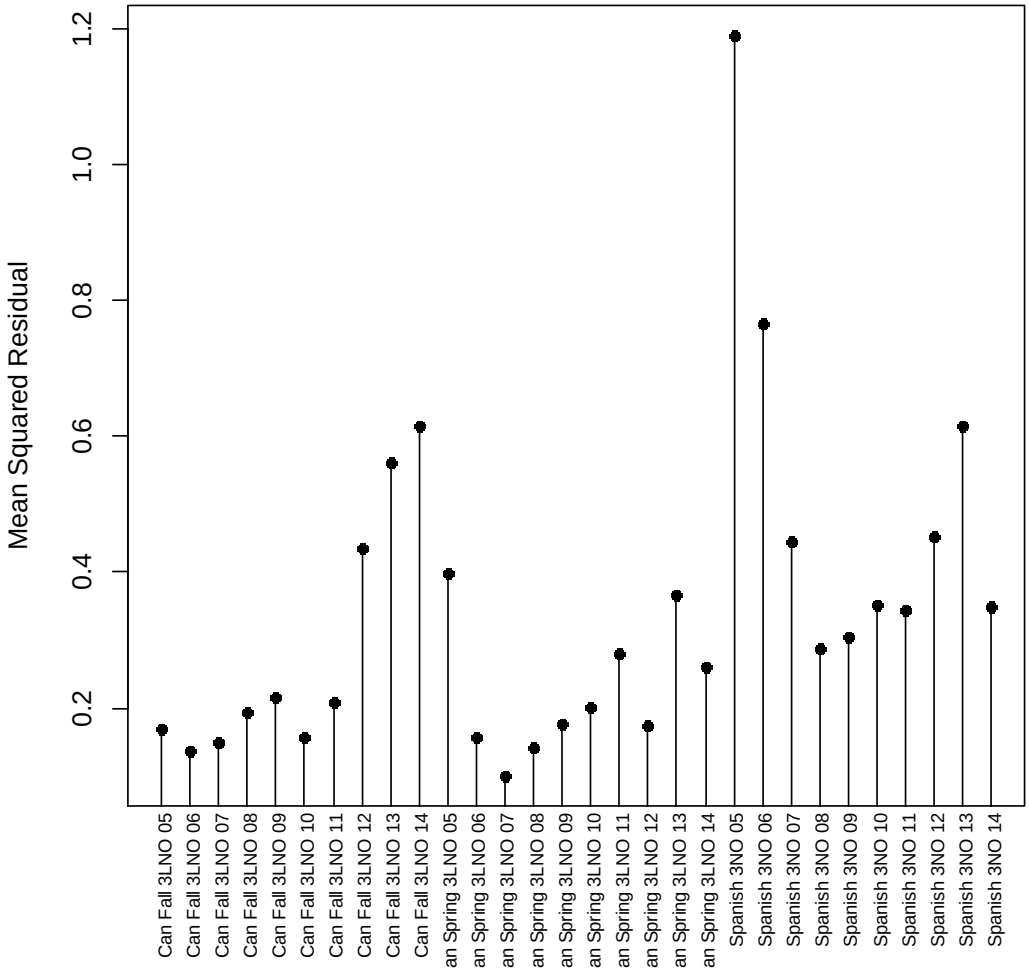

Fig. 26. Mean squared residuals by age for fall, spring and EU-Spain Div. 3NO surveys (MSE = 0.34).

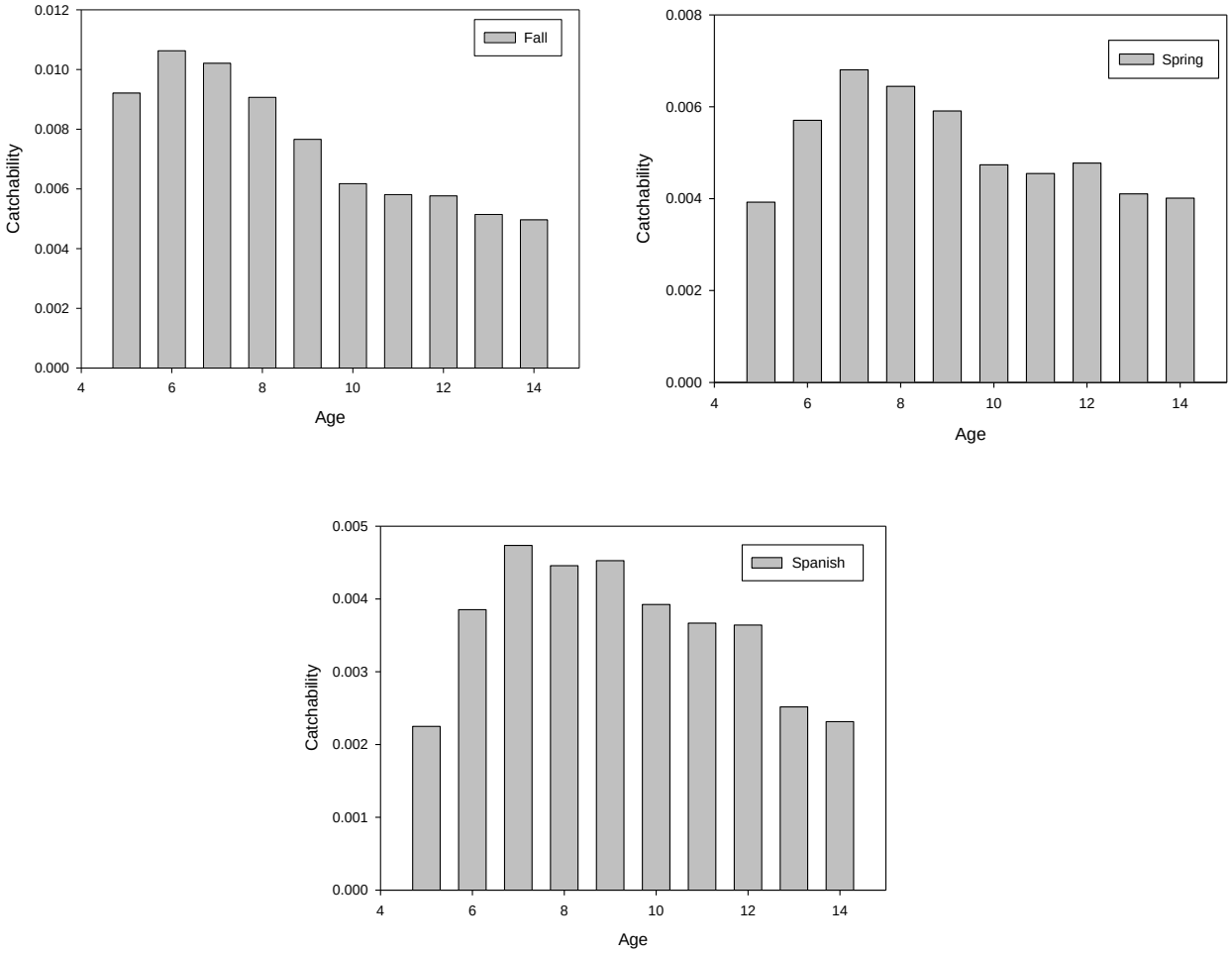

Fig. 27. Survey catchabilities (q) for each survey by age.

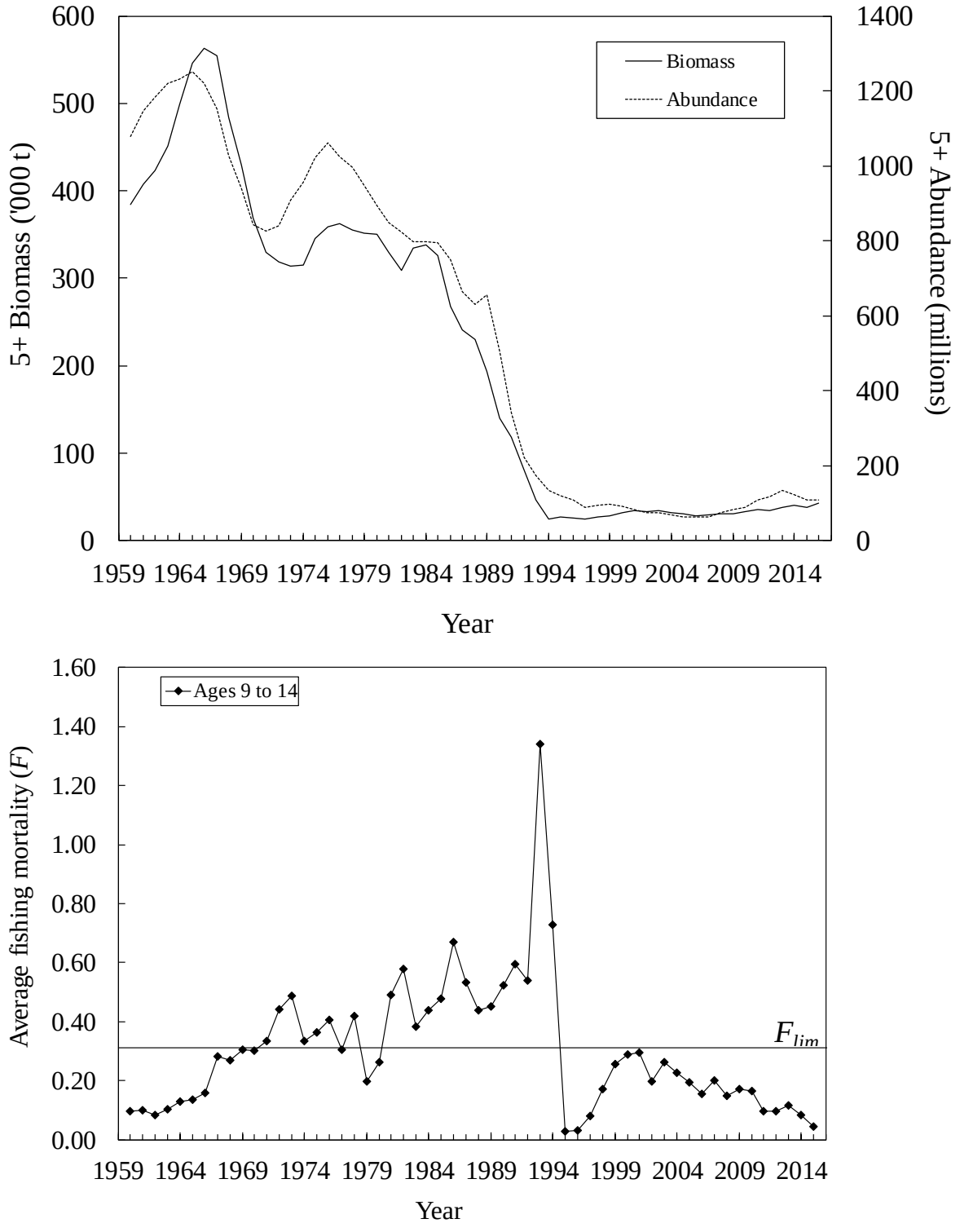

Fig. 28. 5+ biomass and abundance (top) and average fishing mortality on ages 9-14 (bottom) from VPA.

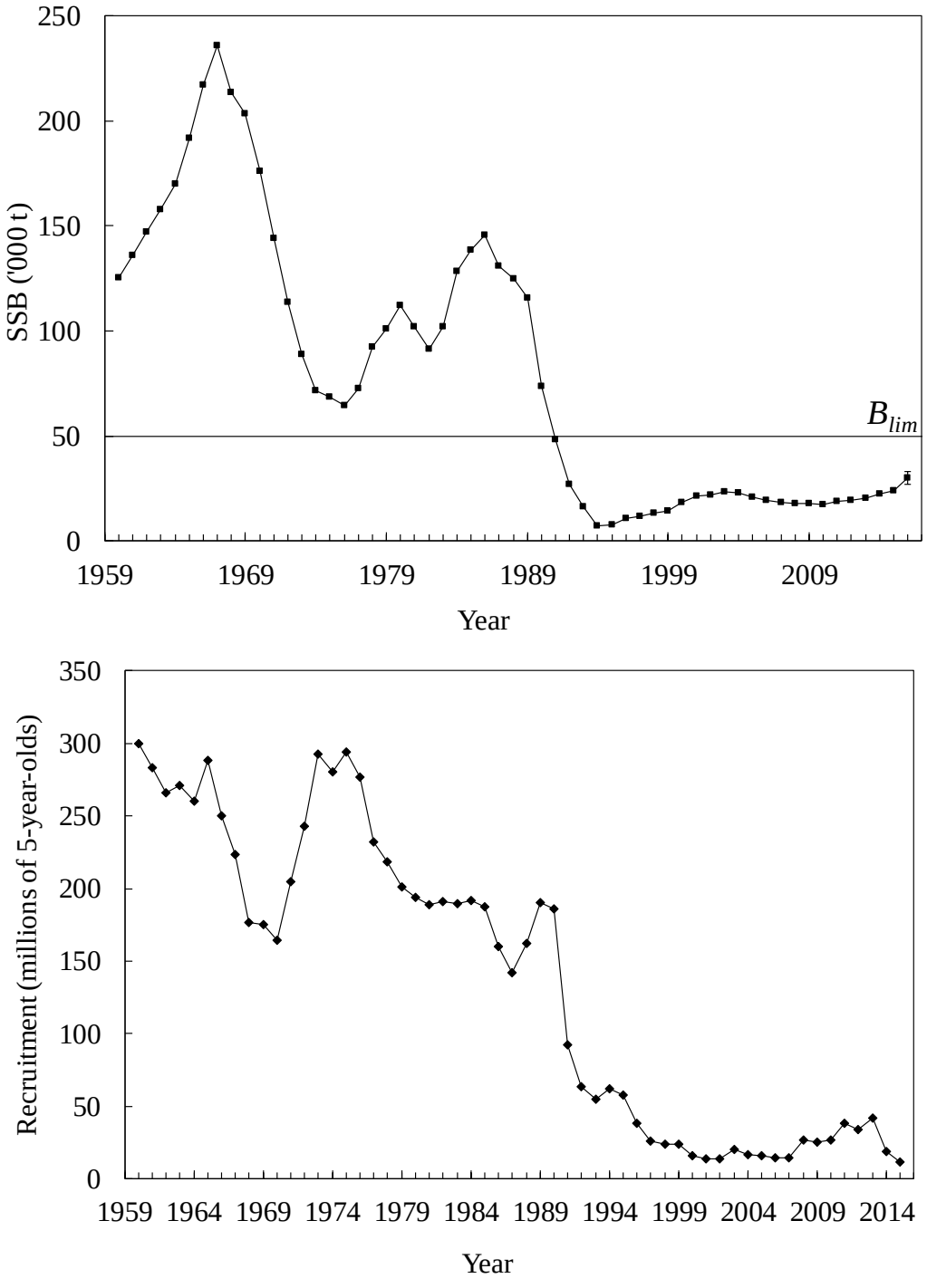

Fig. 29. Spawning stock biomass ('000 t) (top panel) and age 5 recruits (year-class) (bottom panel) from VPA. Horizontal line represents B_{lim}.(50 000 t).

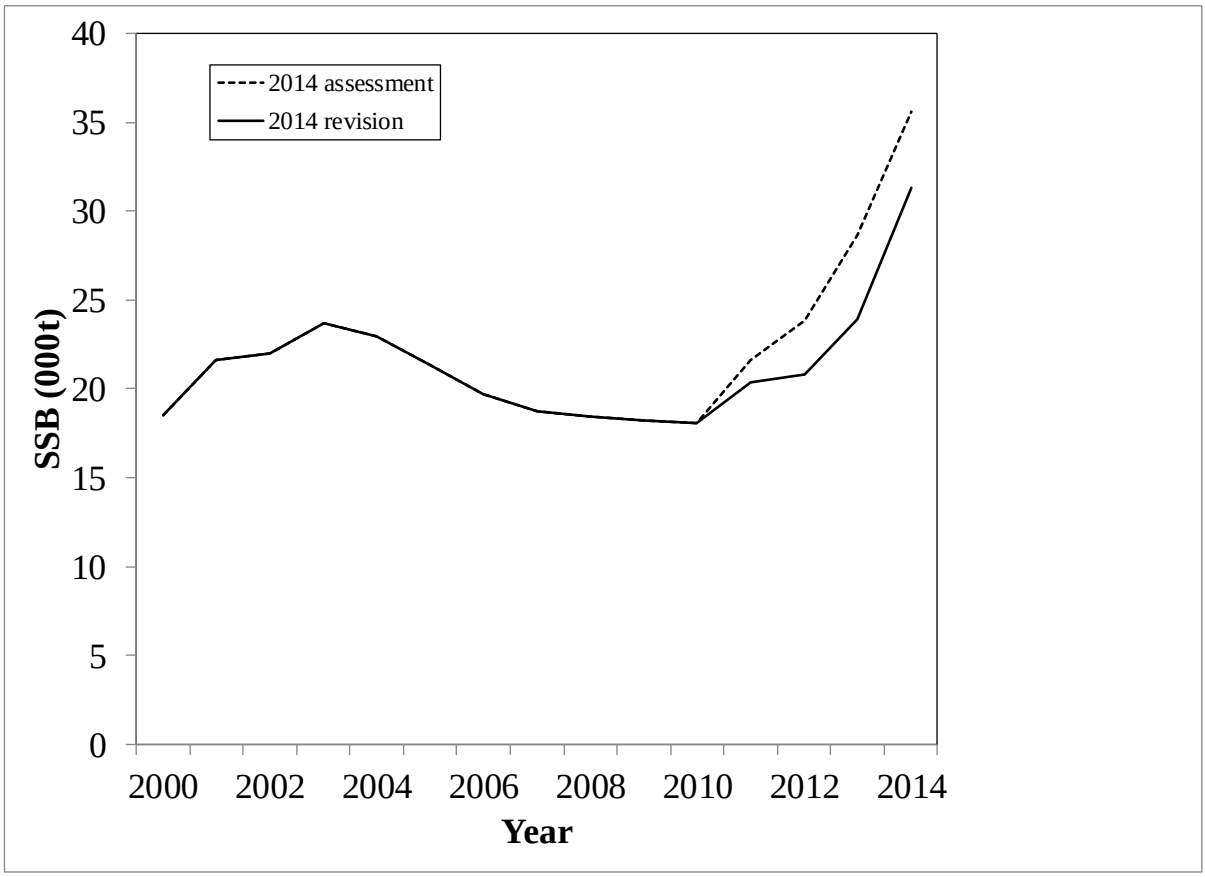

Fig. 30. Comparison of spawning stock biomass estimates from 2014 and those estimates calculated using revised stock weights.

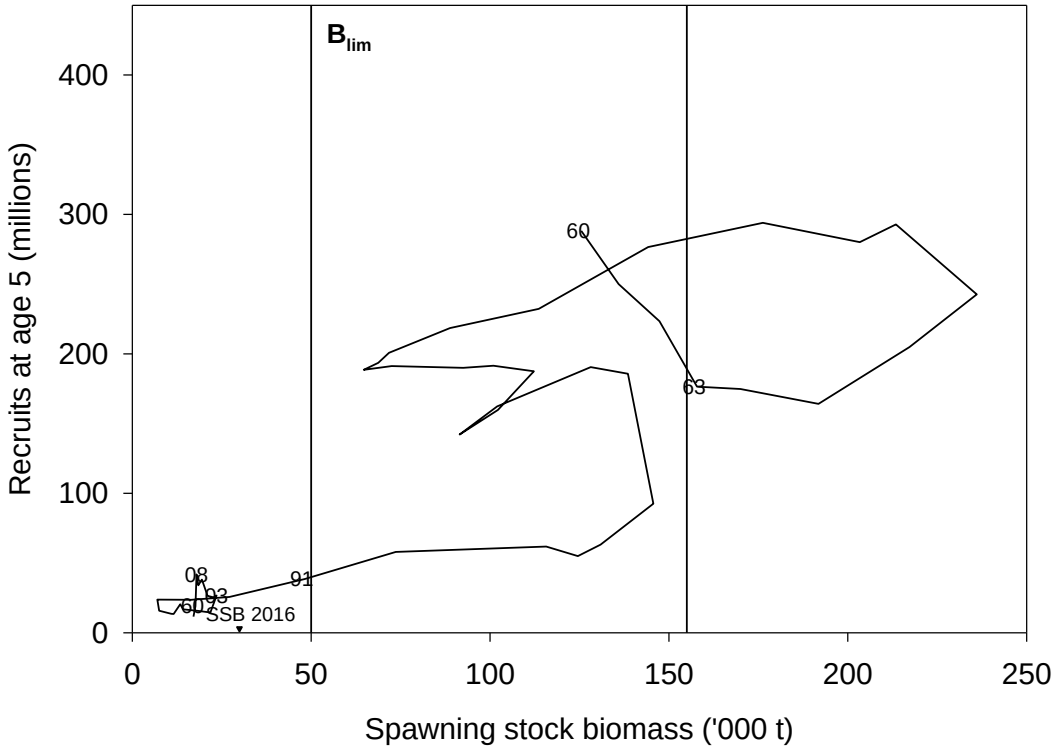

Fig. 31. Observed stock recruit scatter. Vertical line at 50, 000 t illustrates Blim, vertical line at 150, 000 t indicates SSB above which recruitment has been very good.

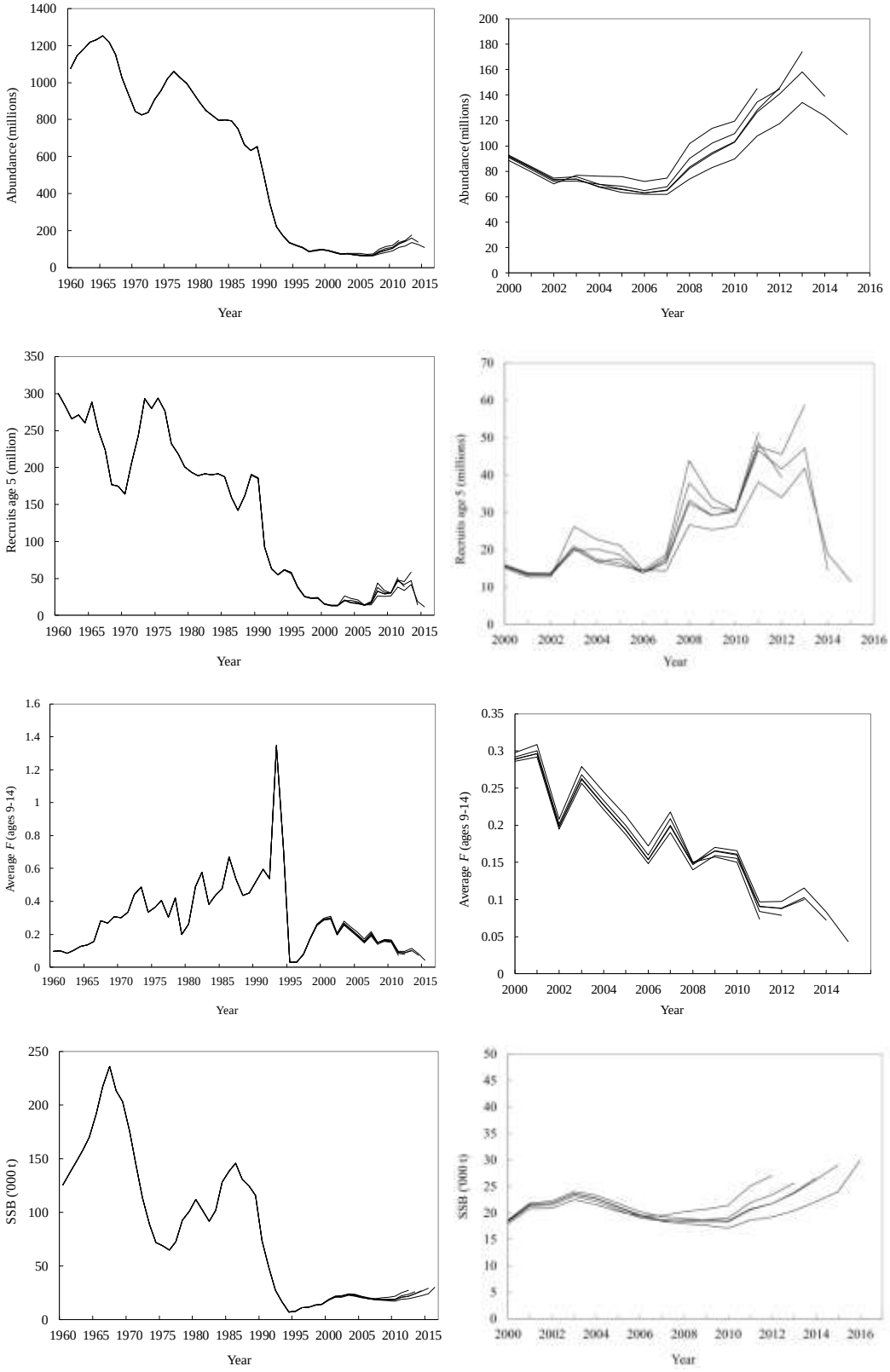

Fig. 32. Retrospective analysis of population numbers, recruitment (age 5), average *F* (ages 9-14), and SSB.

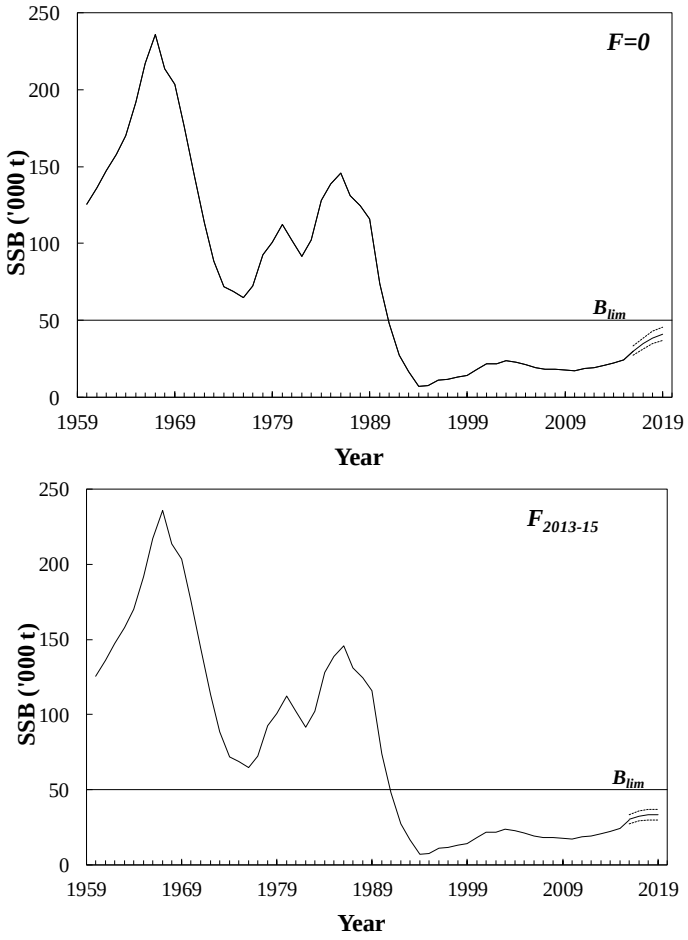

Fig. 33. Spawning stock biomass from projections along with 10th and 90th percentiles (dotted lines) for F=0 (top) and $F_{2013\text{-}15}$ (bottom).