Northwest Atlantic Fisheries Organization

Serial No. N6829 **NAFO SCS Doc. 18/039**

SCIENTIFIC COUNCIL MEETING - JUNE 2018

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 t 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 in some years. 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. Following an increasing trend to 2015, indices have decreased to 2017. 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. Following a large decline from the mid-1980s to the mid-1990s, spawning stock biomass (SSB) gradually increased to the early 2000s, and has varied at a low level since then. SSB in 2018 is estimated to be 17, 300t, 35% of the B*lim* of 50 000 t set for this stock. Stock weights at age have shown overall declines since the early 2000s. 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 2016 assessment was larger than that estimated during the current assessment. This is primarily attributed to the population retrospective pattern (revised downwards), which indicates that abundance and SSB has generally been overestimated and F has been underestimated.

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.

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.

From 2011-2014, STACFIS was unable to get a precise estimate of catch. During this period, it was decided to estimate catch in Division 3N using the ratio of total effort for the division (where effort was available) in the current year to the previous year and multiply by the agreed catch in the previous year (starting with 2010) (Dwyer et al. 2016). In 2015, SC agreed that estimates of catch from Daily Catch Records (DCR) were to be used for American plaice in Div. 3LNO. These were used for catch in 2015 (1149 t) and 2016 (1664 t). 2017 catches were obtained from CESAG estimates with estimated catch of 1172 t. 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.

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 and 2014 autumn surveys (incomplete coverage in Div. 3L), and the 2006, 2015 and 2017 spring multi-species surveys (no otoliths collected in 2006, incomplete

survey in Div. 3NO in 2006 and 2015, and incomplete coverage of Div. 3L in 2017) (Healey and Dwyer 2005; Dwyer *et al.* 2007; Healey *et al*., 2012; Rideout *et al.* 2017; Rideout *et al.* 2018). These data 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 Rideout *et al*. (2018).

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 2017, 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 1996-2017 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 2017.

Biomass estimates for each Division by stratum and depth for 1996 to 2017 are given in Tables 4-6. Note the shaded columns which represent years in which survey coverage was inadequate. In Div. 3L, the biomass index increased consecutively from 2009 to 2013, then decreased to 2016. The 2015 and 2017 values cannot be considered representative 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 to 2016 the biomass estimates from Div. 3N were 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 increased from 2009 to 2014, but a rapid decline was observed to 2016, with the biomass estimate the lowest since 1996 (Figure 3). Mean weight per tow for Divisions 3LNO combined (Figure 4) shows the same trend as the swept area estimate of biomass.

Total abundance for Div. 3LNO combined has fluctuated since 1996, but generally increased to 2014, and subsequently decreased in 2016 (Figure 3). The increase in abundance since 2010 is associated with increases in Div. 3L, which remained relatively stable 2014 to 2016. The overall decline from 2014 to 2016 is resulting from decreased abundance in Divs. 3N and 3O. Mean number per tow for Div. 3LNO show the same trend (Figure 5).

Tables 10-13 show the abundance at age from the Canadian spring surveys by division and for Div. 3LNO combined. Recent surveys show a high abundance of pre-recruit fish (<age 5; Figure 6). The proportion of fish that are ages 0 to 5 has generally been greater than 50% since 2001 (except 2006), with 2016 at 82%, 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 American plaice are distributed over the entire Grand Bank (Figure 8). 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 in these strata (and many others) had disappeared. In the 2016 spring survey, biomass appears equally distributed throughout the survey strata (Figure 8). Abundance of young fish (ages 1-5) is primarily located on the shelf in Div. 3L (Figure 9).

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. Since 1990, fall surveys were also carried out in Div. 3NO. Surveys from 1983 to 1994 were done with the Engel trawl and starting in fall 1995, a Campelen 1800 trawl was used.

Biomass estimates by stratum and depth are given for each Division in Tables 7-9. Biomass estimates from the fall survey increased from 2011 – 2015 in all three Divisions (with the exception of 2014 when survey coverage was inadequate), and then decreased to 2017. The current biomass index remains well below that of 1990. Biomass estimates showed an overall increase from the late 1990s to 2014, and subsequently declines to 2017. Since 2000, there had been a large biomass estimate in Div. 3N fairly consistently, which is heavily influenced by large sets in stratum 360 (Table 10), however, this declined in 2016 and 2017 to values similar to that from the 1990s period. The biomass estimates for Div. 3O has reached the highest point in the survey in 2008, but declined to 2010 and has since remained stable at a low level. Mean weight per tow shows similar trends to the total survey biomass (Figure 10).

Abundance for Div. 3LNO combined (Figure 3) showed a substantial decline from 1990 to 1998 but has been generally increasing since 1998, reaching levels from 2013-2017 that are similar to those observed in the late 1980s. This increase in abundance has been driven by Division 3L, which has shown a steady increase since 2004. Abundance in Divs. 3N and 3O increased from the mid-1990s to 2008, and has since declined. Mean numbers per tow show the same pattern (Figure 11).

Tables 14-17 and Figure 12 show the abundance by age for the fall survey. The age composition has seen younger ages (age 0-5) making up a higher proportion of the population in recent years, increasing from 55% in 1990 to an average of 89% in over 2015-2017.

Plots of distribution by weight per tow (Figure 12) for 2016-2017 show that American plaice are distributed throughout the Div. 3LNO area in the fall. The area of highest concentration in the most recent two years is on the shelf of Div. 3L, and on the southern Grand Bank (Figure 14). An examination of the distribution of numbers at age indicates that the concentration in 3L is mainly of young fish (<5 years old) (Figure 15).

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 (1971-2016). 2006, 2015, and 2017 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 1960's to mid 1970's, 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 1960's and 1970's with an A_{50} of about 4 years compared to 6 years at the beginning of the time series (Fig. 17). 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.

Estimates of maturity at length were produced using the data described above and are presented by cohort in Figure 18. 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 33-35 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 2016, except for 2006 and 2015 when survey coverage was too poor to be considered representative. Coverage in 20175 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 (Fig. 19 and 20). However, weight has been lower for females since about 2010.

EU-Spain Div. 3NO survey (SCR 18/11)

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), with depth strata expanded in 1997. 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 from 2000-2013, but have shown steady declines from 2013-2017 to values at or near the lowest in the time series.

Numbers at Age

Numbers at age (1998 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. In addition, in 2015 and 2017, Canadian spring survey age length keys were unavailable due to survey coverage issues, therefore the age length key from the previous year's Canadian spring survey was used. This resulting mean numbers per tow at age data is found in Table 18 and is used as input to the analytical assessment.

EU-Spain Div. 3L survey (SCR 18/019)

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 from 2010 to 2015, followed by a decrease to 2017. 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, there are consistent patterns in abundance and biomass estimates from Canadian spring and fall surveys, with both showing a slight increasing trend from the mid-1990s, followed by declines since around 2014 (Figure 3). Historically, both surveys have shown the largest decline in Div. 3L. There are some larger catches on the Grand Bank in Div. 3L in the fall in recent years as well as some larger catches on the tail of the Grand Bank in southern Div. 3N.

A comparison of standardized indices illustrating the consistency of datasets currently used to calibrate the analytical assessment is presented in Figure 21. In these figures each survey-age time-series is standardized to have mean 0 and variance 1 and are directly comparable. Figure 22 shows 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 5-6 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 21).

Plots of the standardized proportions by age across years (SPAY) provide additional perspective on the cohort consistency within each of the survey indices (Figure 22). 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 can be tracked in all surveys. In the spring and autumn Canadian surveys particularly strong recent cohorts can be seen entering from 2013-2015. This is not seen in the EU-Spain survey. Particularly in recent years, most relatively strong year classes entering the Canadian surveys do not make it into the model (age 5); positive values at younger ages decrease to negatives at or around age 5, indicating that strong incoming classes are not tracking through to older ages (Figure 22).

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). A similar increase is not observed in the EU-Spain 3NO Survey, presumably because the observed abundance of small fish in the Canadian surveys is located primarily on the bank in Div. 3L, outside of the survey area for the EU-Spain 3NO survey.

Catch at age

Catch at age from Canadian fisheries in 2016-17

Results of the catch at age calculations for American plaice catches from 2014-2016 are given in detail in Dwyer *et al*. (2016), and for earlier catch at age in earlier documents by Dwyer *et al*. (2005, 2007, 2009, 2010, 2014), Rideout *et al*. (2011), and Morgan *et al*. (1999a,b; 2001; 2002, 2003).

In 2016-17, sampling data collected by observers were available from by-catch of American plaice in Canadian fisheries targeting yellowtail in Div. 3NO and from Greenland halibut fisheries in Div. 3L. In 2016, the Canadian catch of A. plaice in Div. 3LNO was 745 t, ~25% higher than the average from 2011-2015 of 590 t. In 2017, the bycatch was 216 t. Most (94%) of the 2016-17 by-catch came from the directed fishery for yellowtail flounder. This percentage is about where it has been in recent years (~96% for most years).

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 bycatch of American plaice there, although the proportion of bycatch in 3L is generally small (~4% in 2017). In 2017, 81% of the bycatch of American Plaice was in Div. 3N and 14% was in Div. 3O (Tables 2-3).

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 2016-2017 was within 1% of the catch. The Canadian catch in 2016-17 consisted of about 1.3 and 0.4 million respectively, compared to 1.7, 1.2 and 0.5 million in 2013-2015, respectively (Tables 20-21). Ages in the 2016 catch ranged from 2 to 23, and catch was comprised mainly of fish aged 7 to 10 years old, with the peak being the 2008 year class (age 8). Ages in the 2017 catch ranged from 3 to 25, and catch was comprised mainly of fish aged 7 to 11 years old, with the peak being the 2009 year class (age 8).

The mean fish weight in the 2016 catch was 0.56 kg per fish, in 2017 was 0.60 kg per fish, both lower than the 2015 value of 0.79 kg per fish. Reasons for the annual fluctuations are likely due to the considerable seasonal and temporal differences in the catches, as noted above.

Catch at age from other countries

For 2016 and 2017, length frequency data were available from EU-Portugal and EU-Spain (in addition to the Canadian data above). No sampling was available from other countries, but the catch was bumped up accordingly. Details on the sampling levels and descriptions of the fisheries are contained in Vargas *et al.* (2017; 2018), and González-Costas *et al*. (2017; 2018). 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. However, because of survey coverage issues in 2017, ALKs from the 2016 Canadian spring survey were used for both 2016 and 2017 EU-Portugal and EU-Spain catch. Catch at age, weight at age (using the weight-length relationship described above) and sum of products (SOP) for 2016 and 2017 are given in Tables 21 and 22.

In 2016 and 2017, 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). In2016, length frequency sampling came from all Divisions in the 130 mm mesh fisheries from Portugal with peak catches ranging from 30-34 cm for the 130 mm mesh size. Length frequency sampling from EU-Spain was mainly in Divisions 3NO in the 280 mm sector, and Div. 3LNO in the 130 mm sector. Spanish frequencies indicated a peak at 38 cm in 2016 in the 280 mm fishery; the peak length in the 130 mm fishery was slightly smaller at 36 cm. In 2017, these were 40 and 36 cm, respectively.

Mean lengths and weights at age in the Canadian fishery were slightly higher at younger ages than in international catches (Tables 20-21), 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 22). 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 23 and 24. The calibration matrix consisted of the following input data (see Table 25):

- Catch at age (1960-2017) (ages 5-15+);
- Canadian spring RV survey (1985-2016) (no 2006 or 2015 value) (ages 5-14);
- Canadian autumn RV survey (1990-2017) (no 2004 or 2014 value) (ages 5-14); and
- EU-Spanish Div. 3NO survey (1998-2017) (ages 5-14).

The results of an ADAPT run using the formulation described above are given in Table 26 and Figures 23-26. The mean square of the residuals was 0.46. Relative errors on the population estimates ranged from 0.13 to 0.49. 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 to 2014, and a subsequent decrease in 2016. Residuals from the Canadian fall survey show no overall trend. The residuals from the EU-Spain Div. 3NO survey have shown a negative trend since 2013, with all negative residuals in the last two years (Figure 23). 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 (Figure 24). Residuals are larger for the older ages in the fall survey but are fairly low overall (Figure 25). The value for age 5s in the EU-Spain Div. 3NO survey is also high. Survey qs show some tendency for lower qs for the youngest fish (age 5), increasing to age 6 for Canadian Spring surveys and to age 7 for Canadian Fall and EU-Spain Div. 3NO surveys, before declining to the oldest ages in all surveys. (Figure 26). Fall surveys catch more small fish than spring surveys.

Population numbers and F from this run are shown in Tables 27 and 28. 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 to early 1900s (Figure 27). Biomass has varied at a low level since then. Average F on ages 9 to 14 showed an increasing trend from about 1965 to 1985 (Figure 28). 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 2017 was 0.06 (Table 28).

Spawning stock biomass was calculated by multiplying the biomass at age by the female maturity ogive (Table 29). SSB has shown 2 peaks, one in the mid-1960s and another in the early to mid-1980s. It declined to a time series low in 1994, and then increased to the early 2000s, though remaining well below the SSB of the pre-1990 period. Since then SSB has oscillated at this relatively low level (Figure 30). Recruitment has been generally poor since the 1986 year class (Figure 30). 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 2018 was 17 300 t, 35% of the B*lim* of 50 000t.

Model Exploration

Sensitivity analyses were completed examining the impact of changing the F ratio assumption in the VPA. The base model described above assumes a constant F ratio from 1.0 from

the last true age to the plus group in all years. The impact of this assumption on model fit and results was examined by completing several different model runs with varying F-ratio assumptions, with the F-ratio allowed to (1) vary in each year from 2000 to present, (2) vary in each year from 2010 to present, and (3) vary in 3 groups (2010-2012, 2013-2014, 2015-2017). Mean squared error of the model was found to decrease relative to the base model in all of these F-ratio scenarios (Table 31), and changes in the retrospective pattern were observed. Estimates of the F ratio to the plus group were generally different than 1.0. However, perception of the state of the stock and its trajectory were consistent among all runs, including the base model. Therefore STACFIS agreed on the use of the base model for this assessment, and further exploration of the F ratio assumption was recommended going forward.

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, biomass, SSB and recruits in Figure 32) indicating that abundance and SSB has been overestimated and F has been underestimated. The retrospective pattern present in the current assessment is larger than that observed in the previous assessment of the stock. While the exact cause of the retrospective pattern cannot be identified, contributing factors may include inconsistency in survey trends at age between Canadian and EU-Spain surveys, low F relative to M, current assumptions on M, unreported catch, etc.

Reference Points

The SSB for this stock is estimated to be 17 300t, 35% of B_{lim} (50 000 t) and fishing mortality in 2017 was below F_{lim} (0.31).

Stochastic Projections

Simulations were carried out to examine the trajectory of the stock under 2 scenarios of fishing mortality: F = 0 and F = $F_{StatusQuo}$ = F2015-2017 (0.077). The three year average was chosen rather than the value for 2017 because of the retrospective pattern. For these simulations the results of the VPA and the covariance of these population estimates were used. Table 32 outlines the assumptions used for the projections. Simulations were limited to a 4-year period. Recruitment was resampled from all historical recruitments produced from SSB< B_{lim}. The simulations contained a plus group at age 15.

SSB projections are presented in Figure 33. SSB was projected to have a probability of >0.99 of being less than B_{lim} by the start of 2022 under both $F_{StatusQuo}$ and F=0 (Table 33). Under the F=0 scenario, there is a 99% probability that SSB in 2022 will be greater than in 2018, however this is reduced to 47% probability under F status-quo (Table 34). Even very low levels of F are inhibiting growth of the stock.

Under status quo fishing mortality (F2015-2017), projected removals are stable from 2019 to 2022 at around 1 500 tons

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, but have declined since 2014. Historically the largest portion of this stock was located in Div. 3L, but the highest declines in survey indices were experienced in this region. However, there has also been a substantial increase in abundance in Div. 3L, with spring and fall survey abundance in this Division at the highest levels observed since 1990. This increase is concentrated in ages ≤5 years. The stock in Divisions 3N and 3O, however, have shown some recent declines. The EU–Spain survey index in Div. 3NO has declined over the past 5 years, reaching lowest levels in the time series. There appear to be large numbers of pre-recruits (<age 5) in Canadian surveys in the three most recent years, 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 has varied at a low level since the early 2000s. However, this model shows a large retrospective pattern. Current SSB is well below historic levels, and still below B_{lim}.

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Table 1. Nominal catches (t) of American Plaice for NAFO Divisions 3LNO, 1960-2017, and TAC from 1973-2017

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]	0
2016	745	920	1,665	1666[g]	0
2017	219	953	1,172	1172[h]	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 t
[c] Effective TAC
[d] STACFIS unable to determine precise estimates because of discrepancies between various sources.
[f] Estimated catch based on ratio of effort in Div. 3N. See text for details.
[g] from Daily Catch Records (DCR)
[h] From CESAG catch estimates

Table 2. Canadian catches of American Plaice by Division, month and gear (OT = otter trawl; GN = gill net) during 2016

	3L		3N	3O	3LNO
	OT	GN	OT	OT	TOTAL
2016					
Jan			32	1	32
Feb			15		15
Mar				1	1
April	7			4	10
May	11		13	0	24
Jun	2		187	1	190
Jul	0		69	4	73
Aug		0	74	0	74
Sept		0	129	26	155
Oct		0	90	21	110
Nov			15	14	29
Dec			29	1	31
Total	**20**	**0**	**653**	**73**	**745**

Table 3. Canadian catches of American Plaice by Division, month and gear (OT = otter trawl; GN = gill net) during 2017

	3L		3N	3O	3LNO
	OT	GN	OT	OT	TOTAL
2017					
Jan			4		4
Feb			4		4
Mar				3	3
April	13		3		16
May	8		26		34
Jun	1		21	14	36
Jul	1	0	29	4	34
Aug		0			0
Sept		0	18	29	47
Oct		0	7	10	17
Nov	1		12	1	15
Dec	1		5		6
Total	**25**	**1**	**130**	**61**	**216**

Table 4. Biomass estimates ('000t) of Am. Plaice, by stratum and depth zone (m), from Canadian spring surveys in Div. 3L in 1998-2017 (Campelen). (+) indicates biomass <50t, (-) means stratum was not surveyed. Shaded columns indicate years when the survey is considered to be incomplete.

Depth (m)	Stratum	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
30-56	784	0.2	+	-	+	0.0	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	0.2	+	-	+	0.0	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
57-92	350	0.3	6.1	1.8	0.5	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	-	0.4	0.5
	363	0.2	3.2	6.2	0.7	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	-	0.2	0.1
	371	0.5	2.4	0.9	0.1	+	1.0	0.5	1.3	1.3	1.4	1.9	+	1.0	0.8	1.8	1.4	1.3	-	0.1	0.5
	372	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	-	0.6	0.8
	384	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	0.2	0.2
	785	0.2	0.5	-	0.7	0.1	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	2.7	15.7	13.9	3.5	1.0	7.7	5.0	9.2	11.5	11.3	15.4	2.9	4.0	7.1	17.7	13.7	17.7	3.0	1.4	2.2
93-183	328	0.1	2.4	0.9	1.4	0.5	0.2	0.6	3.6	1.6	1.4	-	2.9	0.9	6.2	3.4	7.2	3.4	-	4.0	-
	341	0.7	4.5	0.8	1.6	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	-	1.5	0.4
	342	0.4	0.4	0.2	0.1	+	0.1	+	0.1	0.6	0.8	0.1	0.1	+	0.6	0.8	1.3	0.4	0.1	0.1	-
	343	+	0.6	0.2	+	+	0.1	+	0.1	0.3	0.1	+	0.2	-	0.4	0.5	0.1	0.1	0.1	+	-
	348	1.2	2.8	1.5	0.5	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	1.5	-
	349	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	-	0.7	-
	364	0.9	5.6	1.3	1.6	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	2.8	-
	365	0.9	1.4	1.2	0.4	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	1.4	-
	370	1.6	2.4	1.9	1.0	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	1.3	-
	385	0.5	2.5	1.9	1.5	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	2.8	-
	390	0.5	0.3	0.3	0.5	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	0.3	-
	786	0.3	0.5	-	0.4	-	-	0.1	-	-	-	-	-	-	0.6	-	-	-	-	-	-
	787	0.5	0.8	-	0.1	-	-	+	-	-	-	-	-	-	0.9	-	-	-	-	-	-
	788	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	790	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	793	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	794	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	797	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	799	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	7.9	29.1	11.4	9.6	5.5	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	16.4	
184-274	344	0.8	1.8	0.5	0.4	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	0.6	-
	347	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	0.5	-
	366	0.3	0.5	0.7	0.8	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	2.6	-
	369	0.2	1.2	0.7	1.0	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	1.5	-
	386	0.4	1.4	1.7	0.5	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	-	1.0	-
	389	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	-	0.9	-
	391	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	0.2	-
	791	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	795	-	0.1	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	2.9	6.6	4.7	4.0	3.1	2.8	2.9	10.0	15.8	16.0	4.2	3.1	5.0	2.9	3.8	22.2	9.7	8.5	7.2	-
275-366	345	0.3	1.5	0.5	0.8	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	0.4	-
	346	0.2	0.2	0.5	0.2	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	0.5	-
	368	0.1	0.3	0.4	0.2	0.2	0.2	0.2	0.1	0.1	+	0.5	0.7	0.5	0.3	0.7	0.6	0.3	0.7	1.4	-
	387	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	-	0.5	-
	388	0.2	0.8	0.3	0.5	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	-	0.4	-
	392	0.4	0.2	0.1	0.2	0.3	0.1	0.2	+	0.0	+	+	0.3	1.1	0.1	0.6	0.3	0.1	0.5	0.3	-
	789	-	0.5	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
	796	-	0.1	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	798	-	0.1	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	800	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	2.0	4.3	3.4	2.7	2.3	1.8	2.3	5.5	2.9	3.9	4.6	3.6	4.2	3.6	6.5	6.2	6.8	2.7	3.5	-
367-549	729	2.2	0.1	1.3	1.1	1.3	1.2	0.1	+	0.0	0.0	+	1.5	-	0.2	0.4	0.2	+	+	0.6	-
	731	+	0.1	1.2	0.4	0.2	0.1	+	0.0	0.0	0.1	+	0.4	0.1	0.1	0.1	0.0	0.1	-	1.9	-
	733	0.3	1.0	0.1	2.4	0.5	2.1	0.1	+	0.1	+	0.5	+	0.7	0.1	1.5	+	0.1	-	0.1	-
	735	1.2	0.6	1.2	2.1	1.2	4.9	0.3	+	+	0.1	2.3	0.9	1.3	5.6	2.0	0.2	0.6	0.3	0.6	-
	792	-	+	-	0.2	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	3.6	1.8	3.8	6.1	3.2	8.3	0.5	0.0	0.1	0.2	2.9	2.9	2.0	6.0	4.0	0.5	0.7	0.3	3.2	-
550-731	730	0.2	+	0.1	0.1	0.3	+	+	0.0	-	0.0	0.0	+	+	+	0.0	0.0	0.0	0.0	0.0	-
	732	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	+	-	0.7	-
	734	0.1	0.0	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	0.0	+	+	+	0.5	0.1	+	+	-	0.0	0.1	0.5	0.1	+	0.1	0.0	0.0	0.0	0.0	-
	Total	0.3	0.0	0.4	3.7	2.3	1.2	0.0	0.0	-	0.0	0.1	1.9	0.2	0.0	0.1	0.0	0.0	0.0	0.7	-
Grand Total		19.5	57.6	37.7	29.6	17.4	26.4	19.5	47.9	68.8	46.3	50.0	20.7	23.3	37.1	62.4	86.9	65.9	28.7	32.3	-

Table 5. Biomass estimates ('000t) of Am. Plaice, by stratum and depth zone (m), from Canadian spring surveys in Div. 3N in 1998-2017 (Campelen). (+) indicates biomass <50t, (-) means stratum was not surveyed. Shaded columns indicate years when the survey is considered to be incomplete.

Depth (m)	Stratum	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
30-56	375	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	0.6	0.7
	376	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	3.0	1.4
	Total	3.2	5.1	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	3.5	2.1
57-92	360	7.9	27.5	22.8	50.4	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	2.1	21.7
	361	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	0.2	0.6
	362	4.0	4.6	6.6	7.1	2.7	5.1	2.5	5.7	4.5	4.2	4.5	2.4	2.7	4.1	1.8	5.4	6.3	1.8	1.1	0.8
	373	0.9	8.3	3.2	2.6	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	1.0	0.9
	374	0.3	1.7	0.9	1.1	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	0.2	0.4
	383	+	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	0.2	0.1
	Total	15.1	48.4	37.9	70.2	37.8	50.1	43.7	55.7	62.6	118.4	103.7	26.8	63.8	55.4	52.3	68.8	65.0	63.7	4.9	24.5
93-183	359	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	2.7	4.3	0.5	10.6
	377	+	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	1.0	1.1	+	0.1
	382	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	39.7	4.4	+	0.1
	Total	2.3	3.7	5.5	6.2	0.7	7.3	4.0	19.6	-	9.0	12.9	5.4	12.8	4.0	6.6	22.4	43.4	9.9	0.6	10.8
184-274	358	1.4	0.3	0.6	0.6	0.1	0.3	0.3	0.4	-	0.7	0.5	1.5	0.7	0.2	+	0.8	0.2	0.1	0.5	0.2
	378	0.2	0.9	+	0.2	0.1	0.5	0.4	0.1	-	0.4	0.3	9.0	1.1	1.5	0.2	3.8	0.1	+	0.3	1.6
	381	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	1.6	3.3	0.2	+
	Total	1.7	1.4	0.7	0.9	0.3	1.0	1.5	0.6	-	1.8	1.6	10.7	2.7	1.7	2.3	4.8	1.9	3.4	1.0	1.9
275-366	357	0.1	+	0.1	0.2	0.1	0.1	0.1	0.1	-	0.1	0.0	0.4	0.0	+	0.0	0.0	0.0	0.0	0.1	+
	379	0.1	0.1	0.1	0.1	0.1	0.3	+	+	-	+	0.0	0.2	+	0.1	+	+	+	0.0	0.5	1.9
	380	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	+	0.1	0.2	0.2
	Total	0.3	0.3	0.2	0.4	0.2	0.9	0.3	0.1	-	0.1	0.1	0.9	0.3	0.5	0.1	0.7	0.1	0.1	0.8	2.1
367-549	723	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	0.2	+	0.4	0.1	+	0.3	+	+	-	0.0	0.0	0.0	0.0	0.7	0.0	+	0.0	0.0	4.1	+
	727	2.0	0.4	1.2	2.5	0.1	0.5	0.4	+	-	+	+	1.7	0.1	8.3	0.3	2.3	+	+	5.0	38.1
	Total	2.4	0.5	1.6	2.7	0.5	1.8	0.6	0.1	-	+	+	1.7	0.1	9.1	0.3	2.3	+	+	9.1	38.1
550-731	724	0.2	+	0.1	0.2	0.5	0.1	+	0.1	-	0.0		0.0	+	+		0.0	0.0	0.0	0.0	-
	726	+	+	0.1	+	+	+	+	0.0	-	0.0	0.0	0.0	0.0	+	0.0	+	0.0	0.0	0.4	0.0
	728	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	0.0	0.0	0.4	+
	Total	0.5	0.3	0.7	1.2	0.9	0.3	0.1	0.2	-	0.0	0.0	3.8	0.2	0.5	0.2	+	0.0	0.0	0.8	+
Grand Total		25.5	59.7	56.8	93.0	52.9	73.1	64.2	114.2	99.1	140.4	132.5	61.2	85.9	80.4	67.9	106.9	115.6	91.1	20.8	79.5

Table 6. Biomass estimates ('000t) of Am. Plaice, by stratum and depth zone (m), from Canadian spring surveys in Div. 3O in 1998-2017 (Campelen). (+) indicates biomass <50t, (-) means stratum was not surveyed. Shaded columns indicate years when the survey is considered to be incomplete.

Depth (m)	Stratum	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
57-92	330	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	1.1	1.1
	331	0.3	2.7	2.3	2.7	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	0.4	0.4
	338	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	2.6	1.3
	340	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	0.7	0.4
	351	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	0.6	1.1
	352	10.6	14.2	13.4	17.6	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	1.1	1.8
	353	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	1.3	1.7
	Total	40.4	53.4	50.3	59.2	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	7.8	7.8
93-183	329	4.4	4.7	3.9	2.0	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	1.7	0.8
	332	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	3.3	0.3
	337	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	1.1	0.4
	339	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	0.6	1.5
	354	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	1.7	1.0
	Total	17.3	20.6	9.8	9.6	13.3	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	8.4	4.1
184-274	333	0.1	0.1	+	+	0.3	+	+	0.2	-	0.1	+	+	+	+	+	+	+	+	+	+
	336	+	0.2	+	0.1	+	+	+	0.1	-	0.2	+	+	+	+	+	+	+	+	+	+
	355	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	+	0.1	0.1
	Total	0.2	0.4	0.1	0.5	0.7	0.7	0.4	0.5	-	0.5	0.1	0.3	+	0.1	0.1	0.1	0.1	+	0.2	0.2
275-366	334	0.0	0.1	+	+	0.2	0.2	+	+	-	0.1	+	+	0.0	+	+	+	+	+	+	0.0
	335	0.0	+	+	+	+	+	0.0	+	-	+	+	+	+	0.0	+	+	0.0	0.0	0.0	+
	356	+	0.1	+	+	+	0.4	+	+	-	0.1	+	0.1	+	+	+	+	+	+	+	+
	Total	+	0.1	+	0.1	0.2	0.5	+	0.1	-	0.1	+	0.1	+	+	+	+	+	+	+	+
367-549	717	+	0.1	0.0	+	0.4	0.2	0.0	0.1	-	0.0	0.0	0.0	+	+	0.0	+	0.0	0.0	-	+
	719	+	+	0.0	+	+	+	+	+	-	0.0	0.0	0.0	0.0	0.0	0.0	+	0.0	0.0	0.0	0.0
	721	+	0.1	+	0.3	+	0.1	0.0	+	-	0.0	0.0	+	0.0	+	0.0	+	0.0	0.0	+	+
	Total	+	0.2	+	0.3	0.5	0.3	+	0.1	-	0.0	0.0	+	+	+	0.0	+	0.0	0.0	+	+
550-731	718	+	+	0.0	+	+	0.3	0.0	0.0	-	0.0	0.0	+	0.0	+	0.0	+	0.0	0.0	-	+
	720	+	+	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
	722	0.0	0.2	0.1	0.3	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
	Total	+	0.2	0.1	0.4	0.1	0.5	0.0	0.0	-	+	0.0	+	0.0	+	0.0	+	0.0	0.0	+	+
Grand Total		58.0	75.0	60.3	70.1	59.3	60.9	59.1	52.6	43.7	44.4	51.6	41.2	40.9	37.5	38.9	39.0	44.3	24.6	16.4	12.2

Table 7. Biomass estimates ('000t) of Am. Plaice, by stratum and depth zone (m), from Canadian autumn surveys in Div. 3L in 1998-2017 (Campelen). (+) indicates biomass <50t, (-) means stratum was not surveyed. Shaded columns indicate years when the survey is considered to be incomplete.

Depth (m)	Stratum	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
≤56	784	0.0	-	+	+	+	+	+	0.0	-	-	-	-	-	-	-	-	-	-	-	-
		0.0	-	+	+	+	+	+	0.0	-	-	-	-	-	-	-	-	-	-	-	-
57-92	350	1.1	1.0	0.5	7.8	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	1.3	0.4
	363	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	1.0	1.6
	371	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	4.5	4.9
	372	0.3	1.7	0.6	2.6	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	0.5	1.0
	384	0.2	1.5	0.1	1.4	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	0.6	3.0
	785	+	-	+	0.1	0.1	0.1	+	0.3	-	-	-	-	-	-	-	-	-	-	-	-
	Total	4.4	6.5	4.3	16.4	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	8.0	10.9
93-183	328	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	1.4	2.8
	341	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	1.4	1.0
	342	0.2	+	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	+	+	0.1	0.1	0.5	0.7	+	1.2	0.5	1.4
	343	0.1	+	+	0.1	0.1	0.1	+	0.1	0.1	+	0.1	0.1	+	0.1	0.3	0.5	+	0.1	0.4	0.8
	348	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	4.0	8.3
	349	0.8	0.4	0.3	0.7	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	1.6	1.5
	364	5.2	1.2	1.8	3.0	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	2.9	11.3
	365	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	9.8	5.6
	370	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	14.5	12.3
	385	4.0	2.9	0.8	3.6	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	13.5	11.4
	390	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	6.7	3.0
	786	0.1	-	0.1	0.2	0.1	0.1	0.1	0.3	-	-	-	-	-	-	-	-	-	-	-	-
	787	0.1	-	0.1	0.1	0.1	0.1	0.1	0.2	0.2	-	-	-	-	-	-	-	-	-	-	-
	788	0.1	-	0.1	+	0.3	+	0.2	0.3	0.4	-	-	-	0.1	-	-	-	-	-	-	-
	790	+	-	+	+	+	+	0.1	+	-	-	-	-	+	-	-	-	-	-	-	-
	793	0.1	-	+	0.1	+	+	0.1	0.1	-	-	-	-	+	-	-	-	-	-	-	-
	794	+	-	-	+	+	+	+	0.1	0.1	-	-	-	+	-	-	-	-	-	-	-
	797	+	-	+	+	0.1	+	+	0.1	0.1	-	-	-	+	-	-	-	-	-	-	-
	799	+	-	+	+	0.4	+	+	0.1	0.1	-	-	-	+	-	-	-	-	-	-	-
	Total	24.0	15.7	7.1	17.0	23.2	9.2	12.2	16.9	24.4	17.2	23.3	10.5	26.7	33.9	47.4	66.4	22.2	47.1	56.6	59.4
184-274	344	0.5	0.5	0.4	0.7	0.7	0.3	0.8	1.8	1.2	1.6	2.2	0.7	0.7	1.6	4.9	4.5	2.7	1.7	2.7	3.5
	347	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	1.7	8.9
	366	0.8	1.7	0.5	0.4	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	4.0	6.8
	369	1.8	1.6	0.8	2.8	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	8.0	4.3
	386	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	11.1	4.0
	389	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	1.0	5.3
	391	0.2	0.3	0.1	0.2	0.1	0.4	0.1	0.2	0.2	0.4	0.3	0.2	0.3	0.1	+	0.4	5.4	0.7	1.8	1.1
	791	0.4	-	0.3	0.4	0.7	0.2	0.2	0.5	-	-	-	-	+	-	-	-	-	-	-	-
	795	0.1	-	+	+	0.1	+	+	0.2	+	-	-	-	+	-	-	-	-	-	-	-
	Total	6.2	6.4	3.4	7.5	6.5	3.6	2.2	10.1	14.4	13.1	22.6	6.1	9.8	12.7	21.9	25.3	41.3	27.6	30.2	33.9
275-366	345	2.5	1.3	0.6	0.9	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	3.6	1.3
	346	1.7	1.7	0.4	1.0	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	1.3	1.3
	368	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	0.3	0.2
	387	0.2	1.8	1.0	0.5	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	0.7	0.8
	388	+	0.9	0.4	0.2	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	0.4	0.1
	392	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	0.2	+	+	0.1
	789	0.1	-	0.1	0.2	0.1	+	0.1	0.2	0.1	-	-	-	-	-	-	-	-	-	-	-
	791	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	796	0.4	-	0.2	0.2	0.1	0.1	0.1	0.3	0.2	-	-	-	0.2	-	-	0.6	-	-	-	-
	798	0.3	-	+	0.3	+	+	0.3	0.1	-	-	-	-	0.1	-	-	-	-	-	-	-
	800	0.2	-	0.2	0.3	0.3	0.2	0.2	0.2	-	-	-	0.1	0.1	-	-	-	-	-	-	-
	Total	5.9	6.9	3.7	4.0	3.5	2.2	4.2	4.9	7.8	10.2	7.9	5.0	6.1	6.4	4.9	6.2	13.9	11.1	6.4	3.8
367-549	729	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	+	+	+
	731	0.1	1.0	1.2	0.2	+	0.1	0.1	+	+	0.3	0.2	0.3	0.2	-	0.1	0.0	0.1	0.2	+	+
	733	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	+	0.1	+	+	+	0.0
	735	0.8	1.9	2.1	1.7	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	+	0.1
	792	0.3	-	0.2	0.6	0.1	0.2	0.1	0.1	-	-	-	-	0.1	-	-	-	-	-	-	-
	Total	1.9	4.0	6.2	3.5	1.6	0.9	0.5	0.6	1.8	4.2	2.4	3.9	8.7	2.6	0.9	0.2	1.1	0.9	0.1	0.1
550-731	730	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	0.2	1.9	0.7	1.4	+	+	0.1	0.1	+	0.5	0.5	0.2	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.0
	734	0.1	0.1	+	+	+	0.0	-	0.0	0.1	0.1	+	0.6	0.0	1.2	+	0.0	0.0	0.0	0.0	0.0
	736	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	0.1	+
	Total	1.0	2.7	2.7	3.6	1.9	0.4	0.6	0.2	3.1	3.0	1.8	3.1	0.6	1.9	0.2	0.0	0.3	0.1	0.2	+
732-914	737	3.3	0.8	+	1.4	1.0	1.1	-	2.0	1.1	0.1	-	+	2.1	-	-	-	0.6	-	-	-
	741	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	0.7	0.0	0.0	0.0	0.3	-	-	0.0	0.0	-	+	+	-	-	-	0.1	-	-	-
	748	0.0	1.1	0.0	0.0	+	1.1	-	-	0.5	0.0	-	+	0.4	-	-	-	0.0	-	-	-
	Total	5.2	2.7	+	1.4	1.6	2.6	-	2.0	1.6	0.1	-	0.9	2.5	-	-	-	-	-	-	-
915-1097	738	0.0	0.0	0.0	+	+	2.2	-	-	0.0	0.0	-	0.0	0.0	-	-	-	+	-	-	-
	742	0.0	+	0.0	0.0	0.0	3.5	-	-	0.0	0.0	-	0.0	0.0	-	-	-	0.0	-	-	-
	746	+	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	-	-	-	0.0	-	-	-
	749	0.0	-	0.0	0.0	0.0	+	-	-		0.0	-	0.0	0.0	-	-	-	0.0	-	-	-
	Total	+	+	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	-	-	-
	743	0.0	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	-	-	-	0.0	-	-	-
	747	0.1	+	0.0	0.0	0.0	0.0	-	-	0.1	0.0	-	0.0	0.0	-	-	-	0.0	-	-	-
	750	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	0.0	0.0	0.0	-	0.0	0.1	0.0	-	0.0	+	-	-	-	-	-	-	-
1281-1463	740	0.0	0.1	0.0	0.0	0.0	+	-	0.0	0.0	0.0	-	0.0	0.0	-	-	-	0.0	-	-	-
	744	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	-	-	-
	Total	0.1	0.1	0.0	0.0	0.0	+	-	0.0	0.0	0.0	-	0.0	0.0	-	-	-	-	-	-	-
Grand Total		48.9	45.0	27.5	53.4	44.5	26.7	21.3	36.5	57.7	50.9	61.2	33.6	60.2	61.0	82.2	111.3	82.2	92.6	101.4	108.2

Table 8. Biomass estimates ('000t) of Am. Plaice, by stratum and depth zone (m), from Canadian autumn surveys in Div. 3N in 1998-2017 (Campelen). (+) indicates biomass <50t, (-) means stratum was not surveyed. Shaded columns indicate years when the survey is considered to be incomplete.

Depth (m)	Stratum	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
≤56	375	6.4	0.6	1.7	0.7	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	1.6	1.1
	376	4.1	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	2.1	8.8
	Total	10.5	4.9	37.4	16.1	44.0	8.7	13.4	23.4	18.2	13.8	16.3	5.2	14.9	17.4	7.3	13.2	-	9.5	3.7	9.9
57-92	360	32.0	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	23.3	28.2
	361	2.3	1.8	3.9	2.4	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	1.1	2.5
	362	3.9	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	2.1	1.9
	373	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	3.0	1.3
	374	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	2.4	3.2
	383	0.8	0.8	+	0.6	0.5	0.1	+	0.4	0.3	0.7	2.2	1.4	1.1	1.5	3.6	2.2	-	2.7	0.1	0.8
	Total	42.1	55.8	106.4	64.9	86.7	108.2	116.0	97.0	80.3	82.0	139.3	120.3	136.2	140.2	84.1	140.5	-	79.3	32.0	38.0
93-183	359	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	4.3	4.2
	377	1.1	0.9	0.7	3.1	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	0.9	1.8
	382	6.1	2.7	1.0	3.6	2.2	+	0.2	0.9	0.5	7.8	3.3	4.5	1.9	7.6	2.3	32.4	-	8.9	0.6	1.9
	Total	18.9	13.4	33.9	10.6	25.7	9.0	10.9	6.0	19.7	17.8	10.2	12.9	10.6	14.2	6.5	40.0	-	17.4	5.8	7.9
184-274	358	0.3	0.3	0.6	1.0	0.2	+	0.4	+	0.1	0.5	0.4	1.2	0.1	+	0.1	0.0	-	+	0.1	0.4
	378	0.1	0.4	0.2	0.2	0.4	0.5	0.3	0.2	0.4	0.9	0.5	0.6		0.3	0.2	1.4	-	0.9	0.2	0.6
	381	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	0.3	0.7
	Total	0.6	1.0	1.1	1.5	0.7	1.0	1.3	0.9	1.1	6.0	1.4	2.1	0.2	0.4	1.1	1.8	-	1.1	0.6	1.7
275-366	357	+	-	+	+	+	+	+	0.2	+	0.1	+	+	+	0.0	0.0	0.0	-	0.0	0.1	+
	379	+	0.3	+	0.1	+	+	0.5	+	0.0	+	0.4	+	+	+	0.0	0.0	-	0.1	+	0.1
	380	0.1	0.7	0.3	0.1	+	0.1	0.1	0.1	0.2	4.2	+	0.2	+	0.1	+	+	-	0.2	+	0.1
	Total	0.1	1.0	0.4	0.2	0.1	0.1	0.6	0.4	0.2	4.3	0.4	0.2	+	0.1	+	+	-	0.3	0.1	0.2
367-549	723	0.1	+	+	+	0.0	+	+	+	0.0	+	0.1	0.0	+	0.0	0.0	0.0	-	+	+	+
	725	+	0.1	0.2	+	0.0	+	-	0.1	+	0.0	0.1	0.0	-	0.0	0.0	0.0	-	+	0.1	+
	727	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	-	0.1	+	+
	Total	0.2	1.7	0.6	0.1	0.3	0.3	0.2	0.4	0.1	0.1	0.3	+	+	0.1	+	0.0	-	0.1	0.1	+
550-731	724	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	+
	726	+	+	+	+	0.0	+	+	0.0	0.0	0.0	0.0	+	0.0	+	0.0	0.0	-	+	+	+
	728	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	0.1	+
	Total	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	-	+	0.1	0.1
732-914	752	1.5	-	0.0	0.0	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-
	756	0.1	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	-	-	-	-	-	-	-	-
	760	0.0	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	0.0	-	-	-	-	-	-	-	-
	Total	1.5	-	0.0	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	-	0.0	-	-	-	-	-	-	-	-	-	-
	761	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	-	-	-	-	-	-	-	-
			-																		
1098-1280	754	0.0	-	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	-	0.0	-	-	-	-	-	-	-	-
	Total	0.0	-	0.0	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	-	0.0	-	-	-	-	-	-	-	-	-	-
	763	-	-	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		74.0	78.1	180.4	93.5	157.5	127.4	143.5	128.1	119.5	125.6	169.1	141.2	162.1	172.6	99.0	195.5	-	107.7	42.5	57.8

Table 9. Biomass estimates ('000t) of Am. Plaice, by stratum and depth zone (m), from Canadian autumn surveys in Div. 3O in 1998-2017 (Campelen). (+) indicates biomass <50t, (-) means stratum was not surveyed. Shaded columns indicate years when the survey is considered to be incomplete.

Depth (m)	Stratum	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
57-92	330	5.9	5.4	5.3	6.0	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	6.3	1.6
	331	1.8	1.0	1.0	1.2	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	1.4	0.8
	338	3.4	3.8	2.1	4.5	3.2	6.7	5.3	5.4	2.8	2.8	10.6	6.5	3.4	2.6	2.3	2.1	-	5.4	2.0	3.3
	340	1.2	2.8	2.2	1.8	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	2.4	3.6
	351	3.3	2.9	6.3	4.4	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	2.1	3.6
	352	8.6	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	0.9	5.0
	353	19.3	10.3	14.5	14.0	11.3	14.4	24.6	15.6	21.0	27.9	29.1	29.3	11.6	12.3	6.5	8.2	-	8.6	6.3	3.4
	Total	43.6	29.4	39.9	39.8	33.5	38.8	54.0	43.2	43.4	52.2	75.2	64.5	32.1	35.0	30.6	27.3	-	29.2	21.3	21.3
93-183	329	5.0	6.6	8.0	7.7	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	3.2	3.4
	332	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	3.1	4.2
	337	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	1.7	2.5
	339	1.4	-	3.8	2.5	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	3.4	3.1
	354	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	1.7	1.5
	Total	15.5	36.9	20.1	14.7	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	13.2	14.7
184-274	333	0.0	0.1	+	0.0	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+
	336	+	0.1	0.1	+	+	+	+	+	0.1	0.3	0.1	-	+	+	+	+	-	0.0	-	+
	355	+	0.3	+	0.1	0.1	+	0.1	0.1	0.1	0.2	0.3	0.1	0.1	+	0.1	0.1	-	+	+	+
	Total	0.1	0.5	0.1	0.1	0.1	+	0.1	0.1	0.2	0.5	0.4	0.1	0.1	0.1	0.1	0.2	-	+	+	+
275-366	334	+	+	0.0	0.0	0.0	0.0	+	+	+	+	+	0.0	+	+	+	+	-	+	0.0	0.0
	335	+	+	+	+	+	+	+	+	+	+	+	+	+	0.0	+	+	-	+	0.0	0.0
	356	+	+	+	0.0	0.0	+	+	+	+	+	+	+	+	+	+	+	-	+	0.0	0.0
	Total	+	0.1	+	+	+	+	+	+	0.1	+	+	+	+	+	+	+	-	+	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	+	+	+	0.0	0.0	+	+	+	+	+	0.0	+	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0
	721	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
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
	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	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	-
	Total	+	+	+	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	-	0.0	-	-	-	-	-	-	-	-
	768	0.0	-	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	-	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	-	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		59.2	66.9	60.2	54.6	47.2	68.5	68.2	58.9	55.7	65.4	103.2	79.4	59.5	43.8	42.1	46.8	-	42.1	34.4	36.1

Table 10. Abundance index (millions) at age for Am. Plaice in Div. 3L from Canadian spring surveys from 1985-2017

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	2016	2017
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	0.26	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		1.78	
2	0.00	1.32	5.36	4.08	1.86	0.00	1.32	0.00	0.30	0.00	0.00	8.39	0.61	0.69	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		65.23	
3	7.74	4.42	11.49	18.48	17.38	4.06	3.23	1.74	1.84	0.36	0.38	29.88	5.52	3.16	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		241.96	
4	32.03	23.19	50.54	80.86	81.19	68.62	14.00	5.14	5.73	7.48	0.81	91.74	14.05	10.28	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		248.81	
5	156.60	115.34	243.10	279.24	174.42	137.81	110.19	46.07	22.66	31.03	11.84	82.32	31.71	21.14	25.82	8.95	5.95	7.98	17.73	35.53	95.80		16.61	35.83	21.11	20.65	75.43	76.09	118.18	116.70		44.89	
6	350.85	451.11	566.81	554.37	417.43	231.75	178.00	61.69	58.95	46.46	17.42	48.40	26.60	36.62	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		27.46	
7	501.45	496.12	554.93	501.15	352.05	277.32	102.04	89.33	37.79	44.40	31.73	26.13	14.59	30.29	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		18.14	
8	310.29	259.94	334.51	277.15	208.89	152.34	79.23	33.11	16.49	13.72	31.26	8.00	6.83	19.27	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		9.17	
9	148.64	156.71	133.08	188.17	143.52	94.21	43.70	18.53	5.55	6.13	17.62	3.62	2.42	6.32	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		4.98	
10	83.69	66.84	65.91	60.05	52.59	55.70	19.02	7.08	2.91	1.38	5.28	0.64	0.69	2.87	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		2.88	
11	44.29	27.00	22.32	32.65	26.91	18.37	10.45	2.88	1.12	0.83	1.14	0.08	0.39	1.59	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		1.09	
12	21.97	18.07	19.41	20.02	14.78	9.57	6.61	1.44	0.45	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		1.01	
13	12.25	11.81	9.19	10.08	8.57	6.23	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		1.00	
14	5.92	4.40	3.97	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		0.93	
15	2.97	2.64	2.04	3.27	3.36	1.57	0.99	0.19	0.02	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		0.11	
16	1.86	1.58	0.75	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		0.15	
17	0.39	0.44	0.25	0.33	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		0.00	
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		0.01	
20	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	0.00	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	0.00	0.00	0.00	0.00		0.00	
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00		0.00	
unk.	0.23	0.51	0.00	0.45	0.05	3.04	0.03	0.01	0.69	0.00	0.00	0.00	0.07	0.12	0.04	0.01	0.05	0.16	0.04	0.17	0.05		0.34	0.53	5.24	0.00	2.55	0.75	0.52	0.08		0.05	
Ages 0+	1681.22	1641.67	2023.93	2037.75	1509.49	1064.61	573.52	268.29	155.00	152.12	117.76	299.47	103.58	133.30	288.81	168.87	182.03	113.35	122.68	117.81	315.94		240.92	265.38	256.87	238.06	444.46	502.86	733.32	758.38		669.64	
Ages 6+	1484.62	1496.89	1713.19	1654.65	1234.58	851.09	444.75	215.33	123.77	113.25	104.73	86.92	51.63	97.79	249.04	122.63	88.51	45.24	52.90	44.30	136.84		141.40	122.14	50.24	61.76	80.04	178.64	194.23	192.03		66.92	
Ages 9+	322.03	289.72	256.94	321.97	256.22	189.69	85.48	31.20	10.54	8.67	24.32	4.40	3.62	11.61	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		12.15	
Ages 12+	45.41	39.16	35.63	41.11	33.19	21.40	12.31	2.71	0.97	0.33	0.27	0.06	0.11	0.83	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		3.20	
Ages 15+	5.27	4.88	3.06	5.15	4.99	3.19	1.75	0.25	0.10	0.00	0.00	0.00	0.00	0.02	0.13	0.07	0.18	0.00	0.00	0.01	0.11		4.58	0.54	1.15	1.46	1.26	0.95	0.55	1.25		0.26	
Ages 1-5	196.37	144.27	310.75	382.65	274.85	210.48	128.74	52.95	30.54	38.87	13.03	212.55	51.88	35.39	39.73	46.22	93.48	67.94	69.74	73.34	179.05		99.18	142.71	201.38		361.87	323.47	538.57	566.27		602.67	

Table 11. Abundance index (millions) at age for Am. Plaice in Div. 3N from Canadian spring surveys from 1985-2017

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	2016	2017
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	0.26	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.71	0.46	1.31	0.00	0.00	3.34	0.44		6.23	1.52	1.79	0.00	0.00	0.46	2.67	2.26		0.00	
2	2.22	2.41	16.46	3.67	4.37	3.86	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	0.54	1.71	14.40		0.35	
3	33.37	13.28	72.32	45.69	49.06	29.58	2.54	3.00	3.85	1.24	0.74	6.01	1.52	0.22	6.98	44.81	155.19	15.10	10.97	2.76	46.38		8.33	6.41	18.24	23.92	47.17	1.70	5.44	32.68		9.67	
4	109.11	46.74	113.73	87.97	312.98	165.10	30.46	24.35	74.10	4.10	4.08	6.01	4.28	2.89	1.78	20.53	47.80	34.75	18.51	11.47	6.71		197.39	14.21	5.50	45.74	30.51	21.59	7.81	12.82		13.84	
5	60.98	106.19	84.60	62.94	106.44	282.87	117.51	38.48	77.00	29.51	14.99	15.58	5.46	3.83	4.19	3.95	4.18	14.76	75.91	25.09	18.09		122.05	112.44	26.39	28.25	45.37	23.04	51.41	11.95		3.12	
6	60.72	72.89	57.12	27.63	38.68	35.98	75.70	51.69	67.54	12.91	13.30	26.37	16.84	5.82	12.40	6.59	7.98	7.29	28.56	67.31	47.79		43.72	62.05	43.70	74.73	53.31	52.78	64.95	60.48		3.96	
7	30.06	41.14	32.03	17.23	17.28	11.61	12.85	22.66	54.26	12.32	8.39	20.45	24.42	11.32	12.19	17.71	22.99	7.95	16.07	18.39	78.87		76.16	27.65	18.94	97.08	53.59	43.90	87.44	60.67		13.06	
8	25.11	17.95	18.65	13.31	18.09	8.03	5.62	5.58	29.12	7.69	4.62	6.89	15.66	18.76	17.65	15.26	21.47	16.35	16.26	7.18	32.98		55.78	59.84	12.71	23.37	39.38	36.70	42.55	70.22		14.02	
9	20.17	14.61	16.04	11.16	14.71	8.86	5.64	2.67	9.52	4.18	2.46	3.88	5.92	11.92	27.81	21.08	23.17	10.66	18.41	6.61	15.60		47.84	32.54	10.67	11.32	9.30	23.92	30.16	39.69		7.59	
10	20.35	13.31	11.42	8.69	6.77	5.09	5.47	1.25	4.40	1.30	0.81	0.84	1.70	4.72	24.97	16.79	17.00	6.91	6.86	6.80	6.62		6.47	28.47	12.21	7.43	5.46	10.19	17.23	23.60		6.93	
11	15.38	7.36	6.89	4.89	5.23	4.00	3.41	1.04	2.27	1.02	0.28	0.53	0.86	1.96	11.01	9.95	18.15	8.76	6.04	3.22	4.81		3.81	8.98	10.68	6.21	4.61	3.88	7.54	18.90		3.43	
12	9.12	6.16	5.32	3.52	4.34	2.64	1.97	0.72	1.37	0.22	0.05	0.87	0.52	0.76	5.01	4.75	7.67	6.70	6.37	4.48	4.48		1.60	3.94	4.49	6.82	3.38	2.72	5.68	6.83		2.20	
13	4.80	4.19	4.44	2.93	3.70	2.24	1.77	0.28	0.64	0.45	0.00	0.14	0.20	0.43	2.59	2.08	2.28	1.82	2.15	2.57	3.81		1.14	1.49	1.16	2.18	1.63	1.72	2.70	3.66		0.81	
14	2.93	2.19	3.36	2.00	2.70	2.21	1.16	0.33	0.48	0.60	0.00	0.07	0.04	0.17	0.78	0.33	1.17	1.39	1.04	1.93	3.69		1.17	2.00	1.02	0.57	0.73	1.39	2.00	4.67		0.57	
15	2.39	2.16	3.00	1.92	2.96	2.34	1.18	0.45	0.34	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	0.36	0.86	2.63		0.08	
16	0.71	1.28	1.67	0.91	1.11	1.43	0.67	0.30	0.16	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	0.95	1.08	0.94		0.08	
17	0.19	0.99	0.66	0.79	0.96	0.79	0.53	0.03	0.12	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	1.04	0.57	1.07		0.07	
18	0.00	0.18	0.38	0.29	0.43	0.37	0.23	0.03	0.04	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	0.44	0.75	0.56		0.03	
19	0.00	0.05	0.05	0.06	0.08	0.09	0.09	0.00	0.03	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	0.13	0.25	0.37		0.00	
20	0.00	0.00	0.03	0.00	0.00	0.10	0.11	0.06	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	0.11	0.13	0.07		0.04	
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	0.02	0.09	0.17		0.00	
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00		0.00	
unk.	0.26	0.23	0.88	0.07	0.03	0.46	0.00	0.32	0.04	0.00	0.00	0.11	0.13	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	0.24	1.12	0.01		0.09	
Ages 0+	398.12	353.32	449.05	295.69	589.92	567.92	267.32	153.67	326.05	76.05	49.71	89.93	77.73	63.20	146.71	178.15	348.31	136.60	209.62	165.06	301.43		574.14	389.72	176.09	358.65	305.51	227.81	334.16	368.65		79.95	
Ages 6+	191.92	184.48	161.07	95.34	117.02	85.77	116.38	87.10	170.29	41.20	29.90	60.16	66.19	55.97	115.41	95.66	123.71	68.30	102.68	119.20	205.11		239.53	230.51	121.37	233.29	174.43	180.25	264.00	294.52		52.88	
Ages 9+	76.03	52.50	53.28	37.17	42.98	30.15	22.22	7.17	19.36	8.28	3.59	6.45	9.28	20.07	73.18	56.11	71.27	36.71	41.79	26.33	45.48		63.87	80.97	46.02	38.11	28.16	46.88	69.06	103.16		21.84	
Ages 12+	20.13	17.21	18.92	12.43	16.27	12.21	7.70	2.20	3.18	1.78	0.05	1.19	0.79	1.48	9.38	8.28	12.93	10.38	10.49	9.70	18.45		5.76	10.98	12.46	13.15	8.78	8.89	14.12	20.97		3.88	
Ages 15+	3.29	4.67	5.79	3.98	5.53	5.12	2.80	0.87	0.69	0.51	0.00	0.11	0.04	0.12	1.00	1.11	1.82	0.48	0.92	0.72	6.47		1.85	3.55	5.79	3.58	3.05	3.06	3.74	5.80		0.31	
Ages 1-5	205.94	168.62	287.10	200.28	472.86	481.69	150.94	66.25	155.73	34.85	19.81	29.66	11.41	7.23	31.26	82.49	224.52	68.22	106.40	45.34	95.98		334.39	159.16	54.66		131.08	47.32	69.05	74.12		26.98	

Table 12. Abundance index (millions) at age for Am. Plaice in Div. 3O from Canadian spring surveys from 1985-2017

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	2016	2017
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	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.39	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	4.06	1.30	0.00	0.00	35.83	5.76	9.40	22.96	24.09	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		10.70	
3	8.31	13.45	16.95	15.18	20.14	10.62	22.78	28.47	3.39	0.94	0.89	63.65	33.39	7.62	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		33.48	
4	24.12	39.84	57.59	22.47	51.14	113.04	39.64	30.14	40.67	9.54	5.86	27.81	36.82	40.89	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		52.72	
5	56.50	34.87	132.85	26.43	55.67	197.91	170.41	25.73	39.80	38.68	15.08	35.55	28.14	45.97	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		27.29	
6	44.06	37.31	124.23	34.62	96.36	110.17	110.46	76.76	52.21	46.67	26.80	55.64	40.99	27.03	49.12	30.61	18.96	28.85	35.39	80.28	43.32		26.09	25.58	71.85	52.65	33.14	40.59	48.14	62.65		15.40	
7	52.08	40.13	70.48	25.50	101.47	82.08	65.32	38.93	68.15	28.66	19.75	50.51	40.32	34.86	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		10.74	
8	47.24	29.67	45.95	24.51	47.05	39.90	28.07	24.72	43.91	21.87	14.04	24.61	26.23	40.71	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		7.16	
9	35.38	22.76	35.93	18.52	29.60	27.41	18.21	12.92	17.18	9.69	7.39	8.69	10.60	29.29	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		3.88	
10	34.70	18.40	24.03	16.56	15.37	16.74	10.70	9.18	8.76	2.72	2.23	3.02	3.66	11.77	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		2.22	
11	24.27	11.85	12.71	11.09	7.72	9.99	8.41	5.53	3.96	2.10	0.86	1.32	1.43	6.27	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		1.63	
12	13.90	10.37	9.14	8.99	7.98	9.24	4.78	3.24	2.42	1.04	0.28	1.33	1.22	1.85	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		0.52	
13	5.57	5.83	6.33	5.68	4.57	5.87	2.89	2.43	1.30	0.64	0.03	0.35	0.34	1.01	2.58	1.70	2.45	1.84	1.62	1.22	1.42		1.24	0.70	0.47	0.51	0.24	0.45	0.57	1.24		0.16	
14	5.06	2.35	3.84	4.10	2.11	4.20	2.98	1.06	0.57	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		0.00	
15	4.00	2.33	3.03	2.36	2.19	2.04	1.89	1.78	0.65	0.13	0.00	0.10	0.13	0.42	0.74	0.63	1.10	0.40	0.49	0.29	0.51		0.22	0.39	0.70	0.30	0.08	0.17	0.50	0.11		0.00	
16	1.59	0.93	1.83	2.31	1.82	1.71	1.03	1.25	0.49	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	0.52	0.34	0.17	0.43	0.34	0.15	0.30		0.00	
17	0.31	0.73	0.97	0.48	1.07	1.22	0.58	0.24	0.34	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		0.00	
18	0.03	0.18	0.46	0.51	0.43	0.55	0.44	0.50	0.14	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		0.08	
19	0.00	0.05	0.20	0.03	0.03	0.22	0.23	0.12	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	0.00	0.00	0.00	0.03	0.03	0.00	0.07	0.12	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		0.00	
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	0.07	0.00	0.09	0.00	0.00	0.06		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	0.04	0.00	0.08	0.00	0.00	0.00		0.00	
unk.	0.35	0.00	0.00	0.66	0.27	0.00	2.46	0.33	0.79	0.04	0.39	0.37	0.03	0.14	0.07	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		0.00	
Ages 0+	357.48	271.63	552.14	220.73	445.00	638.35	491.36	267.49	286.17	163.16	93.63	309.22	229.40	257.95	288.58	330.07	333.74	344.45	294.69	250.20	422.62		292.02	401.15	344.30	377.77	283.36	396.63	330.35	506.49		165.98	
Ages 6+	268.20	182.89	339.11	155.29	317.78	311.34	256.06	178.76	200.22	113.97	71.41	145.93	125.17	153.54	184.28	142.60	127.12	136.41	104.86	140.35	109.60		99.74	120.36	139.79	108.49	90.63	100.79	139.51	139.57		41.78	
Ages 9+	124.82	75.78	98.46	70.66	72.90	79.18	52.21	38.36	35.95	16.77	10.82	15.16	17.64	50.93	80.28	58.40	51.34	45.28	25.68	18.22	16.26		30.14	31.42	34.61	18.43	16.09	15.49	20.65	23.18		8.48	
Ages 12+	30.46	22.77	25.79	24.49	20.22	25.04	14.89	10.73	6.04	2.26	0.35	2.13	1.95	3.61	10.29	7.01	11.62	8.29	6.46	4.09	4.68		4.66	3.62	3.70	2.84	5.10	2.20	3.17	3.38		0.77	
Ages 15+	5.93	4.22	6.49	5.72	5.56	5.74	4.24	4.01	1.75	0.22	0.00	0.27	0.25	0.47	2.13	1.36	2.32	1.11	1.27	0.50	1.01		1.06	1.55	1.58	0.91	1.43	0.99	1.12	1.12		0.08	
Ages 1-5	88.93	88.74	213.03	64.77	126.95	327.01	232.84	88.39	85.16	49.16	21.83	162.93	104.19	104.27	104.23	187.44	205.91	207.80	189.84	109.56	312.53		192.05	280.65	204.47		192.61	293.56	189.34	366.75		124.19	

Table 13. Abundance index (millions) at age for Am. Plaice in Divs. 3LNO from Canadian spring surveys from 1985-2017

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	2016	2017
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	0.26	0.00	0.52	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.31	0.08	0.55	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		1.78	
2	2.22	4.31	27.20	8.44	6.23	9.31	1.75	4.47	2.38	0.00	0.00	46.28	6.52	10.34	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		76.28	
3	49.42	31.14	100.75	79.35	86.58	44.26	28.55	33.21	9.08	2.54	2.01	99.54	40.43	11.01	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		285.11	
4	165.27	109.77	221.85	191.29	445.32	346.76	84.11	59.64	120.51	21.12	10.75	125.56	55.14	54.06	22.49	72.54	112.98	150.59	95.08	77.80	78.49		320.19	101.69	79.38	191.20	209.45	234.09	267.13	126.99		315.37	
5	274.07	256.41	460.56	368.62	336.54	618.59	398.11	110.28	139.47	99.22	41.91	133.45	65.30	70.94	66.74	34.98	28.85	56.50	188.24	96.53	149.66		193.86	238.98	75.16	85.36	189.29	159.08	219.65	175.92		75.30	
6	455.63	561.31	748.16	616.62	552.47	377.90	364.16	190.14	178.70	106.04	57.51	130.41	84.43	69.47	104.51	67.02	36.35	41.33	72.50	161.93	163.83		89.64	116.46	129.80	146.90	116.47	173.32	187.01	196.79		46.82	
7	583.60	577.39	657.43	543.88	470.80	371.00	180.21	150.92	160.20	85.38	59.86	97.08	79.32	76.46	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		41.93	
8	382.64	307.56	399.10	314.98	274.02	200.27	112.92	63.41	89.53	43.27	49.93	39.50	48.72	78.75	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		30.35	
9	204.20	194.08	185.05	217.85	187.82	130.48	67.55	34.12	32.25	20.00	27.46	16.19	18.95	47.53	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		16.45	
10	138.74	98.56	101.36	85.29	74.73	77.53	35.19	17.51	16.07	5.40	8.32	4.50	6.05	19.36	65.32	47.19	45.04	24.42	18.07	15.55	16.51		16.80	42.58	26.53	18.36	13.17	22.83	33.13	37.58		12.03	
11	83.93	46.21	41.91	48.63	39.86	32.36	22.26	9.45	7.35	3.95	2.28	1.94	2.68	9.81	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		6.15	
12	44.98	34.60	33.87	32.53	27.10	21.45	13.36	5.40	4.24	1.40	0.54	2.23	1.82	3.25	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		3.73	
13	22.62	21.83	19.96	18.69	16.84	14.34	7.23	3.35	2.22	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		1.97	
14	13.91	8.94	11.18	11.97	9.66	8.81	5.53	1.77	1.19	1.00	0.04	0.25	0.18	0.43	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		1.50	
15	9.36	7.13	8.07	7.56	8.51	5.95	4.06	2.42	1.02	0.47	0.00	0.21	0.16	0.48	1.16	1.22	1.96	0.53	1.03	0.78	3.98		2.15	2.04	2.46	1.51	0.94	0.80	1.71	3.43		0.19	
16	4.15	3.79	4.26	4.76	3.99	4.17	2.18	1.61	0.69	0.26	0.00	0.17	0.13	0.13	0.88	0.63	1.05	0.70	0.55	0.33	2.03		2.12	2.24	2.74	1.96	1.33	1.38	1.33	1.45		0.23	
17	0.89	2.17	1.88	1.60	2.45	2.60	1.28	0.27	0.50	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		0.07	
18	0.06	0.58	0.86	0.79	0.94	0.92	0.71	0.53	0.17	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		0.11	
19	0.03	0.10	0.25	0.10	0.16	0.31	0.32	0.12	0.11	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		0.01	
20	0.00	0.00	0.03	0.03	0.03	0.10	0.25	0.18	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		0.04	
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	0.07	0.00	0.13	0.02	0.09	0.23		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	0.04	0.00	0.25	0.00	0.00	0.00		0.00	
unk.	0.84	0.74	0.88	1.19	0.35	3.50	2.50	0.66	1.51	0.04	0.39	0.48	0.23	0.26	0.14	0.05	0.83	0.48	0.58	0.98	0.87		0.78	0.71	5.34	0.05	2.67	3.27	3.14	0.26		0.13	
Ages 0+	2436.82	2266.63	3025.12	2554.17	2544.41	2270.88	1332.21	689.45	767.22	391.34	261.09	698.62	410.71	454.44	724.10	677.09	864.09	594.40	626.99	533.07	1039.99		1107.07	1056.26	777.25	974.49	1033.33	1127.30	1397.83	1633.52		915.56	
Ages 6+	1944.74	1864.26	2213.37	1905.28	1669.39	1248.20	817.19	481.19	494.28	268.42	206.03	293.01	243.00	307.30	548.73	360.89	339.34	249.95	260.44	303.85	451.55		480.67	473.02	311.39	403.55	345.10	459.68	597.74	626.11		161.58	
Ages 9+	522.88	418.00	408.67	429.81	372.09	299.02	159.91	76.73	65.86	33.72	38.73	26.02	30.53	82.62	227.84	151.30	166.69	102.86	92.13	61.30	88.75		131.08	147.58	100.92	77.89	64.95	100.39	129.84	167.39		42.48	
Ages 12+	96.01	79.14	80.35	78.03	69.68	58.65	34.90	15.64	10.19	4.37	0.67	3.38	2.85	5.92	24.69	17.02	28.65	20.16	20.33	16.62	26.70		20.74	20.06	18.67	19.34	20.31	18.61	25.74	35.57		7.85	
Ages 15+	14.49	13.77	15.34	14.84	16.08	14.05	8.79	5.13	2.54	0.74	0.00	0.38	0.29	0.62	3.26	2.54	4.32	1.58	2.19	1.23	7.58		7.49	5.64	8.52	5.94	5.75	5.00	5.41	8.18		0.65	
Ages 1-5	491.24	401.63	810.88	647.70	874.67	1019.18	512.52	207.59	271.43	122.88	54.67	405.13	167.48	146.89	175.22	316.15	523.91	343.96	365.97	228.23	587.57		625.62	582.53	460.51	570.89	685.56	664.35	796.96	1007.15		753.84	
proportion 0-5	0.20	0.18	0.27	0.25	0.34	0.45	0.38	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	0.59	0.59	0.66	0.59	0.57	0.62		0.82	
proportion 9+	0.21	0.18	0.14	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	0.13	0.08	0.06	0.09	0.09	0.10		0.05	

Table 14. Abundance index (millions) at age for Am. Plaice in Div. 3L from Canadian autumn surveys from 1990-2017

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	2016	2017
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	0.05	0.04	0.72	2.09	0.43	0.00	1.70	5.89		7.50	0.00	0.21
1	0.79	0.12	0.00	0.00	0.00	0.45	1.04	0.17	2.72	14.04	15.45	8.93	3.06	1.22		11.78	11.44	22.61	41.78	20.02	63.88	2.42	56.02	325.85		38.56	4.14	4.87
2	2.39	2.09	0.75	3.10	0.00	11.04	16.70	1.58	3.74	19.86	31.38	102.85	66.37	18.37		27.80	34.76	60.08	107.63	133.02	110.83	176.28	26.80	252.62		425.37	70.87	83.09
3	26.07	14.38	12.54	21.10	0.00	25.06	57.94	21.83	6.81	10.52	26.11	70.83	119.40	78.66		33.21	42.72	61.53	73.97	96.84	185.24	141.10	224.38	189.41		881.38	721.07	348.99
4	309.25	91.21	52.65	71.20	14.46	59.27	170.16	64.46	27.25	7.92	8.33	34.66	35.23	77.91		54.99	31.70	52.93	51.83	50.36	147.92	146.45	174.70	325.82		209.01	676.04	887.17
5	597.38	295.78	171.91	123.36	25.71	198.91	149.44	105.95	63.42	29.39	27.69	21.19	16.94	26.20		73.06	35.44	31.14	61.54	30.54	61.46	107.89	180.60	165.00		109.82	93.87	255.47
6	548.02	372.37	269.73	218.20	42.91	188.67	84.71	84.42	83.40	50.01	34.64	21.41	14.52	9.13		55.74	72.86	31.96	35.06	30.19	48.44	43.99	92.81	119.37		89.87	71.49	64.21
7	303.10	164.87	102.94	138.57	54.45	103.29	31.93	35.85	56.90	46.36	22.80	34.83	21.47	7.27		21.49	68.18	45.03	32.66	10.55	22.25	28.56	37.13	45.49		48.28	44.66	38.82
8	145.95	77.59	32.27	27.74	28.52	37.35	6.05	10.58	27.69	37.97	12.56	30.02	25.94	8.56		10.85	27.59	35.87	41.08	8.49	12.74	12.54	19.68	21.32		28.79	18.25	22.69
9	95.12	43.16	10.42	7.97	8.82	19.92	2.46	5.72	13.84	24.81	8.54	25.06	18.13	5.09		3.97	5.26	10.21	28.36	8.67	8.17	5.90	8.95	11.44		13.54	14.55	13.62
10	36.73	18.32	5.51	2.65	1.88	3.75	0.83	1.27	4.65	8.91	2.73	10.39	10.36	4.51		4.52	3.53	5.10	7.15	4.05	16.15	6.32	4.60	6.23		6.23	6.81	8.34
11	17.48	8.27	1.87	1.13	0.29	0.38	0.14	0.82	1.82	4.64	1.77	8.21	7.94	2.73		1.52	1.81	1.95	1.91	1.60	4.83	4.99	3.99	4.54		3.55	1.58	2.64
12	9.07	5.12	1.63	0.29	0.06	0.10	0.06	0.19	0.51	2.10	0.33	3.61	2.04	0.87		2.36	3.66	1.43	1.33	1.06	1.92	3.37	2.95	3.67		2.04	2.24	1.79
13	5.46	1.95	0.46	0.09	0.02	0.00	0.05	0.14	0.03	0.63	0.12	0.55	0.25	0.33		1.72	1.47	0.43	0.93	0.73	1.20	1.20	1.56	2.08		1.18	0.48	0.80
14	3.94	1.51	0.26	0.07	0.07	0.00	0.00	0.00	0.03	0.22	0.00	0.31	0.05	0.04		0.73	1.22	1.13	0.44	0.41	1.39	0.25	0.21	0.77		0.53	0.39	0.67
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		0.95	1.73	0.43	0.52	0.23	0.36	0.20	0.12	0.22		0.18	0.35	0.38
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		0.30	1.13	0.50	0.32	0.09	0.73	0.18	0.25	0.51		0.07	0.21	0.11
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		0.05	0.15	0.52	0.13	0.15	0.37	0.03	0.06	0.00		0.00	0.15	0.04
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		0.12	0.01	0.44	0.43	0.02	0.38	0.19	0.00	0.13		0.20	0.06	0.00
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	0.33	0.00	0.00	0.00	0.00	0.00	0.00		0.07	0.15	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	0.24	0.06	0.00	0.00	0.00	0.00	0.08		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	0.08		0.00	0.00	0.10
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	0.04
unk.	0.31	0.01	0.00	0.00	0.00	1.69	0.14	0.25	0.07	0.08	0.17	0.46	0.22	0.01		0.04	0.18	1.04	0.24	2.17	0.32	0.46	0.51	4.22		0.15	1.02	4.21
Ages 0+	2103.07	1098.07	663.09	615.78	177.19	649.87	521.65	333.23	292.98	257.85	192.73	373.37	341.93	240.91		305.20	344.85	364.91	488.08	401.29	688.99	682.31	837.03	1484.75		1866.31	1728.38	1738.26
Ages 6+	1166.90	694.49	425.24	397.02	137.02	353.45	126.23	138.99	188.87	175.70	83.59	134.45	100.71	38.54		104.31	188.58	135.55	150.38	66.25	118.92	107.71	172.31	215.93		194.53	161.38	154.25
Ages 9+	169.82	79.65	20.30	12.50	11.14	24.14	3.54	8.15	20.88	41.36	13.59	48.20	38.79	13.57		16.24	19.96	22.69	41.58	17.02	35.49	22.62	22.68	29.75		27.59	26.98	28.53
Ages 12+	20.50	9.90	2.50	0.75	0.15	0.10	0.11	0.34	0.57	3.00	0.56	4.54	2.35	1.24		6.23	9.36	5.44	4.15	2.70	6.34	5.42	5.14	7.54		4.26	4.04	3.94
Ages 15+	2.03	1.33	0.15	0.30	0.00	0.00	0.00	0.01	0.00	0.06	0.10	0.07	0.00	0.00		1.42	3.02	2.46	1.45	0.49	1.84	0.60	0.42	1.02		0.51	0.93	0.68
Ages 1-5	935.87	403.57	237.85	218.76	40.17	294.73	395.28	193.99	103.95	81.73	108.96	238.46	241.00	202.37		200.85	156.05	228.29	336.74	330.78	569.32	574.15	662.51	1258.71		1664.14	1565.98	1579.58

Table 15. Abundance index (millions) at age for Am. Plaice in Div. 3N from Canadian autumn surveys from 1990-2017

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	2016	2017
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	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.73		0.00	0.00	0.00
1	2.34	0.82	5.84	0.00	0.00	1.97	0.12	1.66	2.25	46.35	20.47	8.24	1.79	7.76		5.47	1.04	30.08	28.54	59.96	3.89	3.46	3.86	54.58		8.81	0.38	0.04
2	40.24	84.64	78.12	1.90	0.00	17.51	1.70	1.33	1.50	69.91	158.97	19.95	25.17	6.13		257.10	4.64	14.88	135.88	64.49	118.38	28.81	4.17	22.26		57.64	7.32	4.87
3	134.78	193.91	161.07	52.32	16.51	15.08	4.12	8.42	0.84	11.42	264.88	130.79	50.82	41.45		61.80	47.24	27.72	37.39	92.21	94.09	112.37	20.53	20.11		79.25	27.64	11.49
4	295.80	284.75	130.72	283.60	65.29	16.39	3.29	15.92	10.29	2.61	53.91	42.75	190.06	95.11		12.17	21.36	128.44	137.17	68.40	217.27	111.09	60.17	70.48		17.56	41.76	30.63
5	169.59	288.82	130.20	135.26	96.33	27.68	8.94	8.71	15.94	7.83	22.80	5.07	63.36	196.95		47.15	14.79	31.08	260.67	112.38	94.18	125.59	50.85	141.33		32.08	19.30	45.39
6	30.73	72.35	130.88	67.76	43.86	62.37	12.19	32.82	10.30	12.62	38.99	17.05	11.46	39.70		85.33	31.63	14.95	62.42	109.10	165.54	112.97	77.02	180.98		54.19	20.45	20.89
7	9.34	19.55	53.63	74.65	23.61	15.41	11.09	45.46	22.66	12.15	59.27	27.83	26.02	19.89		76.49	35.33	31.80	41.76	40.02	93.85	98.15	59.96	86.58		57.96	27.33	30.17
8	3.83	10.86	12.05	23.64	14.33	9.03	4.07	26.74	32.28	29.10	53.08	22.08	29.25	13.36		18.79	63.02	42.04	34.70	20.98	27.14	61.05	30.57	53.52		35.77	13.91	23.85
9	6.62	10.35	8.23	8.78	7.29	6.08	1.86	8.05	35.67	25.04	39.83	12.52	17.22	7.71		5.66	16.67	45.05	28.03	14.02	14.25	18.21	31.30	25.25		22.85	10.59	12.49
10	3.31	7.24	3.56	4.70	1.97	2.21	0.80	3.23	8.61	18.08	39.29	9.91	13.31	6.11		5.71	3.76	17.24	14.65	12.14	14.20	7.40	11.19	11.67		12.21	5.52	8.77
11	2.53	5.98	2.24	2.20	0.79	0.72	0.27	1.30	3.42	9.46	19.14	13.06	16.11	5.38		4.17	6.70	5.82	5.22	8.03	3.88	7.30	4.59	7.37		10.03	2.47	5.99
12	1.71	3.26	1.75	1.65	1.00	0.71	0.22	0.39	1.01	7.39	5.20	6.16	11.43	4.00		1.50	4.16	5.75	2.64	2.21	1.42	4.91	3.58	6.32		4.99	1.06	3.17
13	1.60	4.31	1.45	0.88	0.42	0.25	0.00	0.40	0.57	2.75	2.49	1.39	6.35	1.25		2.23	3.01	0.32	1.10	1.59	1.23	1.89	2.15	3.96		2.50	0.07	0.43
14	1.53	2.50	1.23	0.78	0.69	0.02	0.00	0.31	0.43	0.58	0.68	0.58	0.54	0.33		2.10	1.83	3.12	1.77	1.67	0.94	0.95	1.15	1.16		0.55	0.51	0.84
15	1.49	1.45	0.33	0.66	0.29	0.00	0.07	0.18	0.06	0.06	0.34	0.27	1.05	0.27		0.77	2.22	3.72	1.13	1.40	0.34	1.05	1.16	0.16		0.55	0.43	0.17
16	1.59	1.05	0.46	0.34	0.00	0.00	0.00	0.05	0.21	0.36	0.00	0.11	1.06	0.18		0.29	0.74	2.32	0.46	2.07	0.91	0.94	0.53	1.05		0.20	0.27	0.17
17	0.47	0.48	0.29	0.10	0.00	0.00	0.00	0.00	0.12	0.30	0.34	0.12	0.00	0.00		0.15	0.70	1.34	0.44	0.55	0.58	0.37	0.00	0.76		0.15	0.00	0.38
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	0.23	0.40	0.26	0.07	0.19	0.88	0.52	0.41		1.19	0.06	0.00
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	0.31	0.23	0.00	0.00	0.94	0.32	0.00		0.04	0.26	0.08
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	0.05	0.00	0.06	0.00	0.29	0.07	0.00	0.00		0.00	0.11	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		0.15	0.05	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	0.06	0.00	0.00	0.00	0.00	0.13		0.00	0.00	0.00
unk.	0.16	0.06	1.73	0.21	0.10	0.07	0.14	0.10	0.00	0.00	0.00	0.18	0.08	0.23		0.17	0.32	0.43	1.15	3.20	0.03	0.59	0.78	0.05		0.83	0.77	0.50
Ages 0+	707.79	992.57	723.79	659.46	272.47	175.50	48.87	155.07	146.15	256.18	779.69	318.06	465.09	445.89		587.04	259.45	406.84	795.75	614.56	852.61	699.00	364.41	688.84		399.50	180.27	200.34
Ages 6+	64.88	139.56	216.11	186.18	94.25	96.81	30.56	118.93	115.34	118.05	258.66	111.09	133.82	98.22		203.17	170.05	174.18	194.94	213.84	324.77	317.09	224.05	379.31		203.32	83.10	107.43
Ages 9+	20.98	36.80	19.54	20.12	12.45	10.00	3.22	13.92	50.11	64.18	107.32	44.12	67.08	25.27		22.57	40.07	85.39	56.06	43.75	38.24	44.92	56.51	58.23		55.40	21.40	32.52
Ages 12+	8.52	13.23	5.51	4.44	2.40	0.98	0.29	1.34	2.41	11.59	9.07	8.63	20.44	6.08		7.03	12.94	17.28	8.16	9.56	5.91	12.00	9.42	13.94		10.31	2.82	5.27
Ages 15+	3.67	3.15	1.08	1.12	0.29	0.00	0.07	0.23	0.39	0.87	0.69	0.51	2.11	0.51		1.21	3.94	8.09	2.65	4.09	2.31	4.26	2.54	2.51		2.28	1.18	0.83
Ages 1-5	642.75	852.94	505.95	473.08	178.13	78.62	18.17	36.03	30.82	138.13	521.03	206.80	331.20	347.39		383.69	89.08	232.22	599.66	397.44	527.81	381.32	139.58	308.75		195.35	96.40	92.41

Table 16. Abundance index (millions) at age for Am. Plaice in Div. 3O from Canadian autum surveys from 1990-2017

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	2016	2017
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	1.38	0.00	0.00	0.00	0.05		0.00	0.10	0.00	0.00	0.00	0.00	0.00	1.93	0.00		0.00	0.00	0.00
1	8.24	0.63	0.00	0.00	0.00	35.75	1.97	1.44	19.45	93.19	54.15	28.67	5.95	8.76		52.70	5.38	151.39	99.68	139.86	20.11	3.72	34.25	135.71		15.30	1.12	0.00
2	10.51	12.11	2.58	5.10	0.00	97.23	64.47	16.81	21.34	80.38	139.26	61.24	58.23	22.83		200.34	97.71	66.49	375.72	122.36	204.61	67.13	34.78	145.50		139.02	54.84	20.90
3	25.25	56.20	44.10	42.54	3.02	20.33	59.81	73.48	9.37	49.89	124.51	100.89	53.27	56.51		70.54	175.59	88.31	81.82	274.80	115.28	82.33	51.23	76.64		190.85	126.85	101.87
4	100.31	73.88	74.89	143.08	23.98	35.09	41.95	71.63	78.62	13.19	60.63	39.78	70.08	101.12		46.91	53.84	147.13	167.21	54.22	158.28	51.30	51.80	55.02		60.19	98.13	129.40
5	86.06	139.80	65.85	101.84	68.22	69.42	46.13	42.68	38.14	55.24	23.18	28.22	25.26	101.92		50.30	24.05	55.84	193.42	86.29	44.19	53.06	54.42	75.54		36.90	42.37	78.48
6	64.07	134.09	98.80	86.11	64.26	86.62	74.11	51.08	27.39	30.79	58.38	29.01	16.41	36.56		55.96	36.65	21.07	48.93	91.38	41.13	27.82	65.24	48.51		28.12	28.80	49.97
7	57.16	64.96	69.40	103.34	56.80	35.26	37.34	47.52	29.62	21.05	33.52	35.87	25.42	21.92		34.12	34.80	51.60	43.09	27.79	18.97	18.35	15.19	26.19		24.00	15.59	15.57
8	41.88	27.82	32.31	52.74	46.38	16.17	10.81	19.32	22.62	31.85	18.16	10.37	20.70	13.07		8.47	18.15	43.26	27.88	22.71	6.81	17.67	16.94	10.48		14.11	7.77	7.77
9	22.78	28.33	17.00	16.26	12.54	14.16	4.40	10.17	15.91	22.84	13.45	11.08	5.70	6.15		4.22	4.39	18.84	12.73	18.88	5.80	5.15	9.35	5.39		5.96	4.01	3.29
10	15.16	18.75	8.59	7.97	3.97	4.88	1.44	2.47	5.37	6.67	6.91	6.58	3.14	1.72		3.04	1.91	2.07	6.42	5.12	6.28	3.26	4.08	2.36		4.04	3.24	1.70
11	9.19	11.66	4.34	3.47	1.60	0.80	1.30	0.74	2.14	4.75	4.47	4.91	2.95	2.89		1.60	1.95	1.29	1.14	4.79	2.95	2.03	2.33	1.52		1.40	1.37	1.15
12	6.66	5.48	3.45	3.16	0.67	0.50	0.26	0.65	2.01	2.82	1.53	2.29	2.32	1.45		1.25	2.11	1.45	0.69	0.47	1.28	1.86	1.22	0.76		0.67	0.51	1.02
13	4.99	5.96	1.43	2.11	0.48	0.20	0.07	0.22	1.41	1.51	0.48	0.90	1.25	0.21		0.96	1.11	1.98	0.56	0.75	0.98	0.58	0.68	0.34		0.11	0.09	0.19
14	3.85	2.96	1.67	1.53	0.41	0.28	0.12	0.27	0.33	0.27	0.16	0.23	0.40	0.47		0.51	0.57	0.62	0.48	0.27	0.64	0.03	0.18	0.41		0.36	0.13	0.00
15	2.41	2.12	0.70	0.79	0.10	0.05	0.28	0.33	0.10	0.08	0.13	0.16	0.31	0.30		0.62	0.81	0.69	0.73	0.31	1.13	0.08	0.09	0.17		0.07	0.00	0.00
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		0.05	0.55	0.25	0.77	0.54	0.00	0.14	0.10	0.16		0.00	0.10	0.00
17	1.17	0.33	0.24	0.18	0.00	0.00	0.00	0.00	0.29	0.28	0.37	0.11	0.18	0.00		0.00	0.27	0.18	0.08	0.53	0.00	0.12	0.05	0.09		0.05	0.10	0.00
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	0.24	0.14	0.00	0.16	0.49	0.05	0.32	0.27		0.00	0.05	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	0.13	0.03	0.00	0.09	0.51	0.00	0.04	0.08		0.00	0.10	0.12
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	0.05	0.03	0.04	0.00	0.00	0.00	0.05	0.17		0.15	0.00	0.12
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	0.07	0.00	0.00	0.08	0.00	0.00	0.00	0.06		0.05	0.03	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	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.12		0.00	0.03	0.20
unk.	0.17	1.31	0.13	1.45	0.00	0.00	0.58	0.37	0.00	1.20	0.09	0.10	0.00	0.25		0.20	1.51	0.54	1.76	4.46	0.77	2.61	0.22	0.27		2.61	0.79	0.05
Ages 0+	462.29	587.85	426.48	573.13	282.42	416.74	345.06	339.22	275.89	417.76	539.58	360.86	291.89	376.63		531.80	461.96	653.21	1063.15	855.87	630.20	337.26	344.48	585.75		523.96	386.04	411.81
Ages 6+	231.75	303.92	238.93	279.11	187.21	158.92	130.14	132.79	107.40	123.29	137.74	101.94	79.10	85.20		110.80	103.78	143.51	143.53	173.87	86.96	77.12	115.84	97.08		79.10	61.93	81.11
Ages 9+	68.64	77.04	38.42	36.92	19.77	20.88	7.87	14.87	27.76	39.59	27.70	26.69	16.56	13.65		12.25	14.18	27.58	23.63	31.99	20.05	13.27	18.47	11.90		12.87	9.77	7.79
Ages 12+	21.51	18.31	8.49	9.23	1.66	1.04	0.73	1.50	4.34	5.33	2.86	4.12	4.76	2.89		3.39	5.95	5.38	3.35	3.21	5.02	2.84	2.72	2.62		1.47	1.15	1.66
Ages 15+	6.01	3.90	1.94	2.43	0.10	0.05	0.28	0.36	0.58	0.72	0.69	0.70	0.80	0.77		0.67	2.16	1.33	1.61	1.71	2.13	0.38	0.65	1.10		0.32	0.42	0.44
Ages 1-5	230.37	282.62	187.41	292.56	95.21	257.81	214.33	206.06	166.91	291.89	401.74	258.81	212.79	291.13		420.79	356.57	509.15	917.85	677.53	542.47	257.53	226.49	488.40		442.25	323.32	330.65

Table 17. Abundance index (millions) at age for Am. Plaice in Divs. 3LNO from Canadian autumn surveys from 1990-2017

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	2016	2017
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	1.72	0.00	0.00	0.00	0.10		0.00	0.14	0.04	0.72	2.16	0.43	0.00	3.62	6.62		7.50	0.00	0.21
1	11.36	1.56	5.84	0.00	0.00	38.16	3.13	3.28	24.42	153.58	90.06	45.83	10.80	17.74		69.96	17.86	204.09	170.00	219.84	87.89	9.60	94.13	516.14		62.66	5.64	4.90
2	53.13	98.84	81.45	10.10	0.00	125.78	82.88	19.71	26.57	170.15	329.62	184.04	149.76	47.32		485.24	137.11	141.45	619.23	319.87	433.82	272.22	65.76	420.38		622.04	133.03	108.86
3	186.10	264.49	217.72	115.96	19.53	60.47	121.87	103.73	17.03	71.84	415.51	302.51	223.50	176.62		165.55	265.55	177.56	193.18	463.85	394.60	335.80	296.14	286.16		1151.48	875.56	462.35
4	705.36	449.84	258.26	497.88	103.72	110.74	215.40	152.01	116.16	23.72	122.87	117.20	295.37	274.14		114.07	106.89	328.50	356.20	172.98	523.46	308.84	286.68	451.32		286.76	815.93	1047.20
5	853.02	724.40	367.96	360.46	190.26	296.01	204.51	157.35	117.50	92.46	73.67	54.49	105.56	325.07		170.52	74.28	118.06	515.63	229.21	199.84	286.53	285.87	381.87		178.81	155.53	379.33
6	642.82	578.81	499.42	372.08	151.04	337.66	171.01	168.32	121.09	93.43	132.01	67.47	42.39	85.38		197.03	141.13	67.98	146.42	230.66	255.12	184.78	235.07	348.87		172.18	120.74	135.07
7	369.60	249.38	225.97	316.57	134.85	153.95	80.36	128.83	109.18	79.57	115.59	98.53	72.91	49.09		132.09	138.30	128.43	117.52	78.37	135.07	145.07	112.28	158.25		130.24	87.59	84.56
8	191.67	116.27	76.63	104.12	89.23	62.55	20.94	56.63	82.59	98.92	83.79	62.47	75.89	34.99		38.11	108.77	121.17	103.65	52.18	46.69	91.25	67.19	85.32		78.67	39.92	54.32
9	124.52	81.84	35.66	33.00	28.65	40.16	8.72	23.94	65.41	72.70	61.82	48.66	41.06	18.96		13.85	26.31	74.10	69.11	41.57	28.22	29.25	49.60	42.09		42.35	29.15	29.39
10	55.20	44.31	17.66	15.32	7.83	10.84	3.07	6.97	18.64	33.66	48.92	26.88	26.82	12.33		13.27	9.19	24.41	28.22	21.31	36.63	16.98	19.88	20.27		22.48	15.57	18.80
11	29.20	25.92	8.45	6.80	2.67	1.90	1.71	2.86	7.38	18.85	25.38	26.18	27.00	11.00		7.28	10.46	9.05	8.28	14.41	11.66	14.32	10.91	13.43		14.98	5.41	9.78
12	17.43	13.86	6.83	5.10	1.72	1.31	0.54	1.23	3.54	12.31	7.07	12.06	15.79	6.32		5.11	9.92	8.62	4.66	3.75	4.62	10.14	7.75	10.75		7.70	3.81	5.98
13	12.06	12.21	3.34	3.08	0.92	0.45	0.12	0.76	2.01	4.89	3.09	2.83	7.85	1.79		4.91	5.59	2.72	2.59	3.08	3.41	3.66	4.39	6.38		3.79	0.64	1.43
14	9.32	6.98	3.15	2.38	1.17	0.31	0.12	0.58	0.80	1.08	0.84	1.12	0.99	0.83		3.34	3.62	4.87	2.69	2.35	2.96	1.22	1.54	2.34		1.44	1.03	1.51
15	5.42	4.46	1.15	1.68	0.40	0.05	0.35	0.52	0.16	0.16	0.53	0.50	1.36	0.57		2.33	4.76	4.84	2.38	1.93	1.83	1.33	1.37	0.54		0.80	0.79	0.55
16	4.45	2.34	1.17	1.36	0.00	0.00	0.00	0.08	0.36	0.71	0.24	0.38	1.33	0.52		0.64	2.42	3.07	1.55	2.71	1.64	1.27	0.88	1.72		0.27	0.58	0.28
17	1.64	1.01	0.52	0.27	0.00	0.00	0.00	0.00	0.41	0.58	0.71	0.23	0.18	0.00		0.20	1.11	2.04	0.65	1.23	0.95	0.52	0.10	0.85		0.20	0.26	0.42
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		0.12	0.48	0.98	0.70	0.25	1.06	1.11	0.84	0.81		1.39	0.17	0.00
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	0.13	0.67	0.23	0.09	0.51	0.94	0.36	0.08		0.11	0.51	0.20
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	0.10	0.28	0.16	0.00	0.29	0.07	0.05	0.25		0.15	0.11	0.12
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	0.07	0.00	0.00	0.08	0.00	0.00	0.00	0.14		0.20	0.09	0.14
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	0.04	0.00	0.06	0.00	0.00	0.00	0.00	0.25		0.00	0.03	0.24
unk.	0.64	1.38	1.86	1.66	0.10	1.77	0.86	0.72	0.07	1.28	0.27	0.74	0.30	0.49		0.42	2.02	2.01	3.15	9.83	1.12	3.65	1.51	4.54		3.59	2.58	4.76
Ages 0+	3273.16	2678.49	1813.36	1848.36	732.08	1242.11	915.58	827.51	715.02	931.80	1511.99	1052.29	1098.91	1063.43		1424.04	1066.27	1424.95	2346.97	1871.71	2171.80	1718.57	1545.92	2759.34		2789.77	2294.68	2350.41
Ages 6+	1463.53	1137.97	880.28	862.31	418.47	609.18	286.94	390.72	411.61	417.04	479.99	347.48	313.63	221.95		418.29	462.41	453.24	488.85	453.96	530.65	501.91	512.20	692.32		476.95	306.40	342.79
Ages 9+	259.45	193.50	78.26	69.54	43.35	55.02	14.63	36.94	98.75	145.14	148.60	119.02	122.42	52.50		51.06	74.21	135.66	121.27	92.75	93.78	80.81	97.67	99.88		95.86	58.15	68.84
Ages 12+	50.52	41.44	16.50	14.42	4.21	2.12	1.13	3.17	7.32	19.92	12.48	17.29	27.55	10.21		16.65	28.25	28.10	15.66	15.47	17.27	20.26	17.28	24.10		16.05	8.02	10.87
Ages 15+	11.71	8.39	3.18	3.85	0.40	0.05	0.35	0.60	0.97	1.65	1.48	1.27	2.92	1.27		3.29	9.12	11.88	5.72	6.29	6.28	5.24	3.61	4.63		3.12	2.53	1.95
Ages 1-5	1808.99	1539.13	931.22	984.40	313.51	631.17	627.78	436.07	301.68	511.75	1031.73	704.06	784.99	840.89		1005.34	601.70	969.66	1854.25	1405.75	1639.61	1213.00	1028.58	2055.86		2301.74	1985.70	2002.64
proportion 0-5	0.55	0.57	0.51	0.53	0.43	0.51	0.69	0.53	0.42	0.55	0.68	0.67	0.71	0.79		0.71	0.56	0.68	0.79	0.75	0.76	0.71	0.67	0.75		0.83	0.87	0.85
proportion 9+	0.08	0.07	0.04	0.04	0.06	0.04	0.02	0.04	0.14	0.16	0.10	0.11	0.11	0.05		0.04	0.07	0.10	0.05	0.05	0.04	0.05	0.06	0.04		0.03	0.03	0.03

Table 18. American plaice age numbers from the EU-Spain Survey of NAFO 3LNO: 1997-2016

ALK used: Canadian Spring survey in 3N. Note: 2016 ALK was not done by sex

Age/Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
0																				
1					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	0.01
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	4.70
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	20.11
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	7.13
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	11.01
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	30.38
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	22.48
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	10.89
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	7.34
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	3.28
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	1.94
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	0.65
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	0.73
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	0.09
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	0.05
17			0.39	0.48	0.20	0.05	0.11		0.09	0.31	0.41	0.73	1.62	1.55	0.91	0.64	0.32	0.53	0.37	0.24
18	0.01	0.05	0.35		0.17		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	0.01
19	0.01	0.05			0.02	0.01		0.02	0.08	0.04	0.00	0.24	0.37	0.49	0.56	0.07	0.13	0.11	0.16	0.00
20			0.05	0.10	0.01					0.03	0.23	0.01	0.20	0.01	0.16	0.08	0.11	0.04	0.07	0.07
21												0.29	0.00	0.00		0.01	0.19	0.02	0.24	0.00
22														0.00	0.07				0.06	0.02
23														0.15						0.00
24														0.00					0.08	0.01
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	121.17
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	491.55	292.26	322.91	89.22
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	83.39	89.19	49.36	25.34
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	11.51	9.65	4.57	3.82
Ages 15+	0.08	0.38	2.47	5.49	1.39	0.42	1.41	0.97	3.38	2.83	4.01	6.11	7.30	6.69	3.10	2.18	2.35	2.42	1.39	0.50
Ages 1-5	13.00	15.04	53.19	318.72	367.01	239.61	333.34	201.99	265.68	499.19	273.12	395.97	94.39	181.76	278.43	134.71	149.11	36.45	100.98	31.95

Table 19. Numbers at age of American plaice from the (a) Canadian fall RV survey (1985-2017; no 2006 or 2014), (b) Canadian spring RV survey (1990-2014; no 2006, 2015, 2017) and (c) EU-Spain Div. 3NO survey (1998-2016)

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
2016.9	155.534	120.740	87.585	39.925	29.152	15.570	5.413	3.813	0.639	1.034
2017.9	379.334	135.071	84.559	54.318	29.392	18.804	9.776	5.981	1.426	1.514

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
2016.5	75.296	46.819	41.934	30.354	16.447	12.028	6.151	3.729	1.973	1.496

Spain	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
2016.5	7.13	11.01	30.38	22.48	10.89	7.34	3.28	1.94	0.65	1.23

Table 20. Catch at age of American Place in Divs. 3LNO by Country in 2016

	Portugal				Spain				Canada				Overall (LF data available)				Japan	Russia	Estonia	USA	Cuba	
	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	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
2	2.0	0.0	14.5	0.0	1.0	0.0	14.5	0.0	0.0	0.0	0.0	0.0	4.0	0.0	14.5	0.1						0
3	305.0	0.0	16.7	11.0	2019.0	0.0	18.3	90.9	2771.0	0.2	26.4	421.2	7233.0	0.1	22.6	745.0						9
4	20117.0	0.1	20.5	1368.0	6602.0	0.1	21.1	501.8	15010.0	0.3	30.4	3812.5	59244.0	0.1	24.2	8057.2						77
5	45544.0	0.1	23.6	4827.7	8663.0	0.1	24.0	1039.6	30545.0	0.4	34.5	11729.3	120324.0	0.2	27.6	25027.4						155
6	58170.0	0.2	27.2	9947.1	16117.0	0.2	29.1	3481.3	114606.0	0.3	33.5	38966.0	268174.0	0.3	31.2	74284.2						346
7	72512.0	0.3	31.2	19288.2	70898.0	0.3	32.9	22474.7	181637.0	0.4	34.9	69748.6	461474.0	0.3	33.6	158285.6						596
8	39440.0	0.4	34.1	14159.0	107382.0	0.4	35.6	43919.2	301091.0	0.5	38.7	163191.3	635907.0	0.5	37.5	314138.1						821
9	32098.0	0.5	36.9	15021.9	73266.0	0.5	37.8	36633.0	230056.0	0.6	40.7	146545.7	476200.0	0.6	39.7	281434.2						615
10	39789.0	0.6	40.5	24828.3	59075.0	0.6	39.9	35208.7	187541.0	0.7	40.9	122089.2	406613.0	0.6	40.6	258199.3						525
11	64880.0	0.7	42.7	48400.5	30239.0	0.7	41.5	20683.5	72276.0	0.8	44.3	60784.1	237652.0	0.8	43.2	184418.0						307
12	34137.0	1.0	46.2	33112.9	17624.0	0.9	44.8	15650.1	55892.0	0.9	44.6	49911.6	152837.0	0.9	45.1	140151.5						197
13	16442.0	1.3	50.0	20749.8	13801.0	1.1	47.1	14532.5	30328.0	1.1	47.3	32117.4	85992.0	1.1	48.0	95709.1						111
14	3239.0	1.7	54.6	5516.0	12360.0	1.1	47.7	13756.7	14889.0	1.5	52.2	21663.5	43284.0	1.3	50.6	58087.1						56
15	880.0	1.5	52.4	1285.7	1945.0	1.2	49.5	2384.6	11187.0	1.5	52.2	16534.4	19893.0	1.4	51.8	28685.7						26
16	291.0	1.5	52.5	426.6	2200.0	1.6	53.5	3495.8	5295.0	1.4	51.4	7550.7	11055.0	1.5	52.0	16295.1						14
17	0.0	0.0	0.0	0.0	1017.0	2.2	59.4	2254.7	2928.0	2.1	58.0	6084.4	5601.0	2.1	58.4	11840.5						7
18	0.0	0.0	0.0	0.0	1017.0	2.2	59.4	2254.7	2717.0	2.1	58.4	5711.1	5301.0	2.1	58.7	11307.0						7
19	0.0	0.0	0.0	0.0	370.0	2.3	60.5	869.1	623.0	2.3	60.2	1454.1	1410.0	2.3	60.3	3298.0						2
20	0.0	0.0	0.0	0.0	606.0	2.8	63.6	1706.5	1412.0	2.3	60.0	3250.4	2866.0	2.5	61.1	7041.8						4
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3462.0	2.3	60.3	8101.1	4915.0	2.3	60.3	11501.1						6
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	276.0	2.3	60.4	647.8	392.0	2.3	60.4	920.0						1
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	133.0	2.4	60.3	314.1	188.0	2.4	60.3	444.1						0
24	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
25																						0
26																						0
27																						0
UNK																						0
Total SOP				198943				220937				770628				1689870						1.29
Catch				204655				222796				745374				1665914	154726	123257	81213	133823	7	

Table 21. Catch at age of American Place in Divs. 3LNO by Country in 2017

	2016																					
	Portugal				Spain				Canada				Overall (LF data available)				Japan	Russia	Estonia	USA	France	
	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	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
2	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
3	23.0	0.1	24.5	2.7	347.0	0.1	19.8	21.2	0.0	0.0	0.0	0.0	598.0	0.1	20.1	38.3						1
4	922.0	0.2	27.5	162.3	2956.0	0.1	24.4	357.7	0.0	0.0	0.0	0.0	25172.0	0.2	29.1	5537.8						32
5	3586.0	0.2	27.5	656.2	9990.0	0.1	24.8	1268.7	11715.0	0.2	30.4	2905.3	55506.0	0.2	28.5	11267.7						71
6	16232.0	0.2	29.6	3652.2	22808.0	0.2	28.0	4265.1	20810.0	0.2	30.4	5056.8	96663.0	0.2	30.2	23489.1						124
7	66683.0	0.3	32.3	19804.9	50860.0	0.3	32.5	15664.9	20843.0	0.3	33.0	6669.8	250093.0	0.3	33.0	80780.0						320
8	72261.0	0.4	34.8	27386.9	77293.0	0.4	35.8	32385.8	37390.0	0.4	35.1	14619.5	377513.0	0.4	36.0	161198.1						484
9	45782.0	0.5	37.1	21517.5	67173.0	0.5	38.4	35601.7	84316.0	0.5	37.2	39965.8	282029.0	0.5	38.6	151731.6						361
10	49670.0	0.6	40.1	30249.0	70571.0	0.6	40.6	44742.0	61762.0	0.6	39.9	36871.9	275287.0	0.6	40.8	177835.4						353
11	74383.0	0.7	42.7	55192.2	46280.0	0.7	42.5	34015.8	50300.0	0.7	41.7	35159.7	258982.0	0.7	42.7	193459.6						332
12	38560.0	1.0	46.2	37403.2	34161.0	0.9	45.2	31257.3	39776.0	0.8	43.2	30627.5	150741.0	0.9	45.9	143053.2						193
13	18606.0	1.3	50.0	23480.8	27454.0	1.1	47.7	30034.7	20663.0	1.0	46.2	20001.8	88269.0	1.2	48.7	103186.5						113
14	3548.0	1.7	55.0	6152.2	21163.0	1.1	47.3	22750.2	8623.0	1.2	49.3	10382.1	56616.0	1.1	47.1	60409.3						73
15	989.0	1.5	52.5	1449.9	3557.0	1.2	48.9	4190.1	10363.0	0.8	43.9	8528.7	11421.0	1.4	51.1	15658.2						15
16	330.0	1.5	52.5	483.8	4291.0	1.5	52.7	6458.0	2530.0	1.6	53.6	4058.1	9504.0	1.6	53.4	15063.8						12
17	0.0	0.0	0.0	0.0	1364.0	2.2	59.0	2949.0	1267.0	1.9	56.1	2388.3	3248.0	2.0	57.6	6531.7						4
18	0.0	0.0	0.0	0.0	1364.0	2.2	59.0	2949.0	649.0	1.7	54.7	1098.1	2955.0	2.1	58.3	6167.1						4
19	0.0	0.0	0.0	0.0	638.0	2.3	60.5	1498.7	467.0	1.9	56.4	871.4	1747.0	2.3	59.9	3979.7						2
20	0.0	0.0	0.0	0.0	821.0	2.6	62.3	2148.6	444.0	2.2	59.1	967.0	1326.0	2.6	62.3	3470.1						2
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	638.0	1.9	56.5	1193.7						1
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	395.0	1.9	56.5	739.0	0.0	0.0	0.0	0.0						0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.0	2.9	64.5	133.7						0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.0	2.9	64.5	84.3	0.0	0.0	0.0	0.0						0
25																						0
26																						0
27																						0
UNK																						0
Total SOP				227594				272558				220995				1164185						1.28
Catch				233000				275000				216214				1169214	123530	105000	52000	13000	34000	

Table 22. Catch at age used in the VPA, with effort method for catch in 2014, DCRs in 2015 and 2016, and CDAG for 2017.

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	63.1	195.5	413.9	715.6	535.7	395.3	260.7	147.0	75.3	28.9	41.2
2017	65.0	136.7	322.7	427.1	360.2	273.9	213.5	102.6	63.6	48.8	33.9

Table 23. Stock weights (kg) for American plaice as calculated by Rivard's (Rivard 1980) 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	0.218	0.242	0.308	0.392	0.494	0.598	0.712	0.868	1.057	1.358	1.654
2011	0.145	0.216	0.324	0.409	0.494	0.626	0.739	0.827	1.073	1.240	1.655
2012	0.121	0.171	0.237	0.358	0.478	0.557	0.739	0.851	0.978	1.236	1.596
2013	0.106	0.174	0.237	0.335	0.457	0.575	0.656	0.836	0.940	1.158	1.584
2014	0.132	0.184	0.253	0.346	0.428	0.548	0.650	0.779	0.961	1.055	1.539
2015	0.066	0.172	0.247	0.325	0.409	0.478	0.609	0.756	0.933	1.054	1.348
2016	0.192	0.173	0.259	0.352	0.452	0.519	0.644	0.780	0.972	1.181	1.379
2017	0.217	0.225	0.299	0.383	0.516	0.618	0.689	0.858	1.035	1.090	1.507
2018	0.159	0.190	0.268	0.353	0.459	0.539	0.647	0.798	0.980	1.108	1.411
Mean	**0.170**	**0.225**	**0.302**	**0.390**	**0.492**	**0.608**	**0.741**	**0.904**	**1.096**	**1.336**	**1.703**

Table 24. 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	0.00	0.05	0.14	0.43	0.76	0.95	0.98	1.00	0.99	1.00	1.00
2014	0.01	0.02	0.16	0.41	0.73	0.91	0.99	1.00	1.00	1.00	1.00
2015	0.01	0.03	0.16	0.44	0.75	0.90	0.97	1.00	1.00	1.00	1.00
2016	0.01	0.03	0.15	0.66	0.76	0.93	0.97	0.99	1.00	1.00	1.00
2017	0.01	0.03	0.15	0.50	0.95	0.93	0.98	0.99	1.00	1.00	1.00
2018	0.01	0.03	0.15	0.50	0.82	1.00	0.98	1.00	1.00	1.00	1.00

Table 25. Indices of numbers at age of American Plaice from the (a) Canadian fall RV survey (1990-2017; no 2004 or 2014), (b) Canadian spring RV survey (1985-2017; no 2006, 2015, or 2017), and (c) the EU-Spain Div. 3NO survey (1998-2017) used in the VPA

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
2016.9	155.534	120.740	87.585	39.925	29.152	15.570	5.413	3.813	0.639	1.034
2017.9	379.334	135.071	84.559	54.318	29.392	18.804	9.776	5.981	1.426	1.514

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
2016.5	75.296	46.819	41.934	30.354	16.447	12.028	6.151	3.729	1.973	1.496

Spain	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
2016.5	7.13	11.01	30.38	22.48	10.89	7.34	3.28	1.94	0.65	1.23
2017.5	6.37	10.04	23.81	16.67	8.11	5.39	2.77	2.02	0.81	0.94

Table 26. 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. Error	Rel. Bias
N[2018 6]	7937.1808	3908.2338	969.9647	0.4924	0.1222
N[2018 7]	5226.7502	1650.7117	262.3473	0.3158	0.0502
N[2018 8]	4307.8209	1202.7962	162.9782	0.2792	0.0378
N[2018 9]	4663.8103	1196.7716	143.9250	0.2566	0.0309
N[2018 10]	5572.2332	1252.8628	131.5502	0.2248	0.0236
N[2018 11]	3820.0714	828.4032	79.0925	0.2169	0.0207
N[2018 12]	2996.1903	642.1958	57.4015	0.2143	0.0192
N[2018 13]	1464.4411	326.6781	28.5736	0.2231	0.0195
N[2018 14]	879.3765	202.0534	17.7133	0.2298	0.0201
N[2018 15]	3343.7095	419.4272	19.7348	0.1254	0.0059
q ID#[1]	0.0125	0.0017	0.0001	0.1367	0.0084
q ID#[2]	0.0136	0.0018	0.0001	0.1354	0.0083
q ID#[3]	0.0128	0.0017	0.0001	0.1351	0.0085
q ID#[4]	0.0107	0.0014	0.0001	0.1349	0.0087
q ID#[5]	0.0089	0.0012	0.0001	0.1348	0.0088
q ID#[6]	0.0071	0.0010	0.0001	0.1350	0.0090
q ID#[7]	0.0068	0.0009	0.0001	0.1349	0.0090
q ID#[8]	0.0068	0.0009	0.0001	0.1353	0.0092
q ID#[9]	0.0054	0.0007	0.0000	0.1358	0.0092
q ID#[10]	0.0056	0.0008	0.0001	0.1362	0.0091
q ID#[11]	0.0048	0.0006	0.0000	0.1254	0.0070
q ID#[12]	0.0068	0.0009	0.0000	0.1251	0.0071
q ID#[13]	0.0079	0.0010	0.0001	0.1249	0.0072
q ID#[14]	0.0073	0.0009	0.0001	0.1248	0.0073
q ID#[15]	0.0066	0.0008	0.0000	0.1248	0.0074
q ID#[16]	0.0053	0.0007	0.0000	0.1249	0.0075
q ID#[17]	0.0051	0.0006	0.0000	0.1251	0.0076
q ID#[18]	0.0055	0.0007	0.0000	0.1250	0.0076
q ID#[19]	0.0047	0.0006	0.0000	0.1253	0.0076
q ID#[20]	0.0047	0.0006	0.0000	0.1253	0.0076
q ID#[21]	0.0027	0.0004	0.0000	0.1577	0.0110
q ID#[22]	0.0047	0.0007	0.0001	0.1556	0.0109
q ID#[23]	0.0062	0.0010	0.0001	0.1549	0.0110
q ID#[24]	0.0055	0.0009	0.0001	0.1546	0.0112
q ID#[25]	0.0052	0.0008	0.0001	0.1545	0.0114
q ID#[26]	0.0045	0.0007	0.0001	0.1547	0.0117
q ID#[27]	0.0042	0.0006	0.0000	0.1550	0.0119
q ID#[28]	0.0042	0.0007	0.0001	0.1555	0.0120
q ID#[29]	0.0028	0.0004	0.0000	0.1562	0.0121
q ID#[30]	0.0029	0.0005	0.0000	0.1570	0.0121

Table 27. Bias adjusted population numbers (000 t) from 2018 VPA.

Pop #s Bia	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	293987	228979	190860	122612	76157	43255	25040	15849	10883	5939	6656
1976	276669	239899	184647	149745	91877	54031	28301	15376	8729	5515	5353
1977	232207	225762	192884	143251	105155	60285	33145	15701	7966	4437	4829
1978	218531	189235	178768	150029	106705	73876	39317	21271	9032	4396	4791
1979	200741	177511	150899	138065	113454	75878	47994	23261	11295	4125	3351
1980	193528	163217	139420	111343	96149	79394	50864	31382	15646	7589	4956
1981	188499	158210	130943	105549	79823	66010	52211	31495	18428	9455	7943
1982	191286	154191	129031	105177	82096	58212	43760	30561	15155	7327	5105
1983	189867	156587	125957	104003	81780	59151	36118	21673	12089	5332	3808
1984	191490	155343	127308	100368	79920	59434	41485	21937	11007	5790	3688
1985	187399	156735	126825	102862	79186	60153	39696	22403	9942	4483	4080
1986	159627	153162	127612	101703	79116	55197	35109	19487	10084	4465	3649
1987	141976	126712	116640	93159	71976	52736	32726	16000	6714	2973	2386
1988	161963	114220	99283	88558	66455	44662	27362	16574	6856	2750	2288
1989	189124	129978	90614	76906	65949	45292	27284	14101	8159	3204	2231
1990	184559	101693	67791	44734	38004	28214	17438	9821	4624	3289	1907
1991	91964	97212	54049	36512	22861	15895	10174	5502	3099	1465	1948
1992	62423	49521	48075	25917	14535	7643	4514	2766	1553	1220	1377
1993	53909	36630	28373	26338	12701	5857	2897	1541	979	489	727
1994	60225	30843	18762	10155	7009	3289	1016	384	194	195	99
1995	55218	32190	15267	7010	2709	2081	1385	250	107	28	111
1996	36664	32426	18709	8643	3874	1441	1175	805	144	63	82
1997	24062	21444	18524	10275	4745	2121	809	684	468	83	83
1998	22080	19683	17435	14675	7764	3516	1602	578	509	359	134
1999	21941	18068	16066	14028	11323	5631	2468	1061	368	354	343
2000	14569	17940	14635	12911	10962	8342	3639	1457	619	188	501
2001	12028	11914	14484	11326	9745	7675	5450	2100	808	331	420
2002	12005	9747	9455	10831	8000	6553	4849	3201	1123	453	440
2003	17007	9547	7702	7191	7527	5261	4391	3017	2076	736	620
2004	13343	12831	6930	5311	4352	4372	3227	2696	1681	1377	851
2005	11757	10612	8795	4580	3477	2588	2668	1977	1676	1088	1531
2006	9795	9573	8427	6300	2991	2147	1597	1702	1311	1138	1759
2007	12240	7951	7632	6325	4654	2026	1439	1027	1166	883	2017
2008	26788	9973	6443	5910	4612	3145	1329	923	617	732	1646
2009	15128	21858	8042	5011	4188	3113	2115	884	577	405	1650
2010	15761	12215	17273	6093	3480	2720	1968	1307	531	393	1284
2011	20426	12790	9381	13346	4488	2414	1706	1244	805	295	1032
2012	17574	16070	9754	6776	10058	3278	1644	1152	790	587	957
2013	18069	14131	12468	7227	4907	7573	2351	1131	744	518	1097
2014	11887	14493	10996	9181	4954	3186	5550	1604	707	483	1068
2015	8393	9667	11531	8317	6672	3432	2141	4287	1154	469	1008
2016	7669	6816	7760	9197	6476	5181	2607	1573	3379	866	1032
2017	8571	6170	5338	5937	6956	4873	3875	1920	1150	2689	1468
2018	8201	6967	4964	4145	4520	5441	3741	2939	1436	862	3324

Table 28. Bias adjusted fishing mortalities from 2018 VPA.

F Bias Adj(	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	0.478	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	1.022	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	0.032	0.055	0.095	0.183	0.293	0.463	0.509	0.561	0.615	0.615
1989	0.090	0.121	0.176	0.175	0.319	0.424	0.492	0.585	0.379	0.517	0.517
1990	0.111	0.102	0.089	0.141	0.342	0.490	0.624	0.623	0.619	0.451	0.451
1991	0.089	0.174	0.205	0.391	0.566	0.729	0.773	0.735	0.402	0.378	0.378
1992	0.003	0.027	0.072	0.183	0.379	0.440	0.545	0.509	0.625	0.744	0.744
1993	0.028	0.139	0.497	0.794	0.821	1.222	1.490	1.542	1.085	1.982	1.982
1994	0.096	0.173	0.455	0.791	0.684	0.335	0.870	0.752	1.412	0.439	0.439
1995	0.002	0.013	0.039	0.063	0.101	0.041	0.013	0.021	0.001	0.005	0.005
1996	0.006	0.030	0.069	0.070	0.073	0.047	0.011	0.013	0.021	0.021	0.021
1997	0.001	0.007	0.033	0.080	0.100	0.081	0.136	0.096	0.064	0.019	0.019
1998	0.001	0.003	0.017	0.059	0.121	0.154	0.212	0.252	0.162	0.163	0.163
1999	0.001	0.011	0.019	0.047	0.106	0.237	0.327	0.339	0.468	0.131	0.131
2000	0.001	0.014	0.056	0.081	0.156	0.226	0.350	0.390	0.424	0.295	0.295
2001	0.010	0.031	0.091	0.148	0.197	0.259	0.332	0.426	0.379	0.336	0.336
2002	0.029	0.035	0.074	0.164	0.219	0.200	0.274	0.233	0.222	0.164	0.164
2003	0.082	0.120	0.172	0.302	0.343	0.289	0.288	0.385	0.210	0.266	0.266
2004	0.029	0.178	0.214	0.223	0.320	0.294	0.290	0.276	0.235	0.175	0.175
2005	0.006	0.030	0.134	0.226	0.282	0.282	0.249	0.211	0.187	0.198	0.198
2006	0.009	0.027	0.087	0.103	0.189	0.200	0.241	0.178	0.195	0.162	0.162
2007	0.005	0.010	0.056	0.116	0.192	0.222	0.244	0.310	0.266	0.367	0.367
2008	0.003	0.015	0.051	0.144	0.193	0.197	0.208	0.270	0.222	0.165	0.165
2009	0.014	0.035	0.078	0.165	0.231	0.258	0.281	0.309	0.185	0.270	0.270
2010	0.009	0.064	0.058	0.106	0.166	0.266	0.259	0.285	0.387	0.285	0.285
2011	0.040	0.071	0.125	0.083	0.114	0.184	0.193	0.254	0.115	0.127	0.127
2012	0.018	0.054	0.100	0.123	0.084	0.133	0.174	0.237	0.222	0.142	0.142
2013	0.021	0.051	0.106	0.178	0.232	0.111	0.182	0.270	0.232	0.214	0.214
2014	0.007	0.029	0.079	0.119	0.167	0.198	0.058	0.129	0.210	0.231	0.231
2015	0.008	0.020	0.026	0.050	0.053	0.075	0.109	0.038	0.088	0.159	0.159
2016	0.017	0.044	0.068	0.079	0.084	0.090	0.106	0.113	0.028	0.057	0.057
2017	0.007	0.017	0.053	0.073	0.046	0.064	0.077	0.090	0.088	0.023	0.023

Table 29. Spawning stock biomass from 2018 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	12888	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	7048	19146	21630	17314	12866	9878	5782	5713
1984	17	417	1460	10698	22163	29599	25457	15815	9762	6752	6029
1985	168	211	2981	9971	24658	30713	25958	18696	10942	6475	7814
1986	95	688	2107	14763	29735	30026	24269	17429	12016	6978	7566
1987	127	863	3626	13788	26115	30463	24034	14721	7876	4455	4807
1988	53	502	4878	15374	27830	23656	19407	15417	8417	4289	4718
1989	20	236	1790	13286	24486	24492	18912	12815	9970	5036	4616
1990	51	151	852	4144	14364	15808	12984	9674	6090	5581	3908
1991	90	266	903	3117	7449	10039	8526	6072	4579	2755	4334
1992	15	265	934	2596	4281	4502	3851	3026	2193	2203	3205
1993	24	70	654	2192	3720	2899	2055	1425	1179	717	1459
1994	131	154	306	846	1837	1842	717	346	226	281	177
1995	688	572	750	902	807	1354	1503	305	140	51	198
1996	39	1087	1713	2091	1740	980	1209	1170	234	132	192
1997	17	163	1717	2734	2368	1544	736	807	716	160	217
1998	53	83	710	2975	3507	2198	1287	563	640	622	269
1999	65	253	498	2054	3627	3047	1658	912	390	480	620
2000	14	317	995	2268	3884	4248	2593	1305	710	255	879
2001	99	121	1223	2510	3879	4244	3920	1955	940	461	751
2002	116	379	718	2672	3301	3702	3461	2960	1266	636	766
2003	286	404	1084	1957	3426	3160	3321	2838	2477	1036	1167
2004	44	710	979	1718	2239	2962	2662	2630	2022	2108	1683
2005	110	182	1390	1489	1800	1802	2260	1992	2043	1589	2954
2006	21	303	592	2072	1527	1427	1396	1691	1582	1725	3274
2007	53	116	779	1312	2284	1317	1159	1141	1411	1221	3445
2008	128	186	467	1525	1984	2121	1103	1010	811	1080	2680
2009	75	460	550	1045	1686	1853	1663	849	768	587	2827
2010	63	300	1513	1237	1373	1461	1360	1125	561	533	2123
2011	25	167	776	3258	1777	1418	1210	1020	861	366	1708
2012	26	98	420	1240	4071	1711	1194	965	770	725	1528
2013	4	114	410	1050	1707	4150	1516	941	695	599	1738
2014	12	50	453	1304	1537	1584	3563	1244	679	508	1643
2015	4	56	460	1185	2050	1480	1262	3228	1076	495	1358
2016	11	40	310	2145	2215	2500	1627	1213	3280	1022	1422
2017	14	47	247	1145	3416	2787	2623	1632	1186	2929	2211
2018	10	44	206	738	1701	2916	2375	2335	1404	954	4691

Table 30. 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 Bia	5	6	7	8	9	10	11	12	13	14	15
1960	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1961	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1962	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1963	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1964	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1965	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1966	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1967	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1968	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1969	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1970	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1971	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1972	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1973	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1974	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1975	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1976	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1977	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1978	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1979	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1980	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1981	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1982	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1983	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1984	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1992	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1993	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
1994	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1995	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
1996	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
1997	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
1998	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.02
1999	0.04	0.03	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02
2000	0.04	0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.03
2001	0.06	0.04	0.04	0.03	0.04	0.03	0.04	0.03	0.03	0.04	0.04
2002	0.06	0.06	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05
2003	0.09	0.06	0.06	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.06
2004	0.11	0.09	0.07	0.07	0.06	0.07	0.06	0.07	0.07	0.07	0.07
2005	0.14	0.11	0.11	0.08	0.09	0.07	0.09	0.08	0.09	0.09	0.09
2006	0.19	0.14	0.12	0.12	0.10	0.11	0.10	0.11	0.10	0.10	0.10
2007	0.29	0.19	0.14	0.13	0.14	0.12	0.13	0.12	0.13	0.12	0.12
2008	-0.48	0.29	0.20	0.15	0.14	0.16	0.14	0.16	0.16	0.16	0.16
2009	0.19	-0.49	0.30	0.20	0.17	0.16	0.19	0.17	0.20	0.19	0.19
2010	0.16	0.19	-0.51	0.31	0.23	0.20	0.20	0.23	0.21	0.23	0.23
2011	0.22	0.17	0.20	-0.56	0.33	0.26	0.25	0.25	0.29	0.29	0.29
2012	0.20	0.22	0.18	0.22	-0.64	0.36	0.30	0.29	0.30	0.31	0.31
2013	0.25	0.20	0.23	0.19	0.24	-0.73	0.39	0.34	0.34	0.34	0.34
2014	0.14	0.26	0.21	0.25	0.22	0.29	-0.90	0.44	0.40	0.39	0.39
2015	0.04	0.14	0.26	0.22	0.28	0.25	0.33	-1.01	0.47	0.45	0.45
2016	0.17	0.04	0.14	0.27	0.23	0.29	0.26	0.35	-1.09	0.49	0.49
2017	0.17	0.18	0.04	0.15	0.29	0.25	0.31	0.28	0.38	-1.15	0.50

Table 31. Model runs with Mean Squared Errors and F ratio estimates for the base run and each exploratory model run.

Run		Base	F1			F2			F3		
Description		F ratio to plus group set to 1.0	F ratio to plus group estimated individual years since 2000			F ratio to plus group estimated individual years since 2010			F ratio to plus group estimated in 3 groups since 2010		
MSE		0.460	0.344			0.403			0.408		
MSE by index	Can Fall 3LNO	0.379	0.326			0.329			0.338		
	Can Spring 3LNO	0.335	0.217			0.284			0.292		
	Spanish 3NO	0.661	0.459			0.581			0.586		
Fratio Estimates		Fratio, all years = 1.0		Estimate	Std. Error		Estimate	Std. Error		Estimate	Std. Error
			Fratio[2000 15]	2.65	0.57	Fratio[2010 15]	1.22	0.34	Fratio[2010 15] (2010-2012)	1.66	0.30
			Fratio[2001 15]	1.11	0.23	Fratio[2011 15]	2.05	0.54			
			Fratio[2002 15]	0.68	0.14	Fratio[2012 15]	1.64	0.37			
			Fratio[2003 15]	0.55	0.12	Fratio[2013 15]	1.22	0.26	Fratio[2013 15] (2013-2014)	1.22	0.18
			Fratio[2004 15]	0.41	0.09	Fratio[2014 15]	1.13	0.23			
			Fratio[2005 15]	0.65	0.15	Fratio[2015 15]	0.56	0.12			
			Fratio[2006 15]	0.50	0.12	Fratio[2016 15]	0.35	0.07	Fratio[2015 15] (2015-2017)	0.32	0.04
			Fratio[2007 15]	0.73	0.17	Fratio[2017 15]	0.18	0.04			
			Fratio[2008 15]	0.68	0.16						
			Fratio[2009 15]	1.02	0.23						
			Fratio[2010 15]	0.85	0.19						
			Fratio[2011 15]	1.48	0.31						
			Fratio[2012 15]	1.25	0.23						
			Fratio[2013 15]	1.02	0.18						
			Fratio[2014 15]	0.93	0.16						
			Fratio[2015 15]	0.52	0.09						
			Fratio[2016 15]	0.30	0.05						
			Fratio[2017 15]	0.19	0.03						

Table 32. Assumptions used for stochastic projections

Age	Estimate of 2018 population numbers ('000)	Relative error on population estimate	Weight-at-age mid-year (avg. 2015-2017)	Weight-at-age beginning of year (avg. 2015-2017)	Maturity-at-age (avg. 2015-2017)	PR rescaled relative to ages 9-14 (avg. 2015-2017)
5			0.17	0.16	0.01	0.14
6	6967.2	0.492	0.24	0.19	0.03	0.36
7	4964.4	0.316	0.31	0.27	0.16	0.69
8	4144.8	0.279	0.42	0.35	0.54	0.92
9	4519.9	0.257	0.52	0.46	0.82	0.81
10	5440.7	0.225	0.61	0.54	0.92	1.01
11	3741.0	0.217	0.73	0.65	0.97	1.25
12	2938.8	0.214	0.90	0.80	0.99	1.14
13	1435.9	0.223	1.11	0.98	1.00	0.90
14	861.7	0.230	1.16	1.11	1.00	0.89
15+	3324.0	0.125	1.68	1.41	1.00	0.89

Table 33. Results of stochastic projections under various fishing mortality options. Labels p05, p50 and p95 refer to 5th, 50th and 95th percentiles of each quantity.

	F = 0			**$F_{2015-2017}$ = 0.077**		
	SSB (‘000t)			SSB (‘000t)		
	P05	P50	P95	P05	P50	P95
2019	14.6	17.0	19.8	14.7	17.0	19.7
2020	15.5	18.0	21.0	14.4	16.7	19.5
2021	16.6	19.5	23.0	14.5	16.9	19.9
2022	18.0	21.1	25.3	14.8	17.2	20.7

Table 34. American Plaice in Divs. 3LNO: Risk assessment under F=0 and $F_{2015-2017}$ of the probability of being below B_{lim}. Yield is median projected value.

Fishing Mortality	Yield				P(SSB<B_{lim})				P(SSB_{2022}>SSB_{2018})
	2019	2020	2021	2022	2019	2020	2021	2022	
F = 0	-	-	-	-	>99%	>99%	>99%	>99%	99%
$F_{2013-2015}$= 0.08	1542	1538	1567	1594	>99%	>99%	>99%	>99%	47%

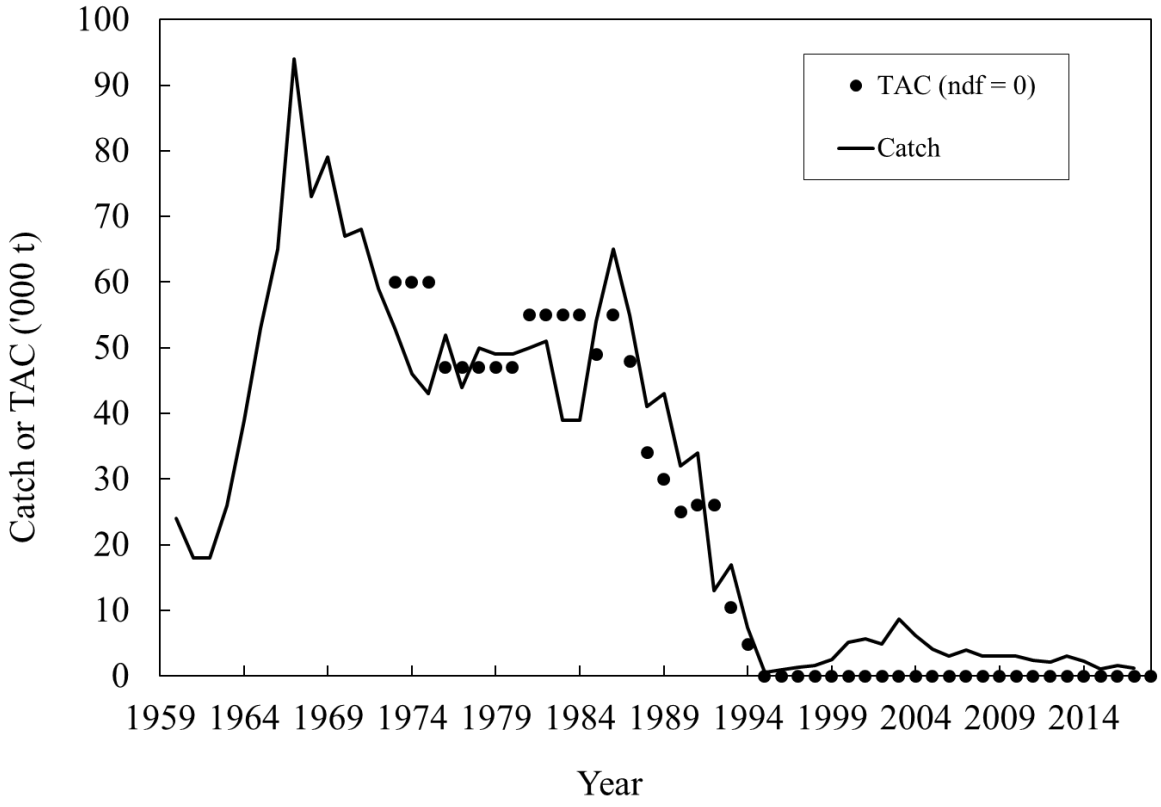

Fig. 1. American Plaice catches ('000 t) from 1960-2017 and total allowable catch (TAC) from 1973-2018

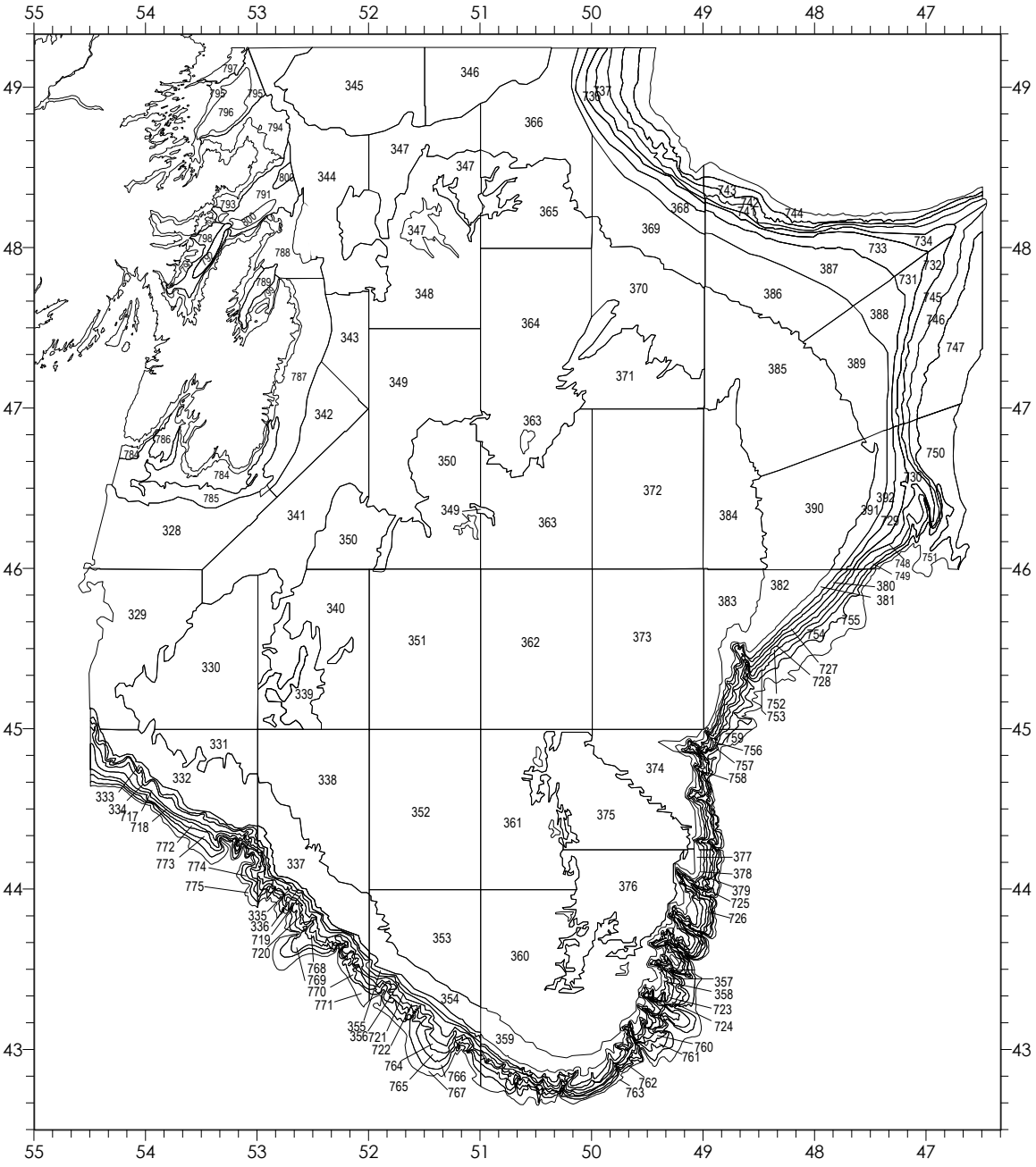

Fig. 2. Stratification scheme used in Canadian research vessel surveys of Div. 3LNO

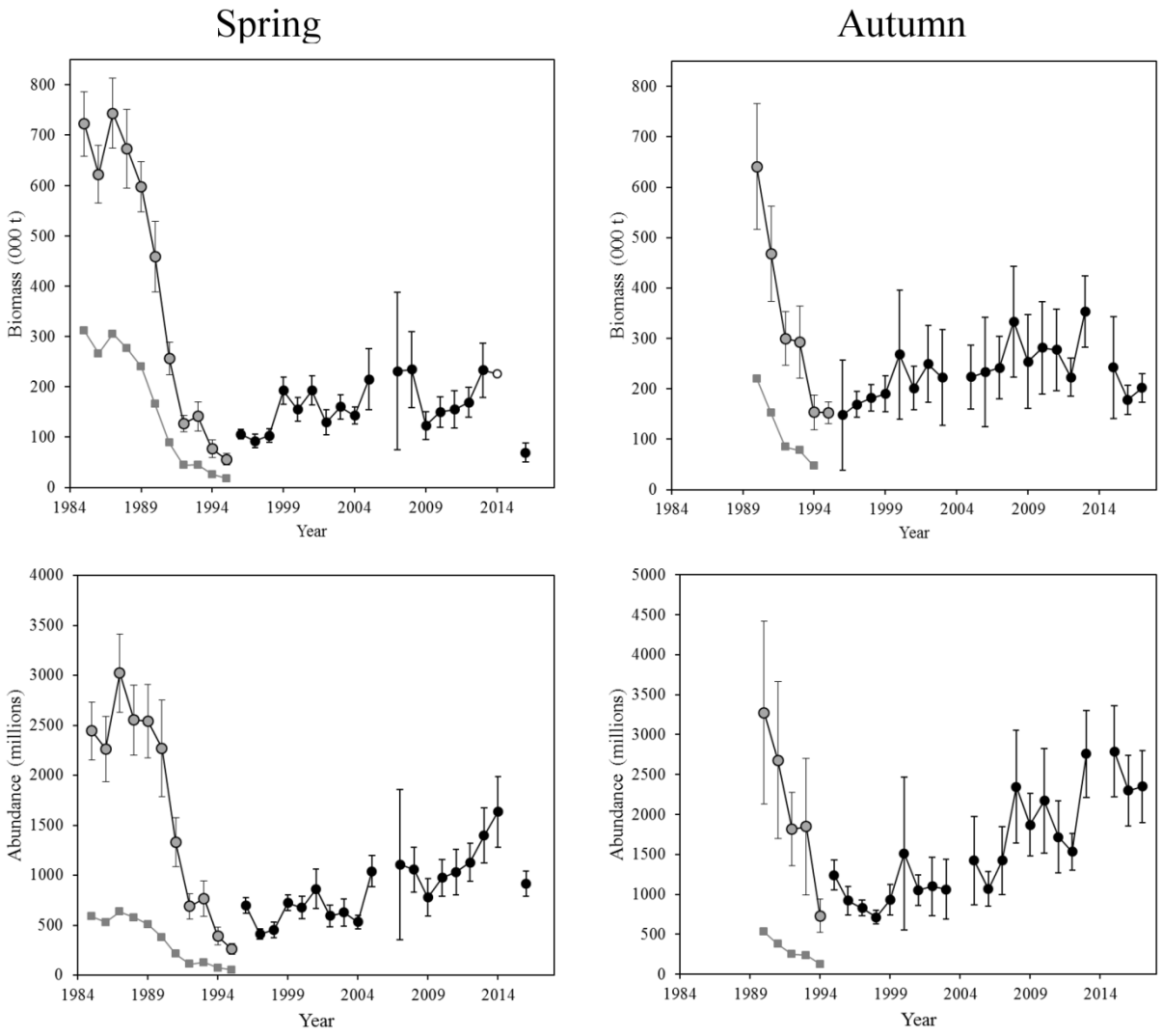

Fig. 3. Total biomass (000 t) and abundance (millions) for American Plaice in Divs. 3LNO for spring (left) and fall (right). Black circles indicate Campelen data, grey circles are campelen equivalent units, and grey squares are unconverted Engel data. Open circles mark years where confidence intervals extend to negative values.

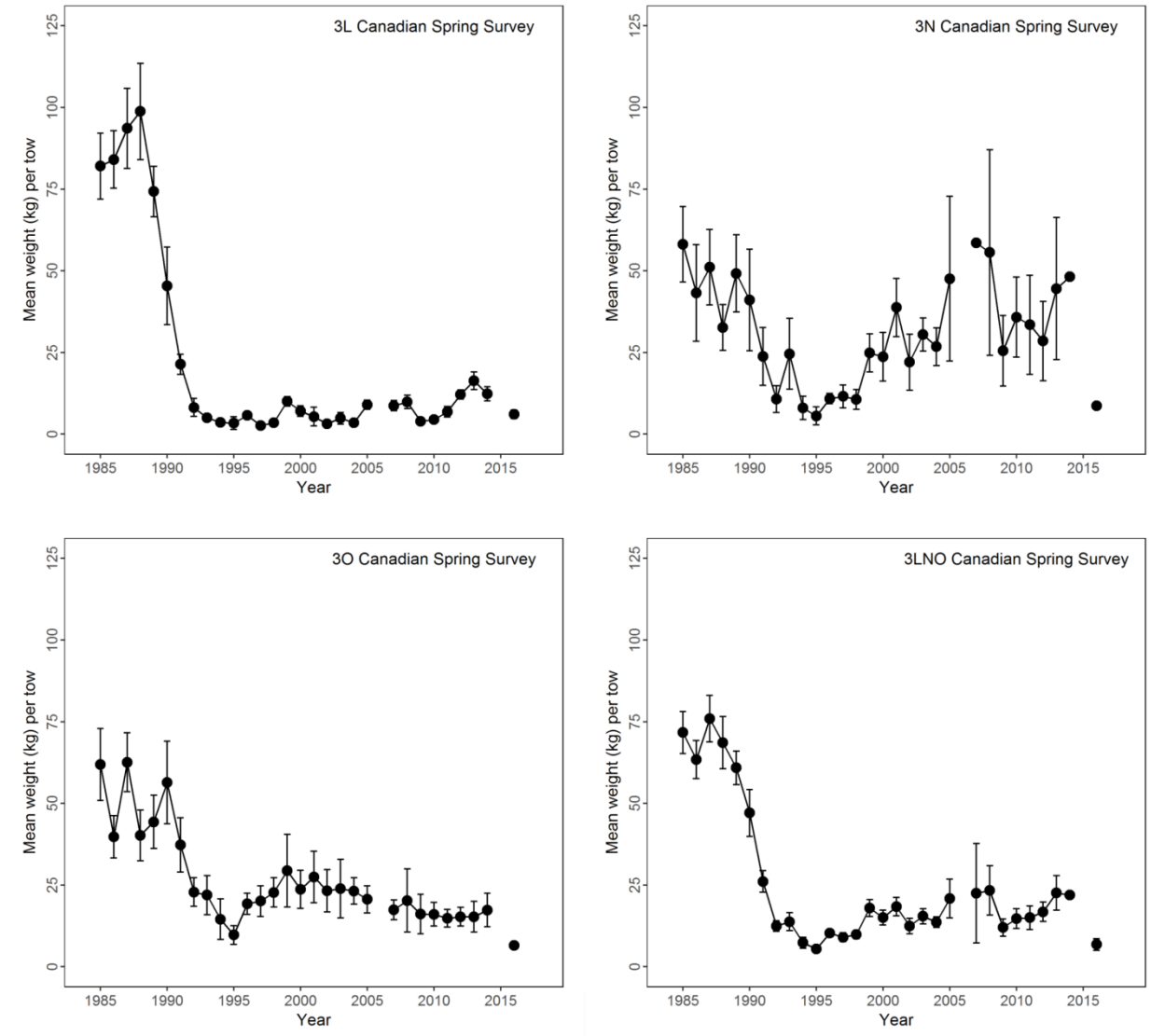

Fig. 4. Mean weight per tow (kg) (with associated 95% CIs) of American Plaice from Canadian spring surveys in Div. 3L, 3N, 3O, and 3LNO combined. Survey coverage was poor in 2006, 2015, and 2017, therefore these years are not plotted.

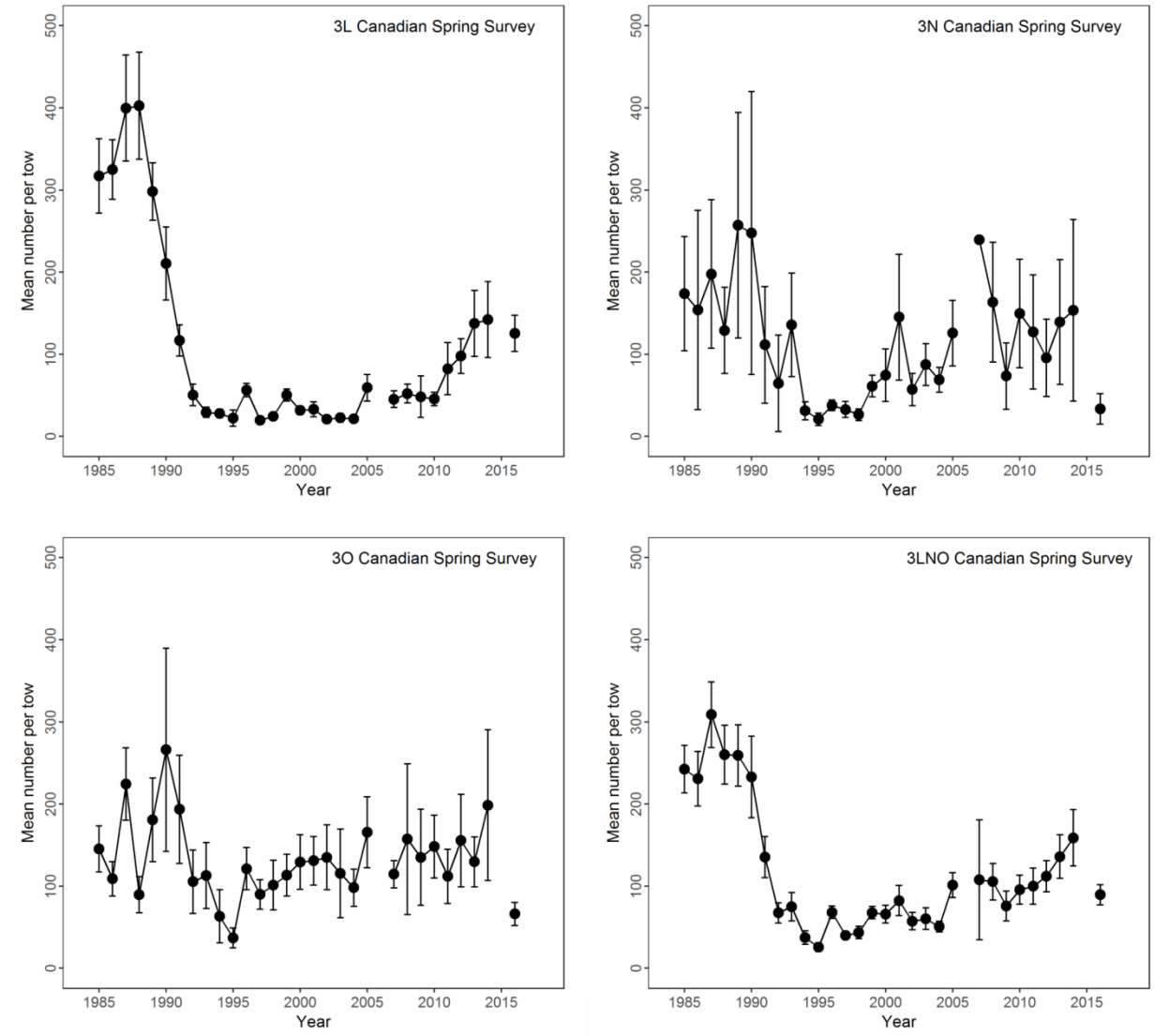

Fig. 5. Mean number per tow (with associated 95% CIs) of American Plaice from Canadian spring surveys in Div. 3L, 3N, 3O, and 3LNO combined. Survey coverage was poor in 2004 and 2014, therefore these years are not plotted.

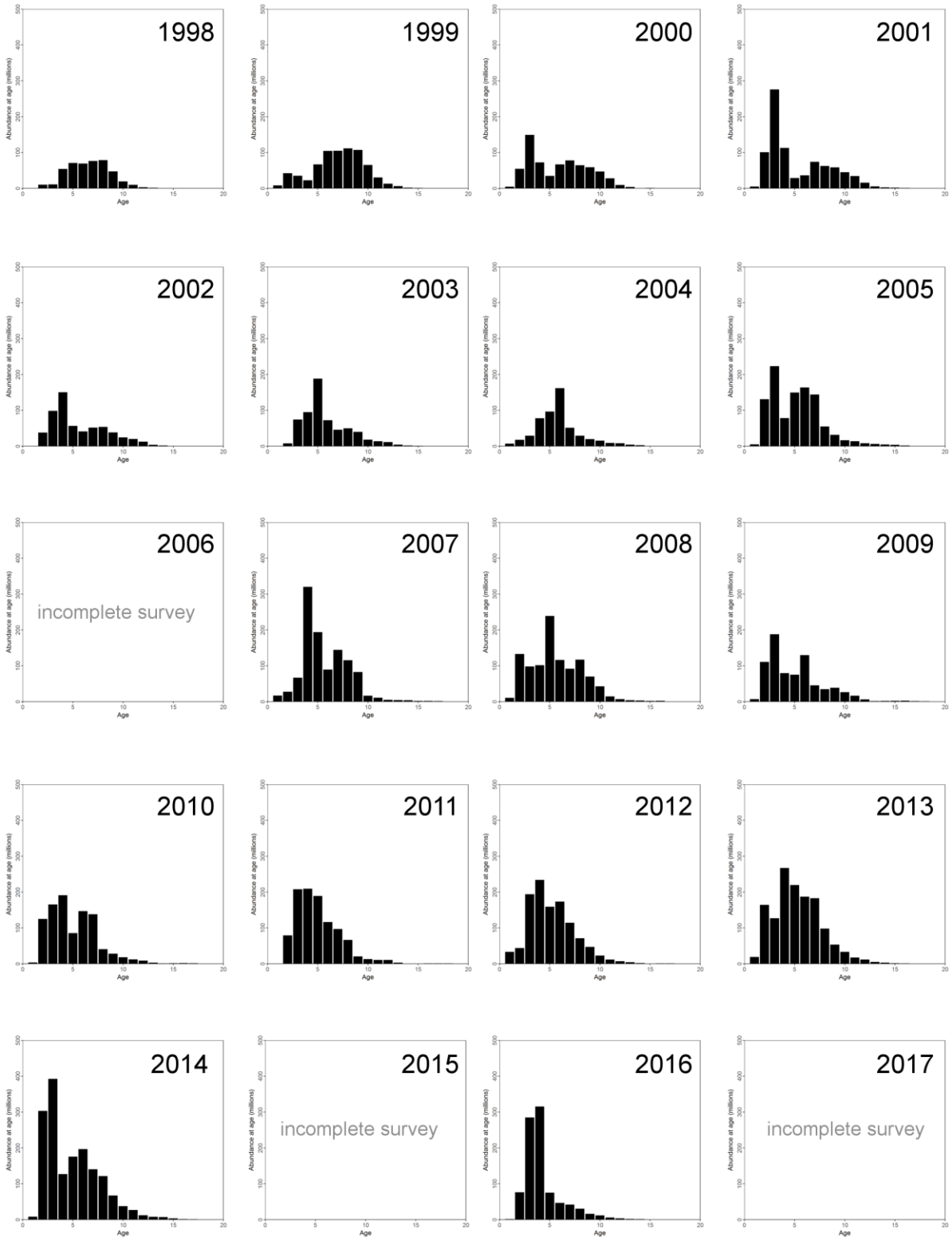

Fig. 6. Abundance at age (millions of fish) from 1998-2017 in the Canadian spring surveys. Survey coverage was poor in 2006, 2015, and 2017, therefore these years are not plotted.

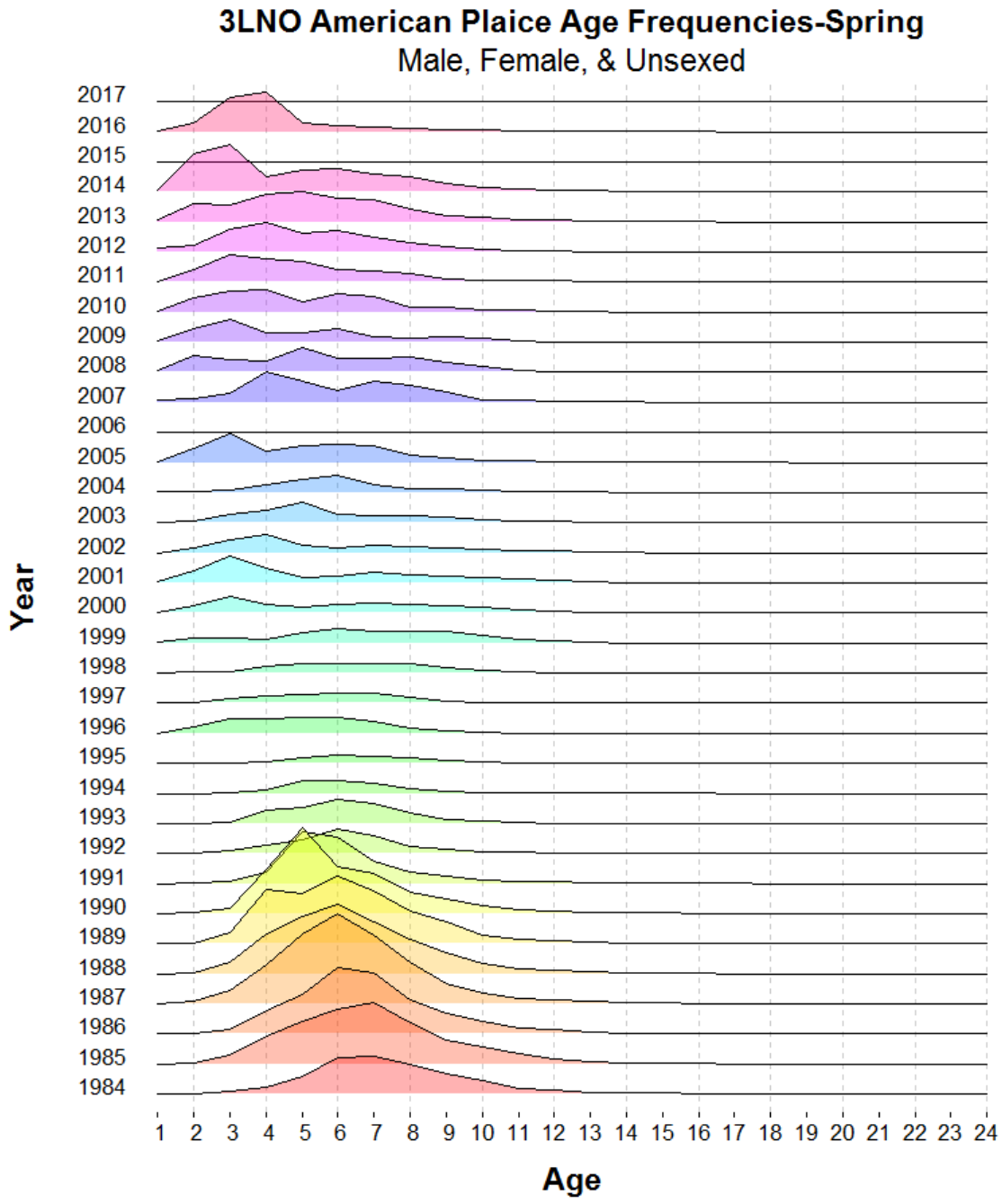

Fig. 7. Abundance at age for American Plaice in Divs. 3LNO from Canadian Spring surveys. Note that surveys in 2006, 2015, and 2017 were incomplete. Surveys prior to 1996 are in Campelen equivalent units, converted from an Engel trawl, and may under represent young fish.

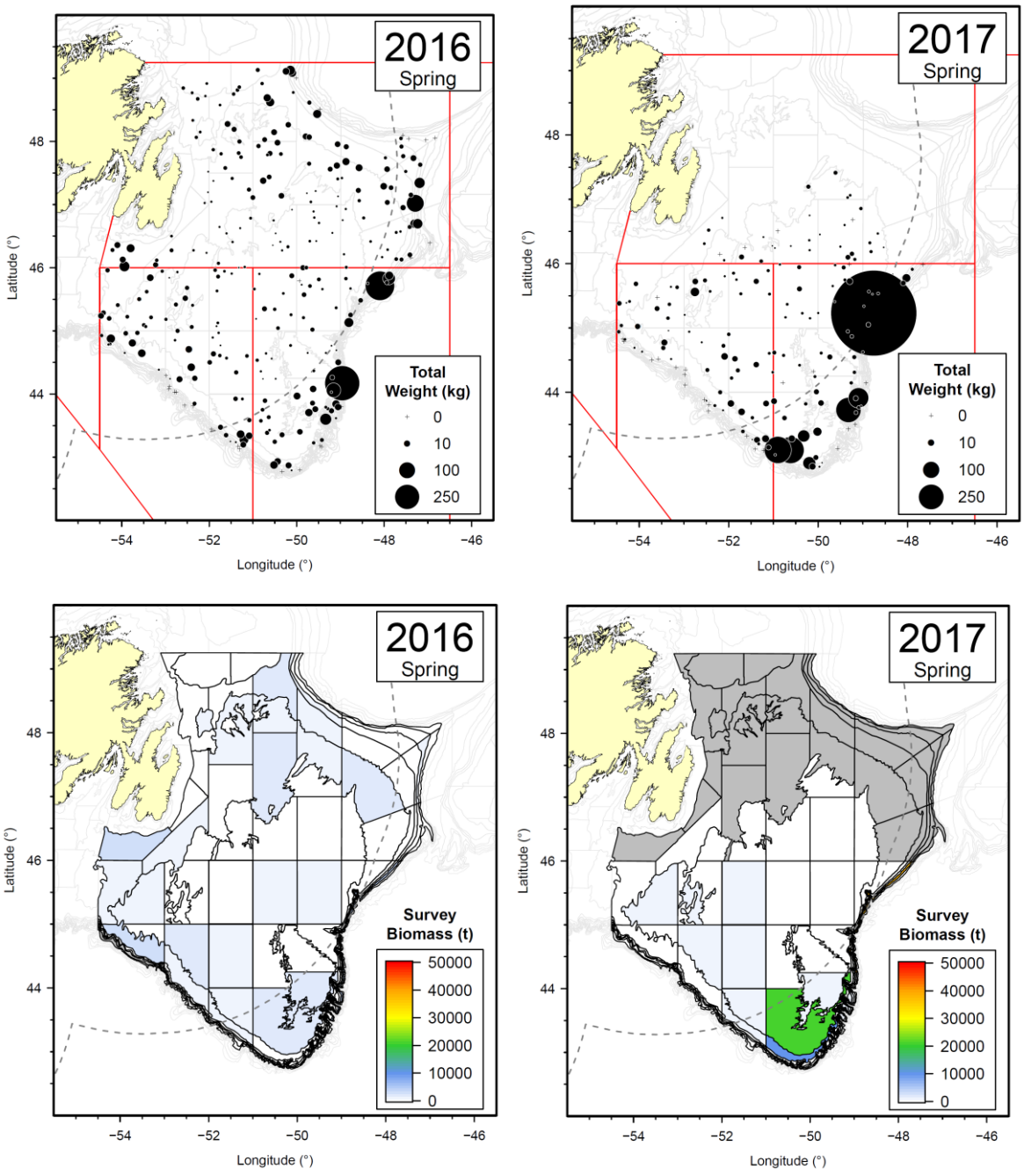

Fig. 8. Distribution of American plaice (top: kg per tow; bottom: biomass estimate for each strata) from Canadian spring surveys in NAFO Divs. 3LNO from 2016 and 2017. Note that the survey in 2017 was incomplete, with much of Div. 3L missing.

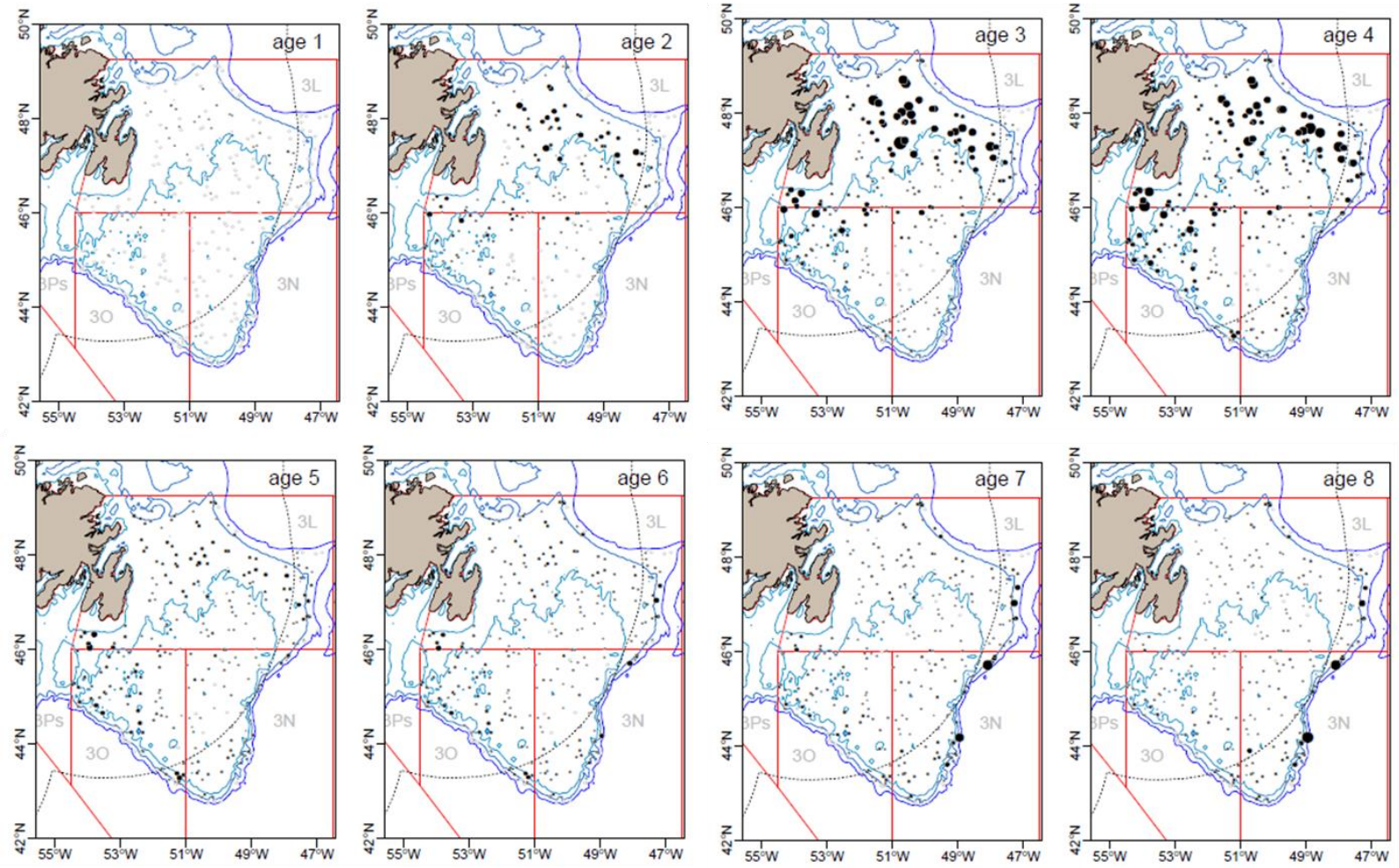

Fig. 9. Distribution (number per tow) of age 1-8 American Plaice in Divs. 3LNO from the Canadian spring survey in 2016.

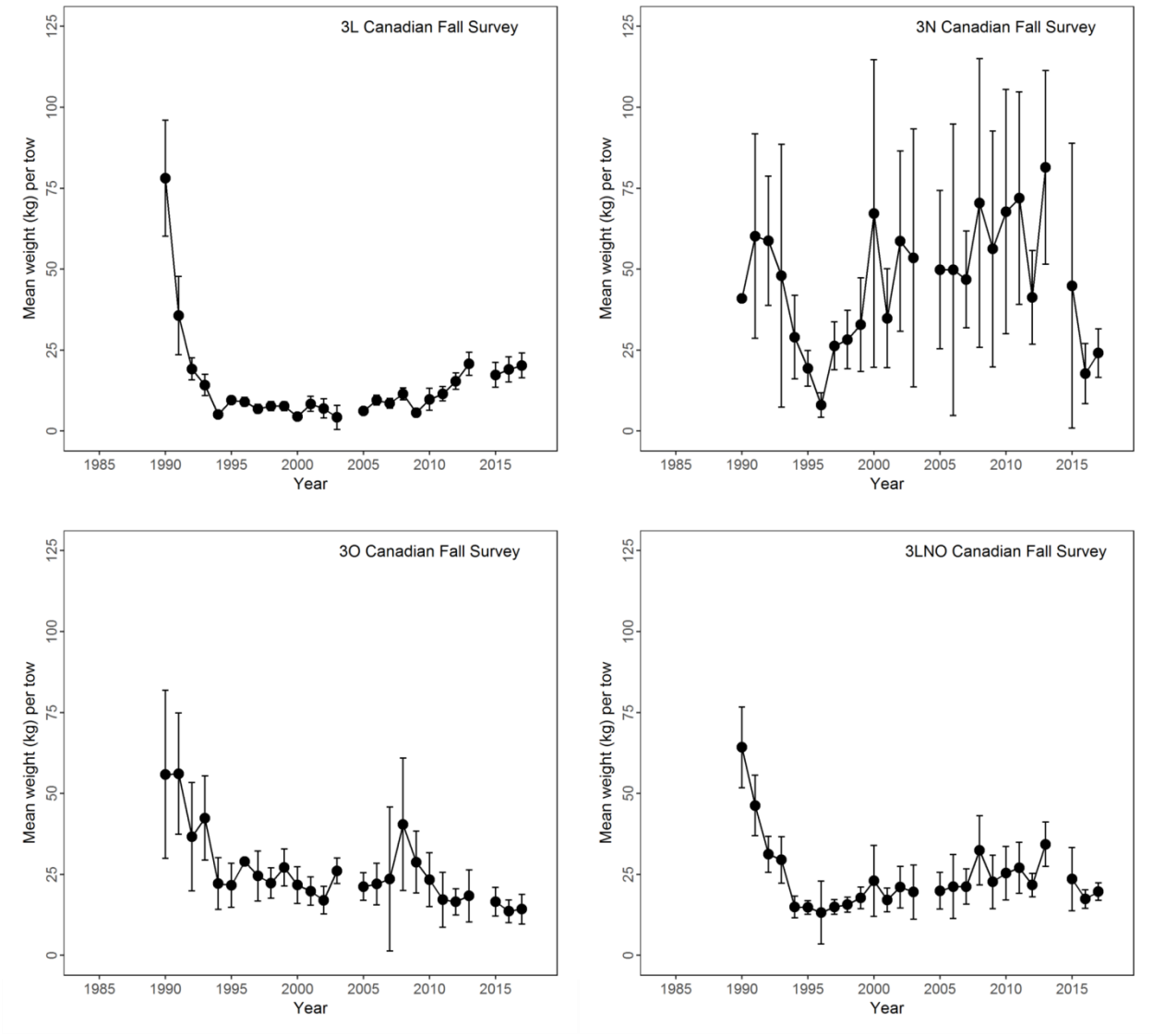

Fig. 10. Mean weight per tow (kg) (with associated 95% CIs) of American Plaice from Canadian autumn surveys in Div. 3L, 3N, 3O, and 3LNO combined. Survey coverage was poor in 2004 and 2014, therefore these years are not plotted.

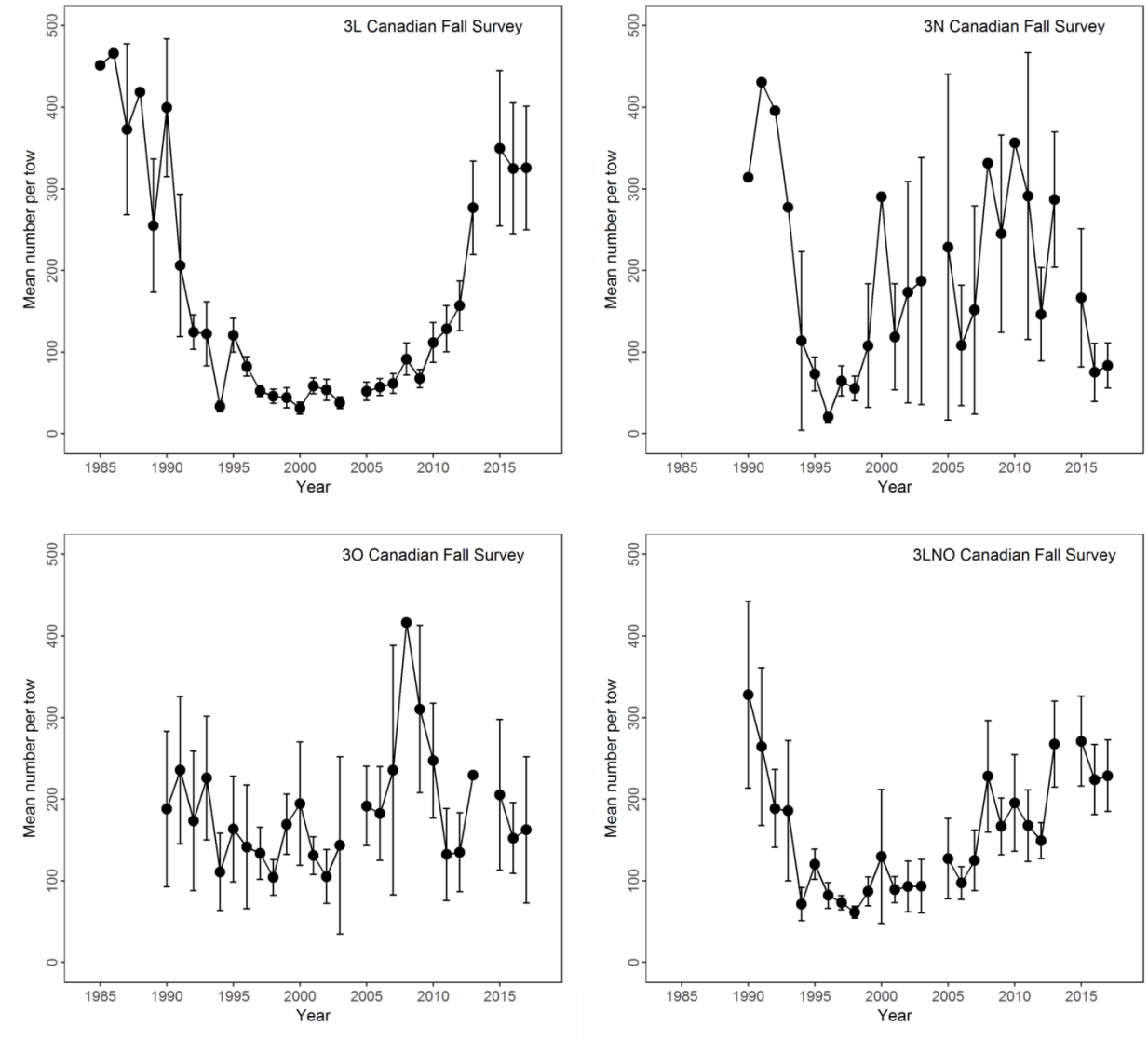

Fig. 11. Mean number per tow (with associated 95% CIs) of American Plaice from Canadian autumn surveys in Div. 3L, 3N, 3O, and 3LNO combined. Survey coverage was poor in 2004 and 2014, therefore these years are not plotted.

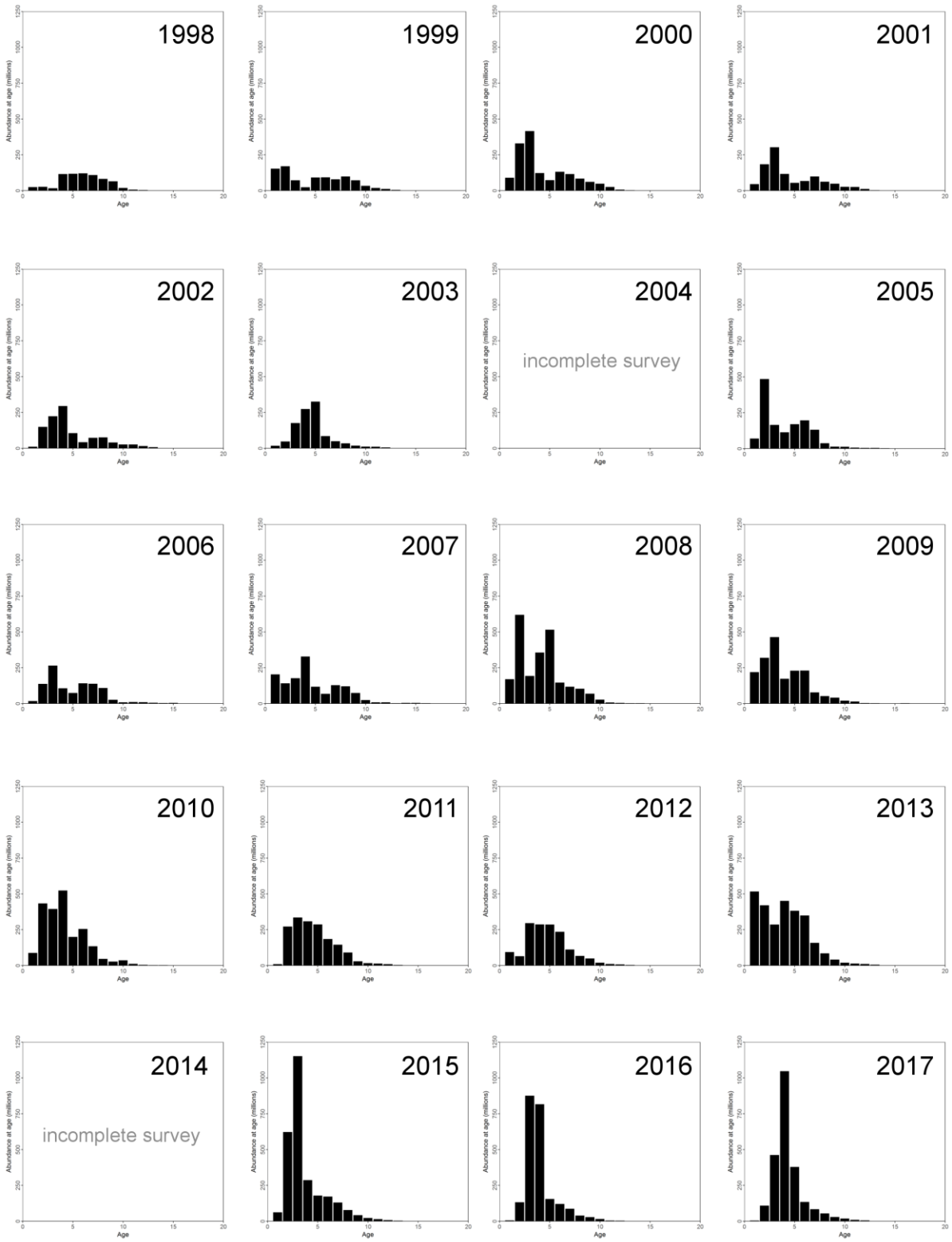

Fig. 12.Abundance at age (millions of fish) from 1998-2017 in the Canadian autumn surveys. Survey coverage was poor in 2004 and 2014, therefore these years are not plotted.

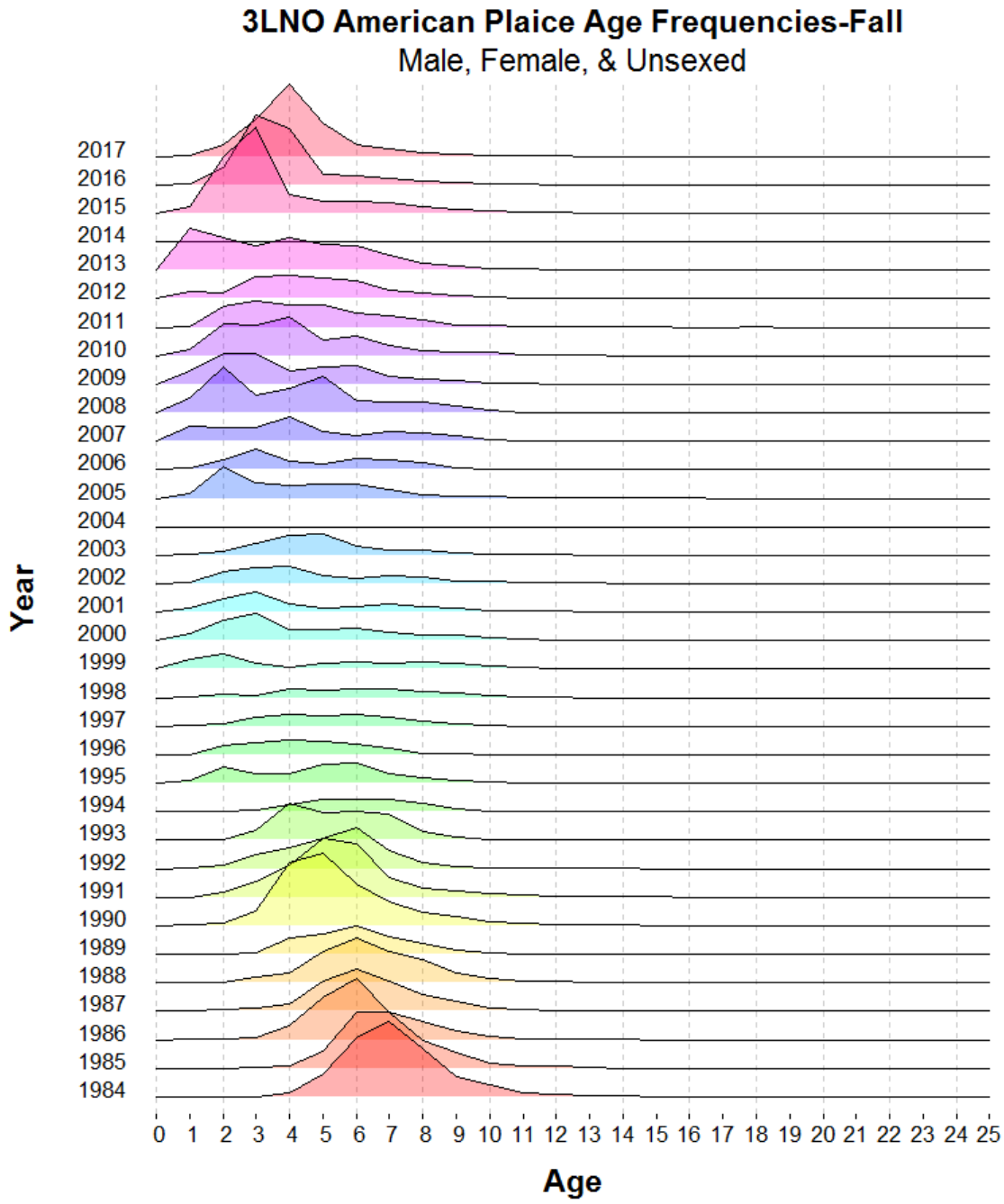

Fig. 13.Abundance at age for American Plaice in Divs. 3LNO from Canadian Autumn surveys. Note that surveys in 2006, 2015, and 2017 were incomplete. Surveys prior to 1996 are in Campelen equivalent units, converted from an Engel trawl, and may under represent young fish.

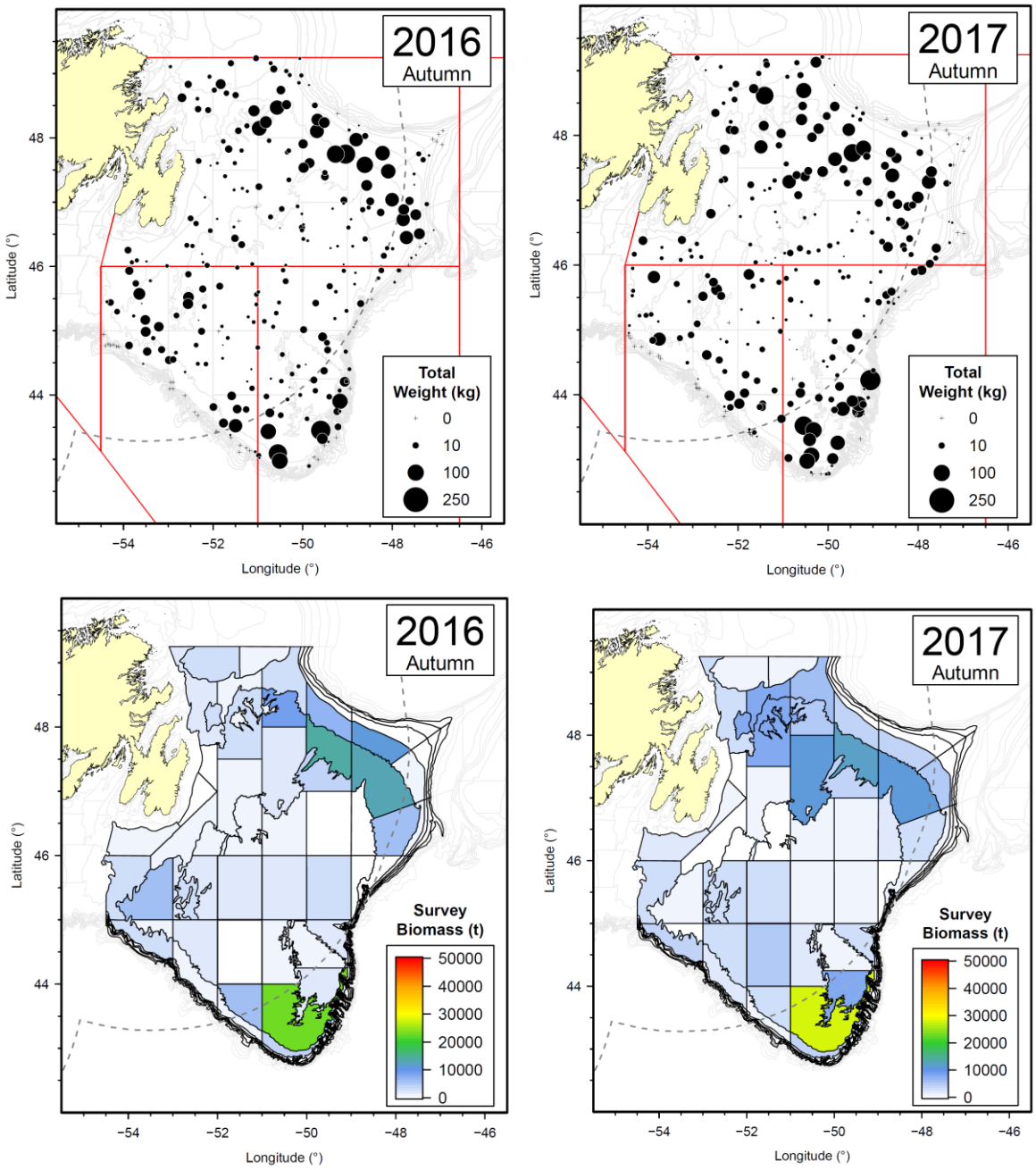

Fig. 14. Distribution of American plaice (top: kg per tow; bottom: biomass estimate for each strata) from Canadian autumn surveys in NAFO Divs. 3LNO from 2016 and 2017.

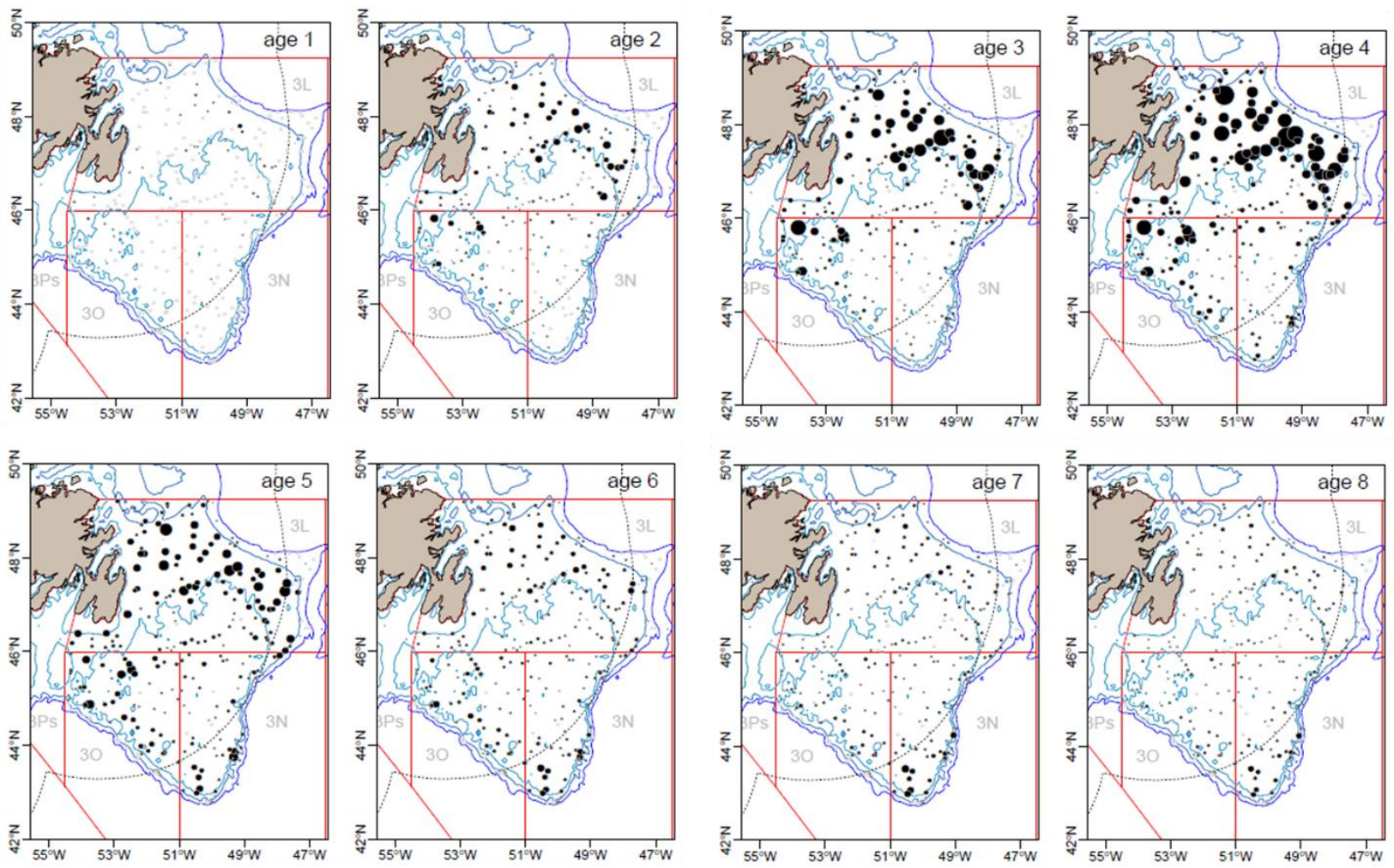

Fig. 15.Distribution (number per tow) of age 1-8 American Plaice in Divs. 3LNO from the Canadian autumn survey in 2017.

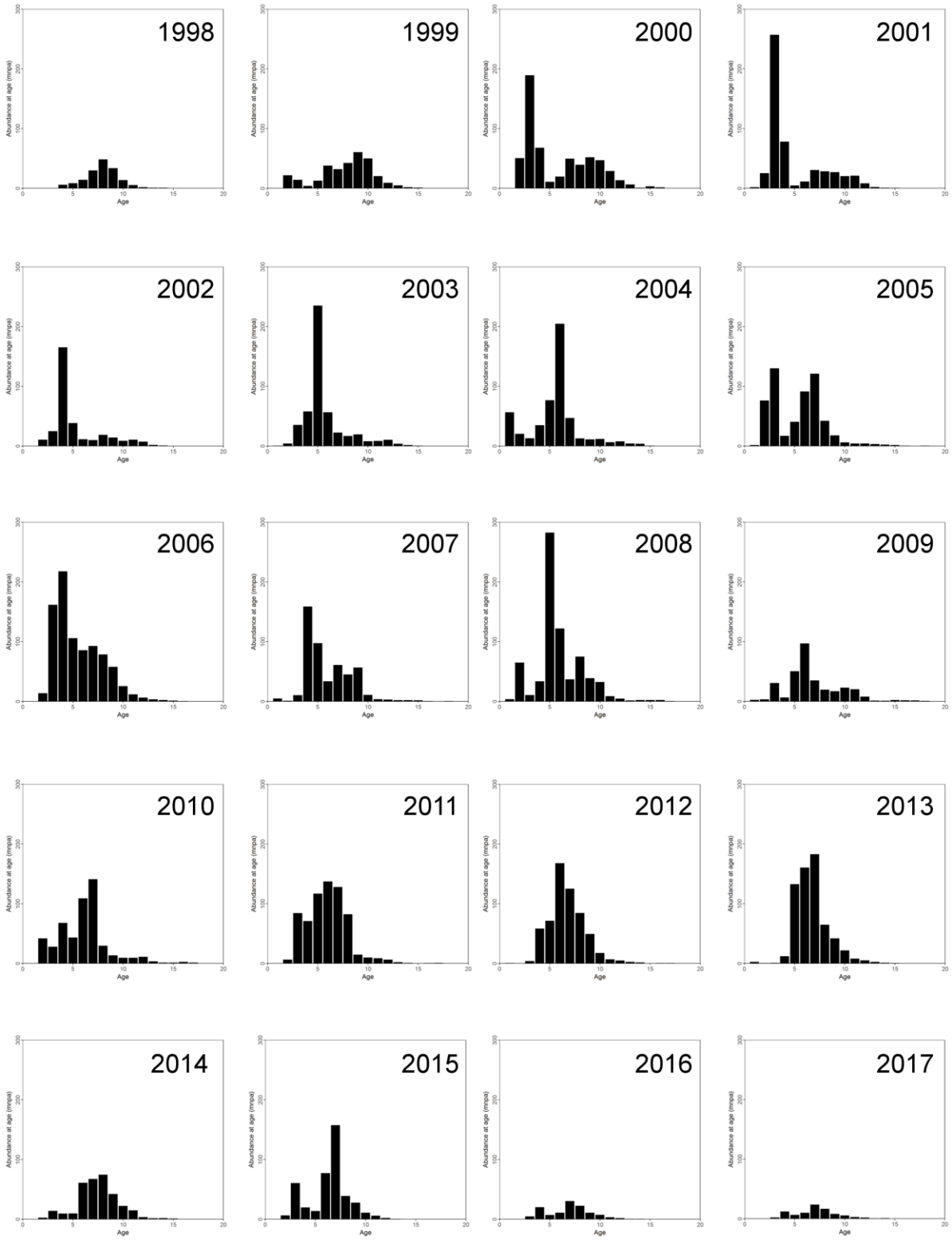

Fig. 16. Abundance at age (mean number per tow) from 1998-2017 in the EU-Spain surveys in Divs. 3NO.

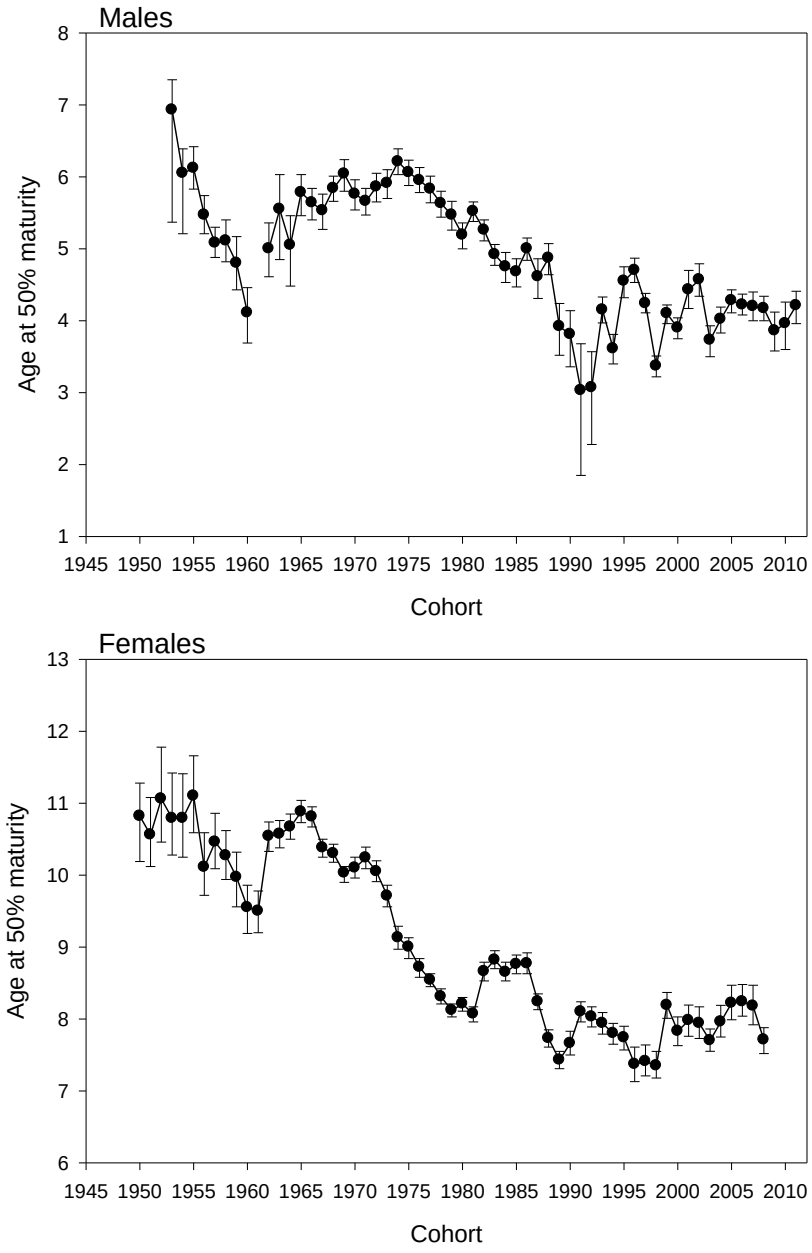

Fig. 17.Age at 50% maturity (± 95% fiducial limits) by cohort for male and female American plaice in NAFO Div. 3LNO.

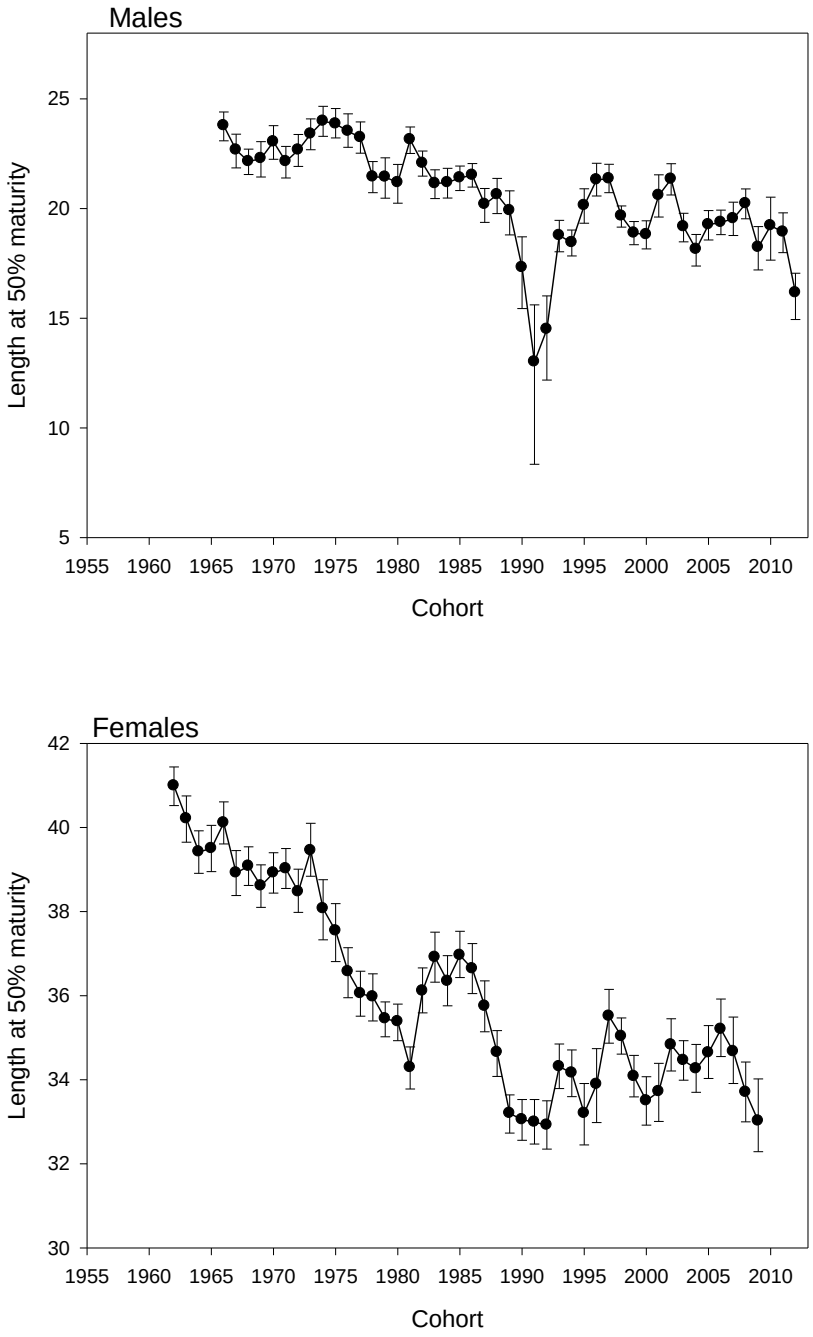

Fig. 18. Length at 50% maturity (± 95% fiducial limits) by cohort for male and female American plaice in NAFO Div. 3LNO.

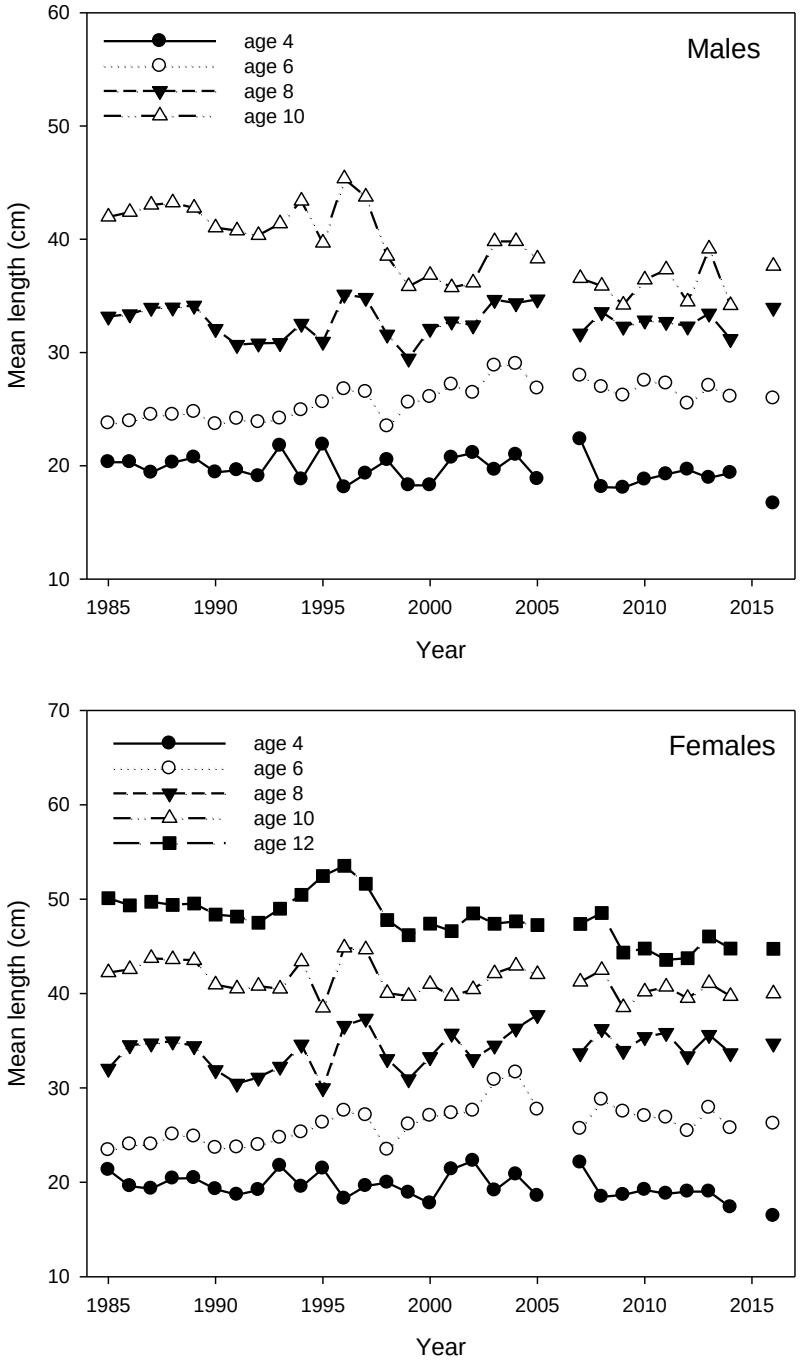

Fig.19. Mean length-at-age for selected ages of Div. 3LNO American plaice from Canadian spring RV surveys.

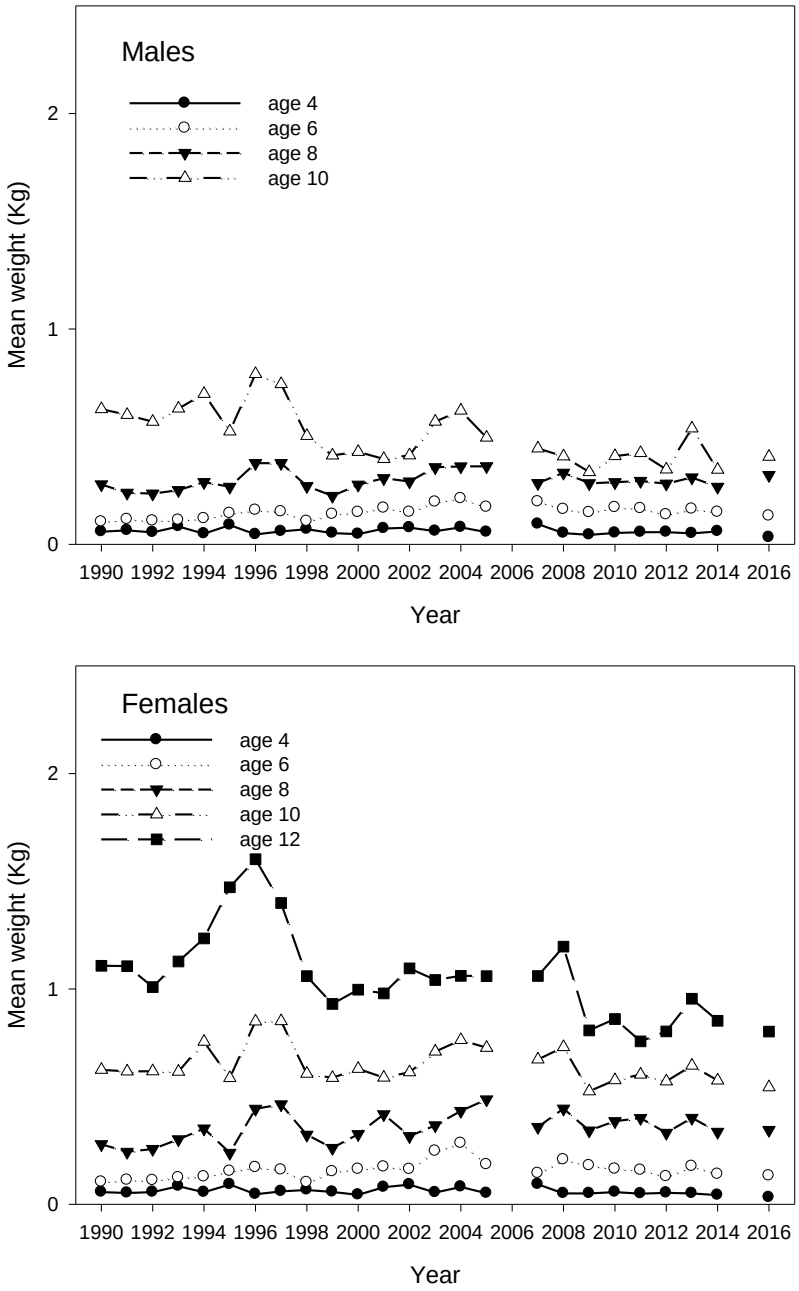

Fig. 20. Mean weight-at-age for selected ages of Div. 3LNO American plaice from Canadian spring RV surveys.

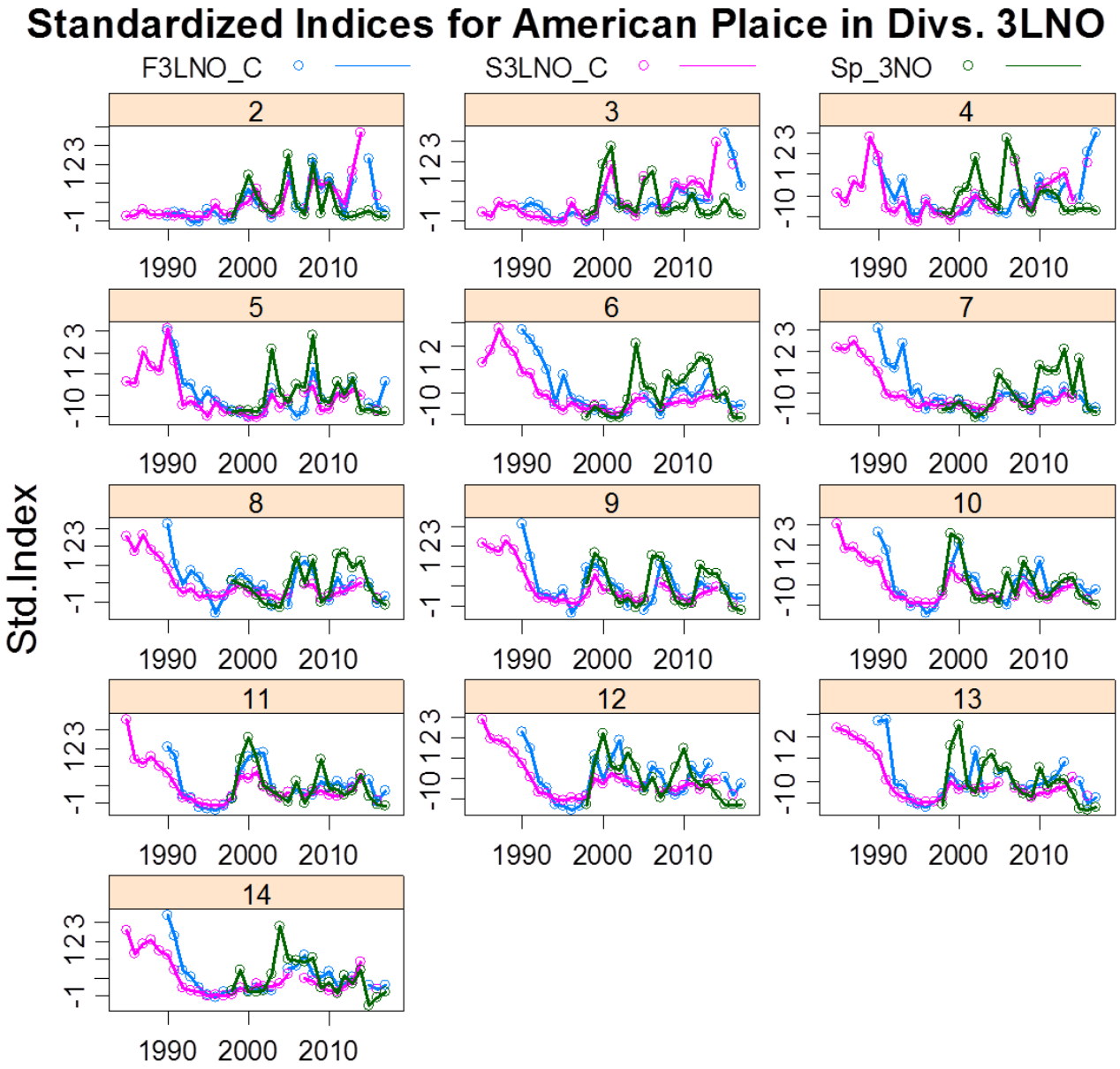

Fig. 21.Standardized age by age abundance between Canadian spring (S3LNO_C), fall (F3LNO_C), and EU-Spain (Sp_3NO) surveys.

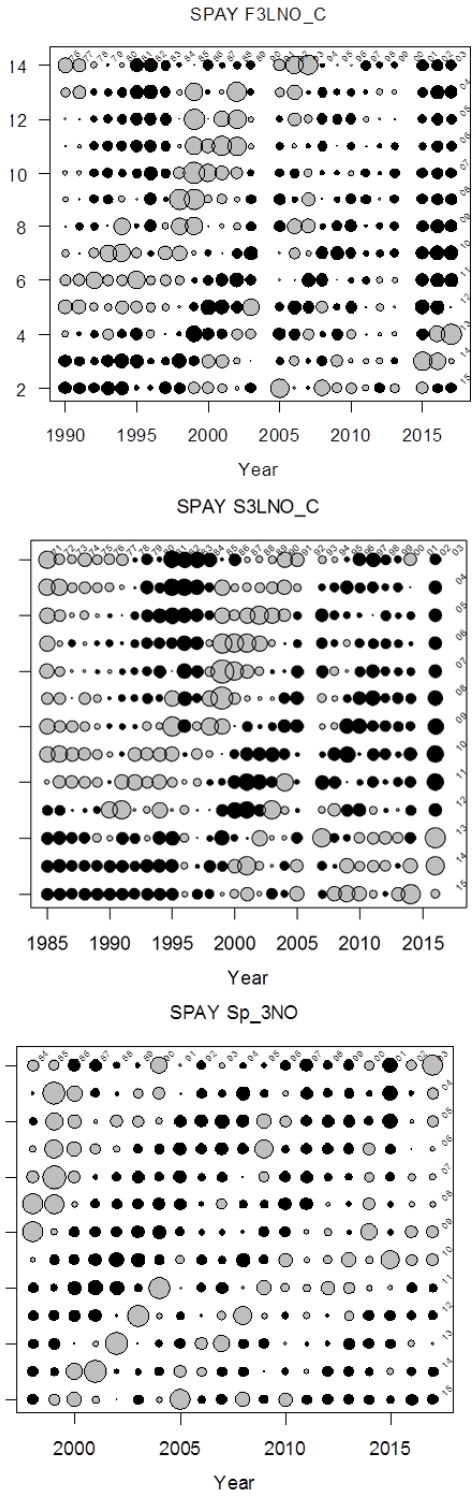

Fig. 22. Plots of standardized proportions by age across years (SPAY) for Canadian spring (S3LNO_C), fall (F3LNO_C), and EU-Spain (Sp_3NO) surveys. Grey indicates positive proportions, black show negatives.

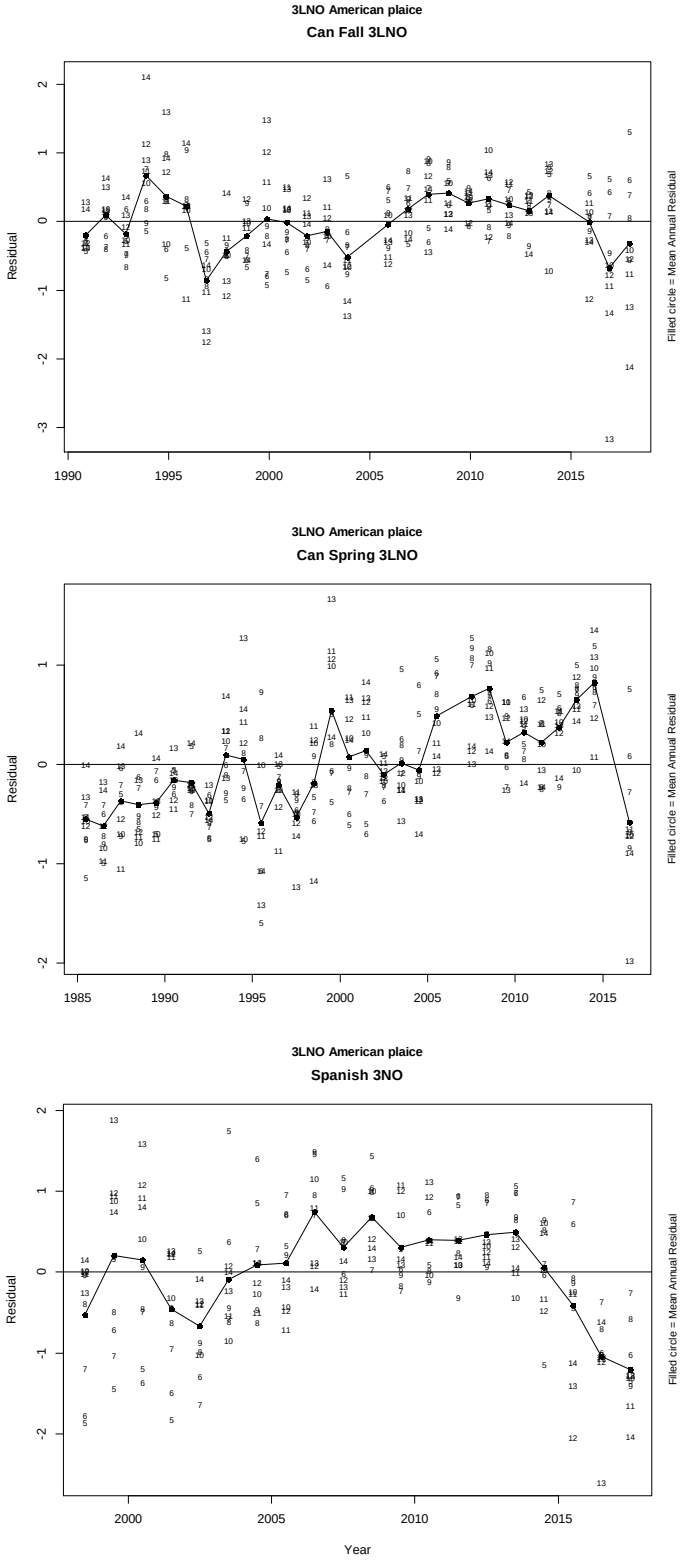

Fig. 23.Residuals by year (numbers represent ages) for Canadian autumn survey (top), Canadian spring survey (middle), and EU-Spain Divs. 3NO survey (bottom). Filled circle is the mean annual residual. Note the scales are different for each plot.

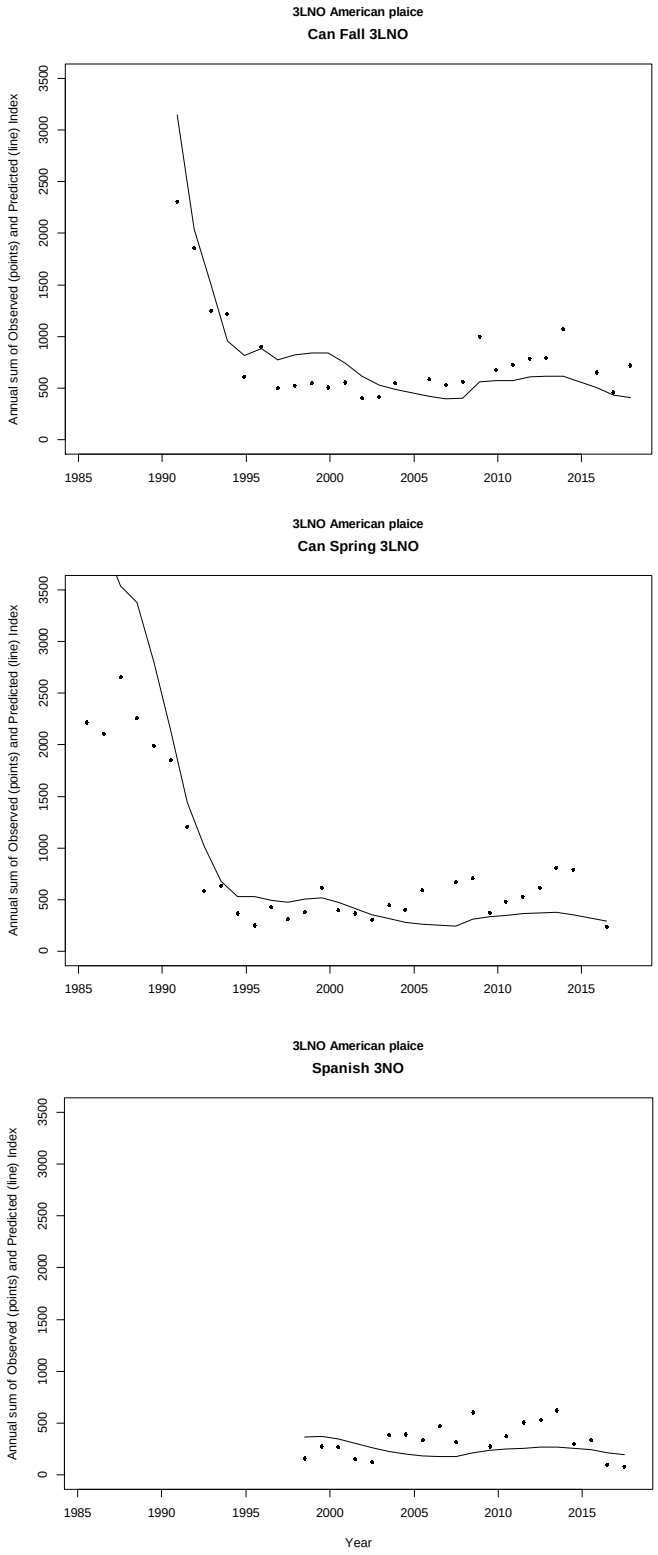

Fig. 24. Observed versus predicted abundance for Canadian autumn survey (top), Canadian spring survey (middle), and EU-Spain Divs. 3NO survey (bottom).

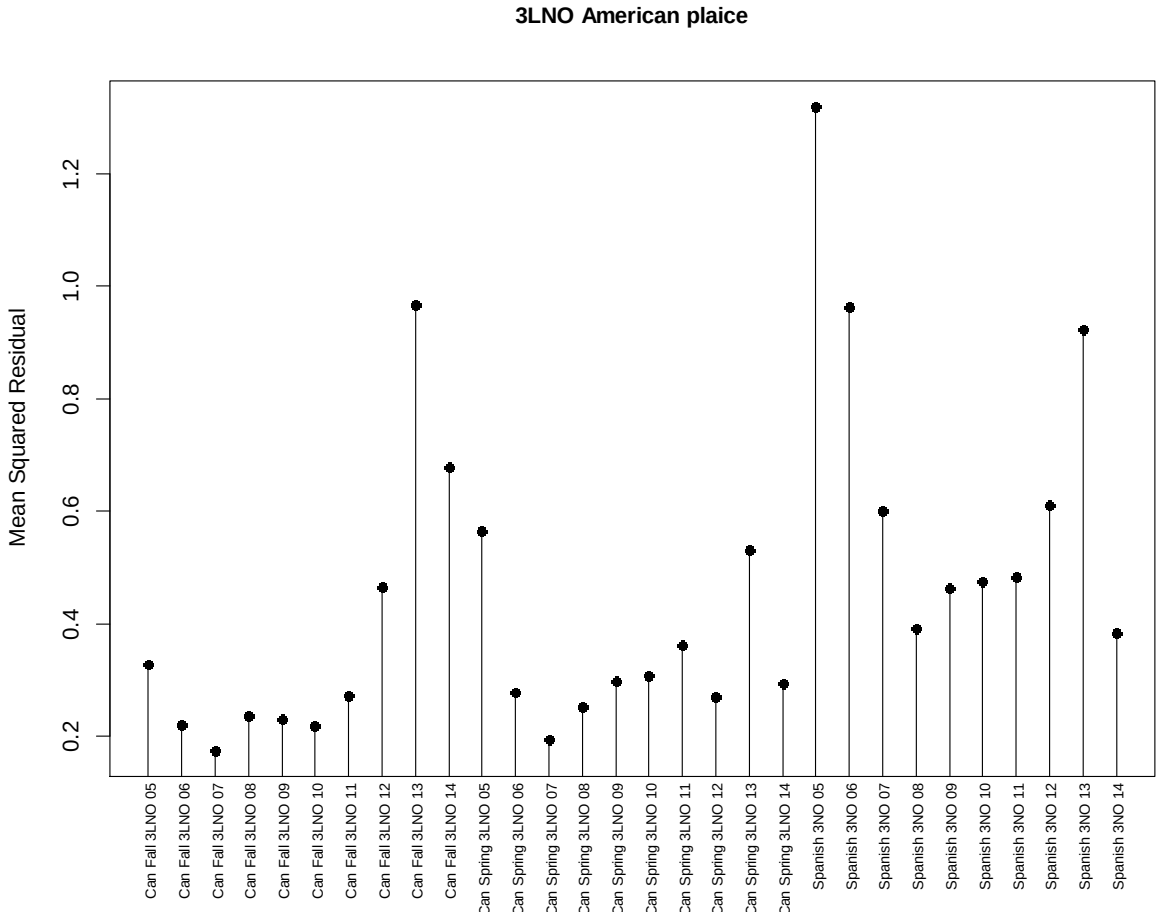

Fig. 25. Mean squared residuals by age for fall, spring, and EU-Spain Divs. 3NO surveys (MSE=0.46)

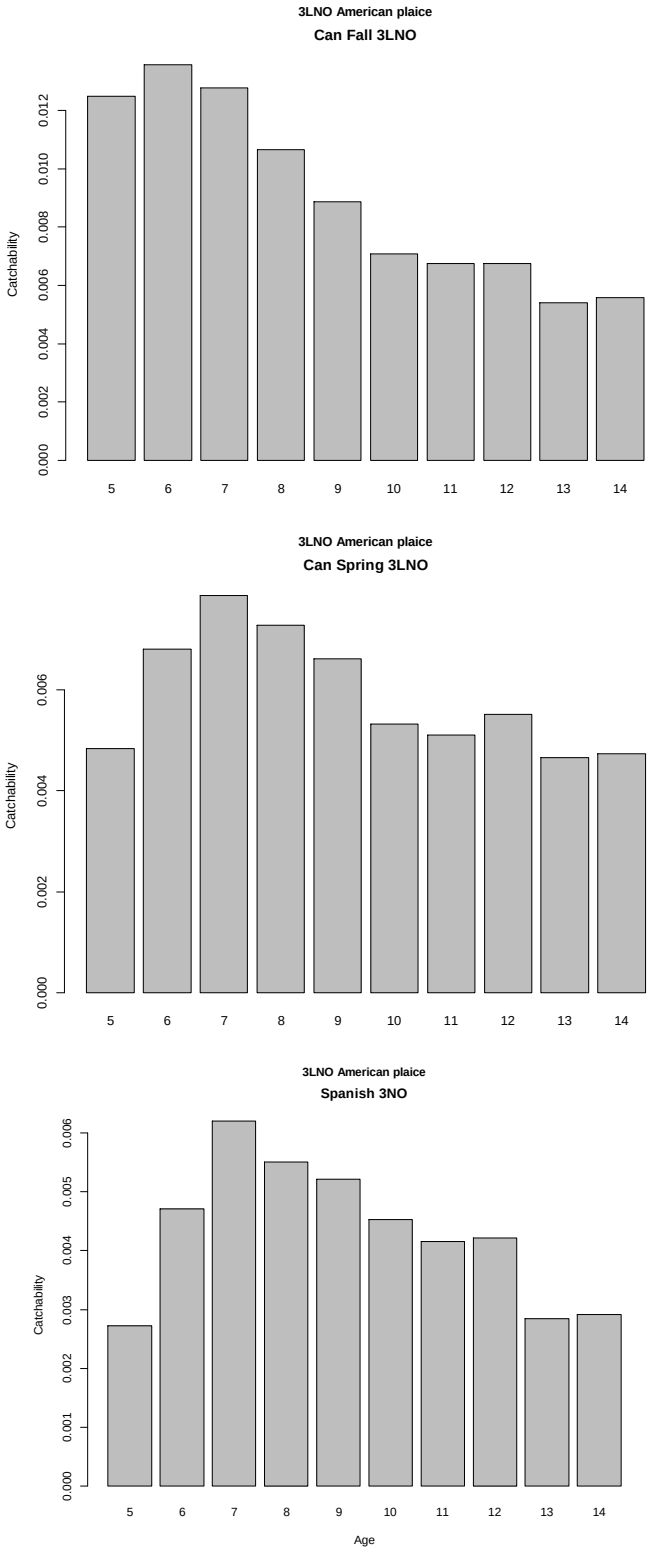

Fig. 26. Survey catchabilites (q) for each survey by age.

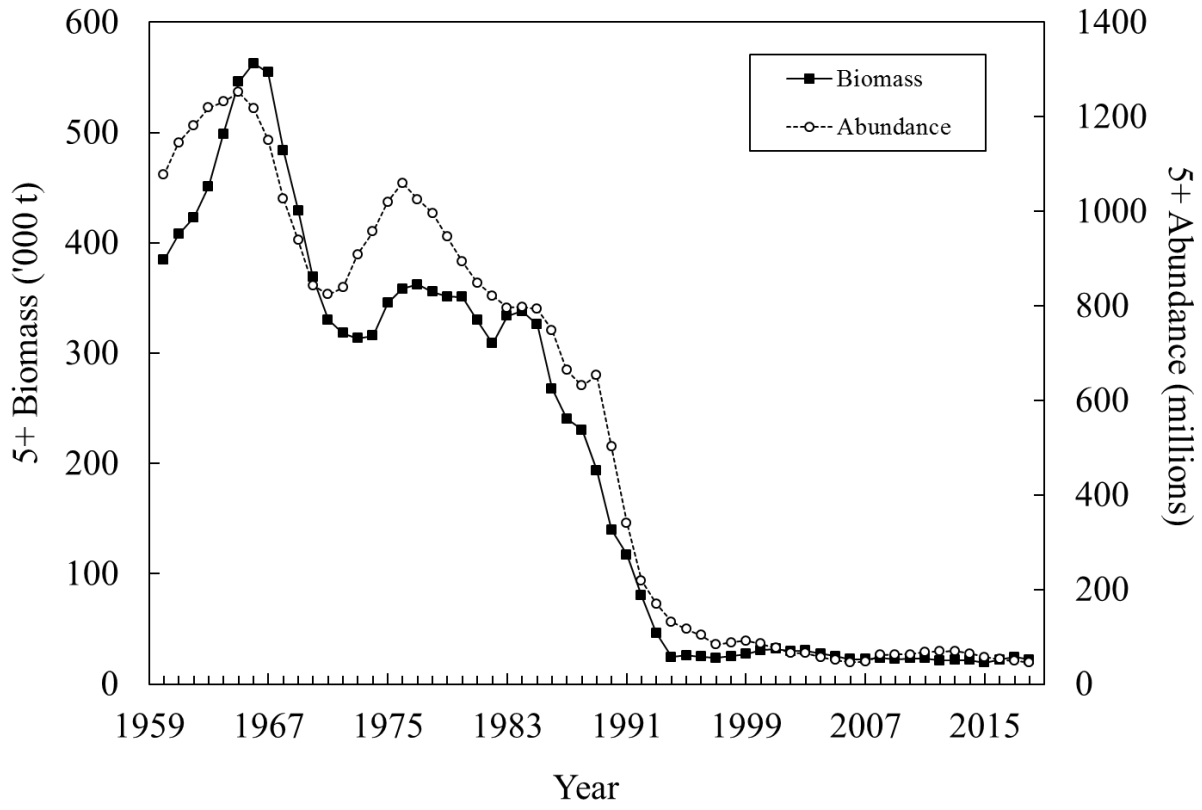

Fig. 27.5+ biomass and abundance from VPA

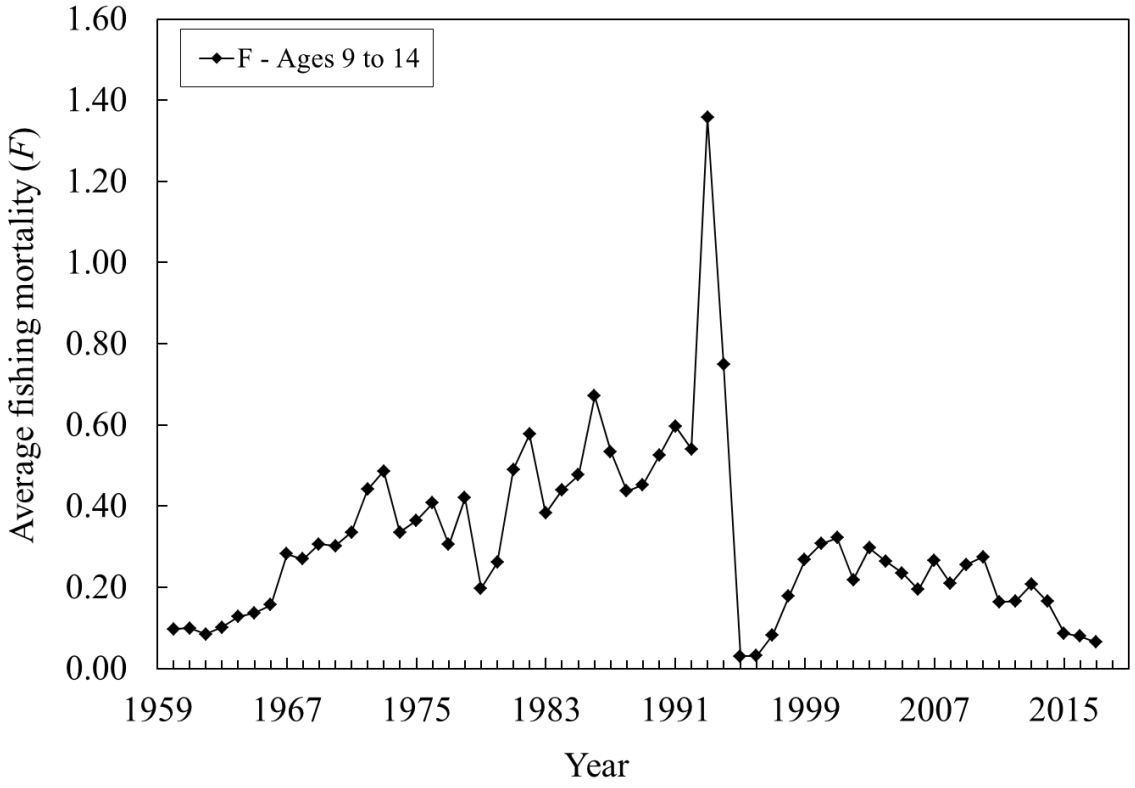

Fig. 28. Average fishing mortality (ages 9-14) from VPA.

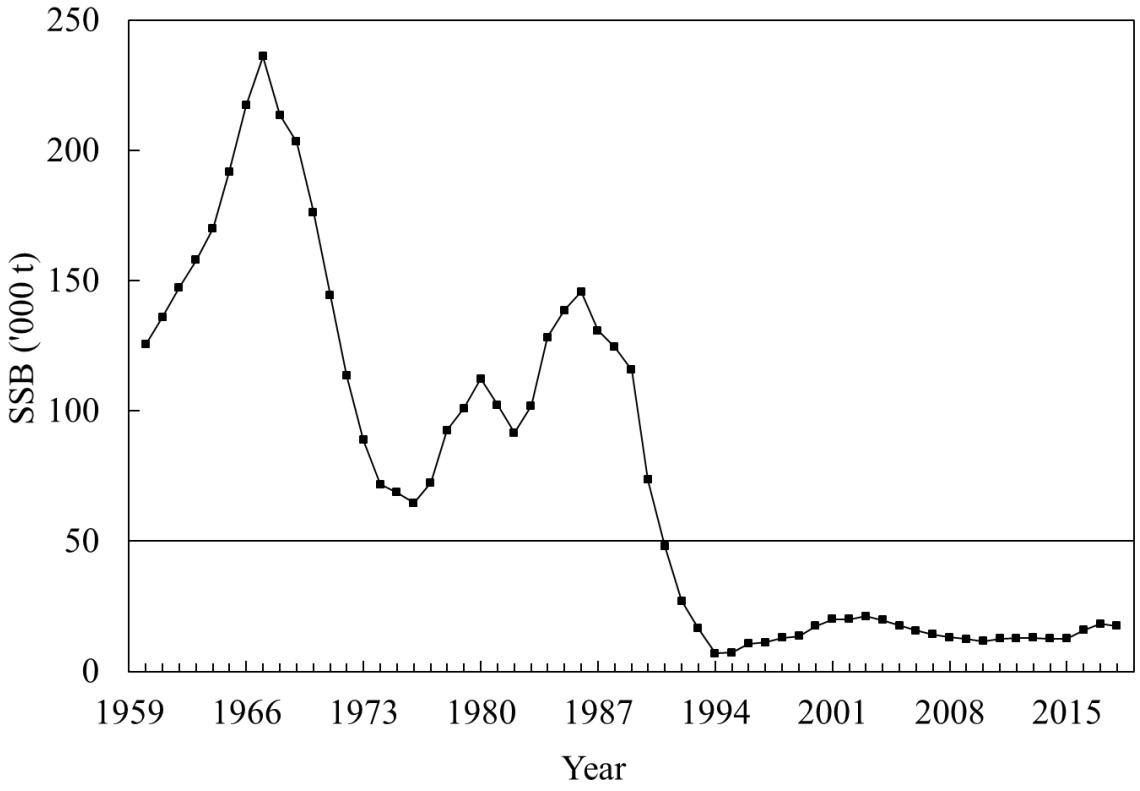

Fig. 29. Spawning stock biomass (SSB; '000 t) from VPA. Horizontal line represents B_{lim} (50 000t)

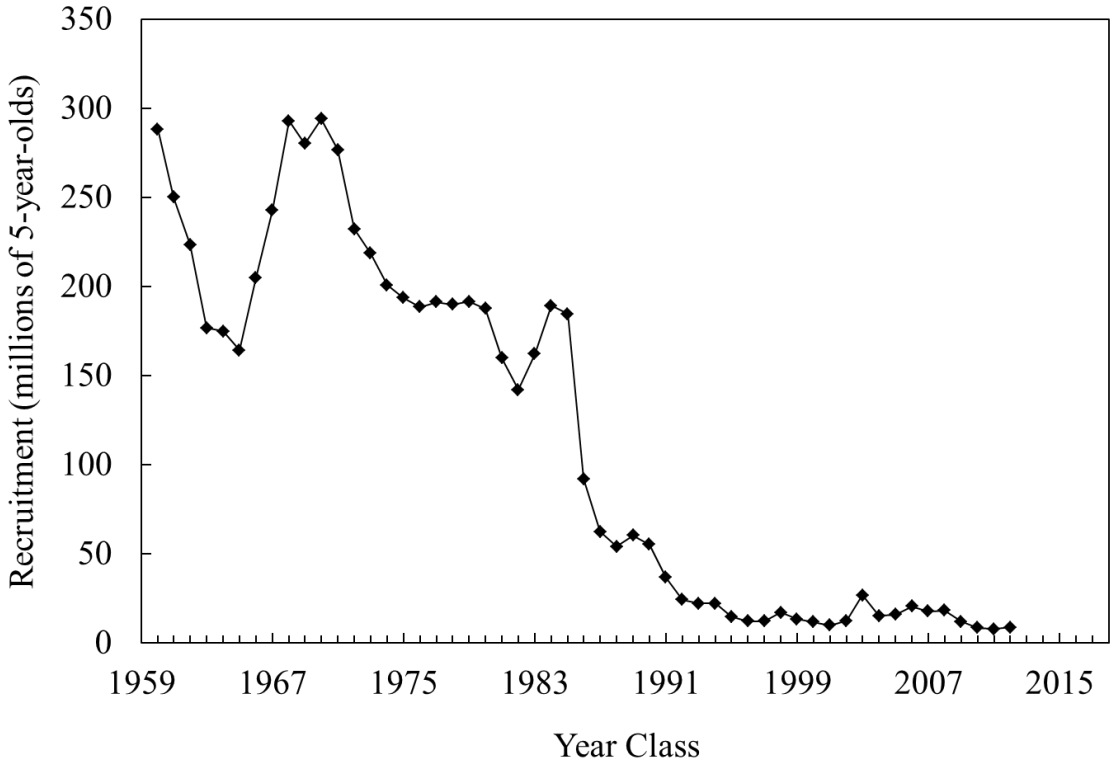

Fig. 30. Age 5 recruits (year class) from VPA.

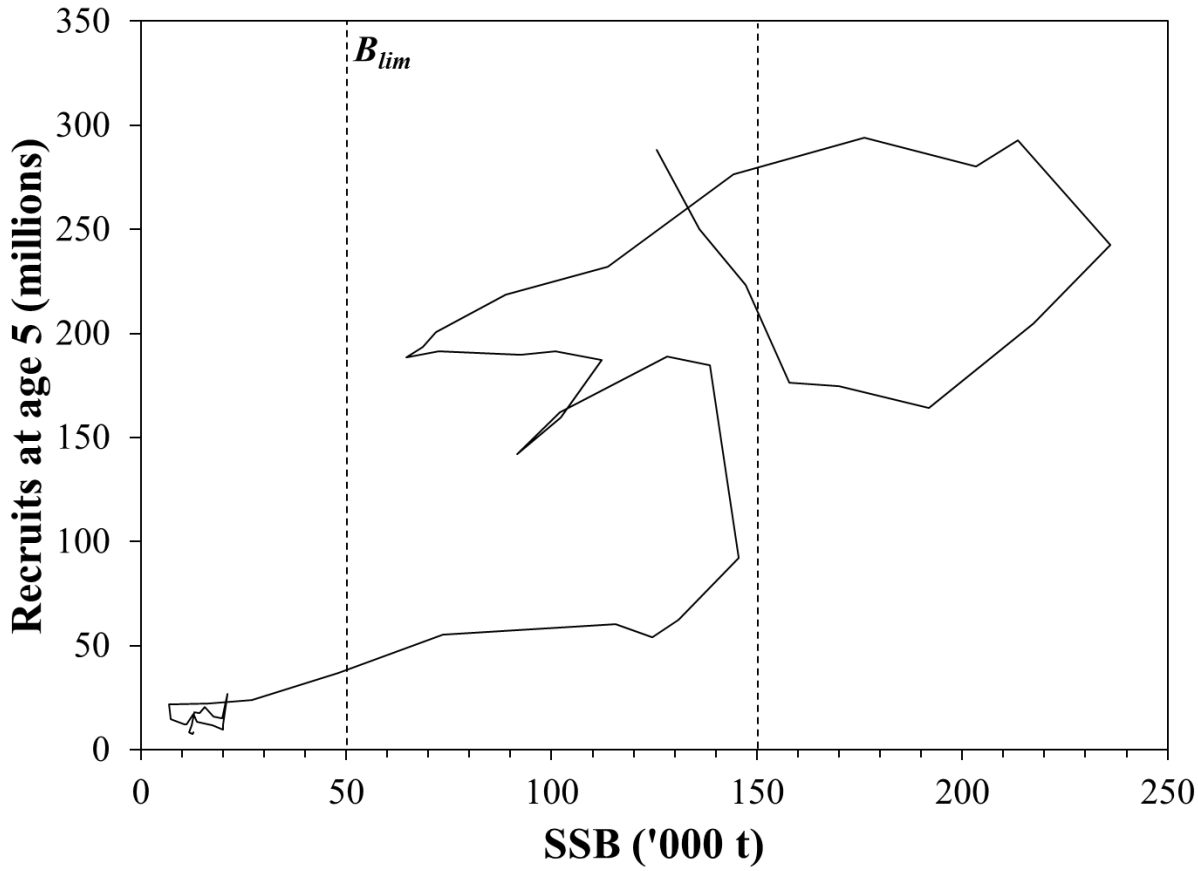

Fig. 31.Observed stock recruit scatter. Vertical line at 50 000 t illustrates B_{lim}, and at 155 000 t indicates SSB above which only good recruitment has been observed.

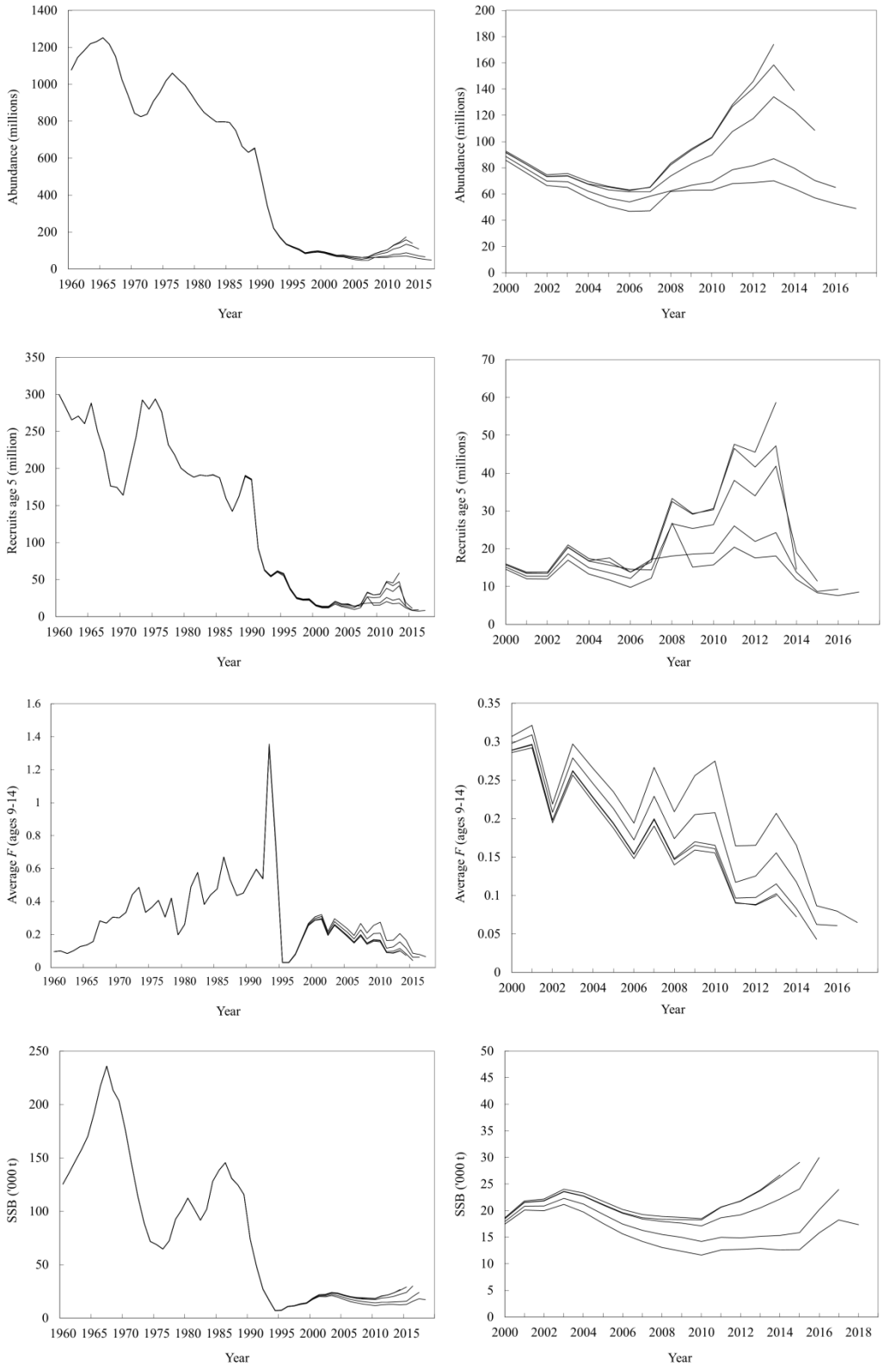

Fig. 32. Retrospective analysis of SSB, recruitment (abundance of age 5s), population numbers, and average F

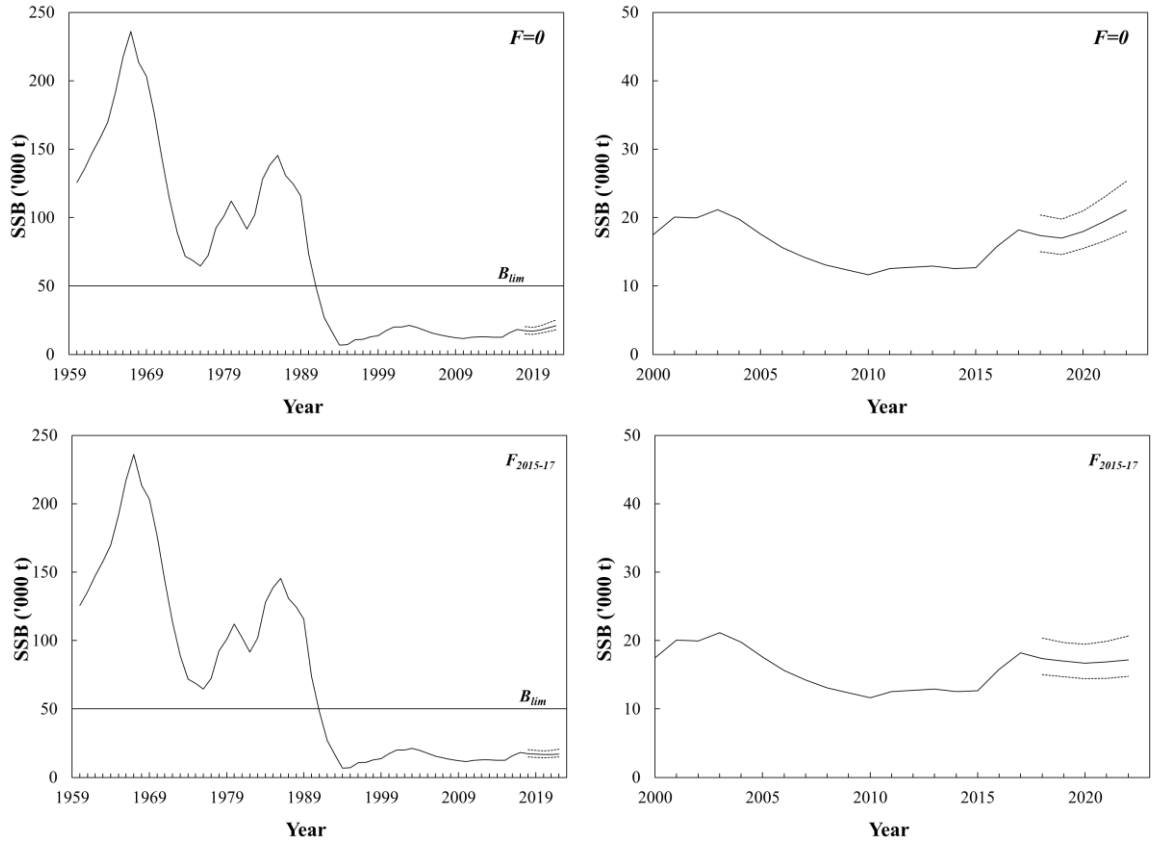

Fig. 33. American plaice in Div. 3LNO: Spawning stock biomass from projections along with 10th and 90th percentiles (dotted lines) for F=0 (left) and $F_{2015\text{-}17}$ (right).