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Greenland halibut (*Reinhardtius hippoglossoides*) in NAFO Subarea 2 and Divisions 3KLMNO: Stock Trends based on annual Canadian Research Vessel survey results during 1978-2006

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Abstract

Greenland halibut are widely distributed throughout the Labrador-eastern Newfoundland area. During the late 1970's and most of the 1980's they were found in relatively high abundance along the deep slopes of the continental shelf, particularly in Division 2G. They were likewise plentiful in the deep channels running between the fishing banks especially in Divisions 2H, 2J and 3K. By 1991 distribution in the northern areas was greatly reduced and most of the resource was located in Division 3K. In Divisions 2J and 3K where most of the Greenland halibut resource presently resides, the stock biomass was relatively stable until the mid 1980's after which it declined substantially to reach an all time low in the early 1990's largely precipitated by the disappearance of older fish from the population. From about 1995 the stock began to increase and continued to improve to 1999 based upon several strong, successive year-classes particularly those of 1993-95. By 1999 the stock declined again and by 2002, it reached its lowest point since the early 1990s. Subsequently, the overall stock has increased and current biomass indices in Divisions 2J3K are similar to the estimates from 1995-1999. Strong recruitment predicted in the 1990s has been overestimated, overexploited or both, and has not contributed growth to the stock as older, larger fish. Although estimates of spawning stock biomass are largely unknown, the annual biomass estimates of Greenland halibut > 70 cm in Divisions 2J3K have been near zero for more than a decade. This paper updates the Canadian research vessel survey results for 2006, and compares these results to prior observations. Although stock biomass has increased in recent years, this improvement has not come from any previous indications of strong recruitment. Recent estimates of recruitment suggest poor stock rebuilding prospects in the near future.

Introduction

The abundance and biomass estimates for Greenland halibut (NAFO Subarea 2 and Divisions 3KLMNO) from random-stratified research vessel (RV) spring and autumn multi-species surveys conducted by Canada are updated for 2006. Stratified mean number and weight per tow are updated for each division, as are age-disaggregated survey indices. In the autumn of 2006, Division 2G was not surveyed, nor were the deepwater strata within Divisions 3NO. Furthermore, due to mechanical problems on the RV *Wilfred Templeman*, several strata in the southern portion of Division 3K had reduced coverage. The spring 2006 survey in Divisions 3NO was not completed, due to mechanical problems with survey vessels. Brodie and Stansbury (2006) review the Canadian spring and autumn RV multi-species surveys in 2006, and provide additional detail regarding survey coverage and timing since 1995.

Materials and Methods

Canadian Research Vessel Surveys

Subarea 2(2G, 2H, & 2J) and Division 3K

Dwyer and Healey (2005) document the sampling design and sampling frequency in Subarea 2 and Division 3K over 1978-2004. In 2005, Divisions 2GH were not surveyed; however, all strata in Division 2J and Division 3K were completed. In 2006, Division 2G was not surveyed; two strata were not completed in Division 2H, and all strata in Division 2J were completed. In Division 3K, several strata in the southern portion of Division 3K had reduced sampling coverage; and one stratum was not surveyed. Beginning in 1996, inshore strata were added to the survey design in Division 3K (and Division 3L) and were surveyed in all years since except for 1999. Refer to Brodie and Stansbury (2006) for illustration of the current survey stratification scheme used in Canadian surveys.

Divisions 3L, 3M, 3N and 3O

Surveys have been conducted by Canada in Divisions 3LMNO for many years; however, prior to 1996 the maximum depth usually did not exceed 400 meters. Therefore, data collected on Greenland halibut were considered inadequate to describe distribution and abundance for this stock and were not used for assessment purposes. In 1996, the survey design was extended to depths of at least 730 meters, and where possible, to 1500 meters. The most extensive coverage of Division 3M was achieved in 1996; since then, only the deep-water strata in the western and northern areas of Division 3M have been included in the survey design. Beginning in 1996, inshore strata were added to the Division 3L survey. These strata have been surveyed in all subsequent years, except 1999 (no coverage) and 2006 (limited coverage).

Comparative Fishing Exercises

The Canadian autumn survey series has employed various survey vessels and gear types (Dwyer and Healey, 2005). In order to maintain consistency in the data time series with the introduction of the new research vessel *Teleost* (which replaced the *Gadus Atlantica*) and replacement of the standard *Engel 145'* High Rise survey trawls by the *Campelen 1800* Shrimp trawl, comparative-fishing trials were conducted. Data analysis and results of these exercises are presented in Warren (1996) and Warren *et. al.* (1997). Based upon conversion factors presented by Warren (1996) and Warren *et. al.* (1997), all data presented in this paper are in *Campelen 1800* trawl catch equivalents.

Data conversions for the *Engel 145'* trawl used in surveys in Divisions 3LMNO have not been conducted due to poor coverage of depths where most Greenland halibut are encountered.

Survey Coverage and Timing

Fall survey coverage details by NAFO division and depth zone for the true *Campelen 1800* surveys from 1996-2006 are presented in Table A. Similar information for the 1996-2006 spring surveys are presented in Table B. Multiple coverage deficiencies are of particular significance in assessing the status of this stock: sporadic coverage of Divisions 2GH during fall surveys, an incomplete survey of Division 3L in the fall of 2004 (see Healey and Dwyer 2005), incomplete coverage of Divisions 3NO during the spring 2006 survey, no survey of Division 3M during 2004 and 2005 fall surveys and irregular coverage of the deep-water strata of Divisions 3NO.

Due to mechanical problems with the survey vessels, the duration of the survey period has lengthened in recent years. This probably affects the survey estimates of Greenland halibut stock size, as it has been shown that the highest catch rates in the fishery have been in the early winter period (see Power, 2004). Healey and Dwyer (2005) note that “*Variable survey timing adds another layer of uncertainty in assessing this stock.*” An additional complicating factor is that vessel breakdowns have led to annual variations in the survey coverage by each vessel (e.g. *Teleost* surveying areas typically covered by the *Wilfred Templeman*). No adjustments for such timing changes or vessel differences have been made. These sources of survey variation are discussed in greater detail by Brodie and Stansbury (2006).

Trends in Stock Size

Survey estimates of stock abundance and biomass are computed using standard stratified estimators, along with the average number and weight for each survey tow. Approximate confidence intervals (95%) are provided for the stratified mean number and weight per tow, computational details can be found in Smith and Somerton (1981). Note that there are several instances when the lower confidence bound of these indices is negative. This is incorrect (obviously, the lower bound should always be greater than or equal to zero), and is a consequence of violating the distributional assumptions used to produce these confidence intervals. This result commonly arises when a limited number of large catches are taken by the survey. See Evans et al. (2000) for an alternate method of estimating the variability of stratified survey indices.

For purposes of consistency, otolith numbers for age-length keys for Division 2GH combined, Division 2J3KL combined, Division 3MNO combined were applied to the respective individual divisions (Table C), in order to obtain estimates at age. This was done except in cases where more than one division was used (for example, Division 2J3K combined – otoliths were only used from Division 2J and 3K) or when spring samples were used (see Table D).

Estimates of mean biomass at length per tow are computed by converting mean numbers at length per tow and transforming to biomass using annual length-weight equations (sexes combined) from 1990-2006. These relationships were calculated using the model $W=aL^b$; resultant estimates are shown in Table E. For the years 1978-89, the 1990 estimates were applied. The R^2 value was high for each relationship (Table E), but in most years tended to underestimate weight for the longer fish in the population, indicating that the biomass is underestimated slightly in the very longest fish in the population. We emphasize that this underestimation is problematic only for the biomass-at-length results.

Results and Discussion

Geographic Distribution

Figure A shows the area covered by this survey and place names referred to in the text. Figure 1 contains distribution plots for the most recent two fall surveys, 2005 and 2006, and for comparison, distribution plots from 1991 (small catches throughout Divisions 2J3K) and 2001 (widespread distribution within 2J3K, large catches along entire slope edge). Distribution patterns in 2005 and 2006 are quite similar to that in 2001, yet the average catch per set has declined. One notable distinction is that catches are now smaller along the entire slope edge (see 500m, 1000m contours). Stock distribution in 2006 was similar to that in 2005, but catches in Divisions 2J were higher in 2006, particularly within the Hawke and Cartwright channels. Large catches were also observed in Division 2H in 2006 in the Hopedale channel, and catches remained high throughout the Funk Island Deep. Abundance in the Flemish Pass (Division 3LM deepwater) is relatively low, despite the concentration of fishing effort in this area.

Trends in Stock Size

Biomass and abundance indices for Division 2G (by stratum) are presented in Tables 1 & 2, respectively; Tables 3 & 4 for Division 2H; Tables 5 & 6 for Division 2J; Tables 7 & 8 for Division 3K; Tables 9 & 10 for Division 3L fall; Tables 11 & 12 for Division 3M; Tables 13 & 14 for Division 3N fall; Tables 15 & 16 for Division 3O fall; Table 17 for Division 3L spring; Table 18 for Division 3N spring; and Table 19 for Division 3O spring. Survey coverage may also be inferred from these tables by examining the number of strata which do not contain survey results. (Table entries with “.” indicate that the stratum was not covered by at least two successful fishing sets, whereas values of 0 indicate the stratum was surveyed with no Greenland Halibut captured.)

Within Divisions 2GH, the temporal coverage of the survey has been irregular. Although Division 2G has not been surveyed since 1999, the biomass and abundance results (Tables 1 and 2, respectively) are provided. In Division 2H, the biomass index (Table 3) declined from 1978 through the late-1980's (excluding 1979 which was considered to be an anomaly). The index has generally increased since then, and the 2006 estimate of survey biomass is now the second largest in the time-series, exceeded by only the 1979 value. The time-series of abundance estimates for Division 2H (Table 4) are not consistent with the trends in biomass, particularly for the earliest data, although the estimates from the most recent two surveys in 2004 and 2006 are amongst the highest in the series.

Unlike Divisions 2G and 2H, the annual survey series is continuous over 1978-2006 for both Divisions 2J and 3K. In Division 2J the biomass index was generally stable from 1978-84 (Table 5a and b). It then declined to reach a minimum in 1992, increased marginally until 1995 after which time it began to increase more rapidly due to improved recruitment. In 1999 the index declined again but remained stable from 2000-2005. The index increased considerably in 2006 (1.75 times larger than 2005 biomass index), resulting primarily from substantial increases in just two strata in Hawke Channel (strata 208 and 227). In the most recent five surveys, these strata have, on average, contributed 16% to the estimated Division 2J biomass. In 2006, they account for almost 50% of the biomass estimate. Estimates of abundance were variable throughout the late 1970's and 1980's (Table 6a and b). This index increased considerably through to the mid-1990's, and the estimated abundance has again been variable at a relatively high level in the past decade. The 2006 result is the second highest in the time-series, but as with the biomass index, is largely influenced by large catches in two of the survey strata. It is noteworthy that the abundance index for Division 2J suggests that current estimates are much higher than earlier (1978-1990) observations. However, the biomass index for Division 2J suggests the opposite, indicative of a substantial change in the size/age composition of survey catches.

In Division 3K, the biomass index was variable over 1978-89 at a relatively high level (Table 7a and b). By 1992, it had declined by over 50%, and remained low until 1995. After this time, the biomass index increased rapidly due to recruitment of the strong 1993, 1994 and 1995 year-classes to the survey, increasing steadily until 1999, the highest value in the time series (Table 7a and b). The index decreased rapidly over 1999 to 2002, but has subsequently increased. Recent increases could be partly attributed to the survey continuing beyond the scheduled completion time, and into early winter (Brodie and Stansbury, 2006). Analyses of commercial data have shown that catch rates have been highest in early winter (e.g. Power, 2004). The 2006 survey, which was completed on schedule, estimated the current biomass to be roughly equivalent to the 2005 value. The Division 3K abundance index (Table 8a and b) indicated an increasing trend over most of the 1980's through to the late 1990's. However, since 1996, the abundance index has decreased, and the 2005 and 2006 values are approximately half of the survey estimated abundance over 1998-2001 (i.e. subsequent to the highest estimates of abundance driven by the 1993-1995 cohorts). Observe that recent increases in the Division 3K biomass index were not precipitated by increases in the estimated abundance.

The fall survey biomass indices for each of Divisions 3L, 3M, 3N and 3O are shown in Tables 9, 11, 13 & 15, respectively. The biomass index in Division 3L has declined from the relatively large values from the late 1990's and recent values indicate an increasing trend. Recent estimates of abundance (Table 10) have been relatively stable. Survey coverage has varied from year to year in Divisions 3MNO (Tables 11, 13 & 15, respectively), particularly so in deeper waters where higher concentrations of Greenland Halibut are typically found. Nevertheless, biomass estimates for these divisions have been declining over the past number of years. Recent estimates of survey abundance indices for Divisions 3M, 3N and 3O (Tables 12, 14 & 16, respectively), are relatively low. The overall combined biomass estimate for Divisions 3LNO is low in proportion to the Subarea 2 + Division 3 total (11% for 2006).

Stock size estimates for the Divisions 3L, 3N and 3O spring survey series are shown in Tables 17, 18 and 19, respectively. Each of the estimated biomass indices has declined substantially relative to the late-1990 levels, but recent estimates have some improvement since 2002. Values remained low through 2006. Abundance estimates from Divisions 3L, 3N, and 3O spring surveys have been generally declining since the late-1990's. As noted previously, during the spring of 2006 very few strata within Divisions 3NO were completed, and those covered were at relatively shallow depths (refer to Tables 17-19 for strata coverage).

Stratified Mean Number and Weight (kg) Per Tow by Division

Mean weights and numbers per tow (MWPT and MNPT, respectively) by division are presented in Tables 21a-g and 22a-g, respectively. Mean weight per tow by division with approximate 95% confidence intervals are also plotted in Figure 2. The mean weights per tow show similar trends to the annual swept area biomass series for all Divisions, although some estimates of MWPT and MNPT are substantially biased due to the previously noted deficiencies in survey coverage.

MWPT estimates were highest in the late 1970's for Division 2G and 2H (Table 21a; Figure 2a) then declined to the lowest value in each time series in 1991. Within Division 2H, increasing MWPT has been observed in more recent

surveys; the 2006 result is the third largest in the time-series. The MNPT trends in each Division (Table 22a) have been similar to the MWPT results.

For Division 2J and 3K, the MWPT are given in Table 21b, as well as Figure 2a. In each division, the MWPT index declined from relatively high estimates of the early 1980's to reach an all time low in 1992. Over the next several years it increased to a peak in 1999 approaching the levels recorded in the early 1980's for Division 3K, compared to about 50% of the early 1980's level for Division 2J. A decline in MWPT from 1999 to 2000 was measured in both Divisions 2J and 3K. The index in Division 2J was stable over 2000-2005, but increased substantially in 2006. However, within Division 3K, further declines were observed until 2002, and the index has subsequently increased in each of the past four years. The MNPT results from Divisions 2J and 3K (Table 22b) have been generally consistent over time, but as noted above, recent results indicate a divergence, particularly since 2002. Consider that the 2006 MNPT estimate in Division 2J is approximately 80% of the peak (1996) value. In Division 3K, however, the 2006 MNPT estimate is only 36% of the maximum (again, 1996) value.

A comparison of mean weight per tow estimates between spring and fall surveys in Divisions 3LNO during 1996-2006 (1995 for Division 3L) is presented in Table 21c-e and Figure 2b (mean number per tow found in Tables 22 c-e). All series indicate substantial declines from the peak values of the late 1990's. Although slight increases have been recorded in Division 3L in recent years, declining trends are continuing within Divisions 3N and 3O. We emphasize that indices from fall surveys in Divisions 3NO may not be reliable indicators of the resource due to variations in the survey coverage of the deepwater over the time-series. In addition, recent problems in completing the surveys have affected the coverage of these divisions (e.g. Division 3L in autumn of 2004, Divisions 3NO during 2006 spring survey). The MNPT results (Tables 22 c-e) are similar to the MWPT, and all indices have been declining since the late 1990's. Contrary to the MWPT results, no recent increases MNPT have been measured within Division 3L.

The MWPT index from Division 3M (Table 21f and Figure 2c) has generally been declining since 1998. Note that this index includes only those strata which are part of the current survey design, located along the western slope of the Flemish Cap (strata 528-536). Similar trends have been measured in MNPT (Table 22f), and the 2006 MWPT and MNPT are the second lowest values in the time-series.

Table 21 g and Figure 2d shows a comparison of mean weight per tow in Divisions 2J3K and Divisions 2J3KL from 1995-2006 (for 2J3KL, we re-iterate the proviso that the 2004 estimate is biased due to incomplete coverage). In general, each of these indices increased up until 1999, subsequently decreased to 2002, and have consistently increased since 2002. The Division 2J3K MWPT index resemble trends from that Division 3K more closely as Division 3K comprises a larger area. Figure 3 compares the mean weight and number per tow for Divisions 2J and 3K combined for the entire time series. There was little trend in mean number per tow (Table 22h and Figure 3) up until the early 1990's, after which there was an increase in the index peaking with the highest level observed by 1996. Subsequent to this, the index has steadily declined.

Trends in Mean Biomass Per Tow by Size Category

Most of the stock biomass resides in Divisions 2J and 3K combined (Tables 23a and 23b) and these divisions comprise the longest time series of annual survey data throughout the stock area. In order to illustrate the mean biomass per tow trends for important size categories from 1978-2006, the data were combined for Divisions 2J and 3K (Fig. 4). Figure 4 shows trends in mean biomass per tow for Greenland halibut <30 cm, between 31-69 cm and >=70 cm. The value of 30 cm was chosen as it is approximately equal to the mean length at age 4 for Greenland halibut surveyed in Divisions 2J and 3K; it represents the recruitment to the fishery in the following year. The value of 70 cm was chosen because it is considered to be an approximation of the length at 50% maturity in female Greenland halibut.

The results presented in Figure 3 indicated that the total stock (as represented by the Division 2J3K index) began to rebuild after 1995 and by 1999 approached near historic highs of the early 1980's. It declined again since then and by 2002 and 2003 was near the low level that it was during the early 1990s. Since then it is clear that any improvement in the stock has not come from the spawning stock biomass. The relatively strong 1993-1995 cohorts can be seen in the improved biomass trends in the <30 cm class from 1995-1998, which translated to a substantial increase in the 30 cm-70 cm length class in the latter half of the 1990's. This increase was not sustained, and by 2002 the 30-70 cm class had returned to the levels of the early 1990's. It was anticipated that as the recruits from 1993-1995 year classes added

growth, the contributions to the stock biomass should shift back to the more usual size compositions assuming normal recruitment patterns. However, this is clearly not the case, suggesting that either the strong recruitment was overestimated, overexploited or both before contributing growth to the stock as older, larger fish. This figure also characterizes an unusual situation arising from recent fall surveys: a significant increase in the 30-70 cm class which was not precipitated by any evidence of recruitment in the <30 cm length class. The 2006 biomass per tow result for Greenland Halibut ranging from 30-70 cm is more than double the 2002-2004 average. Such increases are consistent with indications of improvement in the commercial CPUE from various fleets throughout the stock area (Brodie et al. (2007), Fernández et al. (2007), and Vargas et al. (2007)). The current biomass estimate of the < 30 cm size group is amongst the lowest in the Campelen time-series.

During the late 1970s and early 1980s Greenland halibut greater than 70 cm contributed about 20% to the estimated trawlable stock biomass. However, after 1982 this size category declined to the point that by 1991 virtually no Greenland halibut in this size range contributed to the estimates of stock biomass. Since 1991, this value continues to be at or near zero.

Age Composition

Annual stratified mean number per tow at age compositions from the Divisions 2J and 3K combined time series from 1978-2006 are presented in Table 23 and Figure 5. (The 2005 values in this table have been revised slightly from those reported in Healey et al (2006).) Although Greenland halibut were caught as old as 19 years, very few were ever caught older than 12 years with the age structure fairly consistent from about 1978-88 (Tables 23a and 23b). Since then the older ages began to disappear from the survey catches entirely and by 1995 none were caught older than 11 years. After 1995 some older fish again began to appear in the surveys at least up to 14 years old which continued into 2006 (Table 23b). For ages 1-4, the population abundance increased considerably during the mid-1990s as the large 1993-95 year-classes (Table 23b; Fig. 5) recruited to the survey. The mean number of fish per tow peaked in 1996 then declined to 1993-95 levels by 1998-99. The increase in the youngest ages did not translate into substantial increases in ages 5+, and the abundance of ages 5+ (upon which most commercial fishing takes place) remains low, but has increased over 2002-2006 (Table 23). The most recent two estimates of the recruiting age groups have been much lower than any of the estimates from the previous decade. Improvement in the 2006 recruitment value over the previous year results from a relatively large MNPT estimate of age 1's in 2006. The results for age groups 2-4 are consistent with the poor estimates obtained in the previous survey. The mean number per tow estimate from the fall surveys of Division 2J3KL is shown in Table 24. Trends are generally consistent with the Division 2J3K index.

Age compositions (mean numbers per tow) of Greenland halibut by division from actual Campelen 1800 Shrimp trawl surveys during 1996-2006 are shown in Table 25a and 25b. The data are combined for Divisions 2GH, Divisions 2J3K, Divisions 3LM, and Divisions 3NO as abundance at age (Figure 6) to illustrate the dominance of Divisions 2J3K with respect to the overall stock size and percent at age (Figure 7) to highlight the importance of the various year-classes to stock abundance. The 1993-95 year-classes are clearly dominant throughout the area over several years. The 2000, 2001 and 2002 year classes appear to be about average, at least at very young ages. Subsequent year-classes appear to be poor. Age compositions are also shown for the Div 3LNO combined spring series (Figure 8). The 1995 year class is strong, as are the 1993 and 1994 year classes. None of the subsequent year classes appear as strong at similar ages.

A comparison of age distributions of the spring and fall surveys in Divisions 3LNO during 1996-2006 is shown in Figure 9. Few fish older than age 8 are caught, reflective of depth fished (Table B). The distributions are largely similar for surveys with similar coverage: when fall survey coverage included depths to 1500 m (e.g. 2002), the data are dominated proportionately by older fish than the shallower spring surveys (Figure 9). In surveys covering only the shallow depths (e.g. 2004), the age compositions are similar to that from the spring survey and there are few older fish present.

Mean Length and Weight at Age

Both mean length and weight at age over time are shown in Figure 10. Weight at age was calculated by applying the length/weight relationship for each year to the average length. Length at age seems stable over time; however, weight at age appears to be gradually declining at older ages.

Divisions 2J3K surveys during 2005 and 2006

The majority of this resource is found in Divisions 2J3K, and some unusual trends in the 2005 and 2006 surveys warrant additional discussion. As discussed by Healey et al. (2006), recent values of MNPT and MWPT from this area (Figure 3) exhibit peculiar dynamics. Over the past three years, the MNPT has, excluding 2005, been stable. Yet, over the same time period, the MWPT has increased. This increase is primarily due to increased MWPT in Division 3K (see Table 21b). The stability of mean weight at age indicates that biomass increases are not resulting from growth rate increases.

The 2005 and 2006 results are unusual in that the length structure (and subsequently, age structure) is unlike anything observed in the Divisions 2J3K Campelen time series. We have alluded to this fact when discussing the biomass-at-length, MNPT-at-age and percent at age within Divisions 2J3K. In the most recent two surveys, age groups 5-9 appear relatively strong (Table 23b; Figure 11) despite not being characterized as such in any previous survey. This is demonstrated by the increase in the average biomass for the 30-70 cm length class in Figure 4, the increase in the 5+ MNPT for in Figure 5, in the abundance at age presented in Figure 6 (Division 2J3K 2005, 2006 panels), and most notably, in the percentage at age results for Division 2J3K displayed in Figure 7. In fact, the 2005 age 6 MNPT result is only slightly below the age 6 values for the strong 1993-1995 cohorts, and the 2006 age 7 and 8 MNPT values are the highest over the Campelen (1995-2006) portion of the time series (Figure 11).

Furthermore, there are relatively few fish at the youngest ages. Most of the age 1-3 MNPT values in 2005 and 2006 are at or amongst the lowest values in the Campelen time series, although the age 1 MNPT result for 2006 is an exception. This further skews the size composition of these survey catches (or age distribution), leading to an apparent paradox in the MNPT and MWPT. If the survey observations of low abundance at the youngest age groups translate into poor recruitment into the exploitable and spawning stock biomass, then this stock will be under considerable risk of collapse. The survey results for Division 3L and in Divisions 3NO (Figure 7) have similar age distributions. However, within Divisions 3LNO, these patterns have been observed in previous years, and are not a substantial aberration as in the case of the Division 2J3K results. In Divisions 3NO for instance, the changing age structure is reflecting the variations in annual depth coverage.

Healey et al. (2006) considered several factors to account for the unusual size distribution observed in the 2005 2J3K survey results. Survey timing, distribution shifts, and aging errors were all evaluated as potential mechanisms to explain the atypical size distribution, although the cause for these results was not identified.

It is possible that a non-negligible amount Greenland Halibut may inhabit depths outside of the current survey design (i.e. deeper than 1500m). Norwegian long-line survey experiments during the 1990's in the Davis Strait sampled Greenland Halibut at depths up to 2200m (Boje and Hareide, 1993). Long-line experiments conducted by EU-Spain and EU-Portugal in the NRA during 1996, (de Cárdenas et al., 1996) indicated that relatively large catches of Greenland Halibut were taken at depths of 1300-1900m. We explore the migratory hypothesis in further detail by examining recent survey results by stratum, paying particular attention to strata located along the edge of the continental shelf. If increases in the Greenland Halibut biomass estimates are due to immigration, one might expect an increased proportion of the total estimate of survey biomass in those strata along the edge of the continental shelf. Although we examined such results in both Divisions 2J and 3K, we focus upon the results from Division 3K. This area is larger than 2J and therefore has more influence on the combined index, but more importantly, the unusual abundance/biomass patterns are more pronounced within this division.

Figure 12 presents the proportion of the Division 3K biomass index measured in the deep-water strata along the shelf edge having depths of at least 400m (strata 640-654, inclusive). Although this proportion varies over the Campelen time-series, it is apparent that the recent surveys are not atypical in this respect. To ensure the aggregated totals are not masking within stratum trend, the proportion of the total biomass index estimated in each stratum was also computed. In Figure 13, we compare the average proportion over 2002-2004 against the most recent two survey results. These groupings were chosen due to similar abundance levels within each time period. Although the ratio of these proportions is variable, again, there is no evidence of a systematic change in relative stock density along the shelf edge. This suggests – at least during the period covered by the fall survey - the probability that migratory effects are the causal mechanism behind recent increases in the biomass index is low. In the most recent Division 2J results, strata along the shelf edge comprise a slightly lower proportion of the overall total compared to the long term average (not shown).

Recent survey results from Division 3L, immediately south of Divisions 3K, exhibit similar abundance and biomass dynamics to those within Divisions 2J3K. However, the relative increase in the Division 3L biomass index is much smaller than that within Divisions 2J3K. To the north, in Division 2H, both abundance and biomass indices have been increasing. Survey observations of Greenland Halibut within Sub-area 1 (Sünksen and Jørgensen, 2007) indicate the 2000 and 2002 cohorts to be relatively large at age 1. Further, the Division 1CD Greenland Halibut survey (Jørgensen, 2007) suggested that the 2002 cohort was strong relative to others in the time-series. It should be noted that neither of these surveys appear to be tracking year-classes. Although it has previously been hypothesized that the northern areas are a nursery area for this Greenland Halibut stock, this assertion remains unproven.

It is worth noting that the “appearance” of several year-classes in the Division 2J3K fall index (refer to Figure 11) is an unusual occurrence. A review of the age disaggregated results from the EU summer survey in Division 3M, the Canadian spring 3LNO data and also the earlier Canadian fall 2J3K time-series (Engels survey gear; 1978-1994) does not provide any evidence that any relatively large year-classes were “missed” by these surveys.

It is noteworthy that survey indices for several species within Divisions 2J and 3K have also increased in the recent period. Increases in the abundance and biomass for American Plaice, Atlantic Cod, Redfish, Roughhead Grenadier (biomass increase only), and Witch Flounder have been measured in the past four or five surveys, although several of these species remain at low levels relative to historic observations. This suggests increased productivity in the area, increased survey catchability, or both. This is coincident with relatively high water temperatures in this area (Colbourne et al., 2007). In fact, all current climatic measures for this area exceed the long term mean.

Conclusions

The results from most Canadian surveys indicate that stock abundance has been generally declining since 1996. In Divisions 2J and 3K, survey estimates of biomass decreased from 1999 to 2002, with considerable improvements since then. Although stock biomass in Divisions 2J and 3K has increased in recent years, these increases are due to cohorts which did not appear to be strong at younger ages. Stock size estimates from 2006 among Divisions and surveys are somewhat variable, but they generally remained relatively low. Results indicate that many of the recent year classes appear to be at or below average levels, and are well below the strengths of the 1993-1995 year classes at similar ages. However, it is important to note that when these year classes reach age 5 and are recruited to the fishery, their apparent strength at earlier ages has greatly diminished. Recent recruitment results suggest poor prospects for stock rebuilding in the future.

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Table A. Summary of successful sets in fall surveys in SA 2+3 in 1995 - 2006. Depth range is given in meters, numbers of sets appear in parentheses.

Year	Division	Ship			Year	Division	Ship			
		Teleost	W.Templeman	A.Needler			Teleost	W.Templeman	A.Needler	
1995	2G	Not surveyed in 1995			2001	2G	Not surveyed in 2001			
	2H					2H	999-1466 (8)		117-655 (49)	57
	2J	145-948 (84)				2J	120-1389 (49)		105-574 (71)	120
	3K	166-1444 (31)	162-494 (100)			3K	146-1479 (106)	128-439 (55)	170-252 (4)	165
	3L	733-1210 (5)	63-640 (161)			3L	146-1457 (34)	38-702 (169)	187-203 (2)	205
	3M	Not surveyed in 1995				3M	763-1407 (26)			26
	3N		40-650 (90)			3N	739-1410 (24)	45-660 (70)		94
	3O		63-730 (81)			3O	803-1391 (22)	67-703 (75)		97
	1995 fall survey extended into January 1996 (66 sets)									764
1996	2G	127 - 1436 (47)			47	2002	2G	Not surveyed in 2002		
	2H	122 - 1415 (77)			77		2H			
	2J	126 - 1410 (117)			117		2J	102-1372 (98)	136-572 (19)	117
	3K	111 - 1368 (115)	126 - 472 (60)		175		3K	156-1395 (64)	121-481 (111)	175
	3L	805 - 1433 (31)	51 - 671 (180)		211		3L	763-1431 (30)	35-670 (176)	206
	3M	784 - 1400 (18)	127 - 707 (68)		86		3M	818-1403 (26)		26
	3N	390 - 1147 (13)		37 - 309 (54)	67		3N	811-1429 (24)	44-675 (70)	94
	3O	68 - 690 (24)	65 - 139 (19)	63 - 304 (15)	58		3O	775-1504 (24)	65-696 (75)	99
					838		2002 fall survey extended into January 2003 (128 sets)			
										717
1997	2G	201-1209 (69)			69	2003	2G	Not surveyed in 2003		
	2H	220-1382 (71)			71		2H			
	2J	123-1488 (117)			117		2J	123-1404 (116)		116
	3K	143-1431 (155)	117-421 (20)		175		3K	151-1474 (118)	115-489 (50)	168
	3L	161-1436 (71)	35-714 (134)		205		3L	753-1446 (30)	32-702 (175)	205
	3M	799-1379 (26)			26		3M	795-1455 (26)		26
	3N		41-769 (74)		74		3N		43-727 (70)	70
	3O		62-611 (73)		73		3O	761-1382 (8)	63-650 (75)	83
					810		2003 fall survey extended into January 2004 (210 sets)			
										668
1998	2G	143-1488 (34)			34	2004	2G	Not surveyed in 2004		
	2H	98-1473 (83)			83		2H	109-1415 (87)		87
	2J	126-1398 (118)			118		2J	127-1365 (115)		115
	3K	122-1415 (154)	121-346 (17)		171		3K	112-1412 (135)	212-549 (16)	151
	3L	691-1437 (32)	34-675 (172)		204		3L	151-522 (4)	44-653 (143)	147
	3M	768-1436 (26)			26		3M	Not surveyed in 2004		
	3N	834-1447 (12)	37-1079 (78)		90		3N		40-659 (69)	69
	3O		82-1076 (87)		87		3O		63-634 (76)	76
					813		2004 fall survey extended into February 2005 (36 sets)			
										645
1999	2G	142-1415(69)			69	2005	2G	Not surveyed in 2005		
	2H	104-1454(81)			81		2H			
	2J	109-1375(115)			115		2J	118-1427 (108)	172-416 (9)	117
	3K	146-1477(154)			154		3K	150-1334 (26)	136-669 (141)	167
	3L	1366(1)	63-1407 (169)		170		3L	803-1351 (7)	50-706 (120)	121-667 (57)
	3M	853-1403(12)			12		3M	Not surveyed in 2005		
	3N		39-664(68)		68		3N	776-1445 (17)	42-633 (69)	86
	3O		58-692(75)		75		3O	754-1410 (24)	69-649 (75)	99
					744		2005 fall survey extended into January 2006 (86 sets)			
										653
2000	2G	Not surveyed in 2000				2006	2G	Not surveyed in 2006		
	2H						2H	107-1437 (81)		81
	2J	127-1400 (117)			117		2J	107-1443 (117)		117
	3K	113-1379 (159)			159		3K	153-1384 (93)	109-480 (61)	154
	3L	152-1430 (74)	42-447 (102)		176		3L	111-1401 (34)	61-641 (151)	185
	3M	764-1401 (26)			26		3M	756-1352 (23)		23
	3N	747-1419 (24)	46-642 (70)		94		3N		46-650 (70)	70
	3O	752-1424 (24)	62-654 (76)		100		3O		63-674 (74)	74
					672					704

Table B. Summary of successful sets in spring surveys in SA 2+3 in 1996 - 2006. Depth ranges given in metres, numbers of sets appear in parentheses.

Year	Division	Ship		Year	Division	Ship	
		<i>W.Templeman</i>	Total			<i>W.Templeman*</i>	Total
1996	3L	91-731(188)	188	2002	3L	55-731(146)	146
	3N	55-731(82)	82		3N	55-731(79)	79
	3O	91-731(86)	86		3O	91-731(79)	79
			356				304
1997	3L	91-731(158)	158	2003	3L	55-731 (156)	156
	3N	55-731(71)	71		3N	55-731 (79)	79
	3O	91-731(81)	81		3O	55-731 (79)	79
			310				314
1998	3L	55-731(163)	163	2004	3L	55-731 (151)	151
	3N	55-731(88)	88		3N	55-731 (79)	79
	3O	91-731(93)	93		3O	91-731 (79)	79
			344				309
1999	3L	55-731(177)	177	2005	3L	55-731 (133)	133
	3N	55-731(82)	82		3N	55-731 (78)	78
	3O	91-731(86)	86		3O	91-731 (79)	79
			345				290
2000	3L	91-731(134)	134	2005	3L	55-731 (133)	133
	3N	55-731(81)	81		3N	55-731 (78)	78
	3O	91-731(83)	83		3O	91-731 (79)	79
			298				290
2001	3L	55-731(154)	154	2006	3L	55-731 (141)	141
	3N	55-731(79)	79		3N	55-77 (22)	22
	3O	55-731(79)	79		3O	91-103 (32)	32
			312				195

* CCGS A. *Needler* used for 47 sets in Divs 3NO during 2006 survey

Table C. Number of age samples available per division combinations used to develop fall age-length keys. Age-length keys for 2GH combined, Div. 2J3KL combined and Div. 3MNO combined were applied to the respective individual divisions.

Year	Div. 2GH			Div. 2J3KL			Div. 3MNO			Total	
	2G		2H	2J		3K	3L		3M		
	Total			Total			Total		Total		
1978	1220	1134	2354	766	1616	-	2382	-	-	-	-
1979	756	841	1597	1192	1367	-	2559	-	-	-	-
1980	-	-	-	1561	1065	-	2626	-	-	-	-
1981	756	758	1514	1619	1356	-	2975	-	-	-	-
1982	-	-	-	1699	1349	-	3048	-	-	-	-
1983	-	-	-	1325	1240	-	2565	-	-	-	-
1984	-	-	-	1159	1341	-	2500	-	-	-	-
1985	-	-	-	1298	1457	-	2755	-	-	-	-
1986	-	-	-	1218	1114	-	2332	-	-	-	-
1987	783	1227	2010	1211	1192	-	2403	-	-	-	-
1988	680	1268	1948	1058	1053	-	2111	-	-	-	-
1989	-	-	-	667	533	-	1200	-	-	-	-
1990	-	-	-	575	513	-	1088	-	-	-	-
1991	65	377	442	514	564	-	1078	-	-	-	-
1992	-	-	-	505	498	-	1003	-	-	-	-
1993	-	-	-	476	505	-	981	-	-	-	-
1994	-	-	-	643	449	-	1092	-	-	-	-
1995	-	-	-	562	578	-	1140	-	-	-	-
1996	370	628	998	737	813	661	2211	354	315	134	803
1997	664	721	1385	850	950	897	2697	211	233	160	604
1998	311	635	946	970	870	743	2583	229	465	411	1105
1999	488	671	1159	797	802	516	2115	99	153	91	343
2000	NO SURVEY	-	608	716	673	1997	204	413	210	827	
2001	NO SURVEY	579	579	759	991	797	2547	292	395	287	974
2002	NO SURVEY	-	1101	972	693	2766	107	339	268	714	
2003	NO SURVEY	-	757	622	538	1917	154	150	223	527	
2004	NO SURVEY	848	848	777	614	311	1702	NO SURVEY	168	73	241
2005	NO SURVEY	-	785	846	477	2108	NO SURVEY	260	226	486	
2006	NO SURVEY	794	828	947	487	2262	136	126	50	312	

Table D. Number of age samples available per division combinations used to develop spring age-length keys.
 Age-length keys for Div. 3LNO combined were applied to the respective individual divisions.

Year	Div. 3LNO			Total
	3L	3N	3O	
1996	724	377	475	1576
1997	637	369	375	1381
1998	668	306	334	1308
1999	413	334	172	919
2000	358	230	75	663
2001	730	328	126	1184
2002	320	140	49	509
2003	321	180	65	566
2004	322	141	70	533
2005	316	83	118	517
2006	269	0*	0*	269

*Survey not completed.

Table E. Length-weight relationships for Greenland halibut, for Division 2J3K, 1990-2006. W = round weight (kg) and L = total length (cm). From 1978-1989, the 1990 annual L/W equations were applied.

Year	Sex	Length-Weight Equations	N	r^2
1990	All	$W = 5.765 * 10^{-6} L^{3.118}$	1067	0.978
1991	All	$W = 1.088 * 10^{-5} L^{2.934}$	1073	0.985
1992	All	$W = 9.204 * 10^{-6} L^{2.975}$	933	0.979
1993	All	$W = 6.359 * 10^{-6} L^{3.077}$	975	0.987
1994	All	$W = 1.238 * 10^{-5} L^{2.894}$	1088	0.981
1995	All	$W = 8.677 * 10^{-6} L^{2.979}$	1068	0.983
1996	All	$W = 3.968 * 10^{-6} L^{3.193}$	1421	0.989
1997	All	$W = 5.390 * 10^{-6} L^{3.111}$	1755	0.989
1998	All	$W = 5.518 * 10^{-6} L^{3.105}$	1796	0.988
1999	All	$W = 5.004 * 10^{-6} L^{3.130}$	1535	0.990
2000	All	$W = 4.260 * 10^{-6} L^{3.178}$	1283	0.988
2001	All	$W = 5.062 * 10^{-6} L^{3.127}$	1714	0.983
2002	All	$W = 5.545 * 10^{-6} L^{3.104}$	1916	0.990
2003	All	$W = 5.485 * 10^{-6} L^{3.105}$	1351	0.989
2004	All	$W = 5.526 * 10^{-6} L^{3.111}$	1374	0.991
2005	All	$W = 4.609 * 10^{-6} L^{3.163}$	1601	0.989
2006	All	$W = 4.788 * 10^{-6} L^{3.157}$	1744	0.990

Table 1 Biomass estimates (tons) by depth stratum of Greenland halibut from various Canadian surveys in Division 2G during the period 1978-99 (No survey since then). Estimates are expressed in Campelen units or Campelen equivalents.

Depth Range (m)	V1 Area	V4 Area	Stratum	1978	1979	1981	1987	1988	1991	1996	1997	1998	1999
201 - 300	2773	2773	909	7475	1547	2139	.	.	47	142	.	271	117
	2339	2339	910	11062	1788	1890	.	.	45	23	.	11	128
	1804	1804	925	10644	3064	2508	.	.	.	15	.	.	92
	1213	1213	901	7714	7673	7143	2228	2823	623	517	853	.	1526
	585	585	908	607	1960	393	396	139	86	606	587	451	300
	692	692	911	599	879	585	456	29	110	241	975	525	209
	756	756	924	765	1197	1596	556	198	.	225	815	.	384
	433	433	926	.	.	.	.	592	.	426	443	.	301
	120	120	902	.	.	.	287	41	.	312	253	67	106
	73	73	912	.	.	.	112	2	.	.	227	87	64
301 - 400	186	186	923	5650	.	1357	97	317	.	200	195	.	77
	832	832	927	.	.	.	2694	864	.	6729	1623	.	3342
	80	80	903	.	832	526	120	123	30	.	112	123	95
	62	62	913	.	.	.	181	170	.	.	34	37	19
	186	186	922	5085	.	1591	.	.	.	.	273	.	195
401 - 500	783	783	928	.	.	.	4257	1061	.	6949	2957	.	1134
	153	153	904	.	4025	1816	770	410	.	.	233	249	198
	113	113	914	.	.	.	377	891	.	.	88	211	63
	142	142	921	.	9314	.	209	260	.	.	470	.	127
	1261	1261	929	.	18966	26440	6809	5045	.	5891	2706	.	.
751 - 1000	164	164	905	.	.	.	.	3038	.	.	.	688	481
	96	96	915	.	.	.	.	1835	.	.	.	.	.
	172	172	920	.	.	.	4428	3283	.	.	.	.	.
	229	229	906	.	.	.	40	538	.	.	776	699	795
1001 - 1250	146	146	916	.	.	.	.	181	.	.	.	1092	.
	316	316	919	.	.	.	.	579	.	.	1883	.	.
	360	360	907	.	.	.	.	.	.	.	.	.	773
1251 - 1500	165	165	917	.	.	.	.	.	.	.	.	.	.
	515	515	918	.	.	.	.	.	.	.	.	.	.
Total Biomass (t)				49600	51244	47985	24016	22419	941	22275	15503	4511	10525

Table 2 Abundance estimates (000s) by depth stratum of Greenland halibut from various Canadian surveys in Division 2G during the period 1978-99 (No survey since then). Estimates are expressed in Campelen units or Campelen equivalents.

Depth Range (m)	V1 Area	V4 Area	Stratum	1978	1979	1981	1987	1988	1991	1996	1997	1998	1999
<=200	2773	2773	909	60505	13478	5054	.	.	496	6379	.	8774	1730
	2339	2339	910	34669	9371	4223	.	.	2413	804	.	572	2181
	1804	1804	925	17917	6080	4632	.	.	.	358	.	.	1551
201 - 300	1213	1213	901	56325	25196	50893	42883	15018	5435	14165	6213	.	13349
	585	585	908	724	30794	241	20376	1288	1100	9013	5195	3380	3139
	692	692	911	1690	2546	3395	20593	190	238	4760	12202	6886	2031
	756	756	924	624	1040	2444	9308	3682	.	4312	6397	.	6898
	433	433	926	.	.	.	.	1866	.	1387	1430	.	1162
301 - 400	120	120	902	.	.	.	435	66	.	2330	998	206	388
	73	73	912	.	.	.	110	10	.	.	899	241	176
	186	186	923	2699	.	793	90	563	.	870	915	.	409
	832	832	927	.	.	.	3411	7554	.	15176	5778	.	9557
401 - 500	80	80	903	.	820	259	138	171	99	.	619	314	286
	62	62	913	.	.	.	230	158	.	.	171	132	47
	186	186	922	2162	.	806	.	.	.	.	819	.	422
	783	783	928	.	.	2693	969	.	14756	7827	.	2908	.
501 - 750	153	153	904	.	2498	663	659	442	.	.	968	579	582
	113	113	914	.	.	.	326	847	.	.	315	567	241
	142	142	921	.	5792	.	166	244	.	.	1391	.	498
	1261	1261	929	.	7849	11391	4718	3556	.	23379	7056	.	.
751 - 1000	164	164	905	.	.	.	.	2267	.	.	.	1027	699
	96	96	915	.	.	.	.	1373	.	.	.	.	.
	172	172	920	.	.	.	2904	3005	.	.	.	.	.
1001 - 1250	229	229	906	.	.	.	63	252	.	.	973	630	740
	146	146	916	.	.	.	.	40	.	.	.	1306	.
	316	316	919	.	.	.	.	283	.	.	2360	.	.
1251 - 1500	360	360	907	.	.	.	.	.	.	.	.	.	371
	165	165	917	.	.	.	.	.	.	.	.	.	.
	515	515	918	.	.	.	.	.	.	.	.	.	.
Abundance (000s)	177315	105464	84795	109103	43844	9781	97689	62525	24612	49365			

Table 3 Biomass estimates (tons) by depth stratum of Greenland halibut from various Canadian surveys in Division 2H during the period 1978-2006 (No survey in 2000, 2002, 2003 or 2005). Estimates are expressed in Campelen units or Campelen equivalents.

Depth Range (m)	V1 Area	V4 Area	Stratum	1978	1979	1981	1987	1988	1991	1996	1997	1998	1999	2001	2004	2006
<=200	1028	1028	930	315	263	707	50	96	343	152	.	97	168	1	798	24
201 - 300	971	971	954	583	804	265	103	348	6	91	.	34	127	42	361	92
301 - 400	1051	1051	956	1020	332	562	135	457	57	12	.	102	48	17	600	20
401 - 500	1371	1371	957	3183	693	1274	374	578	86	15	.	29	43	22	151	158
501 - 750	276	276	931	560	68	1113	94	107	200	180	71	171	150	.	211	207
751 - 1000	354	354	943	822	18	1371	242	626	19	338	212	442	234	.	452	504
1001 - 1250	261	261	950	.	.	.	.	.	283	1402	.	211	465	.	781	.
1251 - 1500	291	291	953	11257	940	2984	1115	530	1347	179	659	594	258	224	473	1021
Total Biomass (t)	342	342	964	56300	130030	47835	39539	41694	4946	26062	38628	38988	30730	37682	48222	65849

Table 4 Abundance estimates (000s) by depth stratum of Greenland halibut from various Canadian surveys in Division 2H during the period

Depth Range (m)	V1 Area	V4 Area	Stratum	1978	1979	1981	1987	1988	1991	1996	1997	1998	1999	2001	2004	2006
<=200	1028	1028	930	7813	4949	2811	3708	1966	3300	5374	368	672	47	13683	519	1403
	971	971	954	11300	19528	846	12361	39684	2137	1985	267	4308	445	4702	25666	25666
	1051	1051	956	18988	16795	4735	10771	18014	1157	723	1475	1121	713	9030	1468	1468
201 - 300	1371	1371	957	35154	17225	9304	6361	25231	3018	566	219	1590	571	2402	2525	1652
	276	276	931	3113	456	937	3389	2493	1822	6341	683	1029	1177	2292	12724	5332
301 - 400	354	354	943	2654	1339	3725	8534	9959	536	5235	2237	1777	2844	36645	6791	1167
	261	261	950	100676	4310	13410	74723	17613	6345	1301	12727	2962	1521	3009	4824	11789
	291	291	953	1231	25043	178	7478	7759	1391	49950	5048	1357	1686	1403	9124	9124
	389	389	955	8999	61	5514	7806	5986	2002	8345	3155	4894	6006	8811	1840	1840
401 - 500	55	55	932	13151	25369	5744	13628	9050	2514	6656	53118	10151	24991	16372	6332	2171
	860	860	944	206	949	.	.	29457	7391	.	.	4846	23175	.	.	.
	177	177	952	178	178	959	1730	392	547	1739	502	1146	3783	2204	12515	11164
	178	178	959	50	50	933	.	810	367	103	64	45	65	2253	474	138
	55	55	942	461	461	945	.	36739	19617	22348	55983	6817	10051	19595	5454	1383
501 - 750	246	246	948	234	951	6712	27506	3702	5569	11991	3718	11105	20202	7033	12008	451
	107	107	960	78	78	934	.	2569	199	594	152	110	206	1253	1188	661
	89	89	941	721	721	946	32110	117728	17768	118795	83445	.	30614	35062	32182	274
	227	227	947	211	211	961	.	33053	5574	14957	27870	.	10492	13622	15379	19229
751 - 1000	96	96	935	97	97	940	.	3261	677	697	1180	.	653	839	755	6815
	242	242	962	78	78	936	.	.	.	178	180	.	767	1281	1181	983
1001 - 1250	130	130	939	1251 - 1500	1251	963	.	215	206	638	1276	.	1167	2098	635	1042
	191	191	938	342	342	964	.	.	.	.	428	.	401	149	606	703
Abundance (000s)				232902	366466	93601	322194	373163	42392	217026	239069	168649	140410	203855	280924	286110

Table 5a Biomass (tons) by stratum (converted to Campelen units from 1978-94) from Canadian fall surveys in Division 2J from 1978-1992.

Depth Range (m)	V1 Area	V4 Area	Stratum	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
101 - 200	1427	633	201	257	91	486	439	1620	524	913	91	206	42	21	171	103	34	0
201 - 300	1823	1594	205	1753	2385	1007	2591	4878	2748	1521	502	283	113	168	126	87	104	16
301 - 400	440	621	202	1007	1437	1673	1778	1915	1307	4167	563	448	867	32	246	164	79	
401 - 500	1608	680	209	4481	15830	15100	8547	19662	8897	5183	6062	2398	1491	1997	2003	1488	574	454
501 - 750	1774	1035	210	956	782	960	549	1845	3694	2268	566	374	281	786	654	908	266	373
751 - 1000	664	557	212	11338	15580	7520	9579	9423	3113	4609	7201	23242	21891	4953	2937	5488	1658	2331
1001 - 1250	420	362	218	11403	5223	6388	1767	1695	1461	3151	2308	2513	859	2077	1096	174		
1251 - 1500	177	195	225	219	218	224	2250	3012	1067	2825	1182	1438	1167	847	5782	1554	1661	89
Total Biomass (t)				129254	99533	102747	107311	142873	110193	112208	86927	101716	69422	49917	61433	60215	20968	18121

Table 5b Biomass (tons) by stratum (converted to Campelen units from 1978-94) from Canadian fall surveys in Division 2J from 1993-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
101 - 200	1427	633	201	6	27	82	26	91	0	65	27	133	11	135	50	27		
	1823	1594	205	6	14	514	35	502	281	863	754	706	1055	990	245			
201 - 300	2582	1870	206	28	132	399	1120	404	349	403	357	1367	1586	890	873	1079		
	2246	2264	207	0	33	1	56	51	74	192	16	208	35	192	118	404		
301 - 400	733	237	0	0	0	0	1	4	19	320	0	5	42	3	0	15		
	778	238	8	7	15	0	79	0	53	27	6	54	81	18	37	0		
401 - 500	621	202	8	307	95	89	157	593	1685	574	2215	491	871	2260	898	797		
	1608	680	209	384	123	360	1059	424	282	2204	694	291	1061	1475	811	379		
501 - 600	774	1035	210	589	121	2708	3904	893	1047	613	661	1140	3314	1861	626	285		
	1725	1583	213	302	422	236	1338	1146	1962	1426	893	2332	1336	1950	1163	1325		
601 - 700	1171	1341	214	1064	507	327	4057	1258	1502	1883	1204	1930	485	1337	2500	2520		
	1270	1302	215	1349	855	1370	1247	1448	1889	1986	1139	1967	3499	1360	1592	3091		
701 - 800	1428	2196	228	967	2749	2219	5478	3666	4356	2566	2870	2803	1850	1175	2858	3626		
	508	530	234	895	129	163	753	352	311	122	349	75	1237	54	1367	3389		
801 - 900	480	203	1404	387	946	2233	3303	2553	2200	4090	1134	2846	6523	1792	2581			
	448	588	208	1025	4820	4799	3707	12593	6479	11101	9423	5230	7812	2894	8453	5500		
901 - 1000	330	251	211	1628	871	1400	1343	1875	870	3541	640	2964	2336	2016	2414	5397		
	384	360	216	331	392	64	506	1090	1631	881	1103	1076	397	957	697	1457		
1001 - 1250	441	450	222	170	535	122	1672	930	382	751	995	1151	1086	322	371	164		
	567	536	229	246	1202	1799	3900	1940	2514	1206	1639	1591	1123	2336	439	3408		
1251 - 1500	354	288	204	2512	3442	1437	3823	7941	6171	3707	4652	5240	1762	7283	8250	8979		
	268	241	217	270	226	131	932	676	621	704	628	1983	458	395	433	1027		
1501 - 2000	180	158	223	130	168	162	438	425	598	505	346	419	179	699	424	475		
	686	598	227	1648	2009	909	5850	9244	1793	13071	3628	4226	1316	6852	1325	31416		
2001 - 2500	420	414	235	810	1042	3895	4373	8365	3256	4183	3929	4170	4733	5739	1990	2852		
	664	557	212	5048	1485	5499	4940	10735	4375	14447	4366	4302	7126	4898	3595	4086		
2501 - 3000	420	362	218	136	693	1783	1207	1319	1019	690	1413	732	456	844	661	731		
	270	228	224	85	309	214	702	625	401	293	701	360	130	205	356	538		
3001 - 3500	237	185	230	135	379	652	1350	1589	547	2230	786	569	560	383	356	242		
	237	185	230	1917	1411	1676	2586	2725	4867	4064	1959	1945	867	3470	3389	1776	3456	
3501 - 4000	213	283	219	639	1579	2021	405	1727	2249	1402	1731	1297	621	1248	1156	374	761	
	182	186	231	613	604	376	1013	651	1635	1744	2828	2820	1603	432	720	612	1561	
4001 - 4500	122	193	236	886	230	1007	698	381	725	1107	592	937	881	533	344	468	642	
	324	303	220	.	.	.	1296	503	1196	.	568	786	749	1480	1116	871	472	
4501 - 5000	177	195	225	.	.	.	835	693	655	478	175	1219	65	171	112	481	186	
	236	228	232	.	.	.	717	935	627	1787	1063	1146	626	56	714	502	300	
5001 - 5500	286	330	221	.	.	.	131	1246	692	567	401	268	654	124	166	249	334	
	180	201	226	.	.	.	277	407	1313	626	400	368	243	756	217	217		
Total Biomass (t)				237	233		889	596	542	418	628	844	938	438	195	233	566	
				25880	27786	35591	64772	82095	62111	87147	54858	65777	53591	59769	59135	61078	105925	

Table 6a Abundance (000s) by stratum (converted to Campelen units from 1978-94) from Canadian fall surveys in Division 2J from 1978-1992.

Depth Range (m)	V1 Area	V4 Area	Stratum	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
101 - 200	1427	633	201	654	1669	1570	4515	1865	523	2487	1832	118	196	1080	2895	393	916	0
	1823	1594	205	8777	7147	6457	11159	23615	2981	2382	18275	1505	1304	418	2784	658	752	63
2582	1870	206	21666	20201	9184	71327	9314	4186	4133	23036	4295	4262	4212	1694	1808	6097	3694	
2246	2264	16838	6921	4202	5287	4820	4109	1324	7011	1545	225	2692	649	0	0	0	0	
		733	237															
201 - 300	440	621	202	3768	8353	5947	6446	10774	1604	6567	6234	817	3934		182	2088	3813	444
	1603	680	209	13530	45061	22673	10396	19405	11660	5246	12166	6383	1797	5397	10175	4830	2654	2854
774	1035	210	5491	1012	1022	3230	2200	3780	2502	2209	1171	772	1952	1544	1562	852	5704	
1725	1583	213	5254	1017	2877	4944	9658	3109	3607	26577	5352	1977	4271	1345	3352	712	8792	
1171	1341	214	9274	1101	3286	14755	5739	3947	5638	20807	2524	4618	2175	1638	4382	3383	12323	
1270	1302	215	17317	4542	15592	8491	6639	2621	10366	32058	16422	2920	5341	9288	9725	6383	16212	
1423	2196	228	917	1604	1807	1637	864	1244	2301	1740	1801	2133	1061	4395	4715	2619	4440	
508	530	234	28190	22799	14518	28267	12695	4589	7687	4449	3075	6862	6918	5556	2341	1468	4216	
301 - 400	480	487	203	8716	20491	4226	19710	11313	22142	70783	4380	21856	5547	12810	16683	14725	16463	6119
	448	588	208	10837	12926	8119	14791	31163	6933	16455	32827	15314	15746	6255	22525	22925	14072	24610
330	251	211	4903	3632	4058	2542	3110	5311	2678	6144	6106	12824	10214	3881	16388	4984	3125	
384	360	216	1726	3024	3249	2932	2747	1074	3486	1770	1796	2404	792	1400	1875	370	599	
441	450	222	1626	1031	1320	971	3074	1557	1193	1062	243	1486	910	607	3337	324	586	
567	536	229	507	1190	799	585	585	1034	286	858	202	286	78	520	273	1430	3900	
401 - 500	354	288	204	133064	82687	80982	35662	22254	17093	3068	15169	30825	14658	52836	20867	24933	19284	
	268	241	217	1696	645	866	387	553	369	1843	1677	774	774	258	1807	406	221	
180	158	223	570	322	582	458	483	310	669	631	1350	248	681	483	1770	190	239	
686	598	227	5143	944	5426	3067	2397	1203	1416	2548	1887	7903	3271	12386	6323	3130	7455	
	420	414	235	7511	6355	7453	8291	9841	20106	3486	3149	12740	10313	5287	15599	24439	1521	4410
501 - 750	664	557	240															
	420	362	218	17446	21648	8632	4978	6376	1736	4110	7627	25088	20894	7307	3998	8586	3014	6303
270	228	224	650	817	279	799	371	576	371	390	1857	761	854	149	594	557	316	
237	185	230	636		1369	489	261	1157	196	424	913	864	864	815	1206	1744	3912	
751 - 1000	213	283	219			234		659		440	5538	967	557	674	1494	542	1392	
	182	186	231	964		1527		789	325	1239	1452	351	588	2153	1377	951	1252	
1001 - 1250	324	303	220	513		227	344	646	260	638	1418	613	76	1393	1636	1133		
1251 - 1500	236	228	232	325														
	286	330	221															
	180	201	226	50														
Total No. (000s)			233															
				332313	277137	138197	313166	217059	132178	177961	226308	161466	145374	104242	175753	169218	107390	143301

Table 6b. Abundance (000s) by stratum (converted to Campelen units from 1978-94) from Canadian fall surveys in Division 2J from 1993-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
101 - 200	1427	633	201	87	131	2235	218	740	0	958	305	392	218	1350	522	1219	
	1823	1594	205	157	146	16190	767	4105	4276	1759	10624	16205	9622	7528	13595	3712	
2582	1870	206	161	2315	22586	42257	5071	4336	5549	15413	29015	37704	16515	9801	22306	3197	
2246	2264	207	0	208	78	1142	519	727	857	381	1077	379	1458	1285	346	173	
	733	237	0	0	0	101	34	202	2790	0	50	192	38	0	336	0	
201 - 300	778	238	2569	321	0	603	0	759	71	245	107	617	212	71			
	440	621	214	4328	732	1068	2772	4046	22296	3930	22424	5894	14771	28105	10977	10550	
1608	680	209	2557	6501	3555	17149	4116	1666	41034	8419	1608	13277	17060	5238	2650	28339	
774	1035	210	5944	641	17946	49120	5232	9966	9682	3915	8839	55598	21550	9824	1886	8614	
1725	1583	213	8347	10090	4609	33785	17703	16223	18872	15316	31344	19448	25177	11469	11982	57851	
1171	1341	214	21657	17678	17525	102676	13946	9703	2210	18927	18652	3616	12913	23465	25088	22837	
1270	1302	13146	7988	18080	14129	22364	13051	13433	10961	33998	40295	15536	13110	35248	16836		
1428	2196	228	10909	51858	42618	112816	40114	34324	20882	33305	35242	21339	12472	21977	17181	20013	
508	530	234	8640	802	2625	5209	1786	1005	620	1094	401	8603	365	9806	1750		
301 - 400	480	487	203	13633	11690	3153	5862	19093	27969	19320	13164	37956	8953	37650	82434	10216	
	448	588	208	10111	40470	43881	75750	122273	32031	67095	50294	45512	43569	25277	50149	39917	
330	251	211	17540	8908	12534	16642	16470	3930	22424	4713	18264	22157	17592	11688	18611	17437	
384	360	216	1510	1808	300	2284	4209	5401	3032	6983	4581	1560	4266	2625	1808	3169	
441	450	222	867	18777	1238	11620	5076	1802	2259	5571	4640	9237	3064	3621	1238	1764	
567	536	229	1180	14157	24774	14857	6890	13972	3281	7189	5510	12498	17843	1512	2359	12682	
401 - 500	354	288	204	24682	28327	21397	26841	62076	51107	20444	50711	43690	11073	95691	67614	68221	
	2683	241	217	1061	751	583	3599	2254	1936	2105	2188	8789	1828	1250	928	2967	
180	158	223	283	942	1695	1883	1043	1720	1272	.815	1363	685	1511	716	989		
686	598	227	6773	11039	3743	34184	35002	7486	46025	16946	16740	6299	36401	4748	18056	96369	
420	414	235	5999	6378	19335	25337	41431	13753	17414	14260	19161	24375	36961	7774	11378	10479	
133	133	240	320	427	3061	1601	1336	672	1497	448	1088	1976	924	357	311	1162	
501 - 750	664	557	212	22412	5670	20151	25042	44440	1915	49344	13485	13366	30988	20228	12681	9118	10932
	420	362	218	573	373	3818	5951	3205	3231	2238	1369	2589	1942	1455	1818	1195	
751 - 1000	213	283	219	915	2063	5586	547	2180	3523	2219	2745	1995	1505	1875	1732	553	
	182	231	231	1254	760	1663	1151	3425	2815	4618	3915	2738	572	996	806	1804	
1001 - 1250	237	185	230	305	1120	2799	3084	3932	1400	4428	1513	982	1412	1128	916	531	
	120	239	225	22953	10367	11193	18970	21936	36305	34310	8955	15341	4284	30415	33980	5175	23440
177	195	225	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1251 - 1500	236	228	232	231	832	1254	760	1663	1151	3425	2815	4618	3915	2738	572	996	
	180	286	330	221	1208	195	3270	850	1043	1513	982	1412	1128	916	491	717	
Total No. (000s)																	
	237	233	359	342	560	538	717	880	994	391	261	228	505	53328			
	205162	271047	311890	678016	517293	329415	470904	326101	446712	409089	4938875	424743	348995	53328			

Table 7a Biomass (tons) by stratum (converted to Campelen units from 1978-94) from Canadian fall surveys in Division 3K from 1978-1992.

Depth Range (m)	V1 Area	V4 Area	Stratum	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
101 - 200		798	608															
		445	612															
		250	616															
		1455	1347	618							263	874	49	17	31	70	0	0
		1588	1753	619							685	401	108	41	26	78	0	0
201 - 300		342	609															
		573	611															
		251	615															
		2709	2545	620	18712	9129	9090	9404	7175	6302	4074	5095	4164	2108	3737	583	451	899
		2537	2859	621	41597	36475	15203	11844	6287	12035	6600	12389	2323	4458	3166	4278	485	1151
		668	1105	624	837	878	491	305	467	232	527	343	298	445	196	310	288	335
		447	632	204	147	620	344	426	187	394	133	86	49	81	384	111	267	413
		1618	1555	634	1482	1819	1196	1233	3348	1410	1293	1157	877	1919	776	587	707	526
		1274	1548	960	3092	3013	1388	1668	773	1924	1932	910	1335	307	46	88	293	144
301 - 400		1455	636	1650	872	2155	2163	3642	792	1299	861	806	353	852	701	401	240	282
		1132	1132	637	723	575	907	1180	1366	2275	662	1780	1441	1349	700	466	818	293
		256	610															
		263	614															
		593	617															
		1027	494	623	16992	3898	9646	10319	16038	24364	29298	8090	18912	14251	17661	11384	4603	5417
		850	888	625	1915	1387	1530	3242	822	5794	3856	4936	3449	5773	3204	847	3881	2176
		919	1113	626	7394	4470	14225	6023	11576	11302	20810	13944	16278	8319	12970	11682	3365	5003
		1085	1085	628	4700	4183	8400	2305	1867	5126	4652	9824	9477	5858	6368	4150	2513	902
		499	495	629	532	834	1790	2004	4063	3706	1779	1335	2978	5191	7176	4634	1053	385
		544	332	630	2056	800	1368	7048	4258	485	2244	1861	4436	4313	3075	2065	2188	917
		2179	633	2393	2472	4271	2834	2296	3115	3219	3424	4445	5532	3380	5842	5285	3440	2813
		2059	638	4198	3427	2615	4854	4801	4371	2922	5983	4382	3057	2972	6809	1993	2625	
		1463	639	1031	1254	1385	1266	3321	2174	436	872	1288	703	653	511	854	766	1175
401 - 500		30	613															
		632	691	622	16724	8517	3448	10766	7914	14953	8922	4742	36448	12755	17950	13695	30531	6256
		1184	1255	627	11452	5878	9820	24040	16903	27637	38222	18219	33516	21372	21502	37862	18637	4355
		1202	1321	631	8523	3909	4910	8787	5115	8693	12698	9456	8334	15010	11317	17190	4993	16791
		198	69	640	835	1177	756	531	344	398	204	417	163	225	367	310	130	3570
		204	216	645	462	336	534	434	97	1157	1055	613	351	81	460	103	213	
501 - 750		584	230	641	776	1647	2245	1521	1622	3609	3924	1384	1367			2661	651	440
		333	325	646	2231	3156	1852	2656	590	2959	3167	2337		1143		449	1083	375
		359	651															
751 - 1000		931	418	642	2417	3824	1134	3305		8496	3279		2722			4475	4484	9225
		409	360	647	7096	2019	3855	3634	1817		4473					3857	1197	655
1001 - 1250		1266	733	643	1254	1364												
		954	474	644	1890	783												
1251 - 1500		263	212	649	366													
Total biomass (t)		479	654															
		162396	100851	109450	122259	108737	146777	160510	120223	155137	122493	120451	122490	100699	66310	44458		

Table 7b Biomass (tons) by stratum (converted to Campelen units from 1978-94) from Canadian fall surveys
in Division 3K from 1993-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
101 - 200	.	798	608	.	.	.	.	0	44	37	.	0	8	4	0	5	14
	.	445	612	.	.	.	.	0	135	0	.	1	0	38	0	0	0
	250	616	618	0	8	286	19	4	23	.	15	1	59	0	0	0	0	
201 - 300	1455	1347	618	0	0	18	29	11	15	1	59	0	49	109	55	2	0	
	1588	1753	619	0	0	18	29	57	0	0	13	0	30	109	62	1	0	
	.	342	609	117	386	202	.	177	8	8	86	96	43	3
	.	573	611	113	265	162	.	41	43	164	465	144	34	372
	251	615	615	39	67	176	.	23	20	0	37	1	34	22
301 - 400	2709	2545	620	53	1113	790	4213	1275	1171	1367	3389	992	1280	594	1012	794	905	
	2859	2537	621	972	1021	1068	3967	1320	2524	858	1495	113	1149	1870	1856	185	639	
	668	1105	624	1017	754	508	2516	1610	1752	1805	1186	2358	1027	258	1950	2825	723	
	1455	1455	636	829	398	1393	2336	1171	1054	1002	1015	641	699	303	747	1138	1948	
	1132	1132	637	435	119	179	1722	869	2008	1145	526	393	403	1095	983	1138	241	
	.	256	610	344	630	1638	.	1000	1924	183	793	483	521	241
	.	263	614	.	.	.	.	154	399	184	.	164	12	120	683	274	303
401 - 500	.	593	617	5604	2993	3844	2464	4941	3865	2919	2227	7873	1476	3044	3603	2680	6949	
	1027	494	623	1672	1931	308	3588	1938	6167	3346	4322	5040	3698	1732	4159	1152	591	
	850	888	3229	2385	1437	4381	3075	3944	6783	3649	6294	917	649	6723	3701	1394	1394	
	919	1113	626	3469	4263	1962	5453	10283	9604	18305	3890	2111	3683	4768	6046	2328	5332	
	1085	628	1438	1372	529	2685	3116	10764	5142	2763	1799	1366	2837	4019	4444	4444	4444	
	499	495	629	1324	1337	2682	6569	2179	6214	5900	4291	1429	622	354	518	3839	7928	
	544	332	630	1274	1331	858	4800	3261	1561	5114	3821	4474	1429	1226	1100	3012	2633	
	2179	2067	633	4511	2868	4649	3487	6739	4178	7634	3474	6544	3178	3528	2288	6802	7941	
	2059	2059	638	2804	1908	1750	3952	7031	8115	2400	4792	2535	1686	2512	3399	5441	2775	
	1463	1463	639	1718	872	1520	1381	1556	1266	1183	2362	2114	1330	1120	1667	937	862	
	.	30	613	51	192	92	64	6	6	47	51	43	72	72	72	72	72	
501 - 750	632	691	622	6993	3921	2638	6896	11901	10364	13165	10064	11830	4285	5965	12425	7972	5578	
	1184	1255	627	31882	7308	18946	15576	22176	25568	45497	42775	11732	1721	12754	18257	22914	21080	
	1202	1321	631	9779	9453	10094	25499	14500	13683	18514	23958	20494	15856	13580	8550	17899	15925	
	198	640	77	111	179	105	59	37	39	144	103	44	96	39	25	165	165	
	204	216	645	110	357	192	162	75	114	446	253	242	140	180	186	387	188	
	.	134	650	193	338	252	147	242	224	39	18	109	162	20	193	188	188	
	584	230	641	411	109	227	394	197	369	1020	558	62	602	192	151	1382	1382	
	333	325	646	105	463	327	564	1180	158	84	436	811	205	323	239	122	291	
	359	651	704	894	1222	321	1361	1016	734	.	2603	899	754	199	508	1104	1104	
751 - 1000	931	418	642	1541	2336	1741	760	2036	2513	3081	2134	2677	892	1074	942	4877	1962	
	409	360	647	2413	1829	1087	749	2025	2961	2191	2465	3228	1301	1503	819	4436	1835	
	1001 - 1250	1266	733	643	1445	2366	3585	2575	4843	3246	2591	6162	1366	2990	2034	3554	1247	
	228	648	1718	1583	2306	1643	3660	3927	3045	2514	477	933	668	4436	1835	542	1344	
	954	474	644	870	2036	2845	1480	1917	2084	137	998	760	1082	735	735	735	735	
	263	212	649	387	1083	282	681	622	908	174	1125	427	437	87	87	87	87	
	.	479	654	1376	1016	3612	4808	3358	2287	4953	252	973	981	1241	773	773	773	
Total biomass (t)	.	.	.	89603	53988	69206	120336	130547	142196	175632	143329	128721	67000	71453	90509	112580	110175	

Table 8a Abundance (000s) by stratum (converted to Campelen units from 1978-94) from Canadian fall surveys in Division 3K from 1978-1992.

Depth Range(m)	V1 Area	V4 Area	Stratum	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
101 - 200		798	608															
		445	612															
		250	616															
		1455	1347															
		1588	1753															
201 - 300		342	609															
		573	611															
		251	615															
		2709	2545															
		2859	2537															
		668	1105															
		447	632															
		1618	1555															
		1274	1274															
		1455	1455															
301 - 400		1132	637															
		256	610															
		263	614															
		593	617															
		1027	623															
		850	888															
		919	1113															
		1085	1085															
		499	495															
		544	332															
		2179	2067															
		2059	2059															
		401 - 500	1463															
		632	691															
		1184	1255															
		1202	1321															
		198	69															
		204	216															
		501 - 750	584															
		333	325															
		751 - 1000	359															
		1001 - 1250	931															
		1251 - 1500	409															
	Total No. (000s)	479	654															
		699361	236713	211905	348277	246062	308649	314629	422171	563608	504993	507699	577204	367279	309619	416037		

Table 8b Abundance (000s) by stratum (converted to Campelen units from 1978-94) from Canadian fall surveys in Division 3K
from 1993-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
101 - 200	.	798	608	.	.	.	0	293	110	0	63	37	0	37	63	0	0	
	.	445	612	.	.	.	0	857	0	31	0	92	0	0	0	35	0	
	250	616	0	.	.	0	0	34	120	17	0	0	0	0	0	0	0	
	1455	1347	618	0	53	3330	226	93	139	124	62	0	803	1805	834	226	112	
201 - 300	1588	1753	619	0	0	841	425	448	0	121	95	34	208	1160	543	90	60	
	.	342	609	.	.	.	839	1506	602	349	47	47	528	753	107	256	256	
	.	573	611	.	.	.	465	1340	586	90	109	709	2102	828	158	744	744	
	.	251	615	.	.	236	432	784	138	200	0	104	17	104	259	259	259	
201 - 300	2709	2545	620	233	7702	8286	50340	10662	8370	8816	36955	7433	15989	9484	10722	4119	6754	
	2859	2537	621	8531	12044	17351	40571	14182	14778	3966	10239	2169	9935	16293	19500	2334	6539	
	668	1105	624	14571	20622	9987	41839	15930	17967	14677	10519	34688	14505	3557	13984	14927	5047	
	447	.	632	.	.	.	.	.	.	.	.	.	.	.	.	.	.
301 - 400	1618	1555	634	10642	10321	12468	28382	18641	11979	10390	6369	26367	12868	3893	3102	9334	31373	
	1274	1274	635	643	131	1057	11407	17490	11602	6975	4431	846	779	1297	0	4881	.	
	1455	1455	636	13810	8406	19987	26446	9607	5504	5504	6829	5296	6635	2273	5204	4248	4337	
	1132	.	637	3737	8743	3512	11087	6167	10713	5025	9191	5853	2685	2647	7762	5083	4018	
	.	256	610	.	.	.	1295	7343	11369	3021	923	1318	326	247	724	2098	1194	
	.	263	614	.	.	.	1369	3021	923	.	.	.	.	.	2476	.	.
401 - 500	.	593	617	60446	45722	64933	45872	39808	22113	17998	14955	52343	15541	23140	28823	12236	24508	
	1027	494	623	21321	19594	3228	51938	23445	32102	22561	28065	38176	67140	49177	37036	8087	5946	
	850	888	625	41573	41980	18861	69363	28279	37542	28615	2204	43640	9725	4611	50480	21499	10994	
	919	1113	626	36745	39756	15421	61923	132559	64794	84650	35409	34372	41059	71470	32497	9282	30216	
	1085	1085	628	13980	8557	3974	11330	26359	12955	30657	15530	5048	8969	20482	14746	13963	.	
	499	495	629	9964	9976	23208	55189	18794	37008	35306	25834	8677	3329	2928	3419	11474	17500	
	544	332	630	14310	9286	9215	31901	32380	12240	25141	29679	27676	12240	8837	4362	11354	11192	
	2179	2067	633	53772	35827	54535	31687	47011	16523	37329	13147	39049	22404	27928	16270	17349	28067	
	2059	2059	638	24967	33314	26066	44481	46671	38835	9072	14615	16777	12103	20505	16218	16840	6093	
	1463	1463	639	17173	16628	22428	9276	9224	4595	3815	11346	10546	11770	6105	9258	3211	2348	
	.	30	613	56296	72546	39289	132742	104560	64289	73410	52914	69929	41540	44447	66633	32181	26172	
	632	691	622	35859	96592	225916	116359	206365	158172	160052	151814	69006	78084	70512	98534	68017	68643	
	1184	1255	627	103337	111802	128176	162295	96509	65419	78684	100559	84520	82638	65215	43794	48446	44232	
	1202	1321	631	.	.	.	.	.	.	.	.	.	.	.	.	.	.
501 - 750	584	230	641	1371	475	886	1076	348	902	1951	1076	199	1535	316	323	1962	.	
	333	325	646	343	1371	1185	1321	2347	335	201	700	1140	492	827	536	103	425	
	198	640	326	494	1429	377	142	104	66	242	218	152	380	89	57	195	.	
	204	645	436	396	1590	624	211	178	1040	465	475	461	267	330	490	.	.	
	134	650	1057	2258	2120	654	691	479	100	28	344	544	37	328	240	.	.	
	1001 - 1250	1266	733	643	4277	4969	6637	4969	10470	4933	3336	8239	1810	5324	2910	4401	1333	.
	232	648	.	.	2252	2252	9109	8470	4403	1888	5411	4045	1255	1837	3798	5042	.	
	751 - 1000	931	418	3872	6383	3364	1179	3179	4284	4773	3092	3524	1294	1827	1179	7073	2358	
	409	360	647	2806	3797	1411	5497	3615	2894	4383	3336	8239	1910	5374	2030	5769	2030	
	1251 - 1500	954	474	1437	2264	2849	2131	6063	5750	4325	2854	621	986	840	657	1278	.	
	263	212	649	.	565	587	1891	2706	1695	2013	2237	163	1369	685	1108	652	.	
	.	479	654	.	1120	988	4159	6109	5727	297	937	1167	1263	758	77	.	.	
Total No. (000s)	.	.	.	885602	6333361	742239	1063373	956834	709549	6986691	644371	649233	484453	478268	512769	351981	372466	

Table 9 Biomass estimates (t) of Greenland halibut from Canadian fall surveys in Div. 3L using a Campelen trawl during 1995-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
30 - 56	.	268	784	.	0	0	0	.	0	0	0	0	0	0	.
57 - 92	2071	2071	350	1	0	0	0	0	0	0	0	1	0	0	2
	1780	1780	363	0	0	0	0	0	0	0	0	0	0	0	0
	1121	1121	371	0	3	0	0	24	0	0	0	0	0	0	0
	2460	2460	372	0	0	0	0	0	0	0	0	0	0	0	1
	1120	1120	384	0	0	0	0	0	0	0	0	0	0	0	1
	.	465	785	.	0	0	0	.	0	0	0	0	0	0	.
93 - 183	1519	1519	328	0	1	6	1	11	18	0	1	0	0	2	0
	1574	1574	341	0	2	249	184	0	6	0	13	0	22	0	20
	585	585	342	0	1	85	16	0	6	0	0	0	4	28	0
	525	525	343	0	0	34	45	0	1	0	0	0	43	0	17
	2120	2120	348	0	2	129	177	216	22	2	23	0	162	427	336
	2114	2114	349	4	2	60	252	416	0	0	0	2	47	182	21
	2817	2817	364	1	0	103	414	30	0	1	6	0	56	64	0
	1041	1041	365	17	0	169	140	55	.	0	0	0	.	444	258
	1320	1320	370	0	14	48	871	555	19	1	55	23	.	0	277
	2356	2356	385	73	64	502	334	253	29	47	190	69	348	273	233
	1481	1481	390	43	67	200	625	310	69	497	222	13	193	332	119
	.	84	786	.	67	2	4	.	0	0	0	0	0	1	.
	.	613	787	.	1	86	0	.	0	0	0	0	59	0	1
	.	261	788	.	0	45	31	.	0	0	0	0	0	4	10
	.	89	790	.	0	6	6	.	25	0	0	0	29	14	.
	.	72	793	.	0	4	4	.	0	0	5	0	0	53	.
	.	216	794	.	0	15	4	.	0	0	0	0	0	32	0
	.	98	797	.	0	3	14	.	0	0	0	0	23	0	0
	.	72	799	.	0	0	4	.	0	0	0	0	0	6	0
184 - 274	1494	1582	344	16	11	96	885	181	42	0	7	17	918	761	797
	983	983	347	2	0	37	1021	297	160	88	28	0	476	338	1123
	1394	1394	366	204	338	878	2172	2108	62	265	689	119	.	2545	2185
	961	961	369	72	108	888	2347	719	85	296	55	278	.	3319	1720
	983	983	386	126	447	1010	1683	1129	473	337	998	453	.	3491	1741
	821	821	389	71	900	875	474	673	727	1143	531	563	706	244	644
	282	282	391	177	344	892	257	135	379	89	135	448	144	192	262
	.	164	795	.	5	35	6	.	11	8	0	0	664	58	65
	.	72	789	.	0	14	10	.	12	1	0	1	67	18	2
	.	227	791	.	66	193	151	.	201	2	10	12	81	182	.
	.	100	798	.	76	108	152	.	226	19	50	38	806	1096	.
275 - 366	1432	1432	345	937	3747	1775	4359	1665	2659	1249	2344	2052	3998	2282	2488
	865	865	346	2237	5483	2378	2062	1312	1021	1224	1045	4602	3555	3908	2960
	334	334	368	385	690	338	2272	860	857	871	1829	1059	.	1106	581
	718	718	387	1546	1765	1614	1609	5284	4897	4503	661	1147	.	586	2336
	361	361	388	310	711	814	380	270	704	993	309	554	431	317	582
	145	145	392	69	500	618	215	170	234	116	53	266	165	137	77
	.	175	796	.	37	355	289	.	154	96	41	2	318	385	380
	.	81	800	.	313	517	.	233	191	215	52	636	725	.	.
	186	186	729	215	648	496	242	239	1002	438	100	218	139	13	103
	216	216	731	242	.	713	305	1795	891	407	318	306	262	151	227
	468	468	733	501	706	752	2535	1511	1321	906	312	949	364	1215	2248
367 - 549	272	272	735	526	1111	938	2093	2465	728	1504	1177	412	.	808	1457
	.	50	792	.	186	349	608	.	316	69	31	200	1021	602	.
	170	170	730	140	37	330	44	224	125	627	200	183	74	32	196
	231	231	732	83	463	590	705	519	858	319	152	430	130	226	123
	228	228	734	280	642	604	515	184	554	671	214	124	.	34	136
	175	175	736	271	1117	951	1285	498	4028	1038	910	214	.	195	445
	.	227	737	1244	2198	1981	4765	1472	1522	1689	1433	1041	.	2097	1463
	.	223	741	.	867	3224	5059	961	444	1653	1337	661	.	2061	.
	.	348	745	.	1075	1722	1299	358	364	680	267	971	.	282	.
	.	159	748	.	429	287	166	255	390	458	26	74	.	26	.
915 - 1097	.	221	738	1490	1906	1439	769	548	903	857	571	750	.	527	.
	.	206	742	.	567	901	918	628	451	579	982	2183	.	639	.
	.	392	746	.	783	992	531	1231	363	1126	132	39	.	601	.
	.	126	749	.	125	377	135	.	185	17	50	6	.	.	.
	.	254	739	.	1227	2248	1784	245	515	329	227	918	.	459	569
	.	211	743	.	931	2820	472	2427	861	671	1527	358	.	336	.
	.	724	747	.	438	1446	570	284	622	37	204	110	.	288	.
	.	556	750	.	586	3947	1750	1100	1872	348	581	119	.	.	.
1098 - 1280	.	264	740	.	981	2604	1013	337	1109	1068	946	456	.	738	332
	.	280	744	.	2961	1101	1746	.	698	1295	957	3571	.	1153	.
	.	229	751	.	1207	2810	2633	.	711	1061	206	59	.	.	.
	Total Biomass (t)				11282	36642	48596	55927	33955	34161	29886	22377	26123	15940	30123	32452

Table 10 Abundance estimates (000s) of Greenland halibut from Canadian fall surveys in Div. 3L using a Campelen trawl during 1995-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
30 - 56	.	268	784	.	0	0	0	.	0	0	0	0	0	0	.
57 - 92	2071	2071	350	71	0	0	0	0	0	0	0	41	0	0	41
	1780	1780	363	0	0	0	0	0	0	0	0	0	41	0	0
	1121	1121	371	0	39	0	0	39	0	0	0	0	0	0	0
	2460	2460	372	0	0	42	0	0	0	0	0	0	0	0	97
	1120	1120	384	31	0	0	0	0	0	0	0	0	0	39	116
	.	465	785	.	0	0	0	.	0	0	0	0	0	0	.
93 - 183	1519	1519	328	0	42	42	42	125	84	0	42	0	48	48	0
	1574	1574	341	0	72	595	650	43	173	0	38	0	62	0	87
	585	585	342	0	40	201	80	0	201	0	0	0	40	64	0
	525	525	343	0	0	96	132	0	36	0	0	0	72	0	36
	2120	2120	348	0	83	458	622	311	73	83	79	0	357	708	595
	2114	2114	349	144	125	208	686	914	0	0	0	42	184	337	125
	2817	2817	364	86	0	517	1287	43	0	172	43	0	129	178	0
	1041	1041	365	179	0	668	382	143	.	95	0	48	.	716	1193
	1320	1320	370	73	227	227	2623	986	171	227	136	52	.	0	499
	2356	2356	385	1577	540	3110	1058	770	36	203	648	243	1273	486	1094
	1481	1481	390	272	204	815	1892	693	149	1580	1100	81	477	774	303
	.	84	786	.	331	12	12	.	0	0	0	6	0	6	.
	.	613	787	.	42	295	0	.	0	0	0	0	126	0	42
	.	261	788	.	0	180	90	.	0	0	0	0	0	24	36
	.	89	790	.	0	6	18	.	37	0	0	0	41	12	.
	.	72	793	.	0	5	10	.	0	5	10	0	0	74	.
	.	216	794	.	0	40	15	.	0	0	0	0	0	49	0
	.	98	797	.	0	13	34	.	0	0	0	0	31	0	0
	.	72	799	.	0	0	9	.	0	0	0	0	0	10	0
184 - 274	1494	1582	344	73	69	696	3096	392	64	0	44	87	2497	1312	1237
	983	983	347	120	0	180	3200	541	456	45	90	45	1871	631	1923
	1394	1394	366	2246	2732	6673	7278	4913	192	2923	6286	682	.	5787	5331
	961	961	369	338	1124	4451	7193	1880	595	2071	813	1807	.	13969	4465
	983	983	386	1758	2524	7437	5980	4958	1037	1017	6641	3316	.	12613	4297
	821	821	389	753	8019	7680	2146	3338	2485	7943	3179	3802	4480	652	1778
	282	282	391	886	3369	6459	969	601	3491	369	1410	2289	834	1060	1254
	.	164	795	.	21	104	23	.	20	34	0	15	1523	103	105
	.	72	789	.	0	50	25	.	35	15	5	15	144	38	5
	.	227	791	.	127	487	375	.	283	28	21	16	250	331	.
	.	100	798	.	261	281	468	.	309	55	78	99	1842	1731	.
275 - 366	1432	1432	345	4671	18723	12712	22231	6457	24864	7192	10703	10046	20558	6624	7582
	865	865	346	23203	40360	16064	7913	3490	5421	9162	7972	25821	16698	9963	7175
	334	334	368	3630	8664	1815	7305	1940	1447	3045	4411	4847	.	2924	1358
	718	718	387	16297	13169	8214	5004	10310	11803	12922	1778	8758	.	1462	3731
	361	361	388	1639	2657	6605	894	472	1788	4569	1018	2226	1539	670	957
	145	145	392	537	4317	4149	568	459	559	436	239	1116	973	559	168
	.	175	796	.	72	1071	975	.	1061	542	235	36	746	903	867
	.	81	800	.	1839	1821	.	936	584	145	1788	1677	.	.	.
367 - 549	186	186	729	587	1797	1241	461	486	1689	819	273	537	316	32	193
	216	216	731	604	2333	517	2791	1501	728	700	782	458	198	272	.
	468	468	733	1610	2694	3058	5991	2414	2437	2015	601	2439	554	2110	3358
	272	272	735	2301	3511	3592	4808	4457	1154	3031	2611	1310	.	1219	2927
	.	50	792	.	1494	1510	1861	.	517	277	137	957	2486	1247	.
550 - 731	170	170	730	342	84	503	52	366	164	1050	412	322	104	43	266
	231	231	732	374	607	1414	1176	763	1128	632	234	1198	226	254	170
	228	228	734	668	1854	1812	929	298	795	1129	394	248	.	48	181
	175	175	736	706	2848	2696	3045	867	6644	2195	1626	535	.	277	722
732 - 914	.	227	737	3170	4965	4216	9306	2014	1936	2264	2123	2077	.	3138	1733
	.	223	741	.	1917	8083	10239	1363	506	1810	2163	1210	.	.	2976
	.	348	745	.	1891	3064	1987	404	438	814	407	1963	.	335	.
	.	159	748	.	853	711	264	400	427	667	25	55	.	.	33
915 - 1097	.	221	738	2919	3283	2003	1176	725	1094	1125	775	1094	.	.	623
	.	206	742	.	808	2706	1204	867	468	652	1474	3245	.	.	609
	.	392	746	.	1267	1845	674	770	351	1159	129	67	.	.	620
	.	126	749	.	121	841	186	.	121	19	61	9	.	.	.
1098 - 1280	.	254	739	.	1655	3127	2568	349	472	360	332	1136	.	472	507
	.	211	743	.	1205	2245	493	3316	1055	697	1901	566	.	.	305
	.	724	747	.	498	1029	498	299	697	50	199	199	.	.	238
	.	556	750	.	841	4245	1874	814	2027	153	497	191	.	.	.
1281 - 1463	.	264	740	.	1543	2978	1217	436	1180	908	946	617	.	817	345
	.	280	744	.	2773	1213	2140	.	757	1266	770	4452	.	.	790
	.	229	751	.	1040	2991	3103	.	929	971	221	54	.	.	.
Abundance (000s)		71863	147500	153954	142871	68018	85354	80458	66613	90941	62770	76390	63701		

Table 11 Biomass estimates (t) of Greenland halibut from Canadian fall surveys in Div. 3M using a Campelen trawl during 1996-2006.
Division 3M was not surveyed in 2004 or 2005.

Depth Range (m)	V1 Area	V4 Area	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2006
128 - 146	342	342	501	0	0	0	0	0	0	0	0	0
147 - 184	838	838	502	0	0	0	0	0	0	0	0	0
185 - 256	628	628	503	91	0	0	0	0	0	0	0	0
	348	348	504	0	0	0	0	0	0	0	0	0
	703	703	505	12	0	0	0	0	0	0	0	0
	496	496	506	33	0	0	0	0	0	0	0	0
257 - 366	822	822	507	380	0	0	0	0	0	0	0	0
	646	646	508	230	0	0	0	0	0	0	0	0
	314	314	509	56	0	0	0	0	0	0	0	0
	951	951	510	271	0	0	0	0	0	0	0	0
	806	806	511	316	0	0	0	0	0	0	0	0
367 - 549	670	670	512	261	0	0	0	0	0	0	0	0
	249	249	513	64	0	0	0	0	0	0	0	0
	602	602	514	171	0	0	0	0	0	0	0	0
	666	666	515	434	0	0	0	0	0	0	0	0
550 - 731	634	634	516	342	0	0	0	0	0	0	0	0
	216	216	517	77	0	0	0	0	0	0	0	0
	210	210	518	143	0	0	0	0	0	0	0	0
	414	414	519	581	0	0	0	0	0	0	0	0
732 - 914	525	520	520	0	0	0	0	0	0	0	0	0
	253	524	279	1580	2297	0	0	0	0	0	0	0
	530	528	59	270	77	0	0	0	0	0	0	0
	98	533	539	0	0	0	0	0	0	0	0	0
	133	539	0	0	0	0	0	0	0	0	0	0
915 - 1097	517	521	0	0	0	0	0	0	0	0	0	0
	226	525	0	0	0	0	0	0	0	0	0	0
	488	529	72	218	667	562	508	1233	602	821	255	0
	238	532	938	466	524	398	124	278	114	256	476	0
	486	534	814	2026	1466	0	1437	1020	471	576	796	0
1098 - 1280	533	522	0	0	0	0	0	0	0	0	0	0
	177	526	0	0	0	0	0	0	0	0	0	0
	1134	530	3769	1587	1506	1111	1285	958	162	1127	810	0
	92	535	235	218	434	0	720	30	165	119	25	0
1281 - 1463	284	523	0	0	0	0	0	0	0	0	0	0
	171	527	0	0	0	0	0	0	0	0	0	0
	203	531	346	216	508	337	149	302	0	381	347	0
Total Biomass (t)	112	536	202	385	296	0	219	218	34	202	4306	3249
	10175	6966	7776	2408	5511	5260	2525	0	0	0	0	0

Table 12 Abundance estimates (000s) of Greenland halibut from Canadian fall surveys in Div. 3M using a Campelen trawl during 1996-2006.
 Division 3M was not surveyed in 2004 or 2005.

Depth Range (m)	V1 Area	V4 Area	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2006
128 - 146	342	342	501	0	-	-	-	-	-	-	-	-
147 - 184	838	838	502	0	-	-	-	-	-	-	-	-
185 - 256	628	628	503	199	-	-	-	-	-	-	-	-
	348	348	504	0	-	-	-	-	-	-	-	-
	703	703	505	58	-	-	-	-	-	-	-	-
	496	496	506	184	-	-	-	-	-	-	-	-
257 - 366	822	822	507	1427	-	-	-	-	-	-	-	-
	646	646	508	1595	-	-	-	-	-	-	-	-
	314	314	509	65	-	-	-	-	-	-	-	-
	951	951	510	884	-	-	-	-	-	-	-	-
367 - 549	806	806	511	1360	-	-	-	-	-	-	-	-
	670	670	512	315	-	-	-	-	-	-	-	-
	249	249	513	84	-	-	-	-	-	-	-	-
	602	602	514	180	-	-	-	-	-	-	-	-
	666	666	515	489	-	-	-	-	-	-	-	-
550 - 731	634	634	516	358	-	-	-	-	-	-	-	-
	216	216	517	131	-	-	-	-	-	-	-	-
	210	210	518	176	-	-	-	-	-	-	-	-
	414	414	519	658	-	-	-	-	-	-	-	-
	194	194	538	-	-	-	-	-	-	-	-	-
732 - 914	525	520	-	-	-	-	-	-	-	-	-	-
	253	524	-	-	-	-	-	-	-	-	-	-
	530	528	292	1977	3297	1094	1361	923	778	405	-	-
	98	533	94	351	120	173	74	61	94	128	-	-
915 - 1097	133	539	-	-	-	-	-	-	-	-	-	-
	517	521	-	-	-	-	-	-	-	-	-	-
	226	525	-	-	-	-	-	-	-	-	-	-
	488	529	110	224	614	537	470	1188	470	962	336	-
	238	532	1408	557	688	557	141	327	126	405	507	-
	486	534	735	2674	1790	1872	938	532	557	879	-	-
1098 - 1280	533	522	-	-	-	-	-	-	-	-	-	-
	177	526	-	-	-	-	-	-	-	-	-	-
	92	535	1134	4619	1524	1595	1248	1181	884	201	1025	691
	284	523	171	165	247	373	386	34	104	70	14	-
1281 - 1463	203	531	182	73	517	293	140	115	0	307	312	-
	112	536	74	216	265	-	216	123	35	69	-	-
Abundance (000s)				15841	7841	9258	2635	5672	5045	2452	4267	3271

Table 13 Biomass estimates (t) of Greenland halibut from Canadian fall surveys in Div. 3N using a Campelen trawl during 1996-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<=56	1593	1593	375	0	0	0	0	0	0	0	1	0	0	0
57 - 92	1499	1499	376	0	0	0	0	0	0	0	0	0	0	0
	2992	2992	360	447	880	974	144	165	0	0	32	0	260	0
	1853	1853	361	0	0	0	0	0	0	0	0	0	0	0
	2520	2520	362	0	0	0	0	0	0	0	2	0	12	0
	931	931	374	0	2	0	0	0	0	0	0	0	0	0
	674	674	383	0	12	0	0	0	0	0	0	0	0	0
93 - 183	421	421	359	0	0	160	724	67	28	81	0	0	2	1
	100	100	377	4	166	30	21	30	1	0	10	7	58	0
	647	647	382	0	24	111	0	0	0	96	0	1	42	0
184 - 274	225	225	358	140	94	42	13	5	488	1	8	4	4	12
	139	139	378	112	262	2198	257	5	237	206	20	135	1	274
	182	182	381	802	615	1622	590	253	138	73	67	114	146	170
275 - 366	164	164	357	40	58	7	6	8	20	21	8	228	0	0
	106	106	379	581	41	31	22	36	404	98	59	629	26	15
	116	116	380	178	516	794	330	151	141	95	130	362	138	201
367 - 549	155	155	723	115	109	336	14	48	70	8	31	11	64	0
	105	105	725	165	1646	65	95	171	59	54	42	52	16	16
	160	160	727	1006	371	509	494	391	570	211	209	342	225	19
550 - 731	124	124	724	160	589	374	126	67	62	154	122	99	193	
	72	72	726	296	448	765	55	30	517	214	136	52	74	104
	156	156	728	1035	455	675	511	201	299	510	291	1084	38	54
732 - 914	.	106	756	.	.	242	.	243	230	211	.	.	250	.
	154	760	.	.	352	.	183	283	786	.	.	167	.	.
915 - 1097	.	138	753	.	.	224	.	109	55	75	.	.	.	.
	102	757	.	.	643	.	455	454	175	.	.	260	.	390
	171	761	.	.	687	.	778	402	315	.	.	233	.	.
1098 - 1280	.	180	754	1554	.	.	.	.	.	.	.	.	.	.
	99	758	.	443	.	427	274	78	.	.	126	.	.	.
	212	762	.	.	.	1096	772	339	.	.	233	.	.	.
1281 - 1463	.	385	755	.	658	965	571	454	.	.	.	.	.	.
	127	759	.	165	509	378	217	.	.	85	.	.	.	.
	261	763	.	2135	509	1111	.	.	286	.	.	.	.	.
Total Biomass (t)	.	.	5079	6448	14788	2738	9330	7155	5705	1057	2885	3253	1081	.

Table 14 Abundance estimates (000s) of Greenland halibut from Canadian fall surveys in Div. 3N using a Campelen trawl during 1996-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<=56	1593	1593	375	0	31	0	0	0	0	0	55	0	0	0
57 - 92	1499	1499	376	0	0	0	0	0	0	0	0	0	0	0
	2992	2992	360	3293	4961	3293	257	257	0	0	463	0	823	0
	1853	1853	361	0	0	0	0	0	0	0	0	0	0	0
	2520	2520	362	0	0	0	0	0	0	0	50	0	50	0
	2520	373	0	99	0	0	0	0	0	0	0	0	0	0
	931	374	0	49	0	0	0	0	0	0	0	0	0	0
	674	383	0	0	0	0	0	0	0	0	0	0	0	0
93 - 183	421	421	359	0	1419	1853	87	29	290	0	0	29	29	29
	100	100	377	31	571	76	55	69	16	10	110	28	206	0
	647	647	382	0	45	223	0	0	0	401	0	51	89	0
184 - 274	225	225	358	959	696	232	77	14	2132	15	90	46	45	31
	139	139	378	1027	1589	7276	1013	34	417	676	76	1080	19	1270
	182	182	381	19548	3693	6534	2353	739	663	613	310	688	313	513
275 - 366	164	164	357	370	481	45	21	66	60	113	23	959	0	0
	106	106	379	4511	132	169	69	80	710	416	305	1999	162	26
	116	116	380	2525	1779	2278	846	339	412	465	606	2066	303	766
367 - 549	155	155	723	320	591	1002	53	95	113	38	84	64	107	0
	105	105	725	701	12676	231	217	372	318	213	193	182	64	64
	160	160	727	10334	1123	1868	1079	658	884	649	698	757	430	31
550 - 731	124	124	724	644	2789	1421	213	159	94	468	415	105	409	409
	72	72	726	1124	1406	2665	122	53	1033	1074	584	168	199	185
	156	156	728	3573	1356	2060	1094	377	807	2361	975	2997	46	97
732 - 914	134	134	752	.	995	959	74	184	.	.	.	.	.	.
	106	106	756	.	525	396	314	343	.	.	459	.	.	.
	154	154	760	.	821	354	478	1727	.	191	.	.	.	.
915 - 1097	138	753	.	.	351	142	66	129	.	.	.	.	.	.
	102	757	.	1143	.	687	645	247	.	365	.	.	.	.
	171	761	.	958	1264	524	470	.	.	588	.	.	.	.
1098 - 1280	180	754	.	2392	173	66	99	.	.	.	.	.	.	.
	99	758	.	536	586	302	86	.	109	.	.	.	.	.
	212	762	.	1448	864	525	424	.	335	.	.	.	.	.
1281 - 1463	385	755	.	871	1074	556	424	.	.	96	.	.	.	.
	127	759	.	183	580	376	132	.	.	.	.	.	.	.
	261	763	.	.	2805	521	1364	.	421	.	.	.	.	.
Abundance (000s)				48959	35487	40002	7536	13763	12740	13237	4663	10461	6581	3421

Table 15 Biomass estimates (t) of Greenland halibut from Canadian fall surveys in Div. 3O using a Campelen trawl during 1996-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
57 - 92	2089	2089	330	0	0	0	0	0	0	0	0	0	0	0
456	456	331	0	0	11	0	0	0	0	0	0	0	0	0
1898	1898	338	39	195	38	39	0	0	0	0	26	16	0	0
1716	1716	340	0	0	0	17	0	0	0	0	0	0	0	0
2520	2520	351	0	0	0	0	0	0	0	0	0	0	0	0
2580	2580	352	56	9	28	0	0	4	0	0	0	0	0	0
1282	1282	353	472	769	544	108	0	0	3	0	180	40	0	0
1721	1721	329	28	57	11	50	46	3	0	0	0	0	0	0
1047	1047	332	25	81	74	0	0	0	0	0	16	26	0	0
948	948	337	48	30	21	67	0	0	0	0	7	0	17	0
585	585	339	0	103	8	46	16	0	1	0	0	0	0	0
474	474	354	5	59	15	1094	95	71	24	84	39	6	77	0
184 - 274	151	147	333	10	0	0	3	0	0	0	0	5	0	0
121	121	336	3	7	5	0	0	0	0	0	12	5	0	1
103	103	355	39	22	3	1	0	1	5	3	25	2	9	0
92	96	334	6	6	6	0	0	0	0	0	0	0	0	1
58	58	335	7	2	0	3	3	0	0	5	0	0	0	1
61	61	356	8	6	8	8	9	6	7	0	2	1	0	0
367 - 549	93	166	717	42	27	6	0	72	0	27	1	3	0	0
76	76	719	11	4	14	36	18	10	1	0	31	0	0	0
76	76	721	50	35	47	26	23	42	5	25	0	6	1	1
550 - 731	111	134	718	131	158	186	20	26	107	355	35	82	34	84
105	105	720	82	92	105	181	141	152	131	17	79	0	0	0
93	93	722	153	490	124	160	73	106	40	437	23	109	0	0
732 - 914	.	105	764	.	620	437	239	324	.	.	240	.	.	.
.	.	99	768	.	1070	403	274	460	.	.	101	.	.	.
915 - 1097	.	135	772	.	1334	.	360	194	164	.	358	.	.	.
.	.	124	765	.	175	.	665	155	127	.	162	.	.	.
1098 - 1280	.	138	769	.	409	.	405	438	374	.	306	.	.	.
1281 - 1463	.	128	773	.	560	.	386	340	632	526	.	159	.	.
Total Biomass (t)	.	144	766	.	322	238	267	.	.	94	.	.	.	.
.	.	128	770	.	172	1116	379	.	.	129	.	.	.	.
.	.	135	774	.	186	259	174	480	.	.	113	.	.	.
.	.	158	767	.	101	257	60	.	.	34	.	.	.	.
.	.	175	771	.	171	604	254	.	.	123	.	.	.	.
.	.	155	775	.	96	130	488	290	.	174	.	.	.	.
		1026	2058	5402	1905	4222	4546	4077	2589	407	2339	208	.	.

Table 16 Abundance estimates (000s) of Greenland halibut from Canadian fall surveys in Div. 3O using a Campelen trawl during 1996-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
57 - 92	2089	2089	330	0	0	0	0	0	0	0	0	0	0	0
456	456	331	0	0	63	0	0	0	0	0	0	0	0	0
1898	1898	338	131	940	261	104	0	0	0	0	209	209	0	0
1716	1716	340	0	0	0	34	0	0	0	0	0	0	0	0
2520	2520	351	0	0	0	0	0	0	0	0	0	0	0	0
2580	2580	352	659	25	111	0	0	101	0	0	0	0	0	0
1282	1282	353	4321	4453	2293	397	0	0	88	0	750	353	0	0
1721	1721	329	47	1657	47	95	84	47	0	0	47	0	0	0
1047	1047	332	1224	864	624	0	0	0	0	0	384	192	0	0
948	948	337	717	522	169	261	0	0	0	0	174	0	149	0
585	585	339	0	1086	138	201	80	0	0	40	0	0	0	0
474	474	354	87	619	65	3097	130	174	333	652	531	65	1565	0
184 - 274	184 - 274	333	121	0	0	20	0	0	9	0	71	10	0	0
121	121	336	25	75	31	0	8	0	0	50	42	0	8	0
103	103	355	418	241	21	7	0	13	92	14	305	20	50	0
92	92	334	53	33	0	0	0	0	0	0	6	0	6	0
58	58	335	12	28	0	8	8	0	0	0	16	4	0	4
61	61	356	57	55	8	22	17	4	29	0	17	12	0	0
367 - 549	367 - 549	66	717	34	57	11	0	57	0	46	13	20	0	0
76	76	719	52	37	31	42	12	16	5	0	18	0	0	0
76	76	721	329	182	125	88	37	31	16	105	0	9	5	0
550 - 731	550 - 731	111	718	590	553	120	28	46	116	524	53	199	41	0
105	105	720	461	274	173	276	207	255	231	25	122	186	0	0
93	93	722	2900	385	294	1760	108	203	108	1478	80	182	0	0
732 - 914	732 - 914	105	764	2997	763	429	624	624	624	143	0	0	0	0
135	135	772	3714	592	592	259	248	248	248	520	0	0	0	0
915 - 1097	915 - 1097	124	765	210	1032	273	184	184	184	188	0	0	0	0
1098 - 1280	1098 - 1280	138	769	854	494	484	427	427	427	275	0	0	0	0
1281 - 1463	1281 - 1463	144	766	778	518	376	634	537	537	132	0	0	0	0
		128	773	205	283	271	0	0	0	89	0	0	0	0
		135	774	170	1039	324	0	0	0	88	0	0	0	0
		158	767	186	195	72	244	244	244	93	0	0	0	0
		175	771	116	261	76	0	0	0	54	0	0	0	0
		155	775	179	481	193	0	0	0	108	0	0	0	0
Abundance (000s)				9309	14482	15604	4754	6092	5291	4967	5144	2362	3411	1865

Table 17a Biomass estimates (t) of Greenland halibut from Canadian spring surveys in Div. 3L using a Campelen trawl during 1995-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
30 - 56	.	268	784	.	.	.	0	0	.	0	0	.	0	.	.
57 - 92	2071	2071	350	0	0	0	0	0	0	0	0	0	0	0	0
	1780	1780	363	0	0	0	0	0	0	0	0	0	0	0	0
	1121	1121	371	0	0	0	0	0	0	0	0	0	0	0	0
	2460	2460	372	0	0	0	0	0	0	0	0	0	0	0	0
	1120	1120	384	0	0	0	0	0	0	0	0	0	0	0	0
	465	785	.	.	.	0	0	.	0	0	0	.	0	.	.
93 - 183	1519	1519	328	2	0	0	0	0	18	0	0	0	1	13	0
	1574	1574	341	0	2	0	14	0	26	0	0	0	0	0	0
	585	585	342	0	0	0	5	0	0	0	0	0	0	0	0
	525	525	343	0	0	0	2	0	0	0	0	0	0	30	0
	2120	2120	348	0	1	9	0	0	0	0	0	0	0	0	1
	2114	2114	349	0	1	0	11	0	14	2	0	0	0	5	0
	2817	2817	364	0	0	6	0	0	0	1	0	1	0	0	0
	1041	1041	365	0	1	0	0	14	0	0	0	0	0	45	41
	1320	1320	370	0	0	0	0	0	0	0	0	0	0	0	0
	2356	2356	385	0	0	0	0	0	0	0	0	0	0	12	0
	1481	1481	390	0	0	24	0	0	6	0	0	0	0	9	0
	84	786	.	.	.	0	0	.	0	.	.	.	0	.	.
	613	787	.	.	.	0	0	.	0	.	.	.	0	.	.
	261	788	.	.	.	0	.	.	.	.	.	.	.	.	.
	89	790	.	.	.	10	.	.	.	.	.	.	.	.	.
	72	793	.	.	.	3	.	.	.	.	.	.	.	.	.
184 - 274	216	794	.	.	.	0	.	.	.	.	0	.	.	.	.
	98	797	.	.	.	0	.	.	.	.	0	.	.	.	.
	72	799	.	.	.	.	.	.	.	.	0	.	.	.	.
	1494	1582	344	0	3	59	0	21	24	3	0	31	34	23	0
	983	983	347	0	1	5	0	0	1	0	0	0	0	32	0
	1394	1394	366	90	6	169	10	30	0	1	48	148	255	236	44
	961	961	369	0	1	2	79	17	0	1	0	464	0	199	943
	983	983	386	10	1	84	11	633	0	0	0	0	115	494	2078
	821	821	389	142	38	435	122	435	1070	143	3	2	36	994	909
	282	391	54	9	3	43	0	4	3	16	58	0	238	274	.
	164	795	.	.	.	0	.	.	.	.	0	.	.	.	.
	72	789	.	.	.	18	.	.	.	.	0	.	.	.	.
	227	791	.	.	.	113	.	.	.	.	.	.	.	.	.
	100	798	.	.	.	23	.	.	.	.	0	.	.	.	.
275 - 366	1432	1432	345	122	335	892	302	926	891	495	566	441	1953	429	333
	865	865	346	123	354	1372	639	338	366	513	245	307	469	789	645
	334	334	368	30	137	216	263	228	456	311	327	703	241	362	1826
	718	387	391	208	2514	2585	2026	4356	439	97	359	724	2967	2600	.
	361	361	388	163	304	382	1404	464	482	220	223	608	989	332	483
	145	145	392	51	288	117	464	100	143	85	74	248	111	356	122
	175	796	.	.	.	7	.	.	.	.	0	.	.	.	.
	81	800	.	.	.	210	.	.	.	.	.	.	.	.	.
	186	186	729	136	803	236	3921	1351	1286	555	407	589	724	292	187
	216	216	731	456	897	299	3531	1284	1725	664	217	1336	496	288	507
550 - 731	468	468	733	582	3016	3003	7556	3311	2290	1139	847	3444	1138	2315	943
	272	272	735	1063	302	4063	5100	4332	4656	2186	939	598	1207	1685	977
	50	792	.	.	.	533	.	903	.	148	.	.	.	.	.
	170	170	730	86	245	0	1693	292	745	772	177	53	54	129	160
	231	231	732	291	462	1420	3220	1219	996	1173	533	465	560	354	105
732 - 914	228	228	734	583	1327	1361	4169	1324	2887	621	362	367	592	459	255
	175	175	736	449	791	1793	5037	3463	4372	2804	1378	1747	259	1923	915
	227	737	.	.	.	.	.	.	.	.	.	.	.	.	.
	223	741	.	.	.	.	.	.	.	.	.	.	.	.	.
915 - 1097	348	745	.	.	.	.	.	.	.	.	.	.	.	.	.
	159	748	.	.	.	.	.	.	.	.	.	.	.	.	.
	221	738	.	.	.	.	.	.	.	.	.	.	.	.	.
	206	742	.	.	.	.	.	.	.	.	.	.	.	.	.
1098 - 1280	392	746	.	.	.	.	.	.	.	.	.	.	.	.	.
	126	749	.	.	.	.	.	.	.	.	.	.	.	.	.
	254	739	.	.	.	.	.	.	.	.	.	.	.	.	.
	211	743	.	.	.	.	.	.	.	.	.	.	.	.	.
	724	747	.	.	.	.	.	.	.	.	.	.	.	.	.
1281 - 1463	556	750	.	.	.	.	.	.	.	.	.	.	.	.	.
	264	740	.	.	.	.	.	.	.	.	.	.	.	.	.
	280	744	.	.	.	.	.	.	.	.	.	.	.	.	.
	229	751	.	.	.	.	.	.	.	.	.	.	.	.	.
Total Biomass (t)				4826	9533	18467	40182	22724	26815	13035	6459	12118	9973	14997	14348

Table 17b Abundance estimates (000s) of Greenland halibut from Canadian spring surveys in Div. 3L using a Campelen trawl during 1995-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
30 - 56		268	784				0	0		0	0		0		
57 - 92	2071	2071	350	0	0	0	0	0	0	0	0	0	0	0	0
	1780	1780	363	0	0	0	0	0	0	0	0	0	41	0	0
	1121	1121	371	0	0	0	0	0	0	0	0	0	0	0	0
	2460	2460	372	0	0	0	0	0	0	0	0	0	0	0	0
	1120	1120	384	0	0	0	0	0	0	0	0	0	0	0	0
		465	785				0	0		0	0		0		
93 - 183	1519	1519	328	15	30	0	0	0	84	42	0	0	42	104	0
	1574	1574	341	0	31	0	87	0	130	0	0	0	0	0	0
	585	585	342	0	0	0	40	0	0	0	0	0	0	0	0
	525	525	343	0	0	0	36	0	0	0	0	0	0	32	0
	2120	2120	348	0	29	32	0	0	0	0	0	0	0	0	47
	2114	2114	349	0	65	0	73	0	36	42	0	0	0	48	0
	2817	2817	364	0	30	43	0	0	39	86	0	129	0	0	0
	1041	1041	365	0	29	0	0	32	0	0	0	0	0	143	102
	1320	1320	370	0	30	0	0	0	0	0	0	0	0	0	0
	2356	2356	385	0	0	0	0	0	0	0	0	0	41	0	0
	1481	1481	390	0	0	102	0	0	407	0	0	41	0	73	0
		84	786				0	7		6			0		
		613	787				0	0		0			0		
		261	788				0								
		89	790				24								
		72	793				5								
		216	794				0					0			
		98	797				0					0			
		72	799									0			
184 - 274	1494	1582	344	0	62	261	36	39	163	87	0	44	435	87	0
	983	983	347	0	34	68	0	0	85	0	0	0	0	90	0
	1394	1394	366	341	38	1406	146	170	0	38	1364	1304	1283	805	384
	961	961	369	0	33	59	397	78	0	44	0	3746	0	1425	2380
	983	983	386	30	68	781	68	2710	0	0	0	0	481	1412	5544
	821	821	389	715	791	5141	979	1694	4574	866	142	75	264	2711	2598
	282	282	391	414	388	52	282	0	188	155	116	407	0	892	856
		164	795				0					0			
		72	789				65					0			
		227	791				208								
		100	798				61					0			
275 - 366	1432	1432	345	834	4268	7958	3400	4062	3758	4478	2872	3034	13951	1646	4885
	865	865	346	582	8673	16262	3094	1728	1988	4447	3587	3512	3411	2102	2181
	334	334	368	204	1501	2413	1718	1066	1437	791	1362	4628	1133	1195	4411
	718	718	387	1844	5461	24347	13689	8520	17334	1800	658	2321	2853	11452	6420
	361	361	388	607	4247	1962	7824	1837	2008	1192	1363	3327	3487	971	1217
	145	145	392	253	3551	1127	2753	509	355	509	329	1935	888	1427	329
	175	175	796				43				36				
		81	800				456								
367 - 549	186	186	729	637	3774	1076	20763	3416	2890	1621	1720	2887	2623	721	432
	216	216	731	1301	4958	1530	13617	4115	4558	1598	1000	4632	1638	647	1180
	468	468	733	2361	18551	13680	23219	10880	6152	4178	3122	17443	3813	6695	2157
	272	272	735	3210	1949	18286	17174	11726	10063	5355	3645	2736	4141	3749	2039
		50	792				1220			1401		404			
550 - 731	170	170	730	208	531	0	4022	608	1668	1287	608	118	159	180	269
	231	231	732	713	1657	4435	9612	2955	1729	2599	1624	1321	1285	706	214
	228	228	734	1763	5504	3980	11277	3288	4767	1469	1267	937	2107	1073	596
	175	175	736	1134	2846	5862	13325	6795	6668	4696	2749	5903	824	3723	1575
732 - 914		227	737												
		223	741												
		348	745												
		159	748												
915 - 1097		221	738												
		206	742												
		392	746												
		126	749												
1098 - 1280		254	739												
		211	743												
		724	747												
		556	750												
1281 - 1463		264	740												
		280	744												
		229	751												
Abundance (000s)				17165	69126	110862	147631	68316	71080	38783	27530	60919	44896	44111	39815

Table 18a Biomass estimates (t) of Greenland halibut from Canadian spring surveys in Div. 3N using a Campelen trawl during 1996-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<=56	1593	1593	375	0	0	0	0	0	0	0	1	0	0	0
	1499	1499	376	12	0	0	0	0	1	0	0	0	70	0
57 - 92	2992	2992	360	19	349	130	471	183	23	0	0	71	62	0
	1853	1853	361	0	0	1	0	0	4	0	0	0	0	0
	2520	2520	362	0	0	0	0	0	0	0	0	0	0	0
	2520	2520	373	0	0	0	0	0	0	0	0	0	0	0
	931	931	374	9	0	0	0	0	0	73	0	0	0	0
	674	674	383	0	0	0	0	0	0	0	0	0	0	0
93 - 183	421	421	359	145	133	31	165	96	19	0	2	4	133	.
	100	100	377	6	4	0	321	0	0	0	0	0	25	.
	647	647	382	0	0	76	0	20	0	0	0	1	356	.
184 - 274	225	225	358	259	677	413	458	46	17	29	118	51	27	.
	139	139	378	48	37	49	719	4	14	6	82	7	15	.
	182	182	381	178	90	10	217	33	7	0	41	0	92	.
275 - 366	164	164	357	57	82	375	17	4	43	0	13	134	26	.
	106	106	379	85	183	170	1047	312	28	88	736	16	29	.
	116	116	380	117	162	58	43	53	28	19	287	72	220	.
367 - 549	155	155	723	333	134	300	68	173	71	24	60	27	25	.
	105	105	725	242	952	130	37	289	150	68	153	15	201	.
	160	160	727	389	1482	1499	328	843	358	22	315	219	174	.
550 - 731	124	124	724	196	142	368	575	114	95	201	142	72	24	.
	72	72	726	93	254	1463	63	257	139	52	125	91	45	.
	156	156	728	1226	.	576	1475	1804	1088	222	686	642	79	.
732 - 914	.	134	752	.	.	.	.	.	.	.	.	.	.	.
	.	106	756	.	.	.	.	.	.	.	.	.	.	.
	.	154	760	.	.	.	.	.	.	.	.	.	.	.
915 - 1097	.	138	753	.	.	.	.	.	.	.	.	.	.	.
	.	102	757	.	.	.	.	.	.	.	.	.	.	.
	.	171	761	.	.	.	.	.	.	.	.	.	.	.
1098 - 1280	.	180	754	.	.	.	.	.	.	.	.	.	.	.
	.	99	758	.	.	.	.	.	.	.	.	.	.	.
	.	212	762	.	.	.	.	.	.	.	.	.	.	.
1281 - 1463	.	385	755	.	.	.	.	.	.	.	.	.	.	.
	.	127	759	.	.	.	.	.	.	.	.	.	.	.
	.	261	763	.	.	.	.	.	.	.	.	.	.	.
Total Biomass (t)				3415	4681	5647	6003	4228	2084	805	2761	1422	1603	0

Table 18b Abundance estimates (000s) of Greenland halibut from Canadian spring surveys in Div. 3N using a Campelen trawl during 1996-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<=56	1593	1593	375	0	0	0	0	0	0	0	88	0	0	0
	1499	1499	376	41	0	0	0	0	41	0	0	0	247	0
57 - 92	2992	2992	360	225	2190	1098	2507	453	41	0	0	329	320	0
	1853	1853	361	0	0	32	0	0	85	0	0	0	0	0
	2520	2520	362	0	0	0	0	0	0	0	0	0	0	0
	2520	2520	373	0	0	0	0	0	0	0	0	0	0	0
	931	931	374	85	0	0	0	0	0	299	43	0	0	0
	674	674	383	0	0	0	0	0	0	0	0	0	0	0
93 - 183	421	421	359	852	1390	129	550	347	203	0	91	29	898	.
	100	100	377	14	21	0	935	0	7	7	14	7	83	.
	647	647	382	0	0	178	0	89	0	0	0	51	801	.
184 - 274	225	225	358	3853	6782	1871	1594	138	232	74	327	495	220	.
	139	139	378	660	229	220	1673	223	102	31	429	60	63	.
	182	182	381	2189	490	200	613	2754	206	11	601	0	318	.
275 - 366	164	164	357	471	180	1636	66	20	144	11	80	514	271	.
	106	106	379	853	938	890	5009	7945	97	2318	6517	109	94	.
	116	116	380	1763	1548	559	247	756	121	291	1125	431	810	.
367 - 549	155	155	723	1773	853	1386	192	341	126	47	152	64	85	.
	105	105	725	2035	5545	712	100	650	571	356	718	70	884	.
	160	160	727	3363	7545	7538	1101	2348	1487	204	1436	942	558	.
550 - 731	124	124	724	1002	687	1008	2167	212	159	350	337	179	34	.
	72	72	726	293	763	5477	178	525	228	105	393	256	114	.
	156	156	728	6532	.	2154	4496	4286	2457	707	2384	2382	225	.
732 - 914	.	134	752	.	.	.	.	.	.	.	.	.	.	.
	.	106	756	.	.	.	.	.	.	.	.	.	.	.
	.	154	760	.	.	.	.	.	.	.	.	.	.	.
915 - 1097	.	138	753	.	.	.	.	.	.	.	.	.	.	.
	.	102	757	.	.	.	.	.	.	.	.	.	.	.
	.	171	761	.	.	.	.	.	.	.	.	.	.	.
1098 - 1280	.	180	754	.	.	.	.	.	.	.	.	.	.	.
	.	99	758	.	.	.	.	.	.	.	.	.	.	.
	.	212	762	.	.	.	.	.	.	.	.	.	.	.
1281 - 1463	.	385	755	.	.	.	.	.	.	.	.	.	.	.
	.	127	759	.	.	.	.	.	.	.	.	.	.	.
	.	261	763	.	.	.	.	.	.	.	.	.	.	.
Abundance (000s)				26004	29159	25088	21429	21086	6307	4811	14735	5918	6026	0

Table 19a Biomass estimates (t) of Greenland halibut from Canadian spring surveys in Div. 3O using a Campelen trawl during 1996-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
57 - 92	2089	2089	330	0	0	0	0	0	0	0	0	0	0	0
	456	456	331	0	0	63	0	0	0	0	0	0	0	0
	1898	1898	338	5035	459	298	0	0	0	87	0	186	0	33
	1716	1716	340	0	0	0	0	0	0	0	0	0	0	0
	2520	2520	351	0	0	0	0	0	0	0	0	0	0	0
	2580	2580	352	114	48	0	0	0	0	3	0	0	0	0
	1282	1282	353	119	146	331	2	25	0	3	0	1	84	57
93 - 183	1721	1721	329	1	13	0	0	1	1	0	0	0	0	14
	1047	1047	332	148	376	475	0	4	0	1	6	24	62	.
	948	948	337	179	139	4	0	3	31	1	91	17	37	.
	585	585	339	0	2	8	0	0	33	0	0	0	0	21
	474	474	354	807	122	330	3	0	11	22	8	25	43	.
184 - 274	151	147	333	5	62	23	0	9	0	8	0	2	12	.
	121	121	336	100	168	11	0	7	3	8	11	6	15	.
	103	103	355	249	168	20	0	3	84	5	46	42	13	.
275 - 366	92	96	334	20	39	6	2	1	0	1	0	0	0	3
	58	58	335	9	92	15	0	2	0	0	0	1	1	.
	61	61	356	161	68	47	1	0	3	1	7	1	3	.
367 - 549	93	166	717	42	165	55	0	0	1	0	0	6	0	.
	76	76	719	9	24	29	1	8	0	21	0	23	18	.
	76	76	721	161	59	112	5	30	1	8	2	7	3	.
550 - 731	111	134	718	70	116	154	11	26	8	41	60	73	56	.
	105	105	720	29	61	111	4	45	23	3	12	63	122	.
	93	93	722	57	176	203	23	120	23	43	3	86	51	.
732 - 914	.	105	764	.	.	.	.	.	.	.	.	.	.	.
	.	99	768	.	.	.	.	.	.	.	.	.	.	.
	.	135	772	.	.	.	.	.	.	.	.	.	.	.
915 -1097	.	124	765	.	.	.	.	.	.	.	.	.	.	.
	.	138	769	.	.	.	.	.	.	.	.	.	.	.
	.	128	773	.	.	.	.	.	.	.	.	.	.	.
1098 -1280	.	144	766	.	.	.	.	.	.	.	.	.	.	.
	.	128	770	.	.	.	.	.	.	.	.	.	.	.
	.	135	774	.	.	.	.	.	.	.	.	.	.	.
1281 -1463	.	158	767	.	.	.	.	.	.	.	.	.	.	.
	.	175	771	.	.	.	.	.	.	.	.	.	.	.
	.	155	775	.	.	.	.	.	.	.	.	.	.	.
Total Biomass (t)				2757	2084	2010	1328	284	224	173	245	391	538	88

Table 19b Abundance estimates (000s) of Greenland halibut from Canadian spring surveys in Div. 3O using a Campelen trawl during 1996-2006.

Depth Range (m)	V1 Area	V4 Area	Stratum	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
57 - 92	2089	2089	330	0	0	0	0	0	0	0	0	0	0	0
	456	456	331	0	0	63	0	0	0	0	0	0	0	0
	1898	1898	338	5035	459	298	0	0	0	87	0	186	0	33
	1716	1716	340	0	0	0	0	0	0	0	0	0	0	0
	2520	2520	351	0	0	0	0	0	0	0	0	0	0	0
	2580	2580	352	907	592	0	0	0	0	89	0	0	0	0
	1282	1282	353	1340	1195	1905	8	141	44	176	0	44	441	366
93 - 183	1721	1721	329	79	250	0	0	47	47	0	0	0	47	.
	1047	1047	332	1914	5425	3909	1	144	0	48	144	432	384	.
	948	948	337	1739	1415	98	0	33	391	43	2521	360	130	.
	585	585	339	0	72	40	0	0	161	0	0	0	0	72
	474	474	354	20278	1467	2289	8	0	186	685	98	359	442	.
184 - 274	151	147	333	111	600	233	1	131	0	131	0	22	131	.
	121	121	336	1987	1680	141	0	105	92	75	100	50	227	.
	103	103	355	8005	1467	88	0	6	1155	54	484	681	88	.
275 - 366	92	96	334	343	252	125	6	26	0	33	0	0	26	.
	58	58	335	126	794	156	2	36	8	4	0	9	18	.
	61	61	356	2031	369	183	3	0	30	26	34	38	37	.
367 - 549	93	166	717	544	1060	396	1	0	10	34	0	11	0	.
	76	76	719	97	177	90	1	5	5	54	0	25	183	.
	76	76	721	1673	391	350	12	37	5	28	14	58	33	.
550 - 731	111	134	718	325	664	828	30	28	18	37	147	74	121	.
	105	105	720	182	331	575	7	77	54	17	14	126	200	.
	93	93	722	381	1086	886	70	199	56	30	18	121	125	.
732 - 914	.	105	764	.	.	.	.	.	.	.	.	.	.	.
	.	99	768	.	.	.	.	.	.	.	.	.	.	.
	.	135	772	.	.	.	.	.	.	.	.	.	.	.
915 -1097	.	124	765	.	.	.	.	.	.	.	.	.	.	.
	.	138	769	.	.	.	.	.	.	.	.	.	.	.
	.	128	773	.	.	.	.	.	.	.	.	.	.	.
1098 -1280	.	144	766	.	.	.	.	.	.	.	.	.	.	.
	.	128	770	.	.	.	.	.	.	.	.	.	.	.
	.	135	774	.	.	.	.	.	.	.	.	.	.	.
1281 -1463	.	158	767	.	.	.	.	.	.	.	.	.	.	.
	.	175	771	.	.	.	.	.	.	.	.	.	.	.
	.	155	775	.	.	.	.	.	.	.	.	.	.	.
Abundance (000s)				47095	19746	12652	4013	1017	2262	1651	3573	2595	2633	470

Table 20a. Greenland halibut biomass estimates (000 t), by division, from Canadian fall surveys during 1995-2006.

Year	2G	2H	2J	3K	SA2+3K	3L	2J3KL	3M	3N	3O	3LMNO	TOTAL
1995	NO SURVEY		35.6	69.2	-	11.3	116.1		NO SURVEY		-	
1996	22.3	26.1	64.8	120.3	233.5	36.6	221.7	10.2	5.1	1.0	52.9	286.4
1997	15.5	38.6	82.1	130.5	266.7	48.6	261.2	7.0	6.4	2.1	64.1	330.8
1998	4.5	39.0	62.1	142.2	247.8	55.9	260.2	7.8	14.8	5.4	83.9	331.7
1999	10.5	30.7	87.1	175.6	303.9	34.0	296.7	2.4	2.7	1.9	41.0	344.9
2000	NO SURVEY		54.9	143.3	198.2	34.1	232.3	5.5	9.3	4.2	53.1	251.3
2001	NO SURVEY	37.7	65.8	128.7	232.2	29.9	224.4	5.3	7.2	4.5	46.9	279.1
2002	NO SURVEY		53.6	67.0	120.6	22.4	143.0	2.5	5.7	4.1	34.7	155.3
2003	NO SURVEY		59.8	71.5	131.3	26.1	157.4	4.3	1.1	2.6	34.1	165.4
2004	NO SURVEY	48.2	59.1	90.5	197.8	15.9	213.7	NO SURVEY	2.9	0.4	19.2	217.0
2005	NO SURVEY		61.1	112.6	173.7	30.1	203.8	NO SURVEY	3.3	2.3	35.7	209.4
2006	NO SURVEY	65.8	105.9	110.2	281.9	32.5	314.4	3.2	1.1	0.2	37.0	318.9

Table 20b. Abundance and biomass estimates of Greenland halibut, by Division, from Canadian fall 2006 survey.

Upper and lower indicate approximate 95% confidence limits.

Area	Total	Upper	Lower	Mean	Upper	Lower
Division 2G						
Abundance						
Biomass (kg)				NO SURVEY		
Division 2H						
Abundance	286,109,499	387,485,601	184,733,396	No/Tow	181.8	246.2
Biomass (kg)	65,848,733	99,863,858	31,833,608	Kg/Tow	41.8	63.5
Division 2J						
Abundance	533,727,909	811,509,579	255,946,240	No/Tow	153.5	233.4
Biomass (kg)	105,925,399	319,214,905	-107,364,108	Kg/Tow	30.5	91.8
Division 3K						
Abundance	372,464,926	430,855,939	314,073,914	No/Tow	75.7	87.5
Biomass (kg)	110,174,705	133,230,813	87,118,596	Kg/Tow	22.4	27.1
Division 3L						
Abundance	63,700,068	77,961,007	49,439,129	No/Tow	10.5	12.9
Biomass (kg)	32,451,464	41,005,688	23,897,241	Kg/Tow	5.4	6.8
Division 3M						
Abundance	3,271,103	4,102,789	2,439,417	No/Tow	7.3	9.1
Biomass (kg)	3,248,970	4,465,241	2,032,698	Kg/Tow	7.2	9.9
Division 3N						
Abundance	3,421,335	19,841,105	-12,998,434	No/Tow	1.4	8.3
Biomass (kg)	1,081,291	5,028,239	-2,865,657	Kg/Tow	0.5	2.1
Division 3O						
Abundance	1,864,526	21,758,837	-18,029,786	No/Tow	0.7	8.6
Biomass (kg)	207,775	1,188,388	-772,838	Kg/Tow	0.1	0.5
Combined SA2+Div. 3KLMNO						
Abundance	1,264,559,367	1,463,806,445	1,065,312,289	No/Tow	59.1	68.4
Biomass (kg)	318,938,337	390,265,238	247,611,436	Kg/Tow	14.9	18.2
						11.6

Table 21a. Mean weight (kg) per tow and associated CI for Greenland halibut in Div. 2G and 2H for 1978 - 2006.
 Refer to Tables 1 and 3 for variations in strata surveyed. In several years, Divs. 2GH have not been surveyed.

Year	Division					
	2G		2H			
	Mean wt/tow	Upper Limit	Lower Limit	Mean wt/tow	Upper Limit	Lower Limit
1978	34.2	45.9	22.6	54.2	77.1	31.4
1979	31.6	42.2	21.0	101.3	132.6	70.0
1981	29.0	63.2	-5.2	37.6	47.7	27.4
1987	23.4	31.3	15.5	27.7	35.5	19.8
1988	18.9	33.0	4.8	29.0	36.4	21.6
1991	0.9	1.6	0.2	4.4	8.0	0.8
1996	11.8	23.4	0.1	16.5	19.6	13.3
1997	13.7	17.2	10.3	38.2	49.0	27.4
1998	4.4	8.1	0.6	25.4	43.0	7.7
1999	5.4	7.6	3.2	20.0	24.8	15.2
2001	NO SURVEY			30.7	44.0	17.3
2004	NO SURVEY			30.4	37.6	23.2
2006	NO SURVEY			41.8	63.5	20.2

Table 21b. Mean weight (kg) per tow for Greenland halibut in Division 2J and 3K for 1978-2006.
 Refer to Tables 5 and 7 for variations in strata surveyed.

Year	Division					
	2J		3K			
	Mean wt/tow	Upper Limit	Lower Limit	Mean wt/tow	Upper Limit	Lower Limit
1978	39.0	50.2	27.8	37.9	49.1	26.6
1979	32.2	38.1	26.2	25.0	30.9	19.1
1980	32.5	40.0	25.0	28.0	33.3	22.6
1981	33.2	43.6	22.8	31.2	36.3	26.2
1982	44.3	52.3	36.2	28.3	33.7	22.9
1983	33.8	40.1	27.6	39.6	47.5	31.8
1984	35.8	45.2	26.5	38.3	46.7	29.9
1985	26.7	33.2	20.2	28.0	33.1	23.0
1986	31.2	42.6	19.8	38.9	48.0	29.7
1987	21.3	29.8	12.8	28.6	34.5	22.8
1988	15.6	19.1	12.2	29.9	37.1	22.8
1989	19.1	34.5	3.7	30.5	36.8	24.2
1990	18.5	23.2	13.8	23.2	31.0	15.4
1991	6.4	7.7	5.2	15.3	18.5	12.1
1992	5.6	7.4	3.8	10.3	13.1	7.5
1993	8.2	10.0	6.4	20.4	24.1	16.7
1994	8.5	11.1	5.8	12.5	14.3	10.7
1995	12.8	15.4	10.1	15.0	17.9	12.1
1996	18.6	23.6	13.7	23.6	27.7	19.5
1997	23.6	54.2	-7.0	25.6	29.2	22.0
1998	17.9	20.5	15.2	27.9	32.1	23.7
1999	25.4	29.1	21.6	37.7	46.7	28.7
2000	15.9	19.8	11.9	29.6	41.0	18.2
2001	18.9	24.9	12.9	25.3	28.8	21.7
2002	15.4	19.2	11.7	13.1	16.6	9.7
2003	17.2	21.4	13.0	14.0	16.0	12.0
2004	17.0	28.8	5.3	17.8	21.0	14.5
2005	17.6	21.5	13.7	22.2	26.1	18.4
2006	30.5	91.8	-30.9	22.4	27.1	17.7

Table 21c. Mean weight (kg) per tow for Greenland halibut in Division 3L Fall and Spring for 1995-2006.
Refer to Tables 9 and 17 for variations in strata surveyed.

Year	Division					
	3L - Fall			3L - Spring		
Mean wt/tow	Upper Limit	Lower Limit	Mean wt/tow	Upper Limit	Lower Limit	
1995	2.1	2.7	1.5	0.9	1.8	0.0
1996	5.8	7.0	4.6	1.8	3.0	0.6
1997	7.6	16.9	-1.7	3.5	4.7	2.2
1998	8.8	11.3	6.2	7.3	11.4	3.1
1999	5.8	7.4	4.1	4.0	9.4	-1.5
2000	5.5	7.8	3.2	5.0	6.1	3.9
2001	4.7	5.7	3.7	2.4	2.4	2.3
2002	3.5	4.4	2.6	1.2	1.7	0.7
2003	4.1	6.9	1.3	2.2	3.3	1.2
2004 *	3.4	3.9	2.9	1.8	2.3	1.3
2005	5.1	6.7	3.6	2.8	4.5	1.1
2006	5.4	6.8	3.9	2.7	4.5	0.9

*Substantially reduced coverage (Fall survey).

Table 21d. Mean weight (kg) per tow for Greenland halibut in Division 3N Spring and Fall for 1996-2006.
Refer to Tables 13 and 18 for variations in strata surveyed.

Year	Division					
	3N - Fall			3N - Spring		
Mean wt/tow	Upper Limit	Lower Limit	Mean wt/tow	Upper Limit	Lower Limit	
1996	2.1	3.8	0.4	1.4	4.0	-1.2
1997	2.7	11.8	-6.4	2.0	3.8	0.1
1998	5.6	9.4	1.9	2.4	10.0	-5.3
1999	1.2	2.1	0.2	2.5	4.5	0.5
2000	3.5	13.7	-6.7	1.8	2.9	0.6
2001	2.7	3.7	1.6	0.9	3.6	-1.9
2002	2.1	2.8	1.4	0.3	0.6	0.1
2003	0.4	0.7	0.2	1.1	2.7	-0.4
2004	1.2	6.3	-3.9	0.6	1.0	0.2
2005	1.3	1.7	0.8	0.7	1.4	0.0
2006	0.5	2.1	-1.2	*	*	*

*No Greenland Halibut captured (survey incomplete).

Table 21e. Mean weight (kg) per tow for Greenland halibut in Division 3O Spring and Fall for 1996-2006.
Refer to Tables 15 and 19 for variations in strata surveyed.

Year	Division					
	3O - Fall			3O - Spring		
Mean wt/tow	Upper Limit	Lower Limit	Mean wt/tow	Upper Limit	Lower Limit	
1996	0.4	0.6	0.2	1.1	2.0	0.2
1997	0.8	1.3	0.3	0.8	1.0	0.6
1998	2.0	4.4	-0.4	0.8	1.3	0.3
1999	0.8	6.3	-4.8	0.5	0.9	0.2
2000	1.5	2.3	0.7	0.1	0.2	0.0
2001	1.6	7.4	-4.1	0.1	0.6	-0.4
2002	1.5	2.1	0.8	0.1	0.1	0.0
2003	1.0	1.8	0.2	0.1	0.2	0.0
2004	0.2	0.3	0.0	0.2	0.3	0.0
2005	0.8	1.1	0.5	0.2	0.4	0.1
2006 *	0.1	0.5	-0.3	0.1	0.2	-0.1

*Substantially reduced coverage in spring survey.

Table 21f. Mean weight (kg) per tow for Greenland halibut in Division 3M for 1996-2006.
 Refer to Table 11 for variations in strata surveyed. Div. 3M not surveyed in 2004 or 2005.

Year	Division			Division		
	3M - Fall			3M - Fall Strata 528-536 only		
Mean wt/tow	Upper Limit	Lower Limit	Mean wt/tow	Upper Limit	Lower Limit	
1996	5.3	12.8	-2.2	14.4	42.4	-13.5
1997	15.0	23.2	6.8	15.0	23.2	6.8
1998	16.7	24.3	9.1	16.7	24.4	9.1
1999	8.5	13.5	3.5	8.5	13.5	3.5
2000	11.8	16.9	6.8	11.9	16.9	6.8
2001	11.3	15.1	7.5	11.3	15.1	7.5
2002	5.4	7.3	3.5	5.4	7.4	3.5
2003	9.3	13.3	5.2	9.3	13.3	5.2
2006	7.2	9.9	4.5	7.2	9.9	4.5

Table 21g. Mean weight (kg) per tow and associated confidence intervals for Greenland halibut in Div. 2J3K for 1978-2006 and Div. 2J3KL for 1995-2006. Refer to Tables 5, 7, and 9 for variations in strata surveyed.

Year	Division			Division		
	2J3K			2J3KL		
Mean wt/tow	Upper Limit	Lower Limit	Mean wt/tow	Upper Limit	Lower Limit	
1978	38.4	45.7	31.1	-	-	-
1979	28.1	32.2	24.0	-	-	-
1980	30.0	34.2	25.7	-	-	-
1981	32.1	37.2	27.1	-	-	-
1982	35.6	40.1	31.1	-	-	-
1983	36.9	41.8	32.1	-	-	-
1984	37.2	43.0	31.5	-	-	-
1985	27.5	31.1	23.8	-	-	-
1986	35.4	41.8	29.1	-	-	-
1987	25.5	30.0	20.9	-	-	-
1988	23.6	27.8	19.5	-	-	-
1989	25.4	30.7	20.2	-	-	-
1990	21.2	25.8	16.6	-	-	-
1991	11.5	13.4	9.6	-	-	-
1992	8.2	9.9	6.6	-	-	-
1993	15.3	17.5	13.1	-	-	-
1994	10.8	12.1	9.4	-	-	-
1995	14.1	16.1	12.2	9.1	10.2	8.0
1996	21.6	24.5	18.7	14.9	16.6	13.2
1997	24.8	28.3	21.3	17.5	19.5	15.5
1998	23.8	26.4	21.2	17.4	19.0	15.8
1999	32.5	37.8	27.2	21.3	24.4	18.2
2000	23.9	30.2	17.5	16.0	19.7	12.3
2001	22.7	25.5	19.9	15.0	16.7	13.4
2002	14.1	16.3	11.8	9.6	10.9	8.2
2003	15.3	17.2	13.4	10.5	11.7	9.3
2004 *	17.5	21.1	13.8	12.4	14.8	10.1
2005	20.3	22.9	17.8	14.1	15.7	12.5
2006	25.7	35.7	15.8	17.2	23.1	11.3

*Substantially reduced coverage in Division 3L.

Table 22a. Mean numbers per tow and associated CI for Greenland halibut in Div. 2G and 2H for 1978 - 2006.
 Refer to Tables 1 and 3 for variations in strata surveyed. In several years, Divs. 2GH have not been surveyed.

Year	Division					
	2G			2H		
Mean no/tow	Upper Limit	Lower Limit	Mean no/tow	Upper Limit	Lower Limit	
1978	122.4	171.0	73.7	224.4	670.5	-221.7
1979	65.0	95.0	35.0	285.4	381.5	189.3
1981	51.2	68.3	34.2	73.5	97.8	49.2
1987	106.4	159.4	53.4	225.5	393.5	57.6
1988	37.0	53.6	20.5	259.9	361.1	158.8
1991	9.3	19.3	-0.8	37.6	49.1	26.0
1996	51.5	72.7	30.4	137.1	166.9	107.3
1997	55.3	66.0	44.6	236.3	323.2	149.3
1998	23.8	134.2	-86.6	109.7	186.9	32.4
1999	25.5	34.3	16.7	91.5	116.6	66.5
2001	NO SURVEY			165.9	226.6	105.2
2004	NO SURVEY			177.1	250.6	103.7
2006	NO SURVEY			181.8	246.2	117.4

Table 22b. Mean numbers per tow for Greenland halibut in Division 2J and 3K for 1978-2006.
 Refer to Tables 5 and 7 for variations in strata surveyed.

Year	Division					
	2J			3K		
Mean no/tow	Upper Limit	Lower Limit	Mean no/tow	Upper Limit	Lower Limit	
1978	100.4	419.4	-218.7	163.1	230.8	95.3
1979	89.6	109.0	70.2	58.6	73.4	43.8
1980	43.7	57.8	29.6	54.1	67.9	40.3
1981	96.9	140.3	53.6	88.9	105.6	72.3
1982	67.3	79.8	54.8	64.1	74.7	53.4
1983	40.6	51.8	29.4	83.3	100.6	66.1
1984	56.8	83.3	30.4	74.6	92.0	57.3
1985	69.5	90.7	48.3	97.4	115.9	78.9
1986	49.6	72.4	26.8	141.1	168.3	113.8
1987	44.7	67.0	22.3	118.0	141.4	94.7
1988	32.6	48.2	17.1	126.2	153.2	99.2
1989	54.7	84.9	24.4	143.5	172.2	114.7
1990	52.0	66.3	37.6	84.7	133.3	36.2
1991	33.0	43.4	22.5	71.4	89.2	53.7
1992	44.2	62.1	26.2	96.0	145.4	46.6
1993	64.8	86.1	43.6	201.7	254.3	149.1
1994	82.9	109.5	56.2	146.7	164.0	129.4
1995	112.0	140.4	83.6	160.6	201.2	120.0
1996	195.0	255.8	134.3	208.5	244.8	172.2
1997	148.8	450.9	-153.3	187.7	225.8	149.7
1998	94.8	127.7	61.8	139.2	164.5	113.9
1999	137.1	164.2	110.0	150.1	181.9	118.2
2000	94.4	110.9	77.9	133.1	162.1	104.1
2001	128.5	184.9	72.1	127.4	146.3	108.5
2002	117.7	139.8	95.6	95.1	116.3	73.8
2003	142.1	188.8	95.3	93.8	121.9	65.8
2004	122.2	186.0	58.4	100.6	118.1	83.1
2005	100.4	122.6	78.2	69.5	79.9	59.1
2006	153.5	233.4	73.6	75.7	87.5	63.8

Table 22c. Mean numbers per tow for Greenland halibut in Division 3L Spring and Fall for 1995-2006.
 Refer to Tables 9 and 17 for variations in strata surveyed.

Year	Division			3L - Spring		
	3L - Fall			Mean no/tow	Upper Limit	Lower Limit
	Mean no/tow	Upper Limit	Lower Limit	Mean no/tow	Upper Limit	Lower Limit
1995	13.3	20.1	6.6	3.2	5.8	0.6
1996	23.3	28.1	18.4	13.0	18.0	8.0
1997	24.2	28.6	19.8	20.8	35.4	6.2
1998	22.4	27.5	17.4	26.7	40.0	13.4
1999	11.6	14.7	8.5	11.9	13.7	10.1
2000	13.9	17.1	10.6	13.3	16.1	10.5
2001	12.6	16.1	9.2	7.0	9.3	4.7
2002	10.5	13.2	7.7	5.1	6.6	3.6
2003	14.3	19.2	9.4	11.2	38.7	-16.3
2004 *	13.2	16.5	10.0	8.1	10.1	6.1
2005	13.0	19.8	6.3	8.3	22.8	-6.2
2006	10.5	12.9	8.2	7.5	10.5	4.4

*Substantially reduced coverage (Fall survey).

Table 22d. Mean numbers per tow for Greenland halibut in Division 3N Spring and Fall for 1996-2006.
 Refer to Tables 13 and 18 for variations in strata surveyed.

Year	Division			3N - Spring		
	3N - Fall			Mean no/tow	Upper Limit	Lower Limit
	Mean no/tow	Upper Limit	Lower Limit	Mean no/tow	Upper Limit	Lower Limit
1996	20.4	136.4	-95.7	10.8	14.8	6.8
1997	14.8	83.4	-53.8	12.3	25.7	-1.2
1998	15.3	30.9	-0.3	10.4	46.2	-25.3
1999	3.2	13.8	-7.5	8.9	19.8	-1.9
2000	5.1	18.9	-8.7	8.8	55.4	-37.8
2001	4.7	8.9	0.6	2.6	4.9	0.4
2002	4.9	9.1	0.8	2.0	13.8	-9.8
2003	2.0	3.0	0.9	6.1	41.1	-28.9
2004	4.4	21.0	-12.3	2.5	3.6	1.3
2005	2.6	4.6	0.5	2.5	3.8	1.2
2006	1.4	8.3	-5.4	*	*	*

*No Greenland Halibut captured (survey incomplete).

Table 22e. Mean numbers per tow for Greenland halibut in Division 3O Spring and Fall for 1996-2006.
 Refer to Tables 15 and 19 for variations in strata surveyed.

Year	Division			3O - Spring		
	3O - Fall			Mean no/tow	Upper Limit	Lower Limit
	Mean no/tow	Upper Limit	Lower Limit	Mean no/tow	Upper Limit	Lower Limit
1996	3.8	4.8	2.7	18.5	117.2	-80.3
1997	5.7	8.4	3.0	7.7	11.7	3.7
1998	5.9	6.9	4.9	5.0	8.3	1.6
1999	1.9	14.6	-10.8	1.6	2.8	0.3
2000	2.2	3.5	0.9	0.4	0.6	0.2
2001	1.9	3.7	0.1	0.9	6.6	-4.8
2002	1.8	2.4	1.2	0.6	0.8	0.5
2003	2.0	2.7	1.2	1.4	4.2	-1.4
2004	0.9	1.5	0.3	1.0	1.5	0.5
2005	1.2	1.6	0.8	1.0	1.7	0.4
2006 *	0.7	8.6	-7.1	0.3	1.2	-0.7

*Substantially reduced coverage in spring survey.

Table 22f. Mean numbers per tow for Greenland halibut in Division 3M for 1996-2006.

Refer to Table 11 for variations in strata surveyed. Div. 3M not surveyed in 2004 or 2005.

Year	Division			Division		
	3M - Fall			3M - Fall Strata 528-536 only		
Mean no/tow	Upper Limit	Lower Limit	Mean no/tow	Upper Limit	Lower Limit	
1996	8.3	25.7	-9.2	16.5	82.7	-49.7
1997	16.9	26.4	7.3	16.9	26.4	7.3
1998	19.9	32.4	7.4	19.9	32.4	7.4
1999	9.3	15.0	3.6	9.3	15.0	3.6
2000	12.2	19.1	5.3	12.2	19.1	5.3
2001	10.8	14.3	7.4	10.9	14.3	7.4
2002	5.3	6.6	3.9	5.3	6.6	3.9
2003	9.2	12.9	5.4	9.2	12.9	5.4
2006	7.3	9.1	5.4	7.3	9.1	5.4

Table 22g. Mean numbers per tow and associated confidence intervals for Greenland halibut in Div. 2J3K for 1978-2006 and Div. 2J3KL for 1995-2006. Refer to Tables 5, 7, and 9 for variations in strata surveyed.

Year	Division			Division		
	2J3K			2J3KL		
Mean no/tow	Upper Limit	Lower Limit	Mean no/tow	Upper Limit	Lower Limit	
1978	135.7	180.9	90.6	-	-	-
1979	72.1	83.3	60.8	-	-	-
1980	49.5	58.9	40.1	-	-	-
1981	92.6	113.4	71.7	-	-	-
1982	65.5	73.4	57.7	-	-	-
1983	63.3	73.4	53.3	-	-	-
1984	67.0	79.5	54.5	-	-	-
1985	85.4	99.0	71.9	-	-	-
1986	100.0	116.2	83.8	-	-	-
1987	86.3	101.4	71.3	-	-	-
1988	84.8	100.3	69.2	-	-	-
1989	104.0	121.2	86.9	-	-	-
1990	70.7	92.5	48.8	-	-	-
1991	54.9	65.4	44.5	-	-	-
1992	73.8	99.8	47.8	-	-	-
1993	144.4	174.5	114.2	-	-	-
1994	119.2	133.4	104.9	-	-	-
1995	142.3	168.1	116.6	88.0	102.9	73.1
1996	203.0	234.0	172.1	126.6	144.5	108.7
1997	172.0	208.8	135.1	108.9	130.2	87.7
1998	121.2	138.4	104.0	79.1	89.0	69.1
1999	144.6	165.0	124.1	88.7	100.6	76.8
2000	117.0	134.7	99.3	72.9	83.1	62.7
2001	127.8	148.4	107.3	78.7	90.6	66.8
2002	104.2	119.1	89.4	64.2	72.8	55.7
2003	113.4	133.7	93.0	71.1	82.6	59.6
2004 *	109.4	133.7	85.1	75.1	90.8	59.4
2005	82.1	92.5	71.6	54.0	60.4	47.5
2006	107.9	134.6	81.3	67.1	82.7	51.6

*Substantially reduced coverage in Division 3L.

Table 23a Greenland halibut stratified mean number per set at age from Canadian fall surveys conducted in Divisions 2J and 3K combined during 1978-1992. Only otoliths collected in Div. 2J or 3K are used in the analysis. Numbers expressed in Campelen 1800 catch units.

Age (yrs)	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
0	0.48	0.00	0.00	0.00	0.00	0.00	1.20	1.06	0.00	2.17	0.66	0.00	0.00	0.92	
1	9.61	10.81	6.78	19.39	4.75	1.66	4.47	24.59	17.21	5.04	8.82	7.10	1.34	13.80	5.69
2	40.24	18.07	6.53	22.99	5.10	4.45	7.11	14.67	13.96	11.21	10.54	12.54	5.26	5.59	23.78
3	33.37	13.47	6.20	15.42	12.78	10.56	9.56	8.71	16.62	29.44	15.04	23.84	9.95	6.08	20.40
4	19.52	7.15	5.58	6.01	10.81	11.41	10.29	6.87	14.64	12.17	17.03	25.22	23.39	13.32	13.59
5	12.50	7.47	7.07	6.58	8.09	10.45	15.34	9.50	9.49	9.62	14.90	17.40	15.38	9.05	4.84
6	8.34	7.21	7.56	7.25	5.76	7.45	7.74	8.86	11.04	6.89	7.82	9.95	9.21	5.41	3.11
7	5.15	3.50	4.72	5.15	6.06	7.56	5.44	5.98	9.54	6.39	5.65	5.34	4.81	1.29	1.27
8	2.26	1.41	1.59	2.21	6.29	5.67	3.50	2.26	3.19	3.27	1.65	1.36	0.83	0.26	0.12
9	1.27	0.67	0.71	1.02	2.65	2.19	1.70	1.03	1.00	1.25	0.43	0.40	0.21	0.08	0.02
10	0.96	0.64	0.56	0.59	1.02	0.65	0.74	0.75	0.34	0.37	0.16	0.11	0.10	0.05	0.01
11	0.81	0.42	0.63	0.48	0.60	0.46	0.35	0.30	0.26	0.19	0.10	0.08	0.09	0.02	0.00
12	0.49	0.37	0.41	0.22	0.38	0.33	0.24	0.27	0.23	0.19	0.06	0.02	0.05	0.01	0.00
13	0.32	0.31	0.27	0.12	0.27	0.24	0.20	0.12	0.12	0.10	0.05	0.00	0.03	0.00	0.00
14	0.10	0.15	0.15	0.06	0.28	0.16	0.18	0.13	0.07	0.08	0.04	0.01	0.02	0.00	0.00
15	0.07	0.10	0.06	0.04	0.18	0.07	0.09	0.08	0.08	0.05	0.03	0.01	0.01	0.00	0.00
16	0.05	0.09	0.03	0.00	0.09	0.02	0.06	0.04	0.04	0.03	0.02	0.00	0.00	0.00	0.00
17	0.03	0.03	0.01	0.00	0.01	0.03	0.04	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00
18	0.00	0.02	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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
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
Ages 0-20	135.55	71.89	48.87	87.52	65.12	63.33	67.04	85.44	98.91	86.32	84.53	104.03	70.69	54.94	73.76
Ages 1-4	102.74	49.50	25.09	63.81	33.44	28.08	31.43	54.84	62.43	57.86	51.43	68.70	39.94	38.79	63.46
Ages 5+	32.33	22.39	23.78	23.71	31.68	35.25	35.61	29.40	35.42	28.46	30.93	34.68	30.74	16.16	9.37
Ages 1-10	133.20	70.39	47.29	86.60	63.30	62.04	65.89	83.23	97.03	85.65	82.03	103.24	70.48	54.91	72.83

Table 23b Greenland halibut stratified mean number per set at age from Canadian fall surveys conducted in Divisions 2J and 3K combined during 1993-2006. Only otoliths collected in Div. 2J or 3K are used in the analysis. Numbers expressed in Campelen 1800 catch units.

Age (yrs)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	1.05	16.90	10.95	4.92	2.18	1.52	6.46	3.09	8.49	8.30	9.94	4.15	5.07	3.75
1	8.08	29.79	49.93	98.68	28.05	23.35	15.99	38.57	43.90	40.67	45.70	32.49	16.06	32.34
2	43.64	21.62	51.10	47.82	58.62	25.07	34.42	21.94	22.72	24.08	26.67	32.93	16.15	17.98
3	64.00	22.61	15.13	32.01	43.61	31.19	24.07	16.43	17.00	12.50	11.69	13.89	8.56	8.50
4	19.28	18.90	6.03	9.54	21.13	21.87	28.28	13.20	14.07	9.68	9.49	12.31	13.84	17.60
5	5.56	7.22	6.63	6.28	10.37	10.86	20.04	13.76	9.77	6.03	6.39	9.21	10.98	13.03
6	1.76	1.32	1.99	2.47	5.01	4.45	10.53	7.21	7.59	1.97	2.27	2.68	6.85	9.11
7	0.74	0.61	0.39	0.84	2.00	2.07	3.81	2.16	3.40	0.72	0.89	1.20	3.96	4.18
8	0.23	0.19	0.12	0.19	0.64	0.57	0.70	0.50	0.69	0.19	0.27	0.36	0.66	1.15
9	0.03	0.03	0.02	0.18	0.20	0.13	0.14	0.06	0.11	0.04	0.04	0.08	0.12	0.18
10	0.00	0.01	0.01	0.04	0.06	0.06	0.07	0.03	0.02	0.01	0.02	0.03	0.03	0.03
11	0.00	0.00	0.00	0.02	0.03	0.03	0.02	0.02	0.01	0.00	0.01	0.03	0.02	0.02
12	0.02	0.00	0.00	0.01	0.02	0.02	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01
13	0.00	0.00	0.00	0.02	0.01	0.01	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00
14	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
Ages 0-20	144.39	119.19	142.30	203.02	171.93	121.20	144.57	116.98	127.80	104.20	113.38	109.36	82.33	107.89
Ages 1-4	135.00	92.92	122.19	188.05	151.41	101.48	102.76	90.14	97.69	86.93	93.55	91.62	54.61	76.42
Ages 5+	8.34	9.37	9.16	10.05	18.34	18.20	35.35	23.75	21.62	8.97	9.90	13.58	22.65	27.72
Ages 1-10	143.32	102.29	131.34	198.04	169.68	119.61	138.06	113.86	119.28	95.89	103.43	105.18	77.21	104.10

Table 24 Greenland halibut stratified mean number per set at age from Canadian fall surveys conducted in Divisions 2J3KL combined during 1995-2006. Only otoliths collected in Div. 2J, 3K or 3L are used in the analysis. Numbers expressed in Campelen 1800 catch units.

Age (yrs)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	6.73	2.87	1.44	0.90	3.89	1.84	5.23	4.85	5.72	2.71	3.06	2.29
1	30.32	59.31	17.10	13.19	8.65	23.21	25.96	23.87	27.44	22.10	9.77	19.11
2	31.18	29.08	34.25	15.50	20.62	13.91	12.85	14.56	15.88	20.96	10.21	10.91
3	9.69	20.85	26.66	18.82	15.96	9.74	10.05	7.64	8.13	10.39	5.59	4.98
4	3.62	6.59	15.30	14.01	15.87	7.68	9.75	6.29	6.81	9.06	9.28	10.73
5	4.53	4.62	7.78	10.16	12.83	8.75	6.11	4.37	4.49	6.82	7.84	8.50
6	1.55	2.03	3.75	4.00	7.76	5.45	5.61	1.63	1.68	1.94	4.89	6.48
7	0.29	0.83	1.75	1.78	2.50	1.83	2.49	0.73	0.71	0.80	2.87	3.10
8	0.07	0.18	0.60	0.47	0.48	0.35	0.49	0.23	0.19	0.24	0.45	0.83
9	0.01	0.13	0.17	0.13	0.09	0.06	0.09	0.03	0.03	0.05	0.07	0.13
10	0.01	0.04	0.05	0.04	0.04	0.02	0.02	0.01	0.01	0.02	0.02	0.03
11	0.00	0.02	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.00	0.02	0.02
12	0.00	0.01	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01
13	0.00	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00
14	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
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
Ages 0-20	88.00	126.58	108.91	79.07	88.72	72.86	78.68	64.22	71.10	75.10	54.09	67.12
Ages 1-4	74.82	115.83	93.31	61.52	61.10	54.54	58.61	52.36	58.25	62.51	34.85	45.73
Ages 5+	6.46	7.88	14.17	16.65	23.74	16.49	14.84	7.01	7.13	9.89	16.18	19.10
Ages 1-10	81.27	123.66	107.40	78.11	84.79	71.00	73.42	59.36	65.37	72.39	51.00	64.79

Table 25a Stratified mean number per tow, at age, by division, from 1996 -2001 Canadian fall surveys. See Table B for explanation of otoliths used.

1996												1997											
Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total	Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total				
0	0.79	0.32	10.52	1.10	0.11	0.02	0.24	0.70	1.88	0	0.73	5.91	3.32	1.51	0.35	0.00	0.04	0.00	1.54				
1	19.51	56.79	103.40	96.48	5.26	0.14	8.63	0.54	39.42	1	7.44	33.09	16.35	36.69	1.86	0.00	0.23	0.65	14.81				
2	9.81	43.74	42.63	50.34	4.57	0.93	6.42	1.33	22.81	2	8.66	57.91	52.29	60.18	3.68	0.00	3.57	1.57	30.82				
3	6.34	16.75	18.88	40.79	5.89	0.78	2.46	0.59	13.94	3	10.60	61.60	33.87	49.10	4.78	0.03	6.44	2.06	27.05				
4	5.28	8.62	8.98	10.07	2.48	0.81	1.33	0.33	5.56	4	13.63	45.16	25.07	21.96	4.65	0.18	2.12	0.90	14.77				
5	4.24	5.41	6.48	6.22	2.31	1.26	0.89	0.16	3.68	5	6.57	16.76	9.27	11.11	4.31	2.50	1.61	0.39	7.18				
6	2.78	3.04	2.68	2.26	1.50	2.15	0.36	0.06	1.85	6	3.93	9.06	5.70	4.11	2.39	5.28	0.54	0.10	3.53				
7	1.13	1.23	0.84	0.88	0.79	1.17	0.03	0.01	0.75	7	2.37	4.60	2.14	2.02	1.33	4.88	0.16	0.02	1.80				
8	0.60	0.55	0.19	0.18	0.18	0.69	0.01	0.00	0.24	8	0.84	1.43	0.45	0.77	0.55	3.06	0.05	0.03	0.67				
9	0.58	0.37	0.23	0.09	0.11	0.17	0.00	0.01	0.16	9	0.23	0.44	0.17	0.19	0.15	0.41	0.01	0.00	0.18				
10	0.16	0.08	0.04	0.05	0.04	0.04	0.00	0.00	0.04	10	0.21	0.12	0.06	0.05	0.04	0.12	0.00	0.00	0.07				
11	0.08	0.04	0.02	0.03	0.01	0.03	0.00	0.00	0.02	11	0.11	0.09	0.07	0.01	0.03	0.15	0.00	0.00	0.04				
12	0.05	0.05	0.02	0.01	0.01	0.01	0.00	0.00	0.02	12	0.02	0.03	0.03	0.01	0.02	0.06	0.00	0.00	0.02				
13	0.00	0.00	0.03	0.01	0.00	0.02	0.00	0.00	0.01	13	0.00	0.05	0.02	0.00	0.02	0.14	0.00	0.00	0.02				
14	0.00	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.00	14	0.00	0.06	0.01	0.01	0.02	0.05	0.00	0.00	0.02				
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Unk	0.22	0.10	0.04	0.00	0.01	0.02	0.02	0.04	0.02	Unk	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
5+	9.84	10.87	10.58	9.72	4.95	5.59	1.32	0.27	6.80	5+	14.28	32.64	17.92	18.28	8.84	16.65	2.37	0.53	13.53				
9+	1.08	0.63	0.38	0.19	0.18	0.33	0.03	0.04	0.28	9+	0.57	0.79	0.36	0.27	0.93	0.01	0.01	0.01	0.35				
Total	51.55	137.10	194.99	208.49	23.26	8.26	20.39	3.76	90.40	Total	55.34	236.31	148.81	187.72	24.15	16.86	14.78	5.71	102.52				

1998												1999											
Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total	Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total				
0	0.08	0.61	2.76	0.67	0.07	0.05	0.02	0.03	0.64	0	1.29	3.60	11.43	2.77	0.36	0.00	0.02	0.06	2.77				
1	13.28	8.86	15.80	26.43	1.18	0.00	0.49	0.08	8.94	1	6.56	12.09	23.79	8.23	0.11	0.00	0.02	0.02	5.94				
2	2.82	20.01	18.22	30.35	2.14	0.00	1.32	0.37	12.16	2	5.47	26.09	31.64	37.30	0.90	0.00	0.20	0.17	15.11				
3	1.52	37.54	27.02	33.41	2.69	0.04	2.72	0.88	14.82	3	1.74	10.55	19.49	32.61	0.66	0.00	0.49	0.32	10.82				
4	1.67	22.64	16.18	23.61	5.15	0.67	3.50	1.64	11.46	4	4.21	16.17	21.88	29.54	1.49	0.11	0.70	0.34	11.96				
5	1.52	10.72	9.15	15.81	6.19	3.30	3.42	1.64	8.01	5	3.42	12.89	19.19	20.23	3.23	0.82	1.02	0.46	9.35				
6	1.18	5.26	3.31	5.62	3.07	6.54	2.25	0.79	3.56	6	1.47	5.44	6.81	14.00	3.36	2.58	0.51	0.30	5.44				
7	0.91	2.68	1.61	2.48	1.31	5.94	1.06	0.27	1.61	7	0.74	2.88	2.16	4.37	1.21	3.48	0.17	0.13	1.95				
8	0.55	1.05	0.45	0.58	0.40	2.12	0.30	0.12	0.50	8	0.40	1.02	0.53	0.77	0.22	1.26	0.03	0.05	0.42				
9	0.04	0.19	0.12	0.15	0.13	0.48	0.07	0.03	0.12	9	0.09	0.51	0.11	0.14	0.04	0.51	0.02	0.01	0.11				
10	0.04	0.04	0.04	0.06	0.03	0.29	0.04	0.01	0.05	10	0.04	0.13	0.04	0.08	0.02	0.46	0.00	0.01	0.04				
11	0.02	0.04	0.04	0.02	0.02	0.20	0.02	0.02	0.03	11	0.03	0.07	0.02	0.02	0.01	0.07	0.00	0.00	0.02				
12	0.00	0.02	0.03	0.02	0.01	0.18	0.01	0.00	0.02	12	0.01	0.03	0.00	0.01	0.01	0.00	0.00	0.00	0.01				
13	0.02	0.02	0.01	0.01	0.01	0.08	0.00	0.00	0.01	13	0.01	0.05	0.03	0.02	0.02	0.00	0.00	0.00	0.02				
14	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	14	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
15	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
16	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Unk	0.12	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	Unk	0.00	0.00	0.00	0.07	0.01	0.00	0.28	0.00	0.01				
5+	0.00	0.00	15.76	29.78	6.53	12.17	4.73	1.96	13.47	5+	0.00	25.81	18.05	24.72	5.24	10.82	3.40	1.75	12.51				
9+	0.00	0.00	0.15	0.12	0.09	1.29	0.17	0.11	0.15	9+	0.00	0.46	0.22	0.16	0.11	1.10	0.41	0.15	0.18				
Total	0.00	0.00	94.40	133.09	13.85	12.20	5.12	2.20	52.97	Total	0.00	165.92	128.50	127.37	12.62	10.85	4.74	1.92	63.55				

2000												2001											
Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total	Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total				
No Survey	6.14	0.86	0.20	0.00	0.00	0.00	0.00	0.00	1.31	0	7.84	12.11	6.03	0.83	0.00	0.00	0.00	0.00	0.00	3.98			
1	28.36	45.12	3.23	0.00	0.01	0.00	0.00	0.00	15.33	1	43.08	43.39	43.11	2.75	0.01	0.09	0.04	0.00	19.46				
2	23.35	22.61	1.85	0.00	0.13	0.05	0.00	0.00	10.39	2	42.01	25.43	19.33	0.80	0.00	0.22	0.05	0.00	11.03				
3	12.27	19.48	0.72	0.00	0.04	0.02	0.00	0.00	6.39	3	24.85	15.11	17.72	1.16	0.00	0.71	0.06	0.00	8.68				
4	8.53	15.24	1.31	0.03	0.21	0.17	0.00	0.00	6.10	4	22.33	14.41	16.46	1.85	0.01	0.32	0.03	0.00	7.89				
5	8.71	17.13	2.23	0.76	0.82	0.48	0.00	0.00	6.51	5	11.47	8.72	10.01	1.57	0.45	0.53	0.22	0.00	5.0				

Table 25b Stratified mean number per tow, at age, by division, from 2002-2006 Canadian fall surveys. See Table B for explanation of otoliths used.

2002												2003											
Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total	Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total				
No Survey	0		14.85	3.80	0.23	0.00	0.00	0.00	3.47	0		5.67	12.51	0.32	0.00	0.04	0.02	4.17					
	1		44.05	36.95	2.40	0.00	0.35	0.12	16.64	1		65.67	31.78	3.13	0.00	0.22	0.31	19.51					
	2		24.64	24.35	1.24	0.00	0.27	0.04	10.66	2		37.73	18.60	1.80	0.00	0.25	0.21	11.81					
	3		12.12	12.53	1.28	0.00	1.14	0.09	5.86	3		13.06	11.78	2.51	0.00	0.54	0.15	6.22					
	4		11.25	8.84	1.55	0.01	0.83	0.09	4.62	4		10.13	9.61	2.76	0.26	0.50	0.29	5.32					
	5		6.89	5.82	1.83	0.36	0.70	0.21	3.26	5		6.10	6.50	2.00	1.75	0.31	0.30	3.50					
	6		2.45	1.87	0.98	1.41	0.69	0.41	1.41	6		2.33	2.04	1.03	2.68	0.08	0.28	1.35					
	7		1.00	0.69	0.61	1.57	0.65	0.47	0.72	7		1.06	0.74	0.51	2.08	0.02	0.18	0.59					
	8		0.31	0.18	0.24	1.18	0.21	0.23	0.25	8		0.23	0.21	0.15	1.46	0.01	0.11	0.19					
	9		0.04	0.02	0.04	0.54	0.04	0.06	0.05	9		0.03	0.04	0.03	0.53	0.01	0.03	0.04					
	10		0.02	0.01	0.01	0.15	0.02	0.02	0.02	10		0.02	0.01	0.01	0.21	0.00	0.02	0.02					
	11		0.01	0.00	0.01	0.04	0.01	0.03	0.01	11		0.02	0.01	0.00	0.02	0.00	0.02	0.01					
	12		0.00	0.00	0.01	0.00	0.00	0.01	0.00	12		0.01	0.00	0.00	0.06	0.00	0.01	0.01					
	13		0.01	0.00	0.01	0.01	0.00	0.01	0.01	13		0.01	0.00	0.01	0.00	0.00	0.00	0.00					
	14		0.00	0.00	0.00	0.01	0.00	0.00	0.00	14		0.00	0.00	0.00	0.02	0.00	0.00	0.00					
	15		0.00	0.00	0.00	0.00	0.00	0.01	0.00	15		0.00	0.00	0.00	0.11	0.00	0.00	0.00					
	16		0.00	0.00	0.00	0.00	0.00	0.00	0.00	16		0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Unk	0.05	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	Unk	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00					
5+	0.00	0.00	10.77	8.59	3.73	5.26	2.34	1.44	5.74	5+	0.00	0.00	9.79	9.55	3.74	8.91	0.42	0.98	5.71				
9+	0.00	0.00	0.13	0.03	0.07	0.74	0.08	0.13	0.10	9+	0.00	0.00	0.08	0.07	0.05	0.95	0.01	0.11	0.08				
Total	0.00	0.00	117.68	95.06	10.44	5.27	4.93	1.79	46.99	Total	0.00	0.00	142.05	93.83	14.26	9.18	1.96	1.96	52.74				

2004												2005											
Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total	Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total				
No Survey	0		10.68	6.48	2.56	0.09	0.03	0.02	2.62	0		9.86	1.78	0.15	0.00	0.00	0.00	0.00	0.00	2.97			
	1		44.81	38.71	29.43	2.04	0.53	0.23	17.31	1		31.62	4.56	1.33	0.04	0.08	0.00	0.00	0.00	7.30			
	2		47.15	38.89	26.11	2.31	0.62	0.31	18.90	2		19.61	14.06	1.32	0.17	0.07	0.00	0.00	0.00	6.29			
	3		18.88	15.01	14.84	2.23	0.80	0.17	8.93	3		10.86	7.27	1.03	0.29	0.09	0.00	0.00	0.00	3.92			
	4		22.90	12.32	12.35	3.16	0.84	0.08	8.06	4		11.35	15.31	2.85	0.36	0.08	0.00	0.00	0.00	5.72			
	5		19.11	6.51	11.11	2.42	1.19	0.09	6.21	5		9.38	12.74	2.69	0.57	0.18	0.00	0.00	0.00	4.36			
	6		8.52	2.39	2.74	0.76	0.25	0.01	2.02	6		4.18	8.57	2.13	0.65	0.25	0.00	0.00	0.00	3.15			
	7		3.38	1.32	1.01	0.20	0.09	0.02	0.82	7		2.60	4.85	1.33	0.28	0.18	0.00	0.00	0.00	1.94			
	8		1.22	0.41	0.32	0.02	0.01	0.00	0.26	8		0.56	0.71	0.16	0.14	0.19	0.00	0.00	0.00	0.39			
	9		0.26	0.09	0.08	0.00	0.00	0.00	0.06	9		0.15	0.08	0.02	0.04	0.07	0.00	0.00	0.00	0.08			
	10		0.08	0.04	0.03	0.00	0.00	0.00	0.02	10		0.05	0.02	0.01	0.01	0.02	0.00	0.00	0.00	0.00			
	11		0.00	0.01	0.00	0.00	0.01	0.00	0.00	11		0.01	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00			
	12		0.05	0.01	0.00	0.00	0.00	0.00	0.01	12		0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00			
	13		0.01	0.00	0.01	0.00	0.00	0.00	0.00	13		0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	14		0.02	0.00	0.00	0.00	0.00	0.00	0.00	14		0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	15		0.00	0.00	0.00	0.00	0.00	0.00	0.00	15		0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	16		0.00	0.00	0.00	0.00	0.00	0.00	0.00	16		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Unk	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Unk	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08		
5+	0.00	0.00	13.59	10.77	15.31	3.40	0.00	1.55	0.11	5+	0.00	0.00	17.09	27.04	6.34	0.00	1.69	0.91	0.00	10.03			
9+	0.00	0.00	0.21	0.15	0.13	0.00	0.00	0.01	0.00	9+	0.00	0.00	0.38	0.17	0.03	0.00	0.05	0.10	0.00	0.20			
Total	0.00	0.00	166.44	122.18	100.61	13.23	0.00	4.38	0.92	Total	0.00	0.00	100.39	70.02	13.02	0.00	2.56	1.23	0.00	36.23			

2006												2007											
Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total	Age (yrs)	Div. 2G	Div. 2H	Div. 2J	Div. 3K	Div. 3L	Div. 3M	Div. 3N	Div. 3O	Total				
No Survey	0		2.49	4.48	3.23	0.28	0.00	0.01	0.00	1.66	0												
	1		35.12	51.44	17.88	1.54	0.00	0.15	0.34	15.08	1												
	2		28.69	26.40	12.88	0.40	0.00	0.16	0.24	9.78	2												
	3		26.02	16.22	2.97	0.15	0.00	0.13	0.04	5.56	3												
	4		39.41	22.80	13.79	1.30	0.01	0.21	0.02	10.03	4												
	5		28.76	17.71	9.80	2.14	0.24	0.38	0.06	8.00	5												
	6		12.26	9.78	8.83	2.67	1.90	0.26	0.03	5.42	6												
	7		6.61	3.58	4.75	1.49	2.66	0.07	0.01	2.58	7												
	8		1.70	0.86	1.32	0.43	1.44	0.02	0.01	0.75													

Table 26 - Greenland halibut stratified mean number per set at age from Canadian spring surveys conducted in Divisions 3LNO combined during 1996-2005. Only otoliths collected in 3L, 3N, or 3O are used in the analysis. Numbers are expressed in Campelen 1800 units.

Age (yrs)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
0	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
1	1.62	1.16	0.22	0.29	0.79	0.57	0.64	0.93	0.66	0.35
2	4.24	3.92	0.81	0.55	1.07	0.71	0.57	2.14	0.57	0.31
3	4.60	5.16	3.85	1.15	1.07	0.74	0.60	1.66	1.18	1.09
4	2.18	3.23	6.19	1.98	1.51	0.68	0.58	1.57	1.18	0.95
5	0.83	1.46	4.96	3.39	1.95	0.80	0.61	1.06	1.16	1.37
6	0.28	0.51	1.24	1.09	2.04	0.72	0.21	0.21	0.26	0.82
7	0.06	0.10	0.33	0.24	0.56	0.28	0.05	0.05	0.04	0.21
8	0.00	0.01	0.07	0.05	0.03	0.02	0.01	0.01	0.02	0.03
9	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ages 1-4	12.64	13.47	11.07	3.98	4.44	2.69	2.40	6.30	3.60	2.70
Ages 5+	1.17	2.08	6.60	4.78	4.59	1.81	0.87	1.32	1.48	2.43
Ages 1-10	13.81	15.56	17.67	8.75	9.03	4.51	3.27	7.62	5.08	5.13

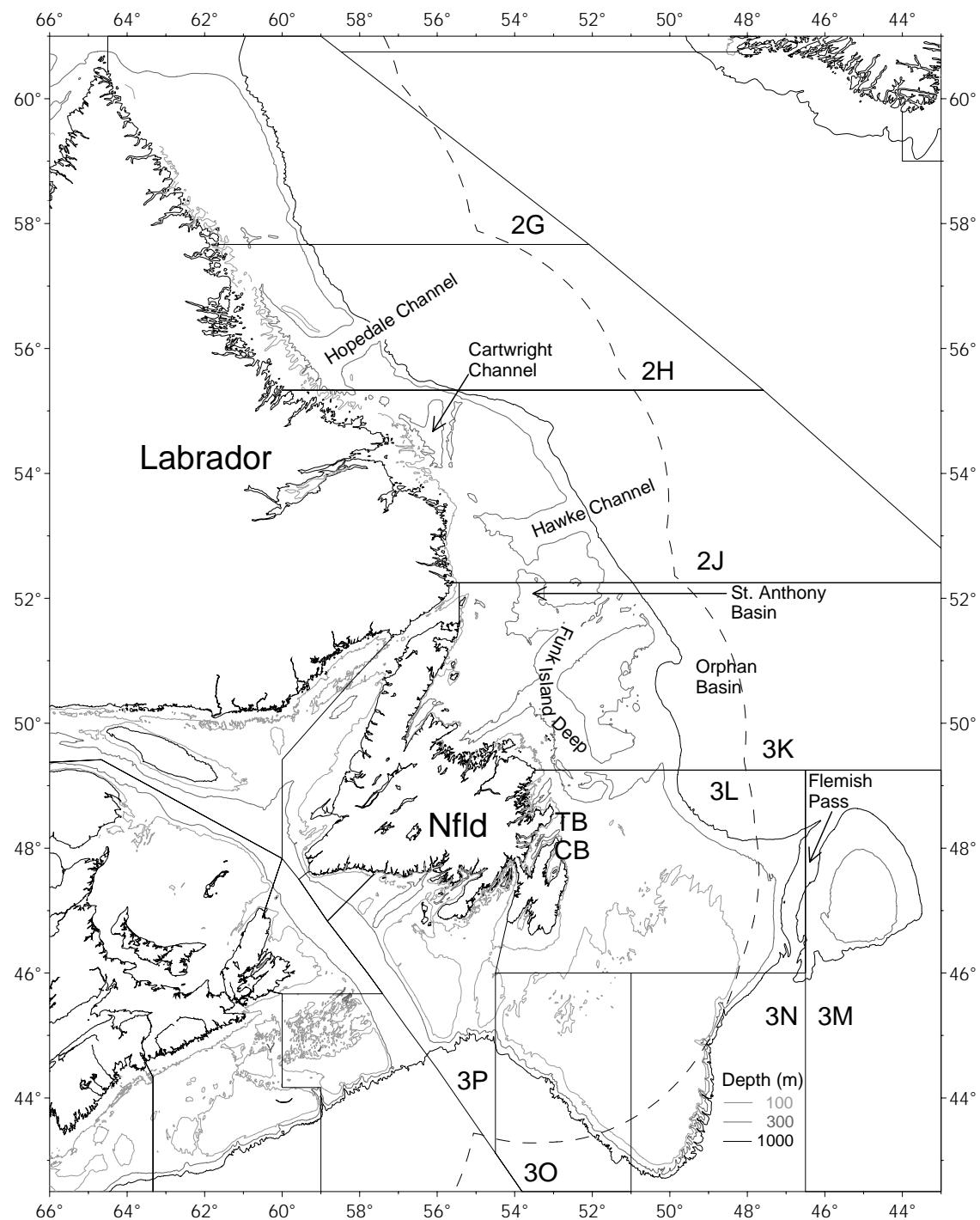


Figure A. Map of stock area, with NAFO dividing lines, select isobaths, and names referred to in the text. TB and CB refer to Trinity and Conception Bays, respectively.

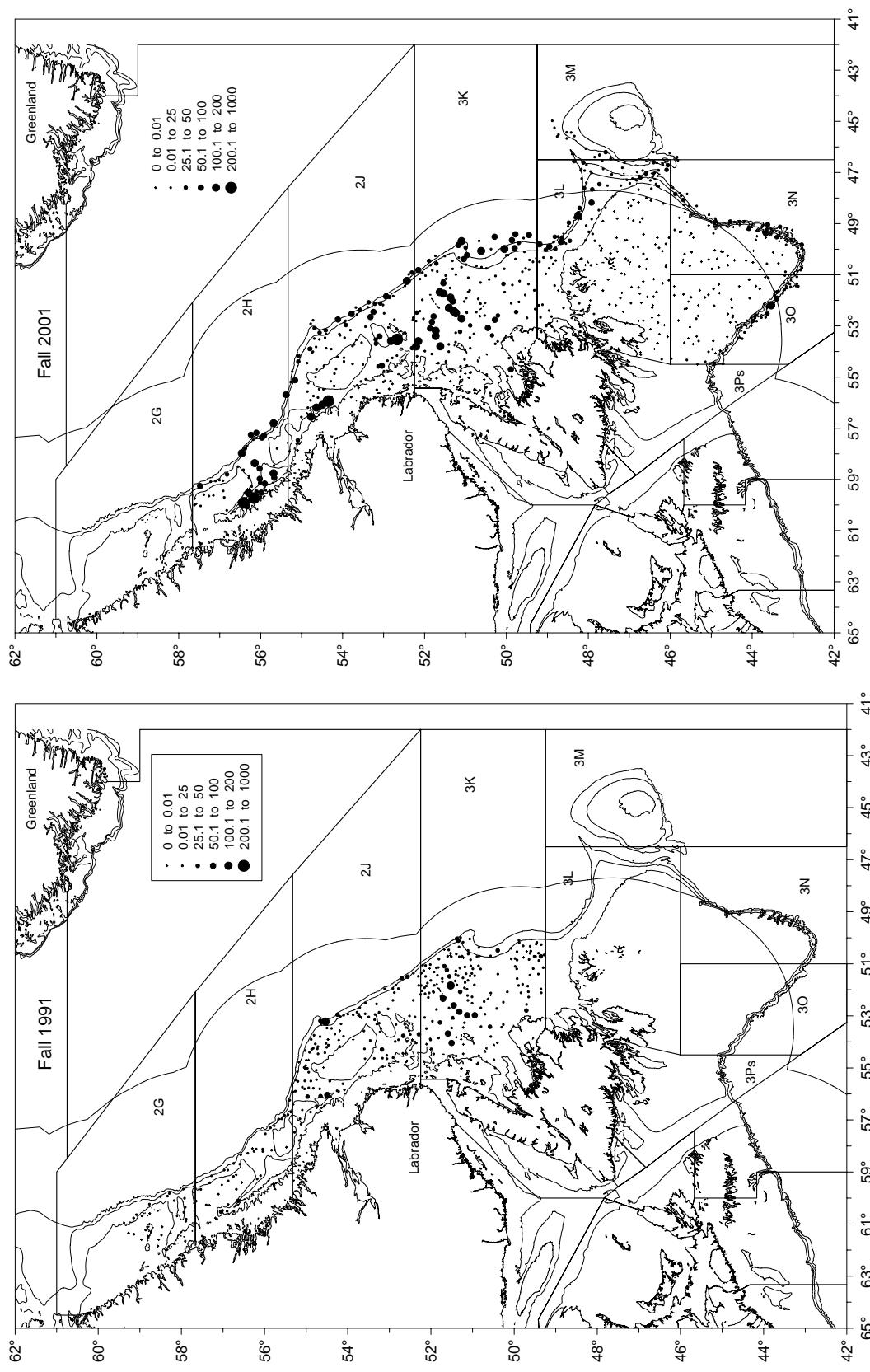


Figure 1. Distribution (kg per set) of Greenland halibut from Canadian fall surveys during 1991 (left) and 2001 (right). Depth contours at 200m, 500m, and 1000m are plotted, along with the NAFO Divisional boundary lines, and the 200 mile limit demarcating Canadian waters.

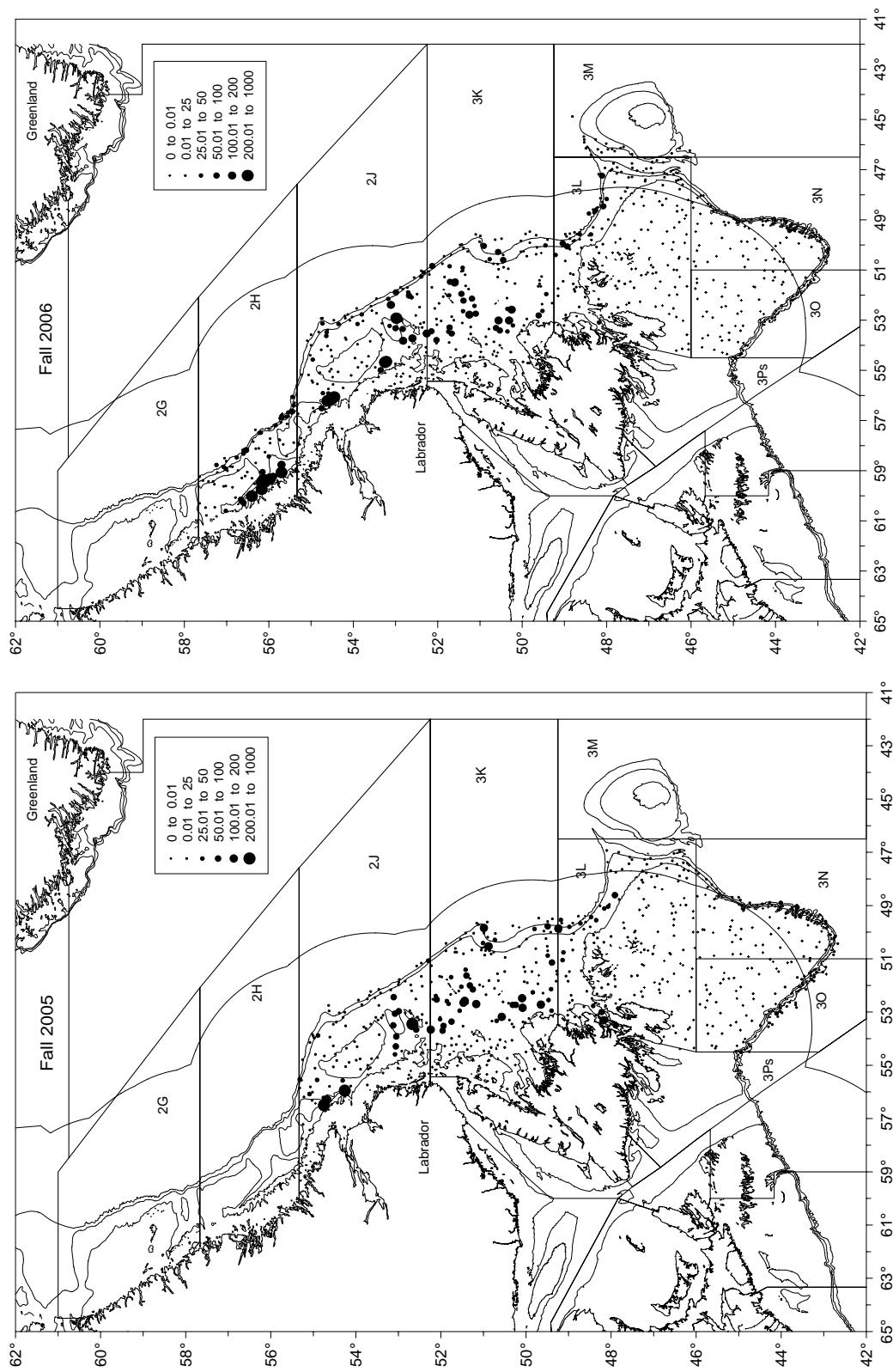


Figure 1 (cont.) Distribution (kg per set) of Greenland halibut from Canadian fall surveys during 2005 (left) and 2006 (right). Depth contours at 200m, 500m, and 1000m are plotted, along with the NAFO Divisional boundary lines, and the 200 mile limit demarcating Canadian waters.

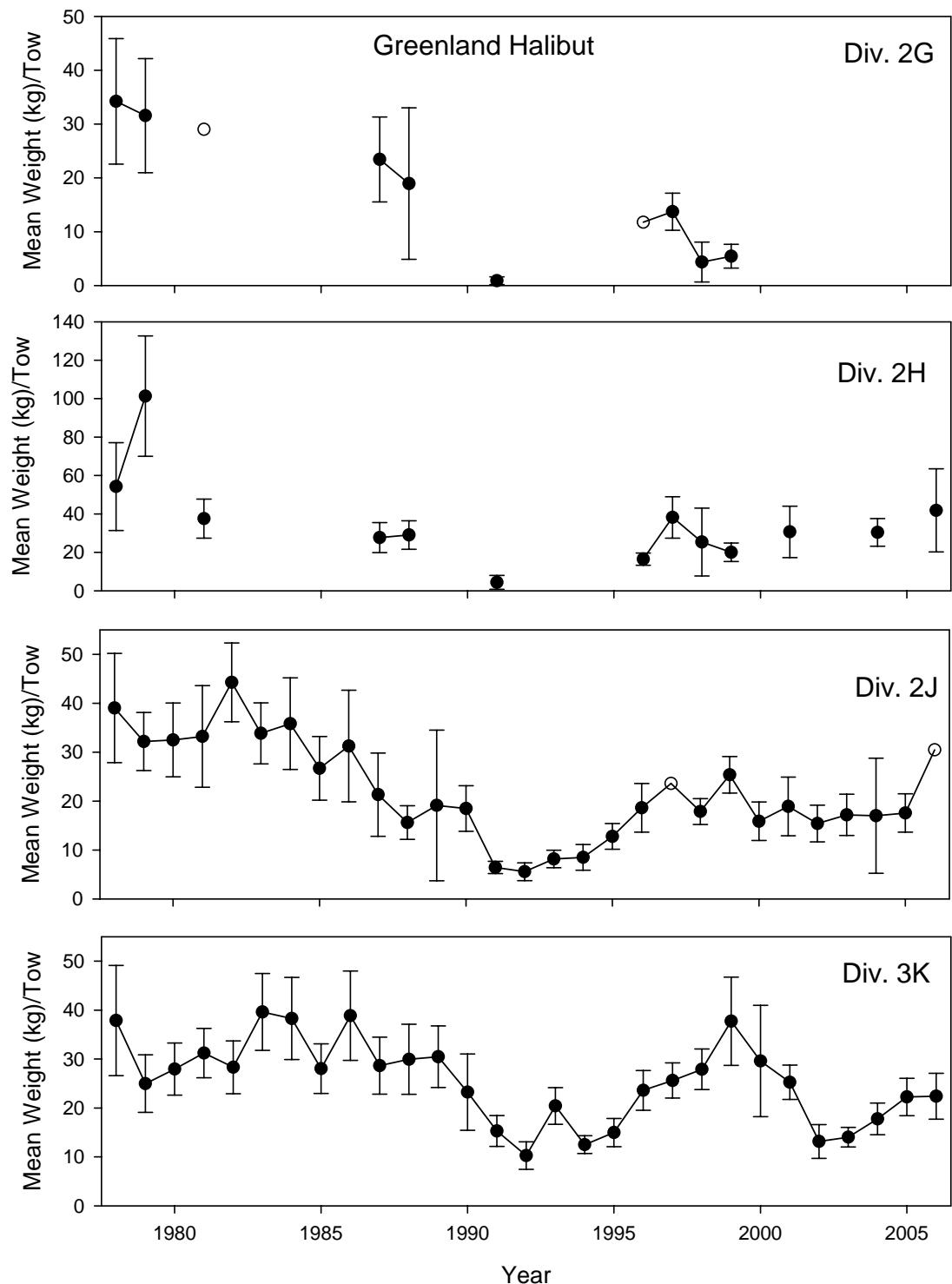


Figure 2a. Camplelen stratified mean weight per tow estimates by NAFO Division from Canadian surveys during 1978-2006. Surveys were completed in the fall, unless otherwise indicated. Open symbols indicate estimates for which the lower value of the confidence interval is negative.

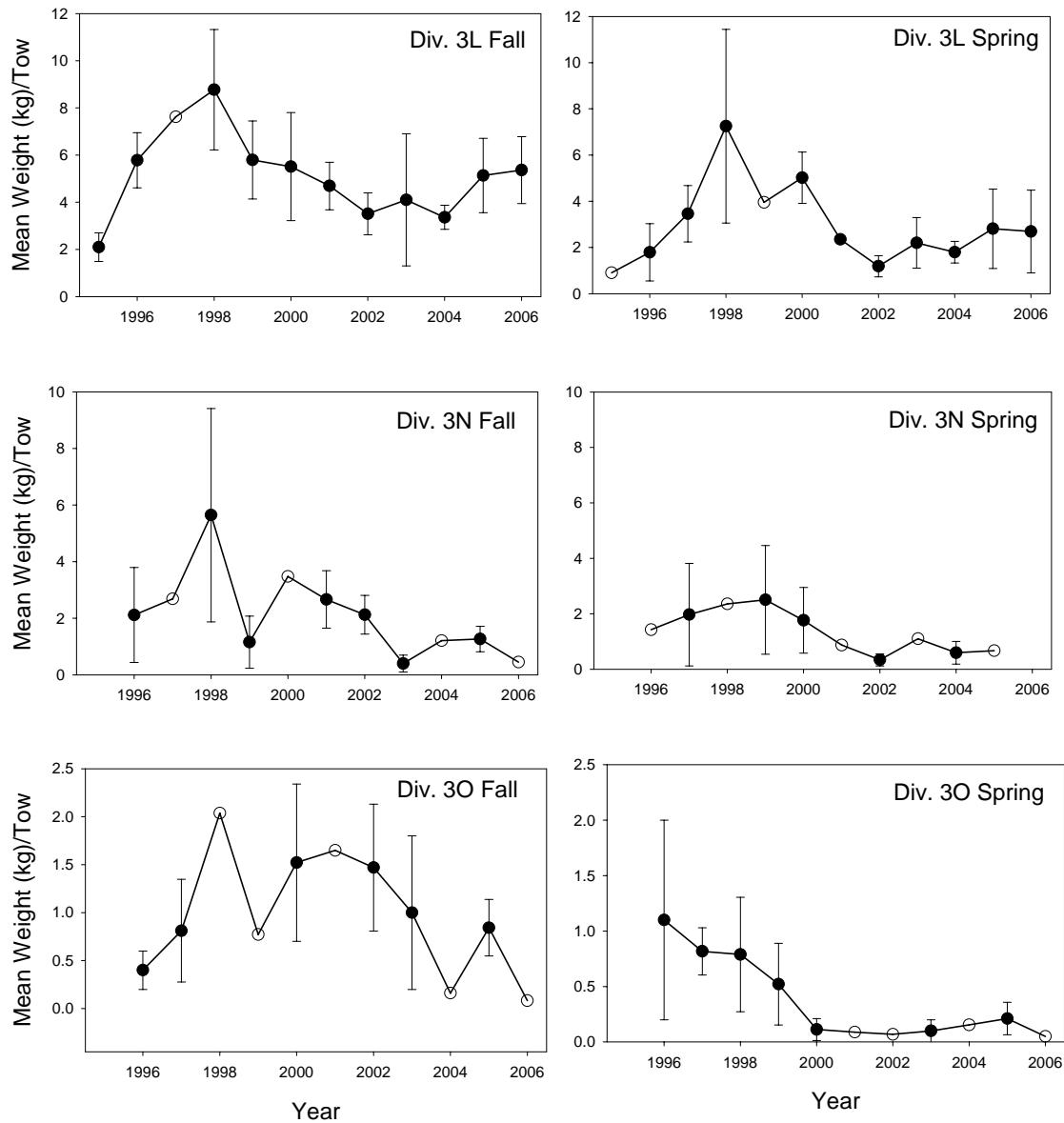


Figure 2b. Continued.

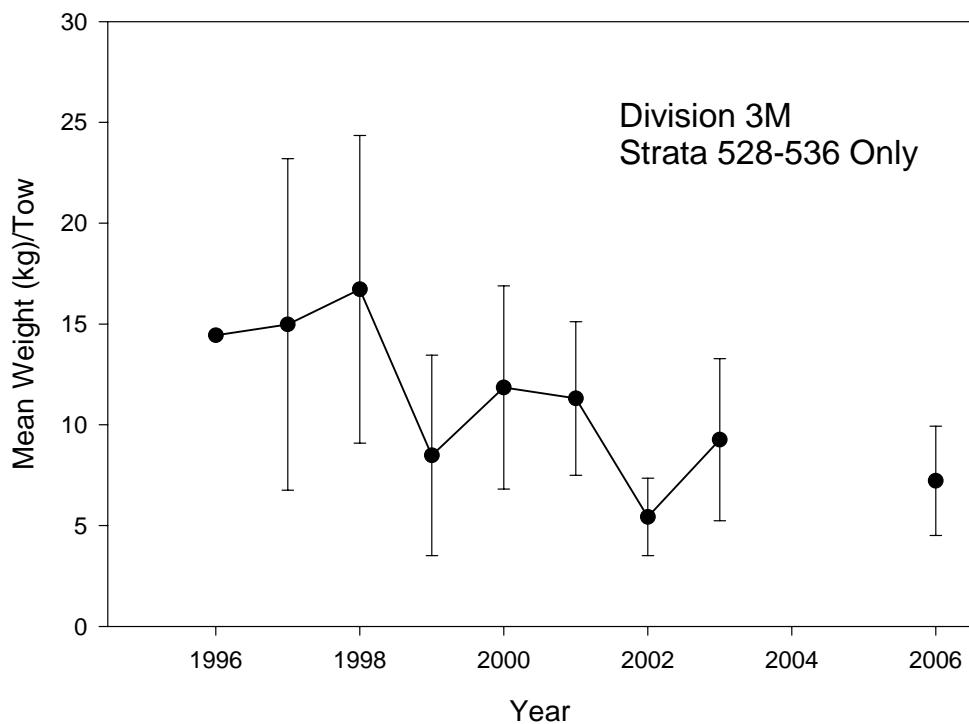


Figure 2c. continued.

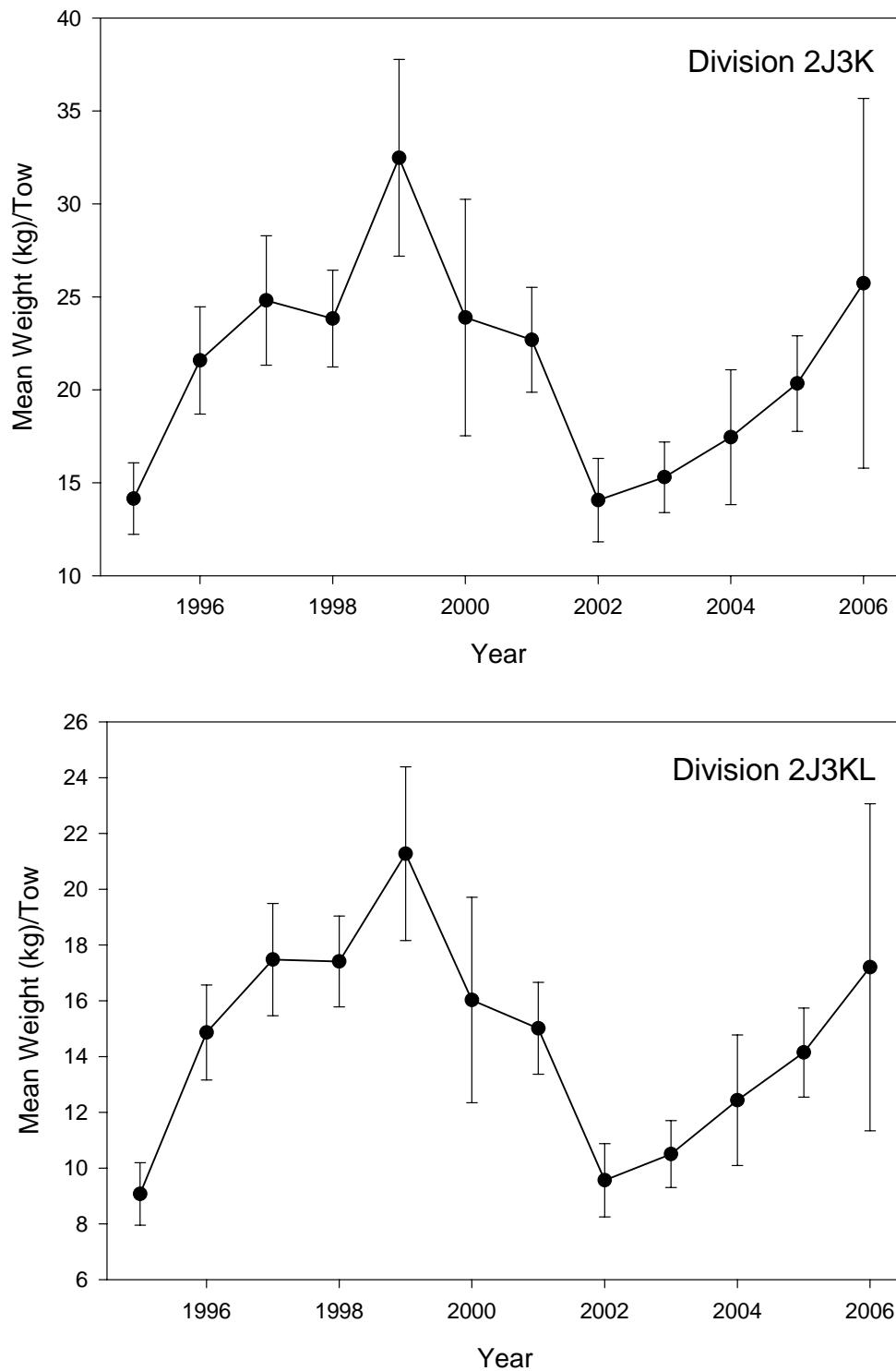


Figure 2d.

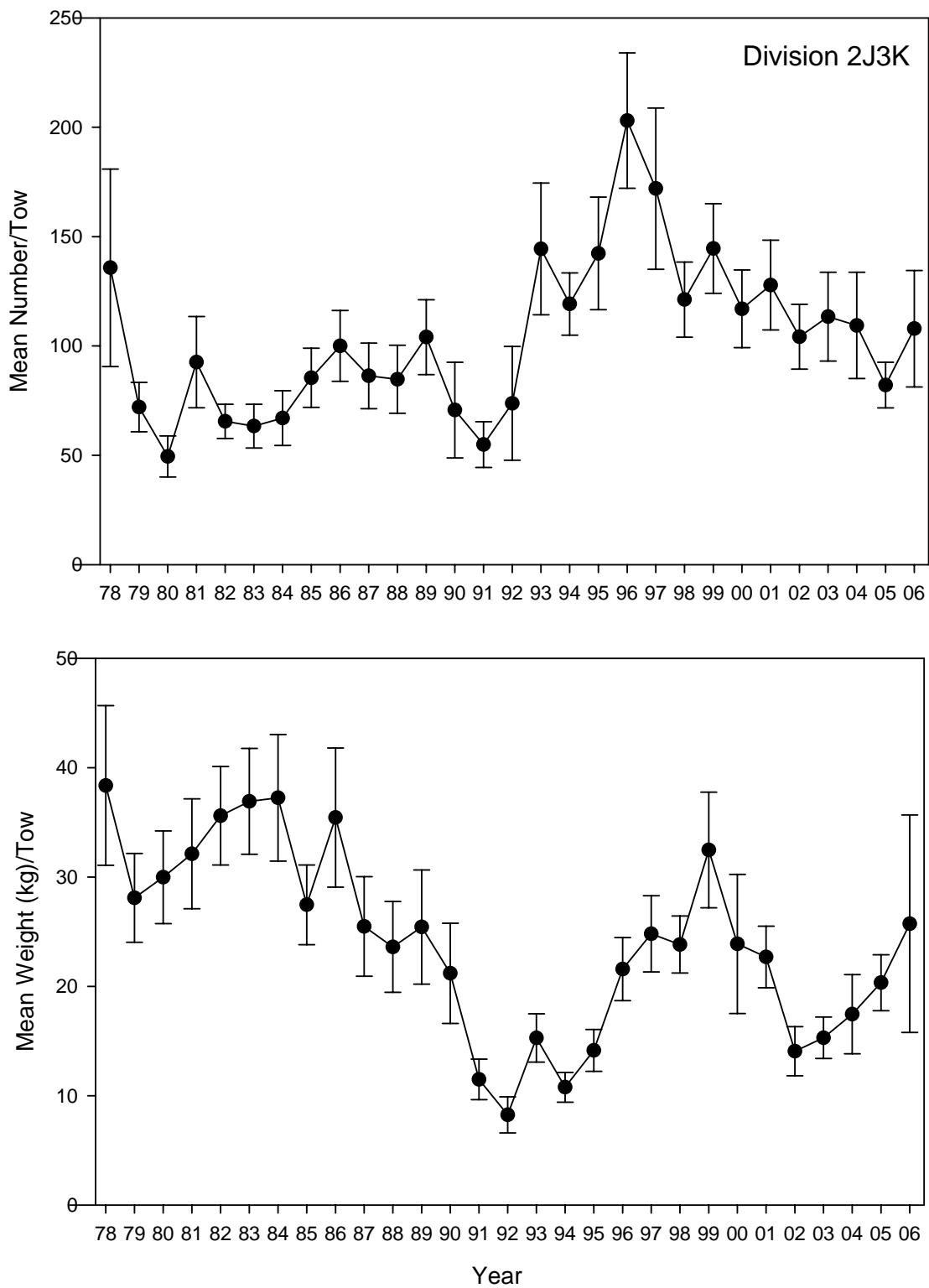


Figure 3. Campelen (or Campelen-equivalent) stratified mean number and weight (kg) per tow of Greenland Halibut from Canadian fall surveys in NAFO Divisions 2J3K combined during 1978-2006.

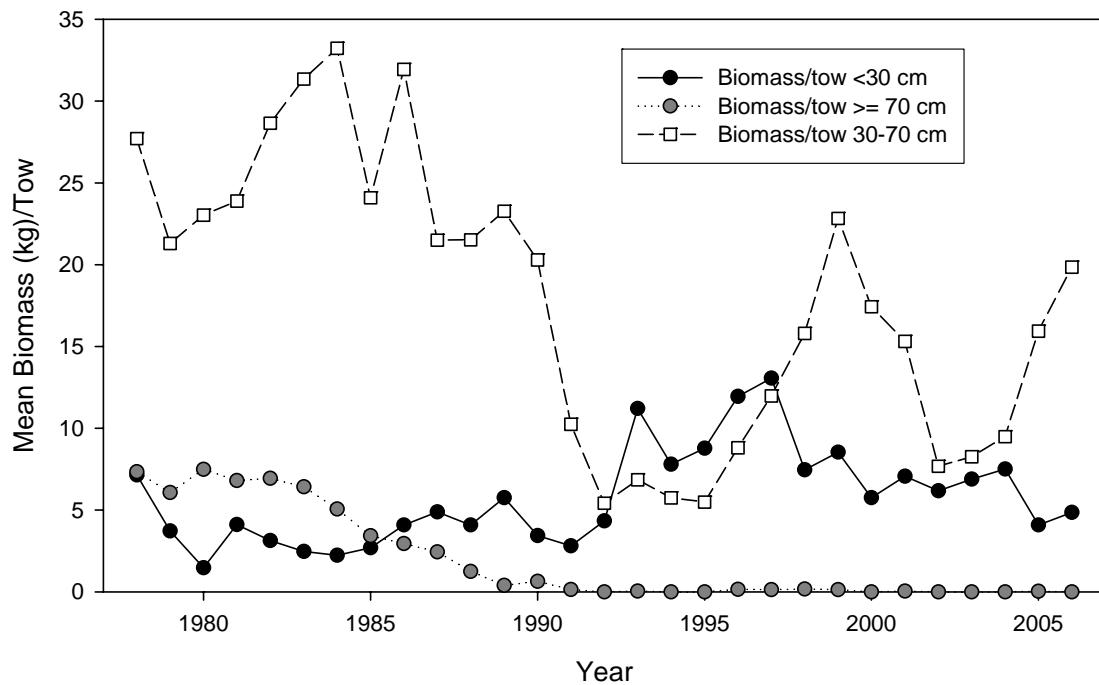


Figure 4. Mean biomass (kg) per tow of Greenland halibut by selected length classes from Canadian fall surveys conducted in Div. 2J + 3K during 1978-2006. See text for computational details.

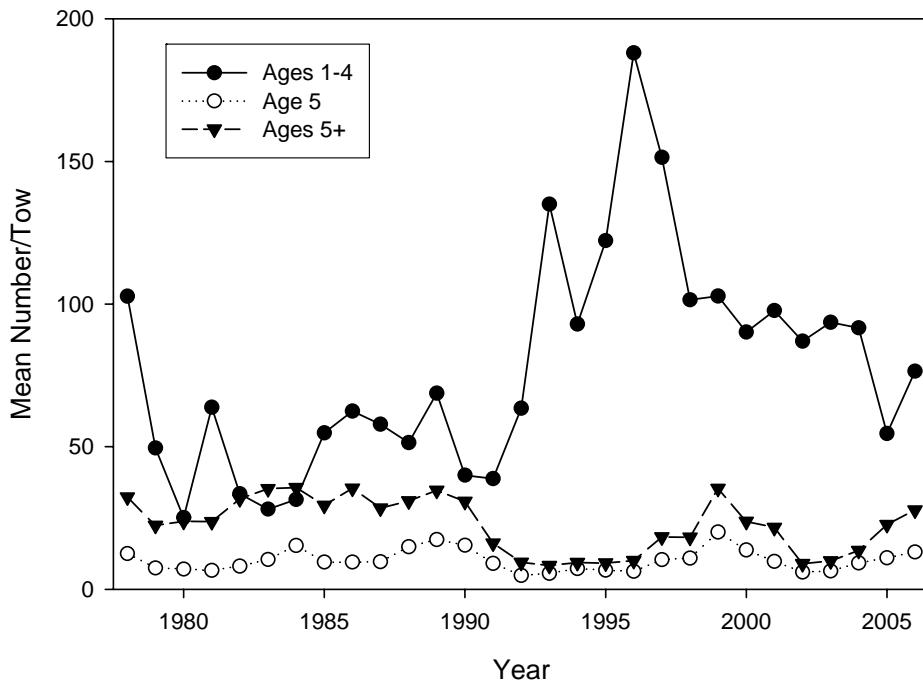


Figure 5. Trends in mean number per tow estimates by age category from Canadian fall surveys in Divisions 2J and 3K combined during 1978-2006. Ages 1-4 represent recruitment, age 5 represents recruitment to the fishery and ages 5+ represent exploitable biomass.

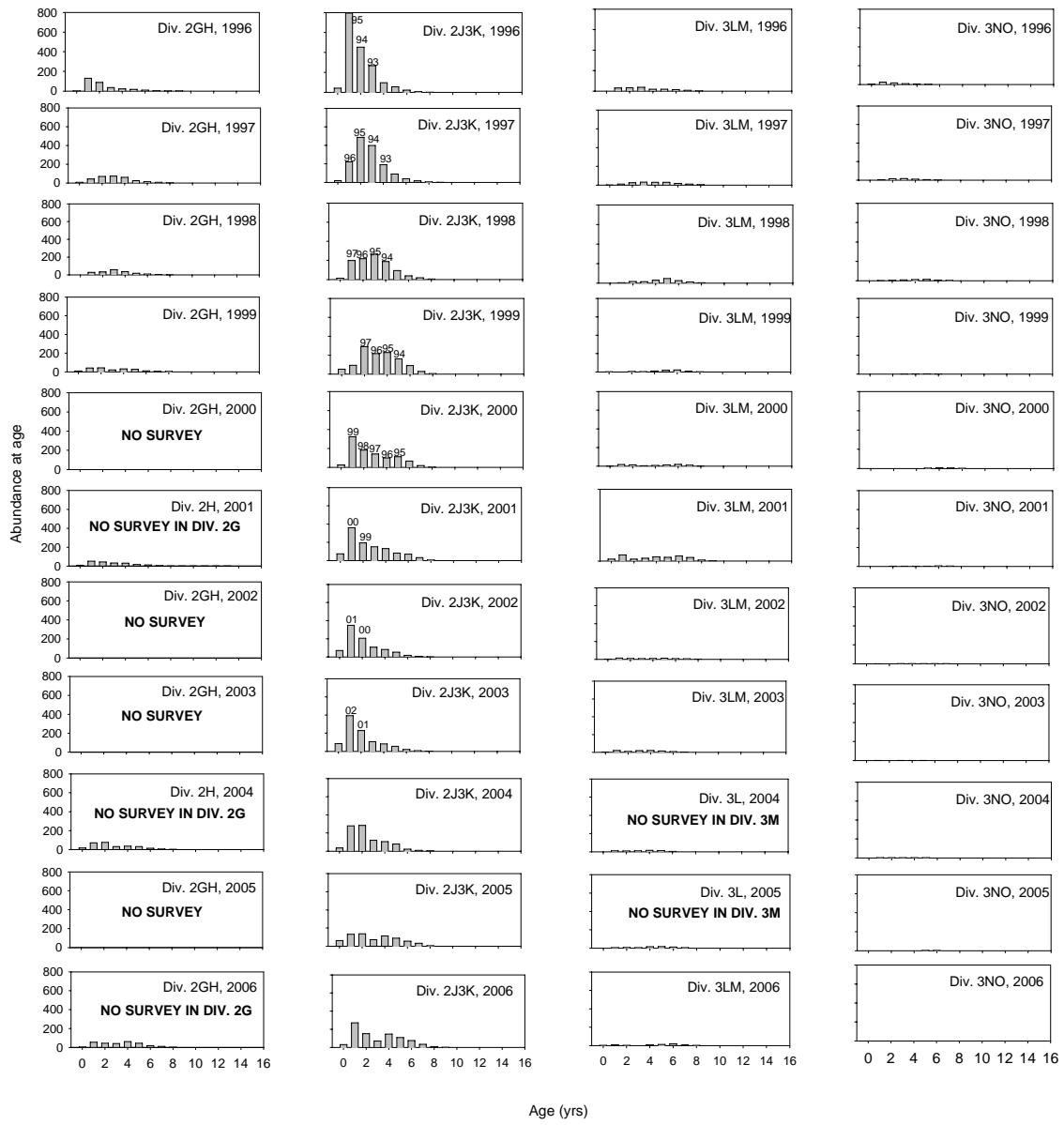


Figure 6. Greenland halibut abundance at age (millions) by year and NAFO Div. groupings from Canadian fall surveys during 1996-2006. Bar labels indicate year-class.

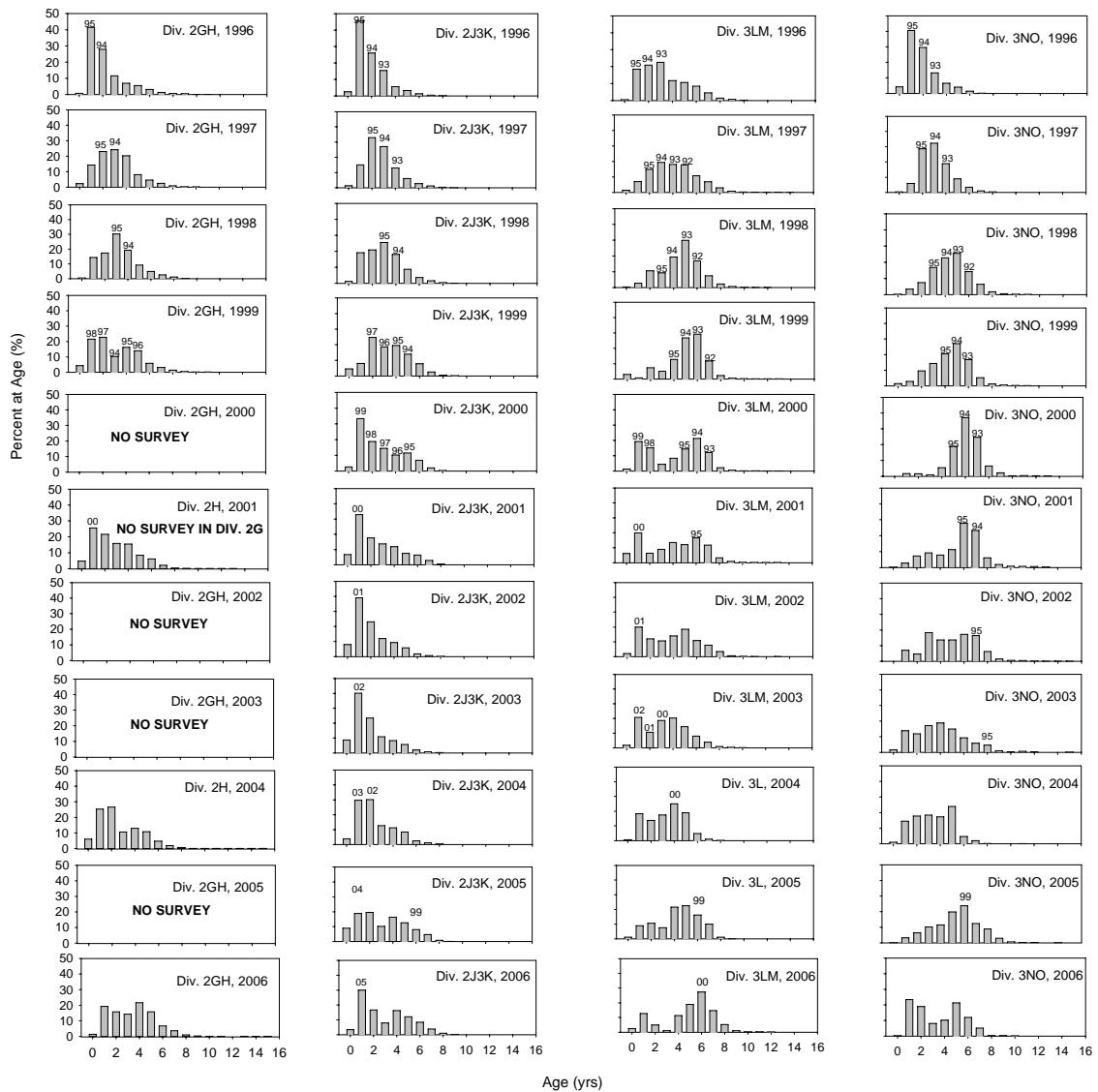


Figure 7. Greenland halibut percent at age by year and NAFO Div. groupings from Canadian fall surveys during 1996-2006. Bar labels indicate year-class.

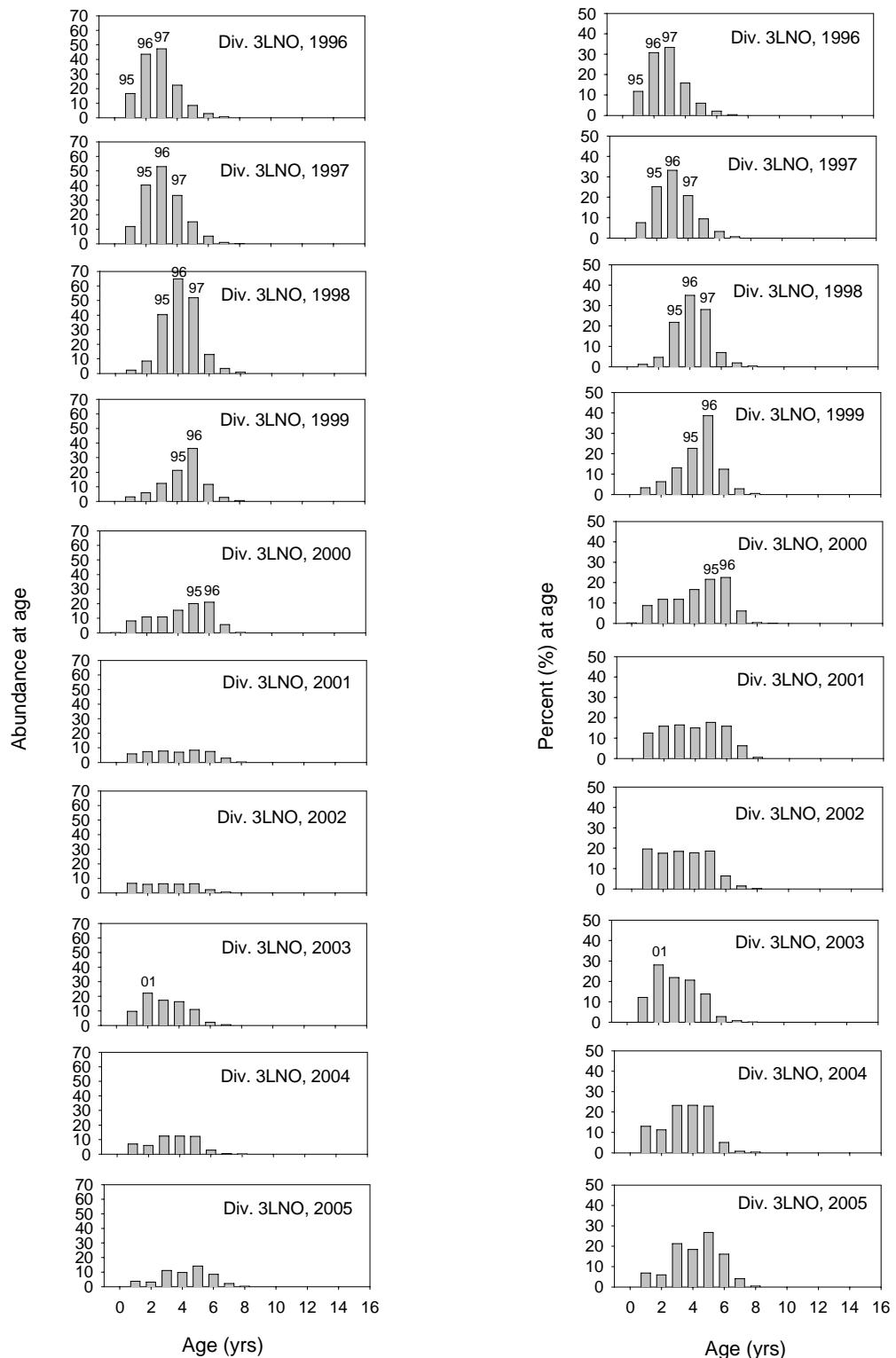


Figure 8. Greenland halibut abundance (millions) and percent at age by year from Canadian spring surveys in Divs. 3LNO during 1996-2006. Bar labels indicate year-class.

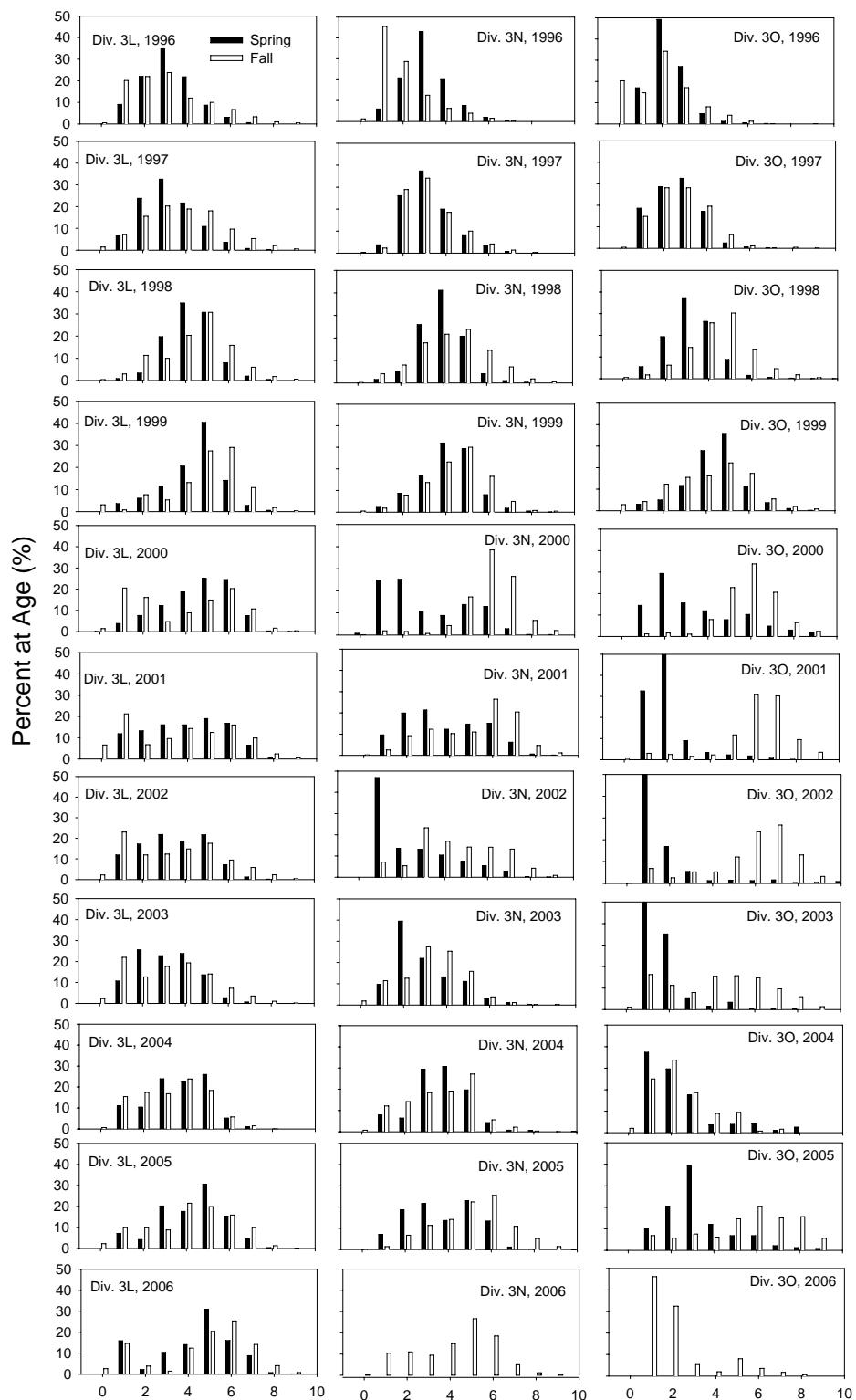


Figure 9. A comparison of percent abundance at age of Greenland halibut from Canadian spring and fall surveys in NAFO Divs. 3L, 3N and 3O during 1996-2006 using a Campelen 1800 shrimp trawl.

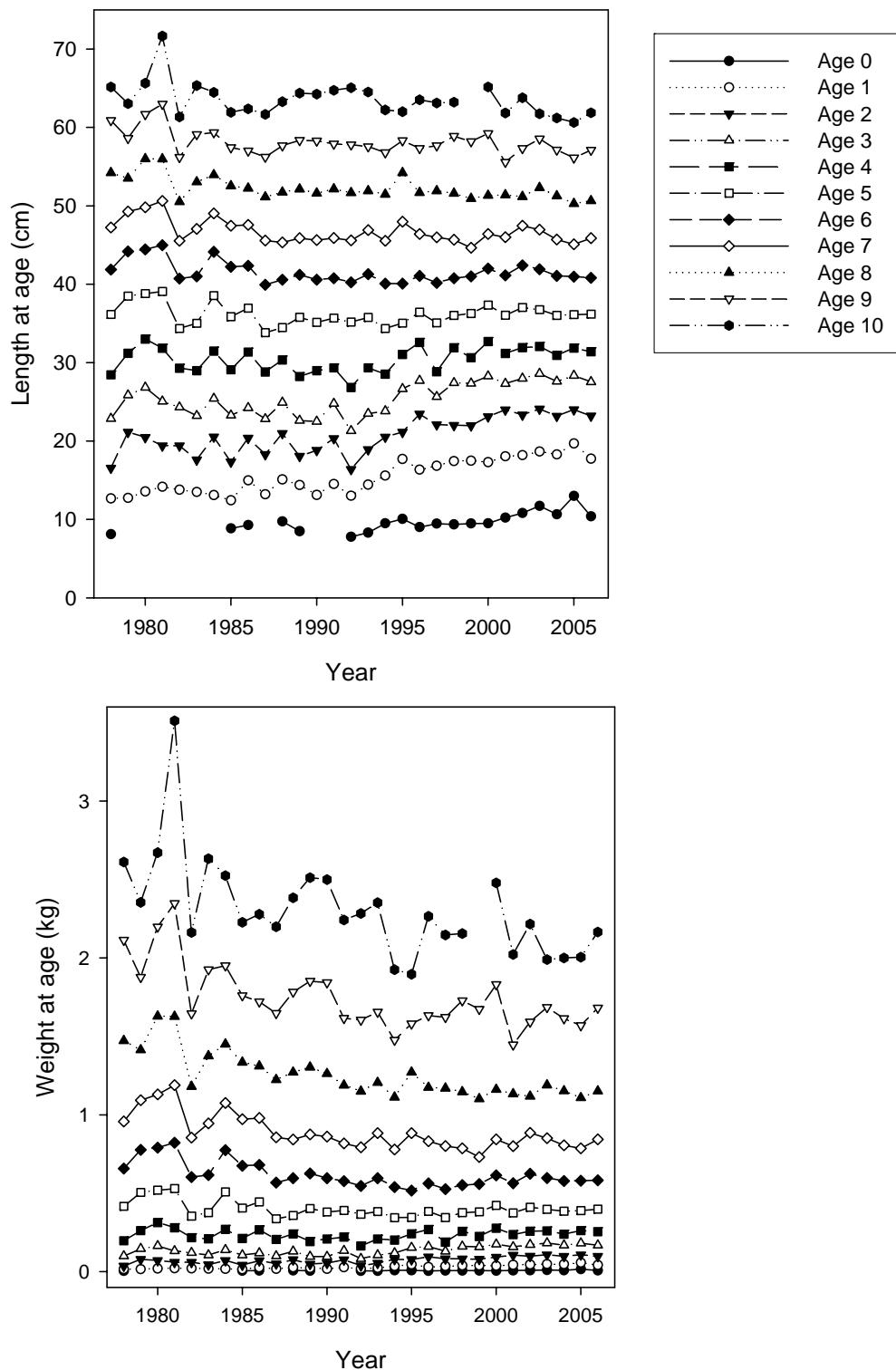


Figure 10. Length at age (cm) and weight at age (kg) for Greenland halibut from Canadian fall surveys in Div. 2J3K, ages 0-10, from 1978-2006.

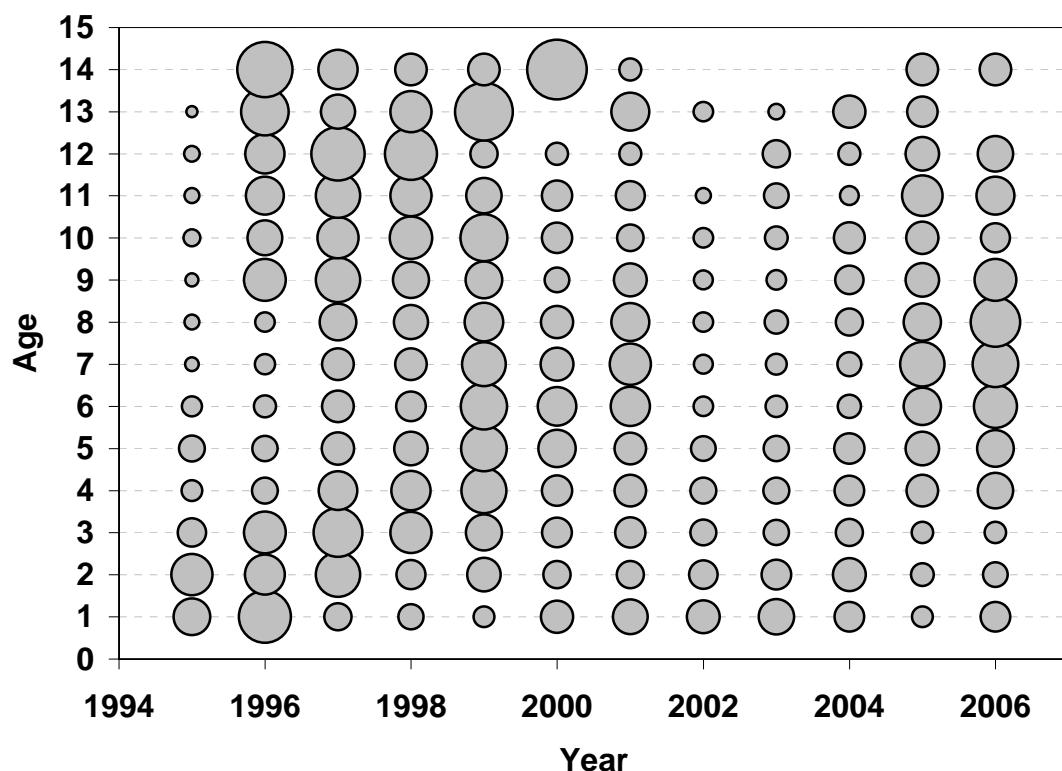


Figure 11 – Mean Numbers per tow from Canadian fall surveys in Divisions 2J3K combined, 1995-2006. Symbol sizes are computed by dividing each value by the average for that age group.

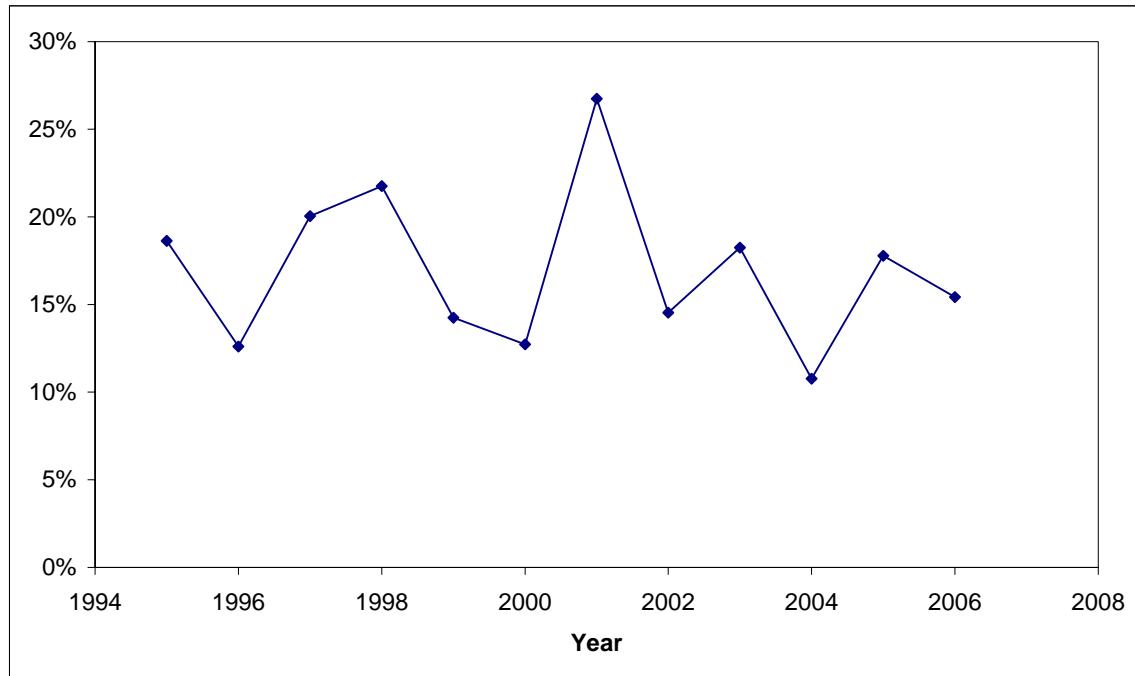


Figure 12. Proportion of the fall Division 3K biomass index observed in the deep-water (400m and deeper) strata along the edge of the continental shelf from 1995-2006.

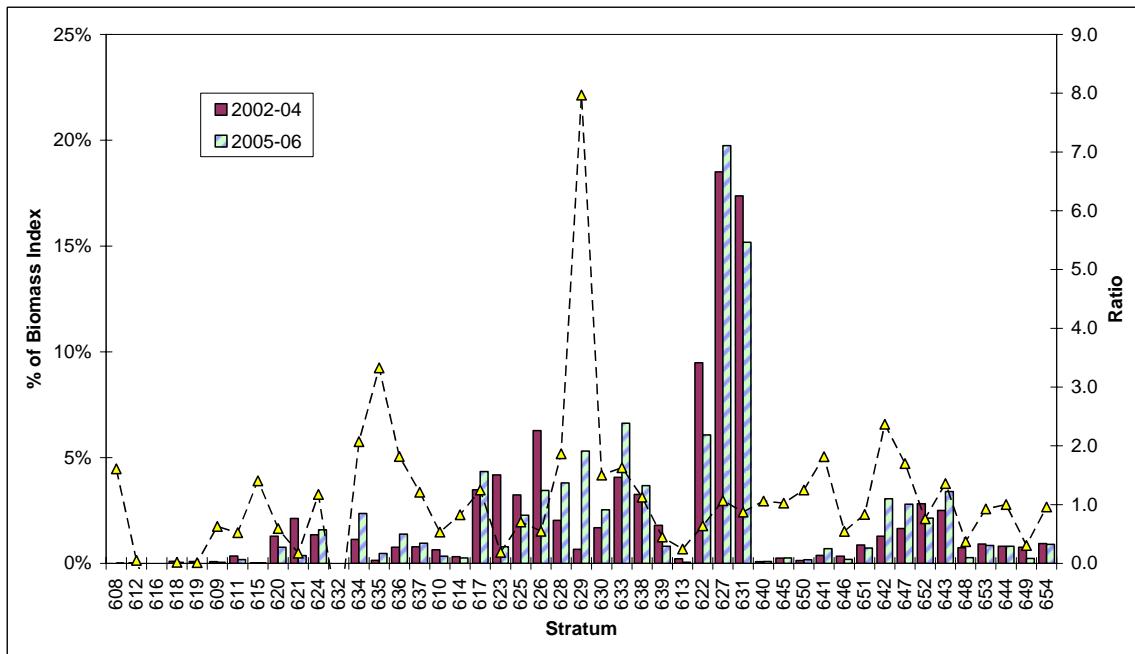


Figure 13. Comparison of relative biomass contributions from each stratum in Division 3K. The vertical bars compare the average proportion from the most recent two surveys against 2002-2004. The triangles represent the ratio of these averages (2005-2006 relative to 2002-2004).