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An Assessment of the Grand Bank Yellowtail Flounder Stock in NAFO Divisions 3LNO

by

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TAC regulation

The stock has been under TAC regulation since 1973, when a precautionary level of 50,000 t was established. In 1976, the TAC was set at 9000 t, following a series of high catches (Fig.1; Table 1) and a reduction in stock size. From 1977 to 1988, the TAC varied between 12,000 t and 23,000 t and was unchanged at 15,000 t for the last 4 years of that period. The TAC was set at 5000 t in 1989 and maintained at that level for 1990, following sharp declines in stock size after the large catches in 1985 and 1986. From 1991-1993, a TAC of 7000 t was set because there appeared to be a slight improvement in recruitment to the fishable stock. In 1994, the TAC of 7000 t was recommended by Scientific Council, but the NAFO Fisheries Commission decided that no directed fisheries would be permitted for this stock and the 2 other flatfish fisheries on the Grand Bank (American plaice and witch flounder). From 1995 to 1997, the TAC has been set at zero and a fishery moratorium was put in place. A pre-cautionary re-opening TAC of 4,000 t was advised for 1998. The re-opening of this fishery is delayed to August 1998 to allow the majority of yellowtail flounder spawning to be completed.

Catch trends

The nominal catch increased from negligible levels in the early 1960's to a peak of over 39,000 t in 1972 (Fig. 1). With the exception of 1985 and 1986, when the catch was around 30,000 t, catches have been in the range of 10,000 to 18,000 t from 1976-93. Canada and the USSR were the major participants in the fishery up to 1975, with Canada taking virtually all the catch from 1976-81 (Table 1). Canadian catches were consistently around the TAC in the mid to late 1970's, but were under the TAC's in the early 1980's as much of the fishery for flounders was directed toward American plaice in Div. 3L. Catches by other nations began to increase in 1982 as freezer trawlers started to fish in the NAFO Regulatory Area on the Tail of the Bank (Tables 1&2) (see also Walsh et al 1995a). In 1985 and 1986, as well as in the period of 1989-1994, catches for all other nations combined exceeded those of Canada. Canadian catches were stable around 6700 t from 1991-93, but declined to • 0" in 1994. USA catches declined steadily from 3,800 t in 1985 to zero in 1991 and 1992 (Table 2) and increased to 700 t from 1993-94.

Catches by Spain and Portugal have also decreased to relatively low levels during the period of 1992-96. South Korea, which has been involved in this fishery since 1982, and caught between 3500 and 5900 t per year from 1989 to 1992, has had no vessels in this fishery since early 1993. It should be noted that the catches for S. Korea in many years included a substantial amount of yellowtail flounder determined from breakdowns of catches reported as unspecified flounder.

Overall, the catches from this stock exceeded the TAC in each year from 1985-93, often by a factor of two (Fig.1). However, there is still considerable doubt about the precise catch levels from this stock in the recent years before the moratorium. Up to one-third of the catch in some years (almost two-thirds in 1994) was being determined from Canadian surveillance reports and estimates of the proportion of yellowtail flounder in catches of unspecified flounder by S. Korea (Brodie et al. 1994). Since the moratorium, the nominal catch of yellowtail flounder in 1995 was 67 t, of which EU-Spain took 65 t in the Regulatory Area, and in 1996, the catch was 287 tons of which EU-Spain took 232 t in the Regulatory Area,

mainly Div 3N, (Tables 1 and 2). In 1996, Canada reported a catch of 55 t in a co-operative Department of Fisheries and Oceans (DFO) and fishing industry exploratory survey. In the 1996 the Statlant 21A statistics, EU-Spain reported a catch of 27 t on the Flemish Cap, NAFO Div 3M. STACFIS noted that this catch was probably an error in reporting or identification since the yellowtail flounder distribution doesn't extend to the Flemish Cap. In 1997, EU-Spain reported 657 t as a by-catch in the skate fishery and Canada reported a catch of 145 t in the co-operative Department of Fisheries and Oceans (DFO) and fishing industry exploratory survey and 1 t by-catch.

Commercial fishery data

There were some length, age samples and catch data from the 1997 by-catch fisheries. Noteworthy is that the catch rate analysis of Canadian data from 1965 to 1993, presented in 1994 showed that the CPUE in 1991 was the lowest in the series (Brodie et al 1994). Although there was a slight increase in the 2 subsequent years, the values in 1992 and 1993 were the second and third lowest CPUE values in the time series. Catch rate analysis of data from the 1996-97 co-operative DFO/fishing industry surveys in Div. 3NO showed that catch rates were higher in the spring and summers surveys relative to the spring-summer Canadian CPUEs in the fisheries of the mid-1980s. However, in the winter survey catch rates were much lower than the winter catch rates in the fishery (see Brodie et al 1998a). Age data from the annual spring and fall surveys were used to convert the length data into age.

Catches of yellowtail by EU-Spain in the Div. 3N of the Regulatory Area were by-catches from the skate fishery. Length frequency of the catches (NAFO SCS Doc. 98/11) are presented in Fig. 2. Catches range in size from 12 to 56 cm, peaking at 30 cm. The presence of many small fish may be due to skate blocking the meshes of the codend and reducing escapement of yellowtail flounder or some other unknown factor.

Canadian research vessel surveys

Canadian survey gears (see Table 3): In 1995, the old standard Engel 145 otter trawl was replaced by a three bridle Campelen 1800 shrimp trawl rigged with rockhopper footgear (see McCallum and Walsh 1996 for details). Campelen trawl surveys of the Grand Bank began in the fall of 1995 aboard the *FRV Wilfred Templeman*. Conversion factors have been derived from comparative fishing trials to convert the Engel trawl data into Campelen trawl units and are presented in Walsh et al. (1998).

A) Spring groundfish surveys

Campelen trawl 1984-98

Annual stratified-random trawl surveys have been conducted by Canada in Div. 3LNO since 1971, with the exception of 1983 when the survey was cancelled due to vessel problems. Data from 1971-82 have not been converted to Campelen trawl units and can be found in the 1997 assessment paper (see Walsh et al. 1997 for details). Stratification is based on depth and the survey strata out to the 731m contour are presented in Fig. 3. Strata deeper than 731 m were fished for the first time in this time series in 1994, however, mechanical problems with the survey vessel did not permit these strata to be fished in 1995 and there was insufficient survey time in 1996 and 1997 to cover these depth zones. In all years, the majority of yellowtail flounder were caught in less than 100 m on the Grand Bank; however, small catches have been taken in deep waters along the slope edge in Div. 3O.

Tables 4 to 9 give the survey catch rates in the form of stratified mean number and weight-per -tow by stratum. Tables 9-15 show biomass per stratum, along with confidence limits, in Div. 3L, 3N, and 3O, respectively, and a combined Div. 3LNO estimate for the time period 1984-97. Figure 4 shows a plot of the biomass estimates from 1984-97 and includes the preliminary estimate from 1998 Div. 3N and 3O survey finished on June 5; the Div. 3L survey is ongoing.

Biomass trends:

Div. 3L, the biomass index has declined steadily from about 22,000 t in 1984 to "0" t in 1995 and then began to increase in 1996 and 1997 to an average of 0.7 t (Table 10; Fig. 4).

Div. 3N, the majority of the stock in this area is distributed in and around the nursery area of the Southeast Shoal. The biomass index has declined gradually from 168,000 t in 1984 to 46,000 tons 1994 and then increased dramatically in 1996 and 1997 to an average level of 112,600 t (Table 11; Fig. 4). In 1998, the preliminary estimate is 147,000 t. In 1997, 34% of the biomass occupied strata 376 and 360 which straddles the Canadian 200 mile limit zone and extends into the Regulatory Area in Div. 3N.

Div. 3O, the biomass index has shown moderate fluctuations around an average value of 25,000 t for the period 1984-92, increasing to 42,000 t in 1993 and then declining to an average of 11,000 t during the 1994-95 period. In 1996 the stock dramatically increased to 70,6000 t and in 1997 and 1998 it declined to an average value of 55,000t (Table 12; Fig 4). Whether these fluctuations are related to movement between Div. 3N and 3O is unknown for certain.

Div. 3LNO, Table 13 and Figure 4 shows the cumulative biomass of the 3LNO stock for the time period 1984 to 1997. Although the overall stock has been steadily declining since the 1984, especially in Div 3L and to a lesser extent in Div. 3O, it has been increasing since 1995. The overall stock biomass appears stable in 1996 and 1997 at a level of 174,500t

Abundance trends:

Tables 14-17 and Figure 5 show the abundance trends by Division up to 1997, with 95% confidence intervals. There has been a continuous decline in Div. 3L to 0" abundance. Abundance in Div. 3N declined slowly from 1989 to 1994 and began to increase in 1995. The high degree of variability around the 1993 estimate in Div. 3O was generated by the high catch rates in stratum 352, however there has been an increase in abundance from 1994 to 1996.

Age-length composition: Table 18 gives the population abundance at age indices for Div. 3LNO combined during the period 1984-1997. Figure 6 compares the population estimates of pre-recruits (ages 3-4), mature population (ages 5+) and the fully recruited population (age 7+). The 1993 and 1994 year -classes at age 3 are the first and second highest estimates, respectively, in the time series and the 1993 and the 1992 at age 4 are the second and third highest estimate next to the strong 1985 year-class. Average strength of ages 1-4 pre-recruits for 1996 and 1997 stands at 226 million fish. The mature population has been showing a steady increase since 1994 and the 1997 estimate stands at 462.3 million fish second only to the 1984 estimate of 504.6 million fish. After a declining trend since 1984 to 1992, the estimates of fully recruited ages have shown a steady increase since 1994 and stands at 178.9 million fish in 1997 compared to the high 1984 estimate of 278.4 million fish. Beginning in 1991, there has been a truncation in the age of the population from age 10 to age 9 in female yellowtail flounder in the surveys. The presence of several year classes contributing to the 1996 and 1997 estimates is also seen in the length composition of the survey catches in Figure 7 and the abundance at age plot in Figure 8.

Table 19 shows the proportion of the biomass for individual cohorts which is estimated by applying average weight at age against population numbers at age for the period 1990-97. These average weights were calculated from individual fish weights taken at sea. For data prior to 1989 the biomass was estimated from a weight length regression analyses. A large proportion of the biomass is contributed by ages 7 and 8 in most years, however in 1996 and 1997 the biomass is spread across ages 5-8 years (Fig. 9).

B) Fall groundfish surveys

Surveys covering all of Div. 3LNO began in 1990, using the 'old' standard survey trawl, the Engel 145 high lift otter trawl. In the fall of 1995 and in the fall of 1996, the survey was conducted using the 'new' standard survey trawl, the Campelen 1800 shrimp trawl. The data presented here will cover the time period 1990-97 using the Campelen converted database as described in Walsh et al. (1998).

Campelen trawl series, 1990-97

Tables 20-24 shows the survey catch rates in the form of stratified mean number and weight-per -tow by stratum. Tables 25-28 show biomass per stratum, along with confidence limits, in Div. 3L, 3N, and 3O, respectively, and a combined Div. 3LNO estimate for the time period 1984-97. Figure 10 shows a plot of the biomass estimates from 1984-98.

Div. 3L, with the exception of 1994 when the biomass dropped to 0 t, the biomass index has ranged from 1000-2200 t over the survey period. (Table 25)

Div. 3N, where the majority of the stock is found, the biomass has shown a steady increase from the average biomass level of about 95,000t in 1993-94 to 164,200 t in 1997 similar to the trend seen in the spring time series (Table 17; Figs. 10 -11).

Div. 3O, most of the biomass was found in stratum 352, similar to the spring time series. The trawlable biomass index, in Table 27, showed no obvious trend from 1990-96. The 1997 estimate of 57,500t was 3 times higher than the 1996 estimate and very close in agreement with the spring estimate of 52,400t and the 1998 preliminary spring estimate of 57,500t.

Div. 3LNO, the overall stock biomass has shown a gradual increase since the first survey in 1990 to a high of 222,900 t in 1998. The 1997 fall estimate is 22% higher than the preliminary 1998 spring survey estimate. Some of the variability in the biomass indices of Div. 3N and 30 may simply reflect movement of the stock. Figure 11 shows the variability in biomass estimates for the spring and fall during comparable time periods. Given that Div. 3L stock size is very low, would be expected given the spatial distribution in the northern area. In Div. 3NO between season variability seems to be more pronounced in Div. 3O spring survey indices when compared to the fall indices. It is interesting to note that some small catches of yellowtail flounder are found in deep water along the slope of the bank of Div. 3O in the spring survey but not in the fall of the year (see tables 6 and 24). Seasonal changes in

Abundance trends:

Tables 29-31 show the abundance trends by Division up to 1997; with 95% confidence intervals. There has been an increasing trend in abundance in recent years, which probably reflects the changes in survey gears and the catching of smaller fish. In Div 3N the abundance has been stabled at around 500-600 million fish. Figure 12 compares the spring and fall estimates of abundance of age 1+. A similar trend is seen in the increase from 1996-97.

Age-length Composition: Table 32 shows a breakdown of abundance at age of yellowtail flounder for the 1990-97 fall surveys in Div. 3LNO. Figure 13 compares the population estimates of pre-recruits (ages 3-4), mature population (ages 5+) and the fully recruited population (age 7+) from both the spring and fall surveys. Estimates of pre-recruits show the same increasing trends in 1996-97, the 1995 fall point is higher than the 1995 spring point and probably is explained by the fact that this is when the survey gears were changed. The 1992 year-class in the fall survey is the highest estimate at age 3 in 1995, at age 4 in 1996 and age 5 in 1997 followed by the 1993 year-class, similar to the spring time series. The 1994 year-class is more moderate in the fall survey than in the spring survey. Average strength of ages 1-4 pre-recruits for 1996 and 1997 stands at 198 million fish compared to 226 million estimated from the spring survey.

In the spring and fall surveys, estimates of both mature and fully recruited ages have shown a steady increase since 1994. The presence of several year classes contributing to the 1995, 1996 and 1997 estimates is also seen in the length composition of the survey catches in Figure 14 and the abundance at age plot in Figure 15.

Table 33 shows the proportion of biomass for individual cohorts which is estimated by applying average weight at age against population numbers at age for the period 1990-97 from individual fish weights taken at sea. A large proportion of the biomass is contributed by ages 7 and 8 in most years, however in 1996 and 1997 the biomass is spread across ages 5-8 years, similar to the trend in the spring time series (Fig. 16).

D) Co-operative surveys with the Canadian DFO and fishing industry 1996-97 (NAFO SCR Doc. 98/73).

The Department of Fisheries and Oceans (DFO) in St. John• s, Newfoundland, and Fishery Products International Limited (FPI), a Canadian company also based in St. John• s, are conducting co-operative trawl surveys based upon a fixed station grid survey directed at yellowtail flounder on the Grand Bank, NAFO Divisions 3NO. The primary objective of the surveys is to provide commercial indices of catch rate and distribution data for yellowtail flounder in this area. These grid surveys are designed to cover an area of approximately 9500 square nautical miles, corresponding to the area where the majority of the yellowtail flounder biomass is distributed, and the area where the Canadian commercial (FPI) fishery operated in most years prior to the current NAFO-imposed moratorium on fishing. Surveys have been carried out in July 1996; March, May, July and November of 1997; and March and May 1998.

Cooperative surveys in Divisions 3NO between DFO and FPI indicate drastic changes in catch rate and distribution of yellowtail and other species in March of 1997 and 1998 compared with surveys at other times of the year. CPUE observed in the 4 other cooperative surveys is relatively high compared to historic CPUE data from the fishery. The similarity of CPUEs from the remaining grid surveys, and the low CPUE of other species in the March surveys, suggests that these March surveys are not reflective of groundfish abundance in the grid area.

E. Spanish Spring groundfish surveys (NAFO SCR Doc. 98/48)

Beginning in 1995 EU-Spain has conducted stratified-random surveys for groundfish in the NAFO Regulatory Area of Div. 3NO using a Pedreria bottom trawl with a swept area per nautical mile of $0.0075m^2$. Most of the biomass was found in stratum 376 (Southeast Shoals) and stratum 360 (south and southwest of the Southeast shoals). The biomass increased almost 5 times from 1995 (27,704 t) to 1996 (129,642 t), however, in 1997, the biomass decreased by 11% to 115,728 t. In 1998 the biomass jump 73% to 425,375 t (Fig. 17) of which 71% was found in stratum 360. The largest catch in this stratum weighed 8100 t. Such large catches suggest that yellowtail are aggregated in certain areas in stratum 360.

Similar trends in abundance estimates were noted (see Paz and Duran 1996). Modal length of the 1995-97 catches was 24 cm and in 1998 it was 27 cm. Figure 19 shows a comparison of length frequencies from the Spanish survey in the Regulatory Area and the Canadian spring survey in Div. 3LNO for the period 1995-98. The Canadian surveys sample more of the adult population than do the Spanish surveys due to spatial differences in adult distribution. The dominance of juvenile yellowtail flounder in both Spanish and Canadian surveys is due to the fact that the main nursery area overlaps into the Regulatory Area of Div. 3N. Fig. 20 compares the length frequency of the 1997-98 survey indices. The peak in 1997 catch represents age 4 and in 1998 age 5 (1993 year-class) (see Tables 34 and 35). The 1993 year-class appears to dominate the peak in the 1997 Spanish trawler indices in Figure 2 and has been identified as the second strongest year-class in the time series.

Distribution analysis

Yellowtail flounder inhabits the continental shelf of the Northwestern Atlantic Ocean from Labrador to Chesapeake Bay at depths of 10-100 m, (Bigelow and Schroeder 1953). This species has reached its northern limit in commercial concentrations on the Grand Bank off the coast of Newfoundland. Brodie et al. (1998b) showed that the area occupied by the yellowtail flounder stock in Divs. 3LNO was positively correlated with stock abundance from surveys, but not with bottom water temperatures from these same surveys. During the years of highest abundance in the late 1970's and early 1980's, the stock was distributed widely over the Grand Bank within the100 meter depth contour. However, as the stock declined from mid 1980's onward, the remaining fish appear to aggregate in the area of the Southeast Shoal and to the area west of the shoal. They concluded that the contraction in the area of distribution for this stock to the preferred habitat around the Southeast Shoal was primarily a function of low stock size, which resulted from increased fishing activity in the mid to late 1980's. Most of these analyses have been presented in various NAFO SCR Docs. and reviewed at recent STACFIS meetings from 1994-97. Examination of data from surveys conducted in 1996 and 1997 suggest that some expansion of the range may have occurred since spring 1994.

Figure 21 illustrates the range contraction of yellowtail flounder from the northern areas using biomass data from the 1973 to 1998 Engel and Campelen survey series. From 1984-87 the proportion of the stock in the northern area, i.e. north of 45^0 was relatively constant, but starting in 1988 there was a downward trend to 1995 in the proportion of the biomass distributed northward. Since 1996, there is indication of a small increase in the northward distribution of the biomass.

Figures 23 and 24 show the standard number and weight of individual fishing sets using the Campelen trawl in the Canadian spring and fall surveys beginning in the fall of 1995. In all surveys, yellowtail are most abundant in the nursery area which covers the area in and around the Southeast Shoal in Div. 3N, straddling the Canadian 200 mile limit and extending into the Regulatory Area confirming earlier descriptions of distribution (see Walsh 1992). In the fall of 1997, average weights were higher in the Regulatory Area. With the exception of fall 1997 survey, yellowtail flounder appear more aggregated in the fall when compared to spring surveys. In the fall of 1997, more yellowtail appear to be distributed in the Regulatory Area than in most years.

Biological Studies

A) Growth and sex ratios

From 1990 onward, when yellowtail flounder were sampled for otoliths during the Canadian surveys individual weights of fish were also recorded. The mean lengths and weights at age from the spring and fall surveys in Div. 3LNO are shown in Figs. 24-25. There was a strong linear mean length at age relationship in both the spring and fall surveys. During 1990-1994 surveys a seasonal shift in growth is evident but absent in survey catches in 1995-1997. Growth rates in males and females are identical (Fig. 26: $r^2 = .99$). Average weight-at-age during the 1990-97 spring and fall period show very little change over time in ages 3 to 7, however, there appears to be an increasing trend in age 8. Age 9 is somewhat more variable which may be a function of low sample sizes. Fig. 26 shows that there is a linear relationship between average weight at age in both males and females ($r^2 = .99$) and females are heavier than males at age after age 6.

Theoretically, the sex ratio is expected to be 1:1, however, Figure 27 shows the sex ratio in the spring and fall surveys since 1984.have a higher preponderance of males to females in most years, in particular 1994-96 spring surveys. These differences may be due to spatial differences in distribution or differences in catchability. The significance of this finding will be explored at a later date.

B) Maturity at length and age (NAFO SCR Doc. 98/27)

Length at 50% maturity (L_{50}) was calculated for males and females separately from samples collected during the 1995-97 Spanish surveys. A decrease in 50% maturity was seen in females but not in males, however a longer time series is needed to see whether the results are true or random variability associated with only three years of data. Morgan and Walsh 1997 in an analysis of data from 1975-95, showed that age and length at 50 % maturity in males declined in recent years. A similar decline in age but not length was evident in females.

C) Food and Feeding (NAFO SCR Doc. 98/42)

Diel patterns in feeding intensity were examined from 1999 yellowtail flounder stomachs over a 24-hr. period. Peak fullness occurred at nightfall (2100-hour) indicating that yellowtail are daytime feeders. Day and night differences in feeding could be related to significant differences in catches rates whereby catches are lower during the day at a time these fish are presumably more active (see Walsh 1998).

D) SSB/R relationships

Figure 28A shows the trend in spring survey estimates of biomass of age 7+ yellowtail flounder (males and females combined) for the time period 1984-97. Age 7+ are considered to be fully matured fish. Between 1988 and 1995, the biomass was below the long-term average, but above it in recent years. Using Age 7+ biomass as a proxy for SSB, Figure 28B shows a plot against recruitment using abundance from combining estimates of ages 3 and 4. With some exceptions, there appears to be an increasing relationship between SSB and recruitment. With one exception, the highest recruitment occurred when the SSB was low. Note that SSB from 1994-97 have no estimate of recruitment due to the lag effect and are shown lying on the "X axis".

E) Total Mortality (Z-values)

Total mortality (Z values) were calculated from the Campelen equivalent trawl data from 1984-97. The Z's were obtained for ages 6 to 7, 7 to 8, and 8 to 9. Figure 29 shows the high total mortality levels commonly observed for this stock. There are no major trends in the data, although the Z's at ages 8 to 9 are higher in 1994-97 than in the rest of the period, consistent with the disappearance of 10-year-old fish from the survey. The negative values at the youngest age indicate that yellowtail were not fully recruited to the Engel gear until age 7. The high values of Z are related to the high natural mortality of this species as they reach the end of their lifespan at age 9 or 10. It is not possible to determine what contribution fishing mortality makes to the total Z estimates.

Assessment

Sequential population analysis (SPA) has been employed in the past to assess this stock but has not been used since 1984 as the basis of advice. Since then, it was concluded that the very high values of mortality at the older ages could not be fully explained and that the SPA models attempted were not appropriate. In 1990, the previously noted difficulties with the catch at age were raised, with the conclusion being that catch-at-age based models, such as SPA, were not suitable for this stock. Confidence in the catch and catch-at-age data for this stock remains at a low level, especially with the lack of sampling from fisheries in the Regulatory Area from 1992-95. Thus, evaluation of stock status continues to rely heavily on the interpretation of fishery-independent indices of abundance, i.e. research vessel surveys.

In the recent assessments, there were 5 indices used to evaluate this stock (Canadian spring and fall groundfish surveys, USSR/Russian groundfish surveys, Canadian juvenile groundfish surveys, and CPUE from the Canadian commercial fleet) and most indicated that the stock was still at a low level compared to historic values. In the current assessment, there are no new data for 3 of these indices (Russian surveys [discontinued], Canadian juvenile groundfish surveys [discontinued] and the Canadian CPUE series. New data are available on stock size in the Regulatory Area of Div. 3NO from the 1995-98 Spanish surveys which indicate that the stock biomass in 1996 and 1997 has stabilized at around 123, 000 tons but increase 3.5 times to around 425,000 t in 1998. New data on catch rate and distribution are also available from seasonal co-operative DFO/fishing industry surveys from 1996-98 which indicate that catch rates inside the the Canadian 200 mile limit of Divs. 3NO are high during spring, summer and fall but not in the winter surveys.

The decline in stock size in the mid- to late-1980's was caused by poor recruitment from the year-classes of the early 1980's as evident in the plot of cohort strength (Fig. 13) and a rapid increase in catches to about 30,000 t in 1985-86 from 10,000-15,000 t in 1980-83. The year-classes of 1984-86 were stronger than their immediate predecessors and likely were responsible for the increased catches from 1989 to 1991. Cohort strength declined during the late 80's early 90's coincidental with the increase in fishing mortality on juvenile yellowtail flounder in the Regulatory Area of Divs. 3NO (Walsh et al. 1995) The 1996 and 1997 levels of SSB (age 7+) from the 1984-95 Campelen spring time series have increase in size and are above the long term mean at around 100,000 t in the spring and fall series. The probability of obtaining good year classes is unpredictable given that the interpretation of a S/R relationship may be confounded by temporal trends in the data and high fishing mortality in juveniles in the late 1980's and early 1990's. Nevertheless, recruitment of the 1992-94 year-classes are expected to be moderate to good year-classes as a result large increase in biomass in recent years is not solely attributed to growth.

Given the continuing inadequacies with the catch and sampling data, and still-unresolved questions about the natural mortality at age for this stock, it remains impossible to estimate the level of fishing mortality in the recent years before the moratorium. However, available data suggests that there has likely been increased fishing mortality at ages 5 and younger in the late 1980's and early 1990's than in earlier years (Myers 1994). Also as shown here, for ages 7-8 the Z- values for the early 1990's are generally higher than in previous years consistent with very high levels of unregulated fishing effort.

Noteworthy is the small increases of catches in NAFO Div. 3L which may appear to be a gradual reversal in the range contraction as the stock continues to grow, consistent with the range contraction hypothesis (Brodie et al. 1998b). In the recent assessment of this stock *STACFIS* noted that contraction of the stock in recent years could strongly influence surveys catch rates and contributed to the high variances seen in recent surveys. However, there is evidence from surveys in 1996 -1998 to suggest some expansion of the stock range.

Summary

- *Canadian surveys* show the stock has been increasing since 1994 in both the spring and fall surveys. The average biomass of the 1997 spring and fall surveys puts the stock size at about 200,000t. The average of the 1997 spring and fall trawlable biomass of age 7+ is 106,400 t;

- *Spanish survey series:* Stock size in the Regulatory Area, Div. 3NO, for the 1996-98 period has shown an increasing trend. The large biomass estimate in 1998 appears to be due to increases in growth and recruitment and to some extent by yellowtail flounder aggregating in a small area;

- *Co-operative DFO/industry series*: Since they began in July 1996, there have been 7 seasonal surveys. High catch rates and a wide distribution were reported in the survey grid area that covers the traditional high areas of abundance mainly inside the Canadian 200 mile limit of Div. 3NO in the spring and summer surveys but very low in the winter survey. This seasonal difference may reflects changes in catchability, i.e. either trawl efficiency or availability. Noteworthy is that the spring-summer catch rates are higher that the Canadian commercial CPUE during the 1980's when the stock size was higher in the grid area,

- *SSB index*: SSB in recent years has increased and is above the long term mean

- *Biological parameters:* growth and maturity show no obvious signs of a population under stress,

- *Fishing Mortality:* Even though there has been no directed fishery for this species since 1995 and the by-catch has been low, total mortality levels on older ages are still high in the absence of a fishery. Although the Fishery Commission has set a pre-cautionary TAC of 4, 000 t for the 1998 fishery, this fishery does not begin till August. Of concern are the by-catch of juvenile yellowtail flounder inside and outside the Canadian 200-mile limit and the by-catch of cod and American plaice that are still under moratorium.

Conclusions: surveys in 1996-98 have shown the stock is more widely distributed than the early 1990's but not extensive as in earlier years. The age structure has remained stable in all of the surveys for which age data are available and many age classes are contributing to the biomass index in 1997 and there are reasonable good signs of incoming year-classes. The SSB has been at a higher level than in recent years relative to the 1980's. The mean weights at age have also remained stable. Based on 7 additional surveys since the 1997 assessment, the current view is that the stock size has increased since 1994.

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Table 1. Nominal catches by country and TACs (tons) of yellowtail in NAFO Divisions 3LNO.

Year	Canada	France	USSR/ Russia	South Korea	Other	Total	TAC
1960	7	-	-	-	-	7	
1961	100	-	-	-	-	100	
1962	67	-	-	-	-	67	
1963	138	-	380	-	-	518	
1964	126	-	21	-	-	147	
1965	3,075	-	55	-	-	3,130	
1966	4,185	-	2,834	-	7	7,026	
1967	2,122	-	6,736	-	20	8,878	
1968	4,180	14	9,146	-	-	13,340	
1969	10,494	1	5,207	-	6	15,708	
1970	22,814	17	3,426	-	169	26,426	
1971	24,206	49	13,087	-	-	37,342	
1972	26,939	358	11,929	-	33	39,259	
1973	28,492	368	3,545	-	410	32,815	50,000
1974	17,053	60	6,952	-	248	24,313	40,000
1975	18,458	15	4,076	-	345	22,894	35,000
1976	7,910	31	57	-	59	8,057	9,000
1977	11,295	245	97	-	1	11,638	12,000
1978	15,091	375	-	-	-	15,466	15,000
1979	18,116	202	-	-	33	18,351	18,000
1980	12,011	366	-	-	-	12,377	18,000
1981	14,122	558	-	-	-	14,680	21,000
1982	11,479	110	-	1,073	657	13,319	23,000
1983	9,085	165	-	1,223	-	10,473	19,000
1984	12,437	89	-	2,373	1,836	[b] 16,735	17,000
1985	13,440	-	-	4,278	11,245	[b] 28,963	15,000
1986	14,168	77	-	2,049	13,882	[b] 30,176	15,000
1987	13,420	51	-	125	2,718	16,314	15,000
1988	10,607	-	-	1,383	4,166b	[b] 16,158	15,000
1989	5,009	139	-	3,508	1,551	10,207	5,000
1990	4,966	-	-	5,903	3,117	13,986	5,000
1991	6,589	-	-	4,156	5,458	16,203	7,000
1992	6,814	-	-	3,825	123	10,762	7,000
1993	6,697	-	-	-	6,868	13,565	7,000
1994	-	-	-	-	2069	2069	7,000 [d]
1995	[c] 2	-	-	-	65	67	0
1996	[c] 55	-	-	-	232	287	0
1997	[c] 146	-	-	-	657	803	0

[a] see text for explanation of South Korean catches.
[b] includes catches estimated from Canadian surveillance reports.
[c] provisional.
[d] no directed fishery permitted.

Table 2. Breakdown of 1984-97 catches from Table 1 listed as "other."

Year	Spain	Portugal	Panamaa	USA	Cayman Isl	Misc.	Total
1984	25	-	1,800	-	-	11	1,836
1985	2,425	-	4,208	3,797	803	12	11,245
1986	366	5,521	4,044	2,221	1,728	2	13,882
1987	1,183	-	-	1,535	-	-	2,718
1988	3,205	-	-	863	-	100b [b]	4,163
1989	1,126	5	-	319	-	101b [b]	1,551
1990	119	11	-	6	-	2,981b [b]	3,117
1991	246	-	-	-	-	5,212b [b]	5,458
1992	122	1	-	-	-	-	123
1993	-	-	-	68	-	6,800 [a]	6,868
1994	719	-	-	700a [a]	-	650 [a]	2,069
1995	65	-	-	-	-	-	65
1996	232	-	-	-	-	-	232
1997	657	-	-	-	-	-	657

[a] Not reported to NAFO. Catches estimated from surveillance reports.

[b] Includes some estimated catches.

Table 3. Trawl design, rigging and geometry of Campelen 1800 shrimp trawl (Adopted from McCallum and Walsh 1996)

Parameter	Campelen 1800 shrimp trawl
Riggings	
Doors	4.3m/1400kg
Sweeps (m)	6.1
Bridles (m)	40
Bouyancy (kg)	226.5
Headline (m)	29.5
Fishing line (m)	19.5
Footgear	
Length (m)	35.6
Material	102 rubber disks (rockhopper)
Weight Air (kg)	501.3
Size (dia./cm)	35
Mesh size (mm)	
Wings/square	80/60
bellies	60/44
Codend	44
Liner	12.7
Material	Polyethylene
Geometry	
Doorspread (m)	45 to 55
Wing spread (m_	15 to 17
Opening (m)	4 to 5
Towing speed (knots)	3.0k
Abundance Model	
Tow duration (min)	15
Tow distance (nm)	0.8
Average wingspread (m)	18.23
Swept area (m2)	0.00727

Table 4. Mean Number of yellowtail by stratum, Div 3L - Spring

Depth Range (m)	Stratum	No. of trawlable Units	1984 *AN 28*	1985 *WT 28-30*	1986 *WT 48*	1987 *WT 58-60*	1988 *WT 70,71*	1989 *WT 82,83*	1990 *WT 96*	1991 *WT 106,107*	1992 *WT 120-122*	1993 *WT 137,138*	1994 *WT 152-154*	1995 *WT 169,170*	1996 *WT 189-191*	1997 *WT 205-208*
57-92	350	284,889.0	3.2	7.4	4.4	1.3	2.8	1.4	0.3	1.5	0.1	0.0	0.1	0.0	1.6	0.0
	363	244,858.7	45.6	27.6	14.5	13.1	9.9	3.4	7.6	1.3	0.2	0.0	0.0	0.0	4.4	1.0
	371	154,206.0		0.7	0.7	0.0	0.8	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.4	0.0
	372	338,400.3	96.6	117.1	62.0	24.4	13.9	19.5	8.0	4.0	0.6	0.7	0.1	0.0	2.5	2.4
	384	154,068.4		7.7	2.5	1.9	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
93-183	328	208,955.3	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.2
	341	216,521.2	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6		0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5		0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	349	290,804.1	0.2	0.1	2.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
	364	387,509.6	1.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	365	143,201.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	390	203,728.0		0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184-274	344	205,516.3		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	369	132,196.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	386	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	389	112,937.7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275-366	345	196,987.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	346	118,990.3		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	368	45,945.4		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	387	98,768.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	388	49,659.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	392	19,946.4		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367-549	729	25,586.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	731	29,713.2		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	733	64,378.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	735	37,416.6		0.0							0.0	0.0	0.0	0.0	0.0	0.0
550-731	730	23,385.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	732	31,776.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	734	31,363.9		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	736	24,073.2		0.0							0.0	0.0	0.0	0.0	0.0	0.0
732-914	737	31,226.4											0.0			
	741	30,676.1											0.0			
	745	47,871.3											0.0			
	748	21,872.2											0.0			
Mean No. (sets)			**22.1(37)**	**9.4(221)**	**5.3(211)**	**2.4(181)**	**1.6(154)**	**1.6(205)**	**0.93(156)**	**0.45(143)**	**0.05(178)**	**0.05(181)**	**0.02(160)**	**0(151)**	**0.5(188)**	**0.2(158)**
Upper			**39.3**	**14.6**	**7.8**	**3.6**	**2.4**	**2.6**	**1.6**	**0.7**	**0.1**	**0.1**	**0.0**	**0.0**	**0.7**	**0.4**
Lower			**5.0**	**4.2**	**2.8**	**1.2**	**0.9**	**0.5**	**0.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.1**

Table 5. Mean Number of yellowtail by stratum, Div 3N - Spring

Depth	Stratum	No. of	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Range		trawlable	*AN 27*	*AN 43*	*WT 47*	*WT 58,59*	*WT 70*	*WT 82*	*WT 95,96*	*WT 106*	*WT 119,120*	*WT 136,137*	*WT 152,153*	*WT 168,169*	*WT 189*	*WT 205,206*
(m)		Units		*WT 29*												
<=56	375	219,134.8	373.6	165.6	409.6	208.3	118.5	82.3	259.5	21.5	340.3	135.7	29.0	139.7	603.3	487.2
	376	206,204.1	91.5	220.3	162.3	719.6	125.7	977.0	521.3	764.1	183.7	35.0	2.3	10.8	67.8	1,029.8
57-92	360	411,582.8	289.7	155.3	32.3	33.0	7.0	480.3	91.7	50.1	140.2	41.9	6.8	133.2	364.7	126.2
	361	254,900.7	338.6	171.0	101.4	130.1	166.6	142.3	293.3	242.9	63.6	237.9	451.0	276.7	453.6	427.2
	362	346,653.9	227.1	74.4	159.9	103.3	73.3	50.9	79.4	53.7	7.5	86.8	2.3	0.6	*169.3*	*210.5*
	373	346,653.9	122.0	*58.1*	*28.2*	38.7	34.6	20.8	2.5	13.4	0.1	0.1	3.0	0.0	7.8	1.9
	374	128,069.4	59.7	38.5	14.8	7.6	4.2	0.2	1.8	0.4	1.0	0.0	0.0	3.3	15.3	10.7
	383	92,716.2	3.7	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93-183	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
	377	13,756.1	0.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	*0.0*	*0.0*	0.0	0.0	0.0
	382	*89,002.0*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184-274	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	381	25,036.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275-366	357	22,560.0	0.0	0.0	0.0		0.0	0.0	*0.0*	*0.0*	*0.0*	0.0	0.0	0.0	0.0	0.0
	379	14,581.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	380	15,957.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367-549	723	21,322.0								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	725	14,443.9								0.0		0.0	0.0	0.0	0.0	0.0
	727	22,009.8								0.0	0.0	0.0	0.0	0.0	0.0	0.0
550-731	724	17,057.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	726	9,904.4								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	728	21,459.5								0.0	0.0	0.0	0.0	0.0	0.0	
732-914	752	18,433.2											0.0			
	756	14,581.5											0.0			
	760	21,184.4											0.0			
Mean No. (sets)			189.7(61)	104.6(85)	100.0(101)	128.1(91)	58.9(77)	208.4(94)	133.1(85)	111.7(93)	79.3(94)	60.4(85)	51.5(76)	66.1(89)	198.0(82)	233.2(71)
Upper			251.2	135.1	141.7	202.3	86.3	335.7	206.4	165.4	127.0	103.6	89.1	101.0	*254.8*	*349.9*
Lower			128.2	74.1	58.3	53.9	31.6	81.2	59.9	57.9	31.6	17.1	13.8	31.3	141.1	116.5

Table 6. Mean Number of yellowtail by stratum, Div 30 - Spring

Depth	Stratum	No. of	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Range		trawlable	*AN 27*	*AN 43*	*WT 47*	*WT 58*	*WT 70*	*WT 82*	*WT 94,95*	*WT 105*	*WT 119,120*	*WT 136*	*WT 152*	*WT 168*	*WT 188,189*	*WT 204,205*
(m)		Units														
57-92	330	287,365.1	1.0	14.8	5.0	1.5	1.1	2.0	1.2	9.2	0.0	0.1	0.0	0.0	1.8	0.6
	331	62,727.9	50.0	62.3	5.3	26.5	9.0	25.0		1.0	0.0	2.0	5.5	0.5	1.5	5.3
	338	261,090.9	30.0	22.2	10.6	4.1	48.9	13.2	11.3	17.1	18.0	13.0	5.0	10.0	66.0	68.1
	351	346,653.9	80.0	85.6	80.7	39.5	75.2	43.5	52.4	24.5	7.2	5.8	0.3	0.8	28.5	65.3
	352	354,907.6	63.7	55.6	73.0	103.4	47.2	50.7	77.9	78.4	50.8	226.1	55.6	36.0	312.6	177.4
	353	17.6353.31	2.0	98.5	32.1	148.5	3.0	9.6	20.7	26.7	10.0	66.5	1.8	70.2	122.2	175.0
93-183	329	236,742.6	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0	0.2	0.0	0.0	0.0	0.0
	332	144,026.5	0.0	0.6	14.2	9.2	0.3	30.4	1.8	1.3	1.0	13.3	0.3	1.5	6.5	1.3
	337	130,407.9	0.0	0.0	1.0	1.2	2.3	2.8	0.0	0.0	1.0	7.0	0.3	0.5	3.0	15.9
	339	80,473.2	1.0	0.3	0.3	0.3	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	354	65,204.0	0.0	1.0	0.0	0.0	0.0	0.5	0.0	3.0	0.0	0.0	0.0	0.7	2.0	0.5
184-274	355	14,168.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.0
	333	20,771.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	336	16,644.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	4.9
275-366	334	12,655.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	1.5	0.0	0.0
	335	7,978.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	6.3
	356	8,391.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
367-549	717	12,793.2								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	719	10,454.6								0.0	0.0	0.0	0.0	0.0	0.8	3.5
	721	10,454.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
550-731	718	15,269.3								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	720	14,443.9								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	722	12,793.2								0.0	0.0	0.0	0.0	6.5	0.0	4.9
732-914	764	14,443.9											0.0			
	772	18,570.8											0.0			
Mean No. (sets)			**27.9(52)**	**36.3(84)**	**29.8(95)**	**36.5(91)**	**25.7(77)**	**20.3(92)**	**24.5(84)**	**21.1(107)**	**11.8(86)**	**43.6(75)**	**9.3(76)**	**12.3(80)**	**69.8(80)**	**59.3(75)**
Upper			**45.8**	**49.6**	**41.8**	**53.5**	**37.2**	**28.1**	**38.4**	**32.6**	**17.2**	**88.5**	**19.0**	**21.2**	**96.2**	**97.3**
Lower			**9.9**	**23.1**	**17.7**	**19.5**	**14.3**	**12.5**	**10.7**	**9.7**	**6.5**	**-1.3**	**-0.4**	**3.4**	**43.4**	**21.3**

Table 7 Mean Weight of yellowtail by stratum, Div 3L - Spring

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 28	1985 WT 28-30	1986 WT 48	1987 WT 58-60	1988 WT 70,71	1989 WT 82,83	1990 WT 96	1991 WT 106,107	1992 WT 120-122	1993 WT 137,138	1994 WT 152-154	1995 WT 169,170	1996 WT 189-191	1997 WT 205-208
57-92	350	284,889.0	1.4	3.5	2.0	0.6	1.4	0.6	0.2	0.7	0.1	0.0	0.1	0.0	0.7	0.0
	363	244,858.7	22.2	12.6	6.9	6.3	4.5	1.6	3.4	0.6	0.1	0.0	0.0	0.0	2.2	0.5
	371	154,206.0		0.4	0.3	0.0	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
	372	338,400.3	46.5	48.2	28.7	11.2	6.2	9.9	4.0	2.0	0.3	0.4	0.1	0.0	1.1	0.7
	384	154,068.4		3.7	1.5	1.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
93-183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1
	341	216,521.2	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6		0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5		0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	349	290,804.1	0.1	0.0	1.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	364	387,509.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	365	143,201.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	390	203,728.0		0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184-274	344	205,516.3		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	369	132,196.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	386	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	389	112,937.7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275-366	345	196,987.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	346	118,990.3		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	368	45,945.4		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	387	98,768.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	388	49,659.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	392	19,946.4		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367-549	729	25,586.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	731	29,713.2		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	733	64,378.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	735	37,416.6		0.0							0.0	0.0	0.0	0.0	0.0	0.0
550-731	730	23,385.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	732	31,776.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	734	31,363.9		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	736	24,073.2		0.0							0.0	0.0	0.0	0.0	0.0	0.0
732-914	737	31,226.4											0.0			
	741	30,676.1											0.0			
	745	47,871.3											0.0			
	748	21,872.2											0.0			
Mean Wt (sets)			10.7(37)	4.0(221)	2.5(211)	1.1(181)	0.7(154)	0.8(205)	0.44(156)	0.22(143)	.03(178)	.02(181)	0.01(160)	0(151)	0.2(188)	0.1(158)
Upper			19.0	6.0	3.6	1.7	1.1	1.3	0.8	0.4	0.1	0.1	0.0	0.0	0.3	0.1
Lower			2.3	1.9	1.4	6.0	4.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0

Table 8 Mean Weight of yellowtail by stratum, Div 3N - Spring

Depth	Stratum	No. of	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Range		trawlable	*AN 27*	*AN 43*	*WT 47*	*WT 58,59*	*WT 70*	*WT 82*	*WT 95,96*	*WT 106*	*WT 119,120*	*WT 136,137*	*WT 152,153*	*WT 168,169*	*WT 189*	*WT 205,206*
(m)		Units		*WT 29*												
<=56	375	219,134.8	150.0	78.2	181.6	103.8	50.6	21.2	84.3	11.7	118.4	49.5	12.1	59.7	78.7	87.5
	376	206,204.1	30.0	66.8	66.8	78.7	12.6	121.7	70.9	143.7	22.4	5.1	0.6	2.8	5.4	123.6
57-92	360	411,582.8	106.6	46.3	11.2	7.4	2.5	61.0	12.2	12.1	25.3	8.8	2.5	39.6	68.1	39.1
	361	254,900.7	126.7	59.9	38.3	58.1	70.2	43.5	105.0	82.3	29.6	82.5	163.9	108.5	106.1	102.5
	362	346,653.9	86.8	32.1	61.2	40.3	35.1	24.6	30.3	24.4	2.9	40.9	1.3	0.3	83.5	97.1
	373	346,653.9	52.9	26.4	13.9	17.8	18.2	11.1	0.9	7.1	0.0	0.0	0.9	0.0	1.9	1.0
	374	128,069.4	30.1	21.1	8.9	4.3	2.3	0.1	0.6	0.2	0.6	0.0	0.0	1.1	7.1	3.0
	383	92,716.2	2.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93-183	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
	377	13,756.1	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184-274	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	381	25,036.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275-366	357	22,560.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	379	14,581.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	380	15,957.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367-549	723	21,322.0								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	725	14,443.9								0.0		0.0	0.0	0.0	0.0	0.0
	727	22,009.8								0.0	0.0	0.0	0.0	0.0	0.0	0.0
550-731	724	17,057.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	726	9,904.4								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	728	21,459.5								0.0	0.0	0.0	0.0	0.0	0.0	
732-914	752	18,433.2											0.0			
	756	14,581.5											0.0			
	760	21,184.4											0.0			
Mean Wt (sets)			**73.1(61)**	**38.4(85)**	**41.5(101)**	**34.1(91)**	**22.4(77)**	**34.1(94)**	**33.0(85)**	**28.8(93)**	**20.8(94)**	**21.1(85)**	**18.9(76)**	**24.1(89)**	**43.3(82)**	**51.0(71)**
Upper			**97.3**	**48.7**	**58.9**	**47.8**	**31.1**	**50.3**	**47.1**	**39.7**	**33.2**	**36.0**	**33.2**	**36.3**	**54.0**	**72.2**
Lower			**48.9**	**28.1**	**24.0**	**20.5**	**13.7**	**18.0**	**18.9**	**17.9**	**8.4**	**6.2**	**4.6**	**11.9**	**32.6**	**29.8**

Table 9. Mean Weight of yellowtail by stratum, Div 30 - Spring

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 27	1985 AN 43	1986 WT 47	1987 WT 58	1988 WT 70	1989 WT 82	1990 WT 94,95	1991 WT 105	1992 WT 119,120	1993 WT 136	1994 WT 152	1995 WT 168	1996 WT 188,189	1997 WT 204,205
57-92	330	287,365.1	0.6	6.7	2.6	0.7	0.6	1.1	0.7	4.0	0.0	0.1	0.0	0.0	0.9	0.2
	331	62,727.9	21.7	29.5	2.8	13.2	4.6	14.8		0.6	0.0	1.4	2.8	0.2	0.5	1.6
	338	261,090.9	12.7	10.6	5.4	1.9	19.6	6.4	5.6	4.1	8.1	5.3	2.7	4.9	30.8	24.8
	351	346,653.9	35.8	37.5	33.8	17.3	32.4	20.0	24.2	11.6	3.2	2.4	0.1	0.3	13.6	26.6
	352	354,907.6	28.1	24.5	30.0	42.9	21.3	22.7	31.5	38.3	19.9	93.0	22.7	15.4	129.7	72.0
	353	17.6353.31	1.1	43.2	15.9	75.7	1.6	4.9	9.9	13.0	4.6	29.8	1.1	31.8	60.5	56.3
93-183	329	236,742.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0
	332	144,026.5	0.0	0.3	7.7	5.0	0.1	11.9	0.8	0.7	0.5	6.2	0.2	0.9	3.5	0.5
	337	130,407.9	0.0	0.0	0.6	0.6	1.0	1.7	0.0	0.0	0.4	4.4	0.2	0.2	2.0	6.4
	339	80,473.2	0.6	0.2	0.1	0.2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	354	65,204.0	0.0	0.6	0.0	0.0	0.0	0.1	0.0	1.6	0.0	0.0	0.0	0.3	0.9	0.4
184-274	355	14,168.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0
	333	20,771.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	336	16,644.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	2.6
275-366	334	12,655.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.9	0.0	0.0
	335	7,978.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	3.1
	356	8,391.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
367-549	717	12,793.2								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	719	10,454.6								0.0	0.0	0.0	0.0	0.0	0.5	2.0
	721	10,454.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
550-731	718	15,269.3								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	720	14,443.9								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	722	12,793.2								0.0	0.0	0.0	0.0	3.9	0.0	2.3
732-914	764	14,443.9											0.0			
	772	18,570.8											0.0			
Mean Wt (sets)			**12.4(52)**	**16.1(84)**	**12.9(95)**	**16.6(91)**	**11.1(77)**	**9.3(92)**	**10.7(84)**	**9.8(107)**	**4.9(86)**	**18.3(75)**	**3.9(76)**	**5.5(80)**	**30.5(80)**	**22.6(75)**
Upper			**20.2**	**22.0**	**17.7**	**24.4**	**15.8**	**12.4**	**16.5**	**15.5**	**7.2**	**36.5**	**7.7**	**9.6**	**41.6**	**35.5**
Lower			**4.6**	**10.3**	**8.0**	**8.8**	**6.5**	**6.2**	**4.9**	**4.2**	**2.5**	**0.0**	**0.2**	**1.4**	**19.4**	**9.8**

Table 10 Biomass estimates ('000t) of yellowtail by stratum, Div 3L - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 *AN 28*	1985 *WT 28-30*	1986 *WT 48*	1987 *WT 58-60*	1988 *WT 70,71*	1989 *WT 82,83*	1990 *WT 96*	1991 *WT 106,107*	1992 *WT 120-122*	1993 *WT 137,138*	1994 *WT 152-154*	1995 *WT 169,170*	1996 *WT 189-191*	1997 *WT 205-208*
57-92	350	284,889.0	0.4	1.0	0.6	0.2	0.4	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0
	363	244,858.7	5.4	3.1	1.7	1.6	1.1	0.4	0.8	0.1	0.0	0.0	0.0	0.0	0.5	0.1
	371	154,206.0		0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	372	338,400.3	15.7	16.3	9.7	3.8	2.1	3.4	1.3	0.7	0.1	0.1	0.0	0.0	0.4	0.2
	384	154,068.4		0.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
TOTAL			21.6	21.0	12.3	5.7	3.7	4.0	2.2	1.0	0.2	0.1	0.0	0.0	1.1	0.4
93-183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	349	290,804.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	364	387,509.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	365	143,201.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	390	203,728.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.3	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184-274	344	205,516.3		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	369	132,196.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	386	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	389	112,937.7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275-366	345	196,987.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	346	118,990.3		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	368	45,945.4		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	387	98,768.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	388	49,659.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	392	19,946.4		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367-549	729	25,586.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	731	29,713.2		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	733	64,378.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	735	37,416.6		0.0							0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0

cont'd

Table 10 Biomass estimates ('000t) of yellowtail by stratum, Div 3L - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 28	1985 WT 28-30	1986 WT 48	1987 WT 58-60	1988 WT 70,71	1989 WT 82,83	1990 WT 96	1991 WT 106,107	1992 WT 120-122	1993 WT 137,138	1994 WT 152-154	1995 WT 169,170	1996 WT 189-191	1997 WT 205-208
550-731	730	23,385.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	732	31,776.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	734	31,363.9		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	736	24,073.2		0.0							0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				1,985.0						1,991.0	1,992.0	1,993.0	1,994.0	1,995.0	1,996.0	1,997.0
732-914	737	31,226.4											0.0			
	741	30,676.1											0.0			
	745	47,871.3											0.0			
	748	21,872.2											0.0			
TOTAL													0.0			
Biomass ('000t)			21.9	21.1	12.6	5.8	3.7	4.0	2.2	1.1	0.2	0.1	0.0	0.0	1.1	0.5
Upper			38.9	32.0	18.3	8.5	5.4	6.8	4.0	1.8	0.4	0.3	0.1	0.0	1.7	0.8
Lower			4.8	10.2	6.8	3.1	2.1	1.2	0.5	0.4	-0.1	-0.1	0.0	0.0	0.5	0.1

Table 11 Biomass estimates ('000t) of yellowtail by stratum, Div 3N - Spring (1984-1997)

Depth Range	Stratum	No. of trawlable Units	1984 AN 27	1985 AN 43 WT 29	1986 WT 47	1987 WT 58,59	1988 WT 70	1989 WT 82	1990 WT 95,96	1991 WT 106	1992 WT 119,120	1993 WT 136,137	1994 WT 152,153	1995 WT 168,169	1996 WT 189	1997 WT 205,206
(m)																
<=56	375	219,134.8	32.9	17.1	39.8	22.8	11.1	4.6	18.5	2.6	25.9	10.8	2.7	13.1	17.3	19.2
	376	206,204.1	6.2	13.8	13.8	16.2	2.6	25.1	14.6	29.6	4.6	1.1	0.1	0.6	1.1	25.5
TOTAL			39.1	30.9	53.6	39.0	13.7	29.7	33.1	32.2	30.6	11.9	2.8	13.7	18.4	44.7
57-92	360	411,582.8	43.9	19.0	4.6	3.1	1.0	25.1	5.0	5.0	10.4	3.6	1.0	16.3	28.0	16.1
	361	254,900.7	32.3	15.3	9.8	14.8	17.9	11.1	26.8	21.0	7.5	21.0	41.8	27.7	27.1	26.1
	362	346,653.9	30.1	11.1	21.2	14.0	12.2	8.5	10.5	8.5	1.0	14.2	0.5	0.1	28.9	33.7
	373	346,653.9	18.3	9.1	4.8	6.2	6.3	3.8	0.3	2.5	0.0	0.0	0.3	0.0	0.6	0.3
	374	128,069.4	3.9	2.7	1.1	0.6	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.9	0.4
	383	92,716.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			128.6	57.3	41.6	38.6	37.7	48.6	42.6	36.9	19.1	38.8	43.6	44.2	85.6	76.6
93-183	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	377	13,756.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184-274	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	381	25,036.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275-366	357	22,560.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	379	14,581.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	380	15,957.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367-549	723	21,322.0								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	725	14,443.9								0.0		0.0	0.0	0.0	0.0	0.0
	727	22,009.8								0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL										0.0	0.0	0.0	0.0	0.0	0.0	0.0
550-731	724	17,057.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	726	9,904.4								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	728	21,459.5								0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL										0.0	0.0	0.0	0.0	0.0	0.0	0.0
732-914	752	18,433.2											0.0			
	756	14,581.5											0.0			
	760	21,184.4											0.0			
TOTAL													0.0			
Biomass ('000t)			167.7	88.2	95.1	77.5	51.4	78.3	75.7	69.1	49.6	50.8	46.3	57.9	103.9	121.3
Upper			223.2	111.9	135.2	108.5	71.4	115.4	108.1	95.3	79.1	86.5	81.5	87.2	129.7	171.7
Lower			112.1	64.5	55.1	46.6	31.4	41.2	43.3	42.9	20.1	15.0	11.2	28.6	78.2	70.9

Table 12 Biomass estimates ('000t) of yellowtail by stratum, Div 30 - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 *AN 27*	1985 *AN 43*	1986 *WT 47*	1987 *WT 58*	1988 *WT 70*	1989 *WT 82*	1990 *WT 94,95*	1991 *WT 105*	1992 *WT 119,120*	1993 *WT 136*	1994 *WT 152*	1995 *WT 168*	1996 *WT 188,189*	1997 *WT 204,205*
57-92	330	287,365.1	0.2	1.9	0.7	0.2	0.2	0.3	0.2	1.1	0.0	0.0	0.0	0.0	0.3	0.1
	331	62,727.9	1.4	1.9	0.2	0.8	0.3	0.9	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1
	338	261,090.9	3.3	2.8	1.4	0.5	5.1	1.7	1.4	1.3	2.1	1.4	0.7	1.3	8.0	6.5
	351	346,653.9	12.4	13.0	11.7	6.0	11.2	6.9	8.4	4.0	1.1	0.8	0.0	0.1	4.7	9.2
	352	354,907.6	10.0	8.7	10.7	15.2	7.5	8.0	11.2	13.6	7.1	33.0	8.1	5.5	46.0	25.6
	353	17.6353.31	0.2	7.6	2.8	13.4	0.3	0.9	1.7	2.3	0.8	5.3	0.2	5.6	10.7	9.9
TOTAL			**27.4**	**35.8**	**27.5**	**36.1**	**24.6**	**18.8**	**23.0**	**22.4**	**11.1**	**40.6**	**9.2**	**12.5**	**69.7**	**51.3**
93-183	329	236,742.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	332	144,026.5	0.0	0.0	1.1	0.7	0.0	1.7	0.1	0.1	0.1	0.9	0.0	0.1	0.5	0.1
	337	130,407.9	0.0	0.0	0.1	0.1	0.1	0.2	0.0	0.0	0.1	0.6	0.0	0.0	0.3	0.8
	339	80,473.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	354	65,204.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
TOTAL			**0.1**	**0.1**	**1.2**	**0.8**	**0.1**	**1.9**	**0.2**	**0.3**	**0.1**	**1.5**	**0.0**	**0.2**	**0.8**	**0.9**
184-274	355	14,168.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	333	20,771.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	336	16,644.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
275-366	334	12,655.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	335	7,978.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	356	8,391.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
367-549	717	12,793.2								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	719	10,454.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	721	10,454.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL										**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
550-731	718	15,269.3								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	720	14,443.9								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	722	12,793.2								0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL										**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
732-914	764	14,443.9											0.0			
	772	18,570.8											0.0			
TOTAL													**0.0**			
Biomass ('000t)			**27.6**	**36.0**	**28.7**	**36.9**	**24.8**	**20.7**	**23.1**	**22.7**	**11.2**	**42.0**	**9.2**	**12.7**	**70.6**	**52.4**
Upper			**44.9**	**49.0**	**39.5**	**54.4**	**35.1**	**27.7**	**35.6**	**35.7**	**16.6**	**84.1**	**18.0**	**22.2**	**96.2**	**82.1**
Lower			**10.1**	**22.9**	**17.9**	**19.5**	**14.4**	**13.7**	**10.6**	**9.7**	**5.8**	**0.0**	**0.5**	**3.3**	**44.3**	**22.7**

Table 13. Biomass estimates ('000t) of yellowtail by stratum, Div 3LN0 - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 27,28	1985 AN 43 WT 28-30	1986 WT 47,48	1987 WT 58-60	1988 WT 70,71	1989 WT 82-83	1990 WT 94-96	1991 WT 105-107	1992 WT 119-122	1993 WT 136-138	1994 WT 152-154	1995 WT 168-170	1996 WT 188-191	1997 WT 204-208
<=56	375	219,134.8	32.9	17.1	39.8	22.8	11.1	4.6	18.5	2.6	25.9	10.8	2.7	13.1	17.3	19.2
	376	206,204.1	6.2	13.8	13.8	16.2	2.6	25.1	14.6	29.6	4.6	1.1	0.1	0.6	1.1	25.5
TOTAL			39.1	30.9	53.6	39.0	13.7	29.7	33.1	32.2	30.6	11.9	2.8	13.7	18.4	44.7
57-92	330	287,365.1	0.2	1.9	0.7	0.2	0.2	0.3	0.2	1.1	0.0	0.0	0.0	0.0	0.3	0.1
	331	62,727.9	1.4	1.9	0.2	0.8	0.3	0.9	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1
	338	261,090.9	3.3	2.8	1.4	0.5	5.1	1.7	1.4	1.3	2.1	1.4	0.7	1.3	8.0	6.5
	350	284,889.0	0.4	1.0	0.6	0.2	0.4	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0
	351	346,653.9	12.4	13.0	11.7	6.0	11.2	6.9	8.4	4.0	1.1	0.8	0.0	0.1	4.7	9.2
	352	354,907.6	10.0	8.7	10.7	15.2	7.5	8.0	11.2	13.6	7.1	33.0	8.1	5.5	46.0	25.6
	353	17.6353.31	0.2	7.6	2.8	13.4	0.3	0.9	1.7	2.3	0.8	5.3	0.2	5.6	10.7	9.9
	360	411,582.8	43.9	19.0	4.6	3.1	1.0	25.1	5.0	5.0	10.4	3.6	1.0	16.3	28.0	16.1
	361	254,900.7	32.3	15.3	9.8	14.8	17.9	11.1	26.8	21.0	7.5	21.0	41.8	27.7	27.1	26.1
	362	346,653.9	30.1	111.4	21.2	14.0	12.2	8.5	10.5	8.5	1.0	14.2	0.5	0.1	28.9	33.7
	363	244,858.7	5.4	3.1	1.7	1.6	1.1	0.4	0.8	0.1	0.0	0.0	0.0	0.0	0.5	0.1
	371	154,206.0		0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	372	338,400.3	15.7	16.3	9.7	3.8	2.1	3.4	1.3	0.7	0.1	0.1	0.0	0.0	0.4	0.2
	373	346,653.9	18.3	9.1	4.8	6.2	6.3	3.8	0.3	2.5	0.0	0.0	0.3	0.0	0.6	0.3
	374	128,069.4	3.9	2.7	1.1	0.6	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.9	0.4
	383	92,716.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	384	154,068.4		0.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
TOTAL			177.6	214.4	81.4	80.4	66.0	71.3	67.8	60.3	30.3	79.5	52.8	56.7	156.4	128.4
93-183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	329	236,742.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	332	144,026.5	0.0	0.0	1.1	0.7	0.0	1.7	0.1	0.1	0.1	0.9	0.0	0.1	0.5	0.1
	337	130,407.9	0.0	0.0	0.1	0.1	0.1	0.2	0.0	0.0	0.1	0.6	0.0	0.0	0.3	0.8
	339	80,473.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	349	290,804.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	354	65,204.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	364	387,509.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	365	143,201.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	377	13,756.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	390	203,728.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.3	0.2	1.5	0.9	0.2	2.0	0.2	0.3	0.1	1.5	0.1	0.2	0.9	0.9

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Table 13. Biomass estimates ('000t) of yellowtail by stratum, Div 3LN0 - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 27,28	1985 AN 43 WT 28-30	1986 WT 47,48	1987 WT 58-60	1988 WT 70,71	1989 WT 82-83	1990 WT 94-96	1991 WT 105-107	1992 WT 119-122	1993 WT 136-138	1994 WT 152-154	1995 WT 168-170	1996 WT 188-191	1997 WT 204-208
184-274	333	20,771.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	336	16,644.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	344	205,516.3		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	355	14,168.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	381	25,036.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	386	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184-274	389	112,937.7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			3,968.0	3,970.0	3,972.0	3,974.0	3,976.0	3,978.0	3,980.0	3,982.0	3,984.0	3,986.0	3,988.0	3,990.0	3,992.0	3,994.0
275-366	334	12,655.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	335	7,978.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	345	196,987.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	346	118,990.3		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	356	8,391.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	357	22,560.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	368	45,945.4		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	379	14,581.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	380	15,957.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	387	98,768.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	388	49,659.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	392	19,946.4		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367-549	717	12,793.2								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	719	10,454.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	721	10,454.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	723	21,322.0								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	725	14,443.9								0.0		0.0	0.0	0.0	0.0	0.0
	727	22,009.8								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	729	25,586.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	731	29,713.2		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	733	64,378.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	735	37,416.8		0.0							0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Table 13 Biomass estimates ('000t) of yellowtail by stratum, Div 3LN0 - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 *AN 27,28*	1985 *AN 43 WT 28-30*	1986 *WT 47,48*	1987 *WT 58-60*	1988 *WT 70,71*	1989 *WT 82-83*	1990 *WT 94-96*	1991 *WT 105-107*	1992 *WT 119-122*	1993 *WT 136-138*	1994 *WT 152-154*	1995 *WT 168-170*	1996 *WT 188-191*	1997 *WT 204-208*
550-731	718	15,269.3								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	720	14,443.9								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	722	12,793.2								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	724	17,057.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	726	9,904.4								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	728	21,459.5								0.0	0.0	0.0	0.0	0.0	0.0	
	730	23,385.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	732	31,776.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	734	31,363.9		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	736	24,073.2		0.0							0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				**0.0**						**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
732-914	737	31,226.4											0.0			
	741	30,876.1											0.0			
	745	47,871.3											0.0			
	748	21,872.2											0.0			
	752	18,433.2											0.0			
	756	14,581.5											0.0			
	760	21,184.4											0.0			
	764	14,443.9											0.0			
	772	18,570.8											0.0			
TOTAL													**1,994.0**			
Biomass ('000t)			**217.0**	**145.2**	**136.4**	**120.3**	**79.9**	**103.0**	**101.1**	**92.8**	**61.0**	**92.9**	**55.6**	**70.6**	**175.6**	**174.1**
Upper			**275.5**	**173.6**	**177.8**	**155.0**	**101.9**	**140.7**	**135.4**	**121.2**	**91.1**	**143.4**	**92.2**	**100.9**	**210.8**	**230.5**
Lower			**158.6**	**116.8**	**95.0**	**85.5**	**57.9**	**65.4**	**66.8**	**64.4**	**30.9**	**42.5**	**19.0**	**40.3**	**140.4**	**117.8**

Table 14 Abundance (millions) of yellowtail by stratum, Div 3L - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 28	1985 WT 28-30	1986 WT 48	1987 WT 58-60	1988 WT 70,71	1989 WT 82,83	1990 WT 96	1991 WT 106,107	1992 WT 120-122	1993 WT 137,136	1994 WT 152-154	1995 WT 169,170	1996 WT 189-191	1997 WT 205-208
57-92	350	284,889.0	0.9	2.1	1.2	0.4	0.8	0.4	0.1	0.4	0.0	0.0	0.0	0.0	0.4	0.0
	363	244,858.7	11.2	6.8	3.6	3.2	2.4	0.8	1.9	0.3	0.1	0.0	0.0	0.0	1.1	0.2
	371	154,206.0		0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
	372	338,400.3	32.7	39.6	21.0	8.3	4.7	6.6	2.7	1.4	0.2	0.2	0.0	0.0	0.8	0.8
	384	154,068.4		1.2	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
TOTAL			**44.8**	**49.8**	**26.3**	**12.1**	**8.1**	**7.9**	**4.6**	**2.2**	**0.3**	**0.2**	**0.1**	**0.0**	**2.4**	**1.2**
93-183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	349	290,804.1	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	364	387,509.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	365	143,201.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	390	203,728.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.7**	**0.1**	**0.7**	**0.2**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**
184-274	344	205,516.3		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	369	132,196.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	386	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	389	112,937.7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
275-366	345	196,987.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	346	118,990.3		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	368	45,945.4		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	387	98,768.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	388	49,659.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	392	19,946.4		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
367-549	729	25,586.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	731	29,713.2		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	733	64,378.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	735	37,416.6		0.0							0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				**0.0**						**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
550-731	730	23,385.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	732	31,776.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	734	31,363.9		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	736	24,073.2		0.0							0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				**0.0**						**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
732-914	737	31,226.4											0.0			
	741	30,676.1											0.0			
	745	47,871.3											0.0			
	748	21,872.2											0.0			
TOTAL													**0.0**			
Abundance (millions)			45.4	49.9	26.9	12.3	8.1	7.9	4.7	2.2	0.3	0.2	0.1	0.0	2.5	1.2
Upper			80.7	77.5	39.7	18.4	11.9	13.2	8.3	3.6	0.7	0.7	0.3	0.0	3.8	2.8
Lower			10.2	22.3	14.2	6.2	4.3	2.7	1.1	0.8	-0.1	-0.2	0.0	0.0	1.2	0.4

Table 15 Abundance (millions) of yellowtail by stratum, Div 3N - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 27	1985 AN 43 WT 29	1986 WT 47	1987 WT 58,59	1988 WT 70	1989 WT 82	1990 WT 95,96	1991 WT 106	1992 WT 119,120	1993 WT 136,137	1994 WT 152,153	1995 WT 168,169	1996 WT 189	1997 WT 205,206
<=56	375	219,134.8	81.9	36.3	89.8	45.6	26.0	18.0	56.9	4.7	74.6	29.7	6.4	30.6	132.2	106.8
	376	206,204.1	18.9	45.4	33.5	148.4	25.9	201.5	107.5	157.6	37.9	7.2	0.5	2.2	14.0	212.3
TOTAL			**100.7**	**81.7**	**123.2**	**194.0**	**51.9**	**219.5**	**164.4**	**162.3**	**112.5**	**36.9**	**6.8**	**32.8**	**146.2**	**319.1**
57-92	360	411,582.8	119.2	63.9	13.3	13.6	2.9	197.7	37.7	20.6	57.7	17.2	2.8	54.8	150.1	51.9
	361	254,900.7	86.3	43.6	25.8	33.2	42.5	36.3	74.8	61.9	16.2	60.6	115.0	70.5	115.6	108.9
	362	346,653.9	78.7	25.8	55.4	35.8	25.4	17.7	27.5	18.6	2.6	30.1	0.8	0.2	58.7	73.0
	373	346,653.9	42.3	20.1	9.8	13.4	12.0	7.2	0.9	4.6	0.0	0.0	1.0	0.0	2.7	0.6
	374	128,069.4	7.6	4.9	1.9	1.0	0.5	0.0	0.2	0.1	0.1	0.0	0.0	0.4	2.0	1.4
	383	92,716.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**334.6**	**158.3**	**106.3**	**97.0**	**83.3**	**258.8**	**141.1**	**105.8**	**76.7**	**108.0**	**119.6**	**126.0**	**329.1**	**235.8**
93-183	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	377	13,756.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
184-274	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	381	25,036.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
275-366	357	22,560.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	379	14,581.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	380	15,957.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
367-549	723	21,322.0								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	725	14,443.9								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	727	22,009.8								0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL										**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
550-731	724	17,057.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	726	9,904.4								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	728	21,459.5								0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL										**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
732-914	752	18,433.2											0.0			
	756	14,581.5											0.0			
	760	21,184.4											0.0			
TOTAL													**0.0**			
Abundance (millions)			**435.3**	**240.1**	**229.5**	**291.0**	**135.3**	**478.3**	**305.5**	**268.1**	**189.2**	**145.0**	**126.4**	**158.8**	**475.3**	**554.9**
Upper			**576.5**	**310.0**	**325.1**	**459.6**	**198.0**	**770.4**	**473.6**	**397.2**	**303.0**	**248.8**	**218.8**	**242.5**	**611.8**	**832.5**
Lower			**294.1**	**170.1**	**133.9**	**122.5**	**72.5**	**186.2**	**137.4**	**139.0**	**75.3**	**41.1**	**34.0**	**75.1**	**338.8**	**277.3**

Table 16 Abundance (millions) of yellowtail by stratum, Div 30 - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 27	1985 AN 43	1986 WT 47	1987 WT 58	1988 WT 70	1989 WT 82	1990 WT 94,95	1991 WT 105	1992 WT 119,120	1993 WT 136	1994 WT 152	1995 WT 168	1996 WT 188,189	1997 WT 204,205
57-92	330	287,365.1	0.3	4.3	1.4	0.4	0.3	0.6	0.3	2.6	0.0	0.0	0.0	0.0	0.5	0.2
	331	62,727.9	3.1	3.9	0.3	1.7	0.6	1.6	0.0	0.1	0.0	0.1	0.3	0.0	0.1	0.3
	338	261,090.9	7.8	5.8	2.8	1.1	12.8	3.4	2.9	4.5	4.7	3.4	1.3	2.6	17.2	17.8
	351	346,653.9	27.7	29.7	28.0	13.7	26.1	15.1	18.2	8.5	2.5	2.0	0.1	0.3	9.9	22.7
	352	354,907.6	22.6	19.7	25.9	36.7	16.7	18.0	27.7	27.8	18.0	80.3	19.7	12.8	110.9	63.0
	353	17.6353.31	0.4	17.4	5.7	26.2	0.5	1.7	3.6	4.7	1.8	11.7	0.3	12.4	21.6	30.9
TOTAL			62.0	80.7	64.1	79.7	57.0	40.4	52.8	48.2	27.0	97.6	21.8	28.1	160.2	134.8
93-183	329	236,742.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	332	144,026.5	0.0	0.1	2.0	1.3	0.0	4.4	0.3	0.2	0.1	1.9	0.0	0.2	0.9	0.2
	337	130,407.9	0.0	0.0	0.1	0.2	0.3	0.4	0.0	0.0	0.1	0.9	0.0	0.1	0.4	2.1
	339	80,473.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	354	65,204.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0
TOTAL			0.1	0.2	2.2	1.5	0.3	4.8	0.3	0.5	0.3	2.9	0.1	0.3	1.5	2.3
184-274	355	14,168.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	333	20,771.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	336	16,644.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
275-366	334	12,655.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	335	7,978.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	356	8,391.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
367-549	717	12,793.2								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	719	10,454.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	721	10,454.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL										0.0	0.0	0.0	0.0	0.0	0.0	0.0
550-731	718	15,269.3								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	720	14,443.9								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	722	12,793.2								0.0	0.0	0.0	0.0	0.1	0.0	0.1
TOTAL										0.0	0.0	0.0	0.0	0.1	0.0	0.1
732-914	764	14,443.9											0.0			
	772	18,570.8											0.0			
TOTAL													0.0			
Abundance (millions)			62.0	80.9	66.3	81.3	57.3	45.1	53.1	48.7	27.3	100.4	21.9	28.5	161.7	137.3
Upper			101.9	110.4	93.1	119.1	82.7	62.5	83.1	75.0	39.6	203.7	44.7	49.0	222.7	226.3
Lower			22.1	51.5	39.4	43.4	31.9	27.8	23.1	22.4	14.9	-2.9	-1.0	8.0	100.6	49.3

Table 17 Abundance (millions) of yellowtail by stratum, Div 3LN0 - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 27,28	1985 AN 43 WT 28-30	1986 WT 47,48	1987 WT 58-60	1988 WT 70,71	1989 WT 82-83	1990 WT 94-96	1991 WT 105-107	1992 WT 119-122	1993 WT 136-138	1994 WT 152-154	1995 WT 168-170	1996 WT 188-191	1997 WT 204-208
<=56	375	219,134.8	81.9	36.3	89.8	45.6	26.0	18.0	56.9	4.7	74.6	29.7	6.4	30.6	132.2	106.8
	376	206,204.1	18.9	45.4	33.5	148.4	25.9	201.5	107.5	157.6	37.9	7.2	0.5	2.2	14.0	212.3
TOTAL			100.7	81.7	123.2	194.0	51.9	219.5	164.4	162.3	112.5	36.9	6.8	32.8	146.2	319.1
57-92	330	287,365.1	0.3	4.3	1.4	0.4	0.3	0.6	0.3	2.6	0.0	0.0	0.0	0.0	0.5	0.2
	331	62,727.9	3.1	3.9	0.3	1.7	0.6	1.6	0.0	0.1	0.0	0.1	0.3	0.0	0.1	0.3
	338	261,090.9	7.8	5.8	2.8	1.1	12.8	3.4	2.9	4.5	4.7	3.4	1.3	2.6	17.2	17.8
	350	284,889.0	0.9	2.1	1.2	0.4	0.8	0.4	0.1	0.4	0.0	0.0	0.0	0.0	0.4	0.0
	351	346,653.9	27.7	29.7	28.0	13.7	26.1	15.1	18.2	8.5	2.5	2.0	0.1	0.3	9.9	22.7
	352	354,907.6	22.6	19.7	25.9	36.7	16.7	18.0	27.7	27.8	18.0	80.3	19.7	12.8	110.9	63.0
	353	17.6353.31	0.4	17.4	5.7	26.2	0.5	1.7	3.6	4.7	1.8	11.7	0.3	12.4	21.6	30.9
	360	411,582.8	119.2	63.9	13.3	13.6	2.9	197.7	37.7	20.6	57.7	17.2	2.8	54.8	150.1	51.9
	361	254,900.7	86.3	43.6	25.8	33.2	42.5	36.3	74.8	61.9	16.2	60.6	115.0	70.5	115.6	108.9
	362	346,653.9	78.7	25.8	55.4	35.8	25.4	17.7	27.5	18.6	2.6	30.1	0.8	0.2	58.7	73.0
	363	244,858.7	11.2	6.8	3.6	3.2	2.4	0.8	1.9	0.3	0.1	0.0	0.0	0.0	1.1	0.2
	371	154,206.0		0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
	372	338,400.3	32.7	39.6	21.0	8.3	4.7	6.6	2.7	1.4	0.2	0.2	0.0	0.0	0.8	0.8
	373	346,653.9	42.3	20.1	9.8	13.4	12.0	7.2	0.9	4.6	0.0	0.0	1.0	0.0	2.7	0.6
	374	128,069.4	7.6	4.9	1.9	1.0	0.5	0.0	0.2	0.1	0.1	0.0	0.0	0.4	2.0	1.4
	383	92,716.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	384	154,068.4	0.0	1.2	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
TOTAL			441.3	288.9	196.6	188.8	148.4	307.1	198.5	156.2	103.9	205.8	141.5	154.0	491.7	371.8
93-183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	329	236,742.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	332	144,026.5	0.0	0.1	2.0	1.3	0.0	4.4	0.3	0.2	0.1	1.9	0.0	0.2	0.9	0.2
	337	130,407.9	0.0	0.0	0.1	0.2	0.3	0.4	0.0	0.0	0.1	0.9	0.0	0.1	0.4	2.1
	339	80,473.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	349	290,804.1	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	354	65,204.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0
	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	364	387,509.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	365	143,201.1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	377	13,756.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	390	203,728.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.7	0.3	2.9	1.7	0.5	4.8	0.4	0.5	0.3	2.9	0.1	0.3	1.5	2.3

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Table 17 Abundance (millions) of yellowtail by stratum, Div 3LN0 - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 27,28	1985 AN 43 WT 28-30	1986 WT 47,48	1987 WT 58-60	1988 WT 70,71	1989 WT 82-83	1990 WT 94-96	1991 WT 105-107	1992 WT 119-122	1993 WT 136-138	1994 WT 152-154	1995 WT 168-170	1996 WT 188-191	1997 WT 204-208
184-274	333	20,771.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	336	16,644.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	344	205,516.3		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	355	14,168.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	369	132,196.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	381	25,036.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	386	135,222.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184-274	389	112,937.7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			3,968.0	3,970.0	3,972.0	3,974.0	3,976.0	3,978.0	3,980.0	3,982.0	3,984.0	3,986.0	3,988.0	3,990.0	3,992.0	3,994.1
275-366	334	12,655.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	335	7,978.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	345	196,987.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	346	118,990.3		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	356	8,391.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	357	22,560.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	368	45,945.4		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	379	14,581.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	380	15,957.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	387	98,768.9		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	388	49,659.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	392	19,946.4		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
367-549	717	12,793.2								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	719	10,454.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	721	10,454.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	723	21,322.0								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	725	14,443.9								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	727	22,009.8								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	729	25,586.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	731	29,713.2		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	733	64,378.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	735	37,416.6		0.0							0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0

cont'd

Table 17 Abundance (millions) of yellowtail by stratum, Div 3LN0 - Spring (1984-1997)

Depth Range (m)	Stratum	No. of trawlable Units	1984 AN 27,28	1985 AN 43 WT 28-30	1986 WT 47,48	1987 WT 58-60	1988 WT 70,71	1989 WT 82-83	1990 WT 94-96	1991 WT 105-107	1992 WT 119-122	1993 WT 136-138	1994 WT 152-154	1995 WT 168-170	1996 WT 188-191	1997 WT 204-208
550-731	718	15,269.3								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	720	14,443.9								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	722	12,793.2								0.0	0.0	0.0	0.0	0.1	0.0	0.1
	724	17,057.6								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	726	9,904.4								0.0	0.0	0.0	0.0	0.0	0.0	0.0
	728	21,459.5								0.0	0.0	0.0	0.0	0.0	0.0	
	730	23,385.4		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	732	31,776.6		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	734	31,363.9		0.0						0.0	0.0	0.0	0.0	0.0	0.0	0.0
	736	24,073.2		0.0							0.0	0.0	0.0	0.0	0.0	0.0
TOTAL				0.0						0.0	0.0	0.0	0.0	0.1	0.0	0.1
732-914	737	31,226.4											0.0			
	741	30,676.1											0.0			
	745	47,871.3											0.0			
	748	21,872.2											0.0			
	752	18,433.2											0.0			
	756	14,581.5											0.0			
	760	21,184.4											0.0			
	764	14,443.9											0.0			
	772	18,570.8											0.0			
TOTAL													1,994.0			
Abundance (millions)			542.8	370.9	322.7	384.6	200.7	531.4	363.3	319.0	216.7	245.6	148.4	187.3	639.4	693.4
Upper			689.8	449.9	421.9	555.8	267.2	824.1	532.7	449.2	330.7	380.1	244.7	272.6	785.8	972.6
Lower			395.8	291.9	223.5	213.3	134.2	238.7	193.9	188.7	102.7	111.1	52.2	102.0	493.1	414.2

Table 18. Abundance (millions) at age (sexes combined) by year, Div 3LNO yellowtail - Spring

Age	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
1													4.1	0.5
2		0.2		10.2	0.7	4.0	0.2	1.7	1.0	0.3			33.8	7.7
3	6.7	17.1	1.7	30.8	4.7	40.1	12.6	7.2	17.9	3.5	5.9	1.6	89.0	72.2
4	32.9	37.5	11.2	80.3	25.9	250.9	78.4	37.2	55.6	15.3	7.2	16.9	119.8	132.8
5	85.1	35.4	39.5	37.9	15.0	97.9	93.1	89.4	36.5	43.5	26.8	24.5	98.1	165.0
6	141.0	89.8	57.5	55.8	20.7	54.6	58.4	74.0	46.9	52.0	42.3	57.4	98.7	118.4
7	184.5	133.6	141.7	105.4	62.8	56.3	64.4	57.9	38.0	69.4	44.3	55.7	129.7	115.4
8	86.9	55.3	63.6	66.5	63.0	25.6	52.3	28.2	17.3	36.7	20.3	28.0	64.9	62.0
9	7.0	4.3	10.1	7.0	9.7	3.1	7.4	4.5	4.4	5.6	1.6	0.3	1.3	1.5
10	0.1	0.5	0.7	0.5		0.4	0.7							
total (millions)	544.2	374.1	326.6	394.2	203.1	532.9	367.4	320.2	217.5	246.3	148.4	187.3	639.4	695.5
upper	691.2	453.2	425.9	565.6	269.6	825.6	536.9	450.5	331.5	380.9	244.6	272.6	785.8	974.7
lower	397.2	295.0	227.3	222.7	136.5	240.3	198.0	190.0	103.4	111.8	52.2	102.0	493.1	416.3

Table 19. Biomass estimates ('000t) at age (sexes combined) by year, Div. 3LNO Yellowtail - Spring

Age	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
1													0.0	0.0
2		0.0		0.1	0.0	0.0	0.0	0.0	0.0	0.0			0.4	0.1
3	0.2	1.3	0.1	1.2	0.2	1.7	0.7	0.3	0.9	0.2	0.3	0.1	3.5	3.0
4	2.9	3.6	1.1	5.1	2.2	21.9	6.5	5.1	5.2	3.5	0.8	2.2	11.7	15.2
5	15.4	6.9	6.5	5.7	2.0	15.5	12.8	15.7	6.5	8.1	5.2	4.6	17.2	29.3
6	47.5	29.9	16.6	16.3	5.4	16.0	15.5	21.8	14.7	16.6	13.4	17.9	30.4	37.1
7	89.3	64.3	64.6	48.5	25.5	27.2	27.9	26.6	18.0	33.4	21.0	26.1	60.6	54.5
8	55.8	36.9	40.2	41.5	37.3	17.2	32.5	19.1	11.7	26.6	14.4	19.9	46.6	44.3
9	6.8	4.1	9.1	6.3	8.4	3.0	6.7	4.3	4.4	6.0	1.7	0.3	1.5	1.5
10	0.2	0.6	0.8	0.6	0.5	0.4	0.9							
Total ('000t)	221.1	149.0	140.5	126.6	82.3	104.8	104.8	94.0	61.8	95.1	57.3	71.7	173.5	186.9

Table 10 Mean Weight of yellowtail by stratum, Div 3L - Fall										
Depth Range (m)	Stratum	No. of trawlable Units	1990 *WT 101*	1991 *WT 114,115*	1992 *WT 128-130* *GA 226*	1993 *WT 145,146*	1994 *WT 161,162*	1995 *WT 176-179,181* *TEL 22,23*	1996 *WT 196-198* *TEL 41*	1997 *WT 213-217* *TEL 57,58*
30 - 56	784	36,866.4	.	.	.	.	.	.	0.0	0.0
57 - 92	350	284,889.0	1.3	0.1	0.1	0.0	0.0	0.2	0.2	0.0
57 - 92	363	244,858.7	1.5	0.3	0.5	0.0	0.1	2.3	1.5	0.6
57 - 92	371	154,206.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57 - 92	372	338,400.3	1.0	1.2	0.8	1.7	0.0	1.9	5.4	3.3
57 - 92	384	154,068.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57 - 92	785	63,965.9	.	.	.	.	.	.	0.0	0.0
93 - 183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	343	72,219.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	348	291,629.5	0.0	0.0	0.0	.	0.0	0.0	0.0	0.0
93 - 183	349	290,804.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	364	387,509.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
93 - 183	365	143,201.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	370	181,580.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	385	324,093.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	390	203,728.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	786	11,555.1	.	.	.	.	.	.	0.0	0.0
93 - 183	787	84,325.0	.	.	.	.	.	.	0.0	0.0
93 - 183	788	35,903.4	.	.	.	.	.	.	0.0	0.0
93 - 183	790	12,242.9	.	.	.	.	.	.	0.0	0.0
93 - 183	793	9,904.4	.	.	.	.	.	.	0.0	0.0
93 - 183	794	29,713.2	.	.	.	.	.	.	0.0	0.0
93 - 183	797	13,481.0	.	.	.	.	.	.	0.0	0.0
93 - 183	799	9,904.4	.	.	.	.	.	.	0.0	0.0
184 - 274	344	217,621.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	347	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	366	191,760.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	369	132,196.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	386	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	389	112,937.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	391	38,792.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	795	22,560.0	.	.	.	.	.	.	0.0	0.0
184 - 366	789	9,904.4	.	.	.	.	.	.	0.0	0.0
184 - 366	791	31,226.4	.	.	.	.	.	.	0.0	0.0
184 - 366	798	13,756.1	.	.	.	.	.	.	0.0	0.0
275 - 366	345	196,987.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	346	118,990.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	368	45,945.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	387	98,768.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	388	49,659.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	392	19,946.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	796	24,073.2	.	.	.	.	.	.	0.0	0.0
367 - 549	729	25,586.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	731	29,713.2	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
367 - 549	733	64,378.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	735	37,416.6	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	792	6,878.1	.	.	.	.	.	.	0.0	0.0
550 - 731	730	23,385.4	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
550 - 731	732	31,776.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
550 - 731	734	31,363.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
550 - 731	736	24,073.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
732 - 914	737	31,226.4	.	.	.	.	.	.	0.0	0.0
732 - 914	741	30,676.1	.	.	.	.	.	.	0.0	0.0
732 - 914	745	47,871.3	.	.	.	.	.	.	0.0	0.0
732 - 914	748	21,872.2	.	.	.	.	.	.	0.0	0.0
915 -1097	738	30,401.0	.	.	.	.	.	.	0.0	0.0
915 -1097	742	28,337.6	.	.	.	.	.	.	0.0	0.0
915 -1097	746	53,924.0	.	.	.	.	.	.	0.0	0.0
915 -1097	749	17,332.7	.	.	.	.	.	.	0.0	0.0
1098 -1280	739	34,940.5	.	.	.	.	.	.	0.0	0.0
1098 -1280	743	29,025.4	.	.	.	.	.	.	0.0	0.0
1098 -1280	747	99,594.2	.	.	.	.	.	.	0.0	0.0
1098 -1280	750	76,484.0	.	.	.	.	.	.	0.0	0.0
1281 -1463	740	36,316.1	.	.	.	.	.	.	0.0	0.0
1281 -1463	744	38,517.1	.	.	.	.	.	.	0.0	0.0
1281 -1463	751	31,501.5	.	.	.	.	.	.	0.0	0.0
Mean Wt (sets)			**0.2 (161)**	**0.1 (219)**	**0.1 (215)**	**.1 (153)**	**.0 (200)**	**.2 (161)**	**.4 (211)**	**.2 (203)**
Upper			**0.4**	**0.2**	**0.3**	**0.3**	**0.0**	**0.4**	**0.8**	**0.5**
Lower			**0.0**	**0.0**	**0.1**	**-0.1**	**0.0**	**0.0**	**-0.1**	**-0.1**

Table 21 Mean Weight of yellowtail by stratum, Div 3N - Fall

Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 102	1991 WT 113,114	1992 WT 128,129	1993 WT 144,145	1994 WT 160,161	1995 WT 176,177	1996 TEL 41,42 AN 253	1997 WT 212-214
<=56	375	219,134.8	6.4	12.4	.	20.1	142.0	67.7	54.8	70.1
<=56	376	206,204.1	49.4	17.8	16.4	61.9	49.4	118.6	117.2	157.4
57 - 92	360	411,582.8	5.7	8.5	10.4	27.8	27.3	39.6	89.4	114.8
57 - 92	361	254,900.7	20.5	35.5	49.9	61.8	161.0	133.7	122.5	142.9
57 - 92	362	346,653.9	10.4	9.6	1.5	0.4	3.0	35.0	23.0	79.7
57 - 92	373	346,653.9	0.3	0.8	0.0	0.0	2.5	2.8	0.0	12.2
57 - 92	374	128,069.4	0.0	0.5	.	0.0	0.0	0.0	8.2	6.2
57 - 92	383	92,716.2	0.0	0.0	.	0.0	0.0	0.0	0.0	0.0
93 - 183	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	377	13,756.1	0.0	.	0.0	0.0	0.0	0.0	0.0	1.4
93 - 183	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	381	25,036.1	.	0.0	.	0.0	0.0	0.0	0.0	0.0
275 - 366	357	22,560.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	379	14,581.5	0.0	.	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	380	15,957.1	.	0.0	.	0.0	0.0	0.0	0.0	0.0
367 - 549	723	21,322.0	.	0.0	.	0.0	0.0	0.0	0.0	0.0
367 - 549	725	14,443.9	.	.	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	727	22,009.8	.	.	.	0.0	0.0	0.0	0.0	0.0
550 - 731	724	17,057.6	.	0.0	.	0.0	0.0	0.0	0.0	0.0
550 - 731	726	9,904.4	.	.	.	0.0	0.0	0.0	0.0	0.0
550 - 731	728	21,459.5	.	.	.	.	0.0	0.0	0.0	0.0
Mean Wt (sets)			10.2 (80)	9.8 (67)	26.7 (34)	18.7 (70)	20.5 (73)	42.8 (90)	47.2 (82)	68.4 (100)
Upper			18.6	16.3	48.2	29.4	34.8	56.5	65.0	87.1
Lower			1.7	3.2	5.1	8.0	6.2	29.1	29.3	49.6

Table 21A Mean Weight of yellowtail by stratum, Div 3O - Fall

Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 102	1991 WT 114	1992 WT 128	1993 WT 144	1994 WT 160,161	1995 WT 176,177	1996 WT 200 AN 253, TEL 42	1997 WT 212,213
57 - 92	330	287,365.1	0.3	0.0	0.2	0.8	0.1	3.7	0.0	2.6
57 - 92	331	62,727.9	1.8	7.8	2.2	4.5	0.0	0.6	0.0	0.3
57 - 92	338	261,090.9	1.9	4.0	0.5	2.2	0.2	27.7	0.2	21.7
57 - 92	340	236,054.8	1.3	8.8	0.1	0.5	0.8	2.0	0.0	10.9
57 - 92	351	346,653.9	8.2	3.3	0.3	7.5	2.8	6.4	3.7	42.0
57 - 92	352	354,907.6	10.7	30.5	25.1	12.6	26.1	38.6	42.8	74.6
57 - 92	353	176,353.3	7.4	0.0	0.0	1.8	0.0	4.8	4.2	41.4
93 - 183	329	236,742.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	332	144,026.5	0.2	0.1	0.4	3.3	2.6	0.9	1.7	0.0
93 - 183	337	130,407.9	0.0	0.3	0.0	0.0	0.0	0.0	10.2	0.9
93 - 183	339	80,473.2	0.3	0.5	0.0	0.0	0.5	0.0	0.1	0.3
93 - 183	354	65,204.0	0.1	0.0	0.0	0.0	0.0	0.0	0.7	0.0
184 - 274	333	20,221.5	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
184 - 274	336	16,644.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	355	14,168.8	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	334	13,205.9	0.0	0.0	0.0	0.0	0.2	0.0	.	0.0
275 - 366	335	7,978.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	356	8,391.2	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	717	22,835.1	0.0	.	.	0.0	1.0	0.0	.	0.0
367 - 549	719	10,454.6	0.0	0.0	.	0.0	0.0	0.0	0.0	0.0
367 - 549	721	10,454.6	.	0.0	.	0.0	0.0	0.0	0.0	0.0
550 - 731	718	18,433.2	.	.	.	0.0	0.0	0.0	.	0.0
550 - 731	720	.	.	.	.	0.0	0.0	0.0	0.0	.
550 - 731	722	12,793.2	.	0.0	.	0.0	0.0	0.0	0.0	0.0
Mean Wt (sets)			3.7 (91)	6.3 (84)	8.7 (54)	3.6 (75)	2.1 (75)	10.1 (81)	7.6 (60)	22.7 (203)
Upper			5.6	9.3	19.1	5.9	4.0	15.0	12.7	31.7
Lower			1.8	3.3	-1.8	1.2	0.1	5.1	2.5	13.6

Table 22 Mean Number of yellowtail by stratum, Div 3L - Fall										
Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 101	1991 WT 114,115	1992 WT 128-130 GA 226	1993 WT 145,146	1994 WT 161,162	1995 WT 176-179,181 TEL 22,23	1996 WT 196-198 TEL 41	1997 WT 213-217 TEL 57,58
30 - 56	784	36,866.4	.	.	.	.	.	.	0.5	0.0
57 - 92	350	284,889.0	3.2	0.3	0.2	0.0	0.1	0.4	0.3	0.0
57 - 92	363	244,858.7	2.7	0.5	1.0	0.0	0.3	5.2	3.5	1.2
57 - 92	371	154,206.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57 - 92	372	338,400.3	2.1	2.3	1.6	3.6	0.0	6.4	16.9	17.2
57 - 92	384	154,068.4	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0
57 - 92	785	63,965.9	.	.	.	.	.	.	0.0	0.0
93 - 183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	343	72,219.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	348	291,629.5	0.0	0.0	0.0	.	0.0	0.0	0.0	0.0
93 - 183	349	290,804.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	364	387,509.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
93 - 183	365	143,201.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	370	181,580.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	385	324,093.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	390	203,728.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	786	11,555.1	.	.	.	.	.	.	0.5	0.0
93 - 183	787	84,325.0	.	.	.	.	.	.	0.0	0.0
93 - 183	788	34,665.4	.	.	.	.	.	.	0.0	0.0
93 - 183	790	12,242.9	.	.	.	.	.	.	0.0	0.0
93 - 183	793	9,904.4	.	.	.	.	.	.	0.0	0.0
93 - 183	794	29,713.2	.	.	.	.	.	.	0.0	0.0
93 - 183	797	13,481.0	.	.	.	.	.	.	0.0	0.0
93 - 183	799	9,904.4	.	.	.	.	.	.	0.0	0.0
184 - 274	344	217,621.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	347	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	366	191,760.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	369	132,196.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	386	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	389	112,937.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	391	38,792.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	795	22,560.0	.	.	.	.	.	.	0.0	0.0
184 - 366	789	11,142.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 366	791	42,368.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 366	798	13,756.1	.	.	.	.	.	.	0.0	0.0
275 - 366	345	196,987.5	.	.	.	.	.	.	0.0	0.0
275 - 366	346	118,990.3	.	.	.	.	.	.	0.0	0.0
275 - 366	368	45,945.4	.	.	.	.	.	.	0.0	0.0
275 - 366	387	98,768.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	388	49,659.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	392	19,946.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	796	24,073.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	729	25,586.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	731	29,713.2	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
367 - 549	733	64,378.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	735	37,416.6	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	792	6,878.1	.	.	.	.	.	.	0.0	0.0
550 - 731	730	23,385.4	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
550 - 731	732	31,776.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
550 - 731	734	31,363.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
550 - 731	736	24,073.2	0.0	0.0	0.0		0.0	0.0	0.0	0.0
732 - 914	737	31,226.4	.	.	.	0.0	.	.	0.0	0.0
732 - 914	741	30,676.1	.	.	.	.	.	.	0.0	0.0
732 - 914	745	47,871.3	.	.	.	.	.	.	0.0	0.0
732 - 914	748	21,872.2	.	.	.	.	.	.	0.0	0.0
915 -1097	738	30,401.0	.	.	.	.	.	.	0.0	0.0
915 -1097	742	28,337.6	.	.	.	.	.	.	0.0	0.0
915 -1097	746	53,924.0	.	.	.	.	.	.	0.0	0.0
915 -1097	749	17,332.7	.	.	.	.	.	.	0.0	0.0
1098 -1280	739	34,940.5	.	.	.	.	.	.	0.0	0.0
1098 -1280	743	29,025.4	.	.	.	.	.	.	0.0	0.0
1098 -1280	747	99,594.2	.	.	.	.	.	.	0.0	0.0
1098 -1280	750	76,484.0	.	.	.	.	.	.	0.0	0.0
1281 -1463	740	36,316.1	.	.	.	.	.	.	0.0	0.0
1281 -1463	744	38,517.1	.	.	.	.	.	.	0.0	0.0
1281 -1463	751	31,501.5	.	.	.	.	.	.	0.0	0.0
Mean No. (sets)			0.4 (161)	0.2 (219)	.2 (215)	.2 (153)	.0 (200)	.7 (161)	1.1 (211)	1.0 (203)
Upper			0.9	0.3	0.3	0.6	0.0	1.3	2.2	2.7
Lower			0.0	0.7	0.1	-0.1	0.0	.0.1	-0.1	-0.7

Table 23 Mean Number of yellowtail by stratum, Div 3N - Fall

Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 102	1991 WT 113,114	1992 WT 128,129	1993 WT 144,145	1994 WT 160,161	1995 WT 176,177	1996 TEL 41,42, AN 253	1997 WT 212-214
<=56	375	219,134.8	16.0	24.0	.	34.8	329.8	398.5	216.7	212.6
<=56	376	206,204.1	123.7	64.5	57.0	187.0	206.3	711.6	831.3	873.3
57 - 92	360	411,582.8	21.3	26.4	20.9	72.2	100.9	171.3	392.1	406.2
57 - 92	361	254,900.7	37.9	87.9	106.9	132.4	385.2	450.0	415.8	397.3
57 - 92	362	346,653.9	21.4	19.6	3.3	0.8	6.8	245.0	75.6	307.3
57 - 92	373	346,653.9	0.6	1.3	0.0	0.0	7.1	13.9	0.0	35.3
57 - 92	374	128,069.4	0.0	0.4	.	0.0	0.0	0.0	30.0	18.0
57 - 92	383	92,716.2	0.0	0.0	.	0.0	0.0	0.0	0.0	0.0
93 - 183	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	377	13,756.1	0.0	.	0.0	0.0	0.0	0.0	0.0	3.0
93 - 183	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	381	25,036.1	.	0.0	.	0.0	0.0	0.0	0.0	0.0
275 - 366	357	22,560.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	379	14,581.5	0.0	.	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	380	15,957.1	.	0.0	.	0.0	0.0	0.0	0.0	0.0
367 - 549	723	21,322.0	.	0.0	.	0.0	0.0	0.0	0.0	0.0
367 - 549	725	14,443.9	.	.	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	727	22,009.8	.	.	.	0.0	0.0	0.0	0.0	0.0
550 - 731	724	17,057.6	.	0.0	.	0.0	0.0	0.0	0.0	0.0
550 - 731	726	9,904.4	.	.	.	0.0	0.0	0.0	0.0	0.0
550 - 731	728	21,459.5	.	.	.	.	0.0	0.0	0.0	0.0
Mean No. (sets)			24.4 (80)	25.7 (67)	26.7 (34)	46.2 (70)	44.0 (73)	212.0 (90)	215.0 (82)	256.7 (100)
Upper			43.1	42.7	48.2	73.9	73.9	294.2	302.9	313.4
Lower			5.7	8.6	5.1	18.5	14.0	129.8	127.2	191.9

Table 24 Mean Number of yellowtail by stratum, Div 3O - Fall

Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 102	1991 WT 114	1992 WT 128	1993 WT 144	1994 WT 160,161	1995 WT 176,177	1996 WT 200 AN 253, TEL 42	1997 WT 212,213
57 - 92	330	287,365.1	0.6	0.1	0.6	1.6	0.1	8.2	0.2	7.3
57 - 92	331	62,727.9	3.1	14.9	3.6	8.7	0.0	2.0	0.0	1.0
57 - 92	338	261,090.9	3.7	8.7	0.9	4.4	0.3	97.0	0.5	38.2
57 - 92	340	236,054.8	2.9	19.8	0.1	1.3	1.6	4.8	0.0	28.2
57 - 92	351	346,653.9	18.2	7.5	0.8	15.9	7.0	15.8	11.6	107.3
57 - 92	352	354,907.6	20.8	65.6	57.0	26.7	69.7	121.9	134.3	249.0
57 - 92	353	176,353.3	12.9	0.0	0.0	3.7	0.0	8.7	7.0	82.8
93 - 183	329	236,742.6	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0
93 - 183	332	144,026.5	0.4	0.1	1.0	6.4	5.0	3.3	3.0	0.0
93 - 183	337	130,407.9	0.0	0.4	0.0	0.0	0.0	0.0	19.0	1.3
93 - 183	339	80,473.2	0.4	1.3	0.0	0.0	1.0	0.0	0.3	0.5
93 - 183	354	65,204.0	0.4	0.0	0.0	0.0	0.0	0.0	1.8	0.0
184 - 274	355	14,168.8	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	333	20,221.5	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
184 - 274	336	16,644.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	334	13,205.9	0.0	0.0	0.0	0.0	0.5	0.0	.	0.0
275 - 366	335	7,978.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	356	8,391.2	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	717	22,835.1	0.0	.	.	0.0	3.0	0.0	.	0.0
367 - 549	719	10,454.6	0.0	0.0	.	0.0	0.0	0.0	0.0	0.0
367 - 549	721	10,454.6	.	0.0	.	0.0	0.0	0.0	0.0	0.0
550 - 731	718	18,433.2	.	.	.	0.0	0.0	0.0	.	0.0
550 - 731	720	.	.	.	.	0.0	0.0	0.0	0.0	.
550 - 731	722	12,793.2	.	0.0	.	0.0	0.0	0.0	0.0	0.0
Mean No. (sets)			7.4 (91)	13.6 (84)	8.7 (54)	7.5 (75)	4.9 (75)	31.2 (81)	22.7 (60)	62.7 (203)
Upper			10.9	19.9	19.1	12.6	9.5	50.5	37.7	84.4
Lower			3.9	7.3	-1.8	2.4	0.3	11.9	7.6	41.0

Table 25 Biomass ('000t) of yellowtail by stratum, Div 3L - Fall

Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 101	1991 WT 114,115	1992 WT 128-130 GA 226	1993 WT 145,146	1994 WT 161,162	1995 WT 176-179,181 TEL 22,23	1996 WT 196-198 TEL 41	1997 WT 213-217 TEL 57,58
30 - 56	784	36,866.4	.	.	.	.	.	.	0.0	0.0
57 - 92	350	284,889.0	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	363	244,858.7	0.7	0.1	0.2	0.0	0.0	0.6	0.4	0.2
	371	154,206.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	372	338,400.3	0.6	0.8	0.6	1.1	0.0	0.6	1.8	1.1
	384	154,068.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	785	63,965.9	.	.	.	.	.	.	0.0	0.0
93 - 183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5	0.0	0.0	0.0	.	0.0	0.0	0.0	0.0
	349	290,804.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	364	387,509.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	365	143,201.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	390	203,728.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	786	11,555.1	.	.	.	.	.	.	0.0	0.0
	787	84,325.0	.	.	.	.	.	.	0.0	0.0
	788	35,903.4	.	.	.	.	.	.	0.0	0.0
	790	12,242.9	.	.	.	.	.	.	0.0	0.0
	793	9,904.4	.	.	.	.	.	.	0.0	0.0
	794	29,713.2	.	.	.	.	.	.	0.0	0.0
	797	13,481.0	.	.	.	.	.	.	0.0	0.0
	799	9,904.4	.	.	.	.	.	.	0.0	0.0
184 - 274	344	217,621.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	369	132,196.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	386	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	389	112,937.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	795	22,560.0	.	.	.	.	.	.	0.0	0.0
184 - 366	789	9,904.4	.	.	.	.	.	.	0.0	0.0
	791	31,226.4	.	.	.	.	.	.	0.0	0.0
	798	13,756.1	.	.	.	.	.	.	0.0	0.0
275 - 366	345	196,987.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	346	118,990.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	368	45,945.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	387	98,768.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	388	49,659.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	392	19,946.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	796	24,073.2	.	.	.	.	.	.	0.0	0.0
367 - 549	729	25,586.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	731	29,713.2	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
	733	64,378.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	735	37,416.6	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	792	6,878.1	.	.	.	.	.	.	0.0	0.0
550 - 731	730	23,385.4	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	732	31,776.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	734	31,363.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	736	24,073.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
732 - 914	737	31,226.4	.	.	.	.	.	0.0	0.0	0.0
	741	30,676.1	.	.	.	.	.	.	0.0	0.0
	745	47,871.3	.	.	.	.	.	.	0.0	0.0
	748	21,872.2	.	.	.	.	.	.	0.0	0.0
915 -1097	738	30,401.0	.	.	.	.	.	0.0	0.0	0.0
	742	28,337.6	.	.	.	.	.	.	0.0	0.0
	746	53,924.0	.	.	.	.	.	.	0.0	0.0
	749	17,332.7	.	.	.	.	.	.	0.0	0.0
1098 -1280	739	34,940.5	.	.	.	.	.	.	0.0	0.0
	743	29,025.4	.	.	.	.	.	.	0.0	0.0
	747	99,594.2	.	.	.	.	.	.	0.0	0.0
	750	76,484.0	.	.	.	.	.	.	0.0	0.0
1281 -1463	740	36,316.1	.	.	.	.	.	.	0.0	0.0
	744	38,517.1	.	.	.	.	.	.	0.0	0.0
	751	31,501.5	.	.	.	.	.	.	0.0	0.0
Biomass ('000t)			**2.1**	**1.0**	**0.9**	**1.1**	**0.0**	**1.3**	**2.2**	**1.3**
Upper			**4.1**	**1.6**	**1.5**	**2.7**	**0.1**	**2.2**	**5.3**	**3.1**
Lower			**0.0**	**0.4**	**0.4**	**-0.5**	**0.0**	**0.3**	**-0.8**	**-0.5**

cont'd

Table25 Biomass ('000t) of yellowtail by stratum, Div 3L - Fall

Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 101	1991 WT 114,115	1992 WT 128-130 GA 226	1993 WT 145,146	1994 WT 161,162	1995 WT 176-179,181 TEL 22,23	1996 WT 196-198 TEL 41	1997 WT 213-217 TEL 57,58
30 - 56	784	36,866.4	.	.	.	.	.	.	0.0	0.0
TOTAL									**0.0**	**0.0**
57 - 92	350	284,889.0	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	363	244,858.7	0.7	0.1	0.2	0.0	0.0	0.0	0.4	0.2
	371	154,206.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	372	338,400.3	0.6	0.8	0.6	1.1	0.0	0.6	1.8	1.1
	384	154,068.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	785	63,965.9	.	.	.	.	.	.	0.0	0.0
TOTAL			**2.1**	**1.0**	**0.9**	**1.1**	**0.0**	**1.2**	**2.2**	**1.3**
93 - 183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5	0.0	0.0	0.0	.	0.0	0.0	0.0	0.0
	349	290,804.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	364	387,509.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	365	143,201.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	390	203,728.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	786	11,555.1	.	.	.	.	.	.	0.0	0.0
	787	84,325.0	.	.	.	.	.	.	0.0	0.0
	788	35,903.4	.	.	.	.	.	.	0.0	0.0
	790	12,242.9	.	.	.	.	.	.	0.0	0.0
	793	9,904.4	.	.	.	.	.	.	0.0	0.0
	794	29,713.2	.	.	.	.	.	.	0.0	0.0
	797	13,481.0	.	.	.	.	.	.	0.0	0.0
	799	9,904.4	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
184 - 274	344	217,621.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	369	132,196.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	386	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	389	112,937.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	795	22,560.0	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
184 - 366	789	9,904.4	.	.	.	.	.	.	0.0	0.0
	791	31,226.4	.	.	.	.	.	.	0.0	0.0
	798	13,756.1	.	.	.	.	.	.	0.0	0.0
TOTAL									**0.0**	**0.0**
275 - 366	345	196,987.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	346	118,990.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	368	45,945.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	387	98,768.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	388	49,659.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	392	19,946.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	796	24,073.2	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
367 - 549	729	25,586.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	731	29,713.2	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
	733	64,378.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	735	37,416.6	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	792	6,878.1	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
550 - 731	730	23,385.4	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	732	31,776.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	734	31,363.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	736	24,073.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

cont'd

Table 25 Biomass ('000t) of yellowtail by stratum, Div 3L - Fall										
Depth Range (m)	Stratum	No. of trawlable Units	1990 *WT 101*	1991 *WT 114,115*	1992 *WT 128-130 GA 226*	1993 *WT 145,146*	1994 *WT 161,162*	1995 *WT 176-179,181 TEL 22,23*	1996 *WT 196-198 TEL 41*	1997 *WT 213-217 TEL 57,58*
732 - 914	737	31,226.4						0.0	0.0	0.0
	741	30,676.1							0.0	0.0
	745	47,871.3							0.0	0.0
	748	21,872.2							0.0	0.0
TOTAL								1,995.0	1,995.0	1,997.0
915 -1097	738	30,401.0						0.0	0.0	0.0
	742	28,337.6							0.0	0.0
	746	53,924.0							0.0	0.0
	749	17,332.7							0.0	0.0
TOTAL								0.0	0.0	0.0
1098 -1280	739	34,940.5							0.0	0.0
	743	29,025.4							0.0	0.0
	747	99,594.2							0.0	0.0
	750	76,484.0							0.0	0.0
TOTAL									0.0	0.0
1281 -1463	740	36,316.1							0.0	0.0
	744	38,517.1							0.0	0.0
	751	31,501.5							0.0	0.0
TOTAL									0.0	0.0
Biomass ('000t)			2.1	1.0	0.9	1.1	0.0	1.3	2.2	1.3
Upper			4.1	1.6	1.5	2.7	0.1	2.2	5.3	3.1
Lower			0.0	0.4	0.4	-0.5	0.0	0.3	-0.8	-0.5

Table 26 Biomass ('000t) of yellowtail by stratum, Div 3N - Fall										
Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 102	1991 WT 113,114	1992 WT 128,129	1993 WT 144,145	1994 WT 160,161	1995 WT 176,177	1996 TEL 41,42 AN 253	1997 WT 212-214
<=56	375	219,134.8	3.2	5.1	.	8.0	31.1	14.8	12.0	15.4
	376	206,204.1	20.1	10.9	10.8	31.3	10.2	24.4	24.2	32.5
TOTAL			23.3	16.0	10.8	39.3	41.3	39.2	36.2	47.9
57 - 92	360	411,582.8	6.7	8.3	8.0	24.8	11.2	16.3	36.8	47.2
	361	254,900.7	9.5	19.6	24.3	29.8	41.0	34.1	31.2	36.4
	362	346,653.9	6.8	6.4	1.0	0.3	1.0	12.1	8.0	27.6
	373	346,653.9	0.2	0.5	0.0	0.0	0.9	1.0	0.0	4.2
	374	128,069.4	0.0	0.1	.	0.0	0.0	0.0	1.1	0.8
	383	92,716.2	0.0	0.0	.	0.0	0.0	0.0	0.0	0.0
TOTAL			23.2	34.9	33.3	54.9	54.1	63.5	77.1	116.2
93 - 183	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	377	13,756.1	0.0	.	0.0	0.0	0.0	0.0	0.0	0.0
	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	381	25,036.1	.	0.0	.	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	357	22,560.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	379	14,581.5	0.0	.	0.0	0.0	0.0	0.0	0.0	0.0
	380	15,957.1	.	0.0	.	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	723	21,322.0	.	0.0	.	0.0	0.0	0.0	0.0	0.0
	725	14,443.9	.	.	0.0	0.0	0.0	0.0	0.0	0.0
	727	22,009.8	.	.	.	0.0	0.0	0.0	0.0	0.0
TOTAL				0.0	0.0	0.0	0.0	0.0	0.0	0.0
550 - 731	724	17,057.6	.	0.0	.	0.0	0.0	0.0	0.0	0.0
	726	9,904.4	.	.	.	0.0	0.0	0.0	0.0	0.0
	728	21,459.5	.	.	.	.	0.0	0.0	0.0	0.0
TOTAL				0.0		0.0	0.0	0.0	0.0	0.0
Biomass ('000t)			46.5	50.9	44.2	94.2	95.5	102.8	113.2	164.2
Upper			80.3	84.4	79.9	148.9	169.5	135.7	156.1	209.2
Lower			12.6	17.4	8.4	39.5	31.5	69.9	70.3	119.1

Table 27 Biomass ('000t) of yellowtail by stratum, Div 30 - Fall

Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 102	1991 WT 114	1992 WT 128	1993 WT 144	1994 WT 160,161	1995 WT 176,177	1996 WT 200 AN 253, TEL 42	1997 WT 212,213
57 - 92	330	287,365.1	0.2	0.0	0.2	0.5	0.0	1.1	0.0	0.8
	331	62,727.9	0.2	0.9	0.3	0.5	0.0	0.0	0.0	0.0
	338	261,090.9	1.0	2.0	0.2	1.1	0.1	7.2	0.0	5.7
	340	236,054.8	0.6	4.0	0.0	0.3	0.2	0.5	0.0	2.6
	351	346,853.9	5.5	2.3	0.3	5.0	1.0	2.2	1.3	14.5
	352	354,907.6	7.0	21.0	18.2	8.3	9.3	13.7	15.2	26.5
	353	176,353.3	2.4	0.0	0.0	0.6	0.0	0.8	0.7	7.3
TOTAL			**16.9**	**30.2**	**19.2**	**16.3**	**10.6**	**25.5**	**17.2**	**57.4**
93 - 183	329	236,742.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	332	144,026.5	0.1	0.0	0.1	1.0	0.4	0.1	0.2	0.0
	337	130,407.9	0.0	0.1	0.0	0.0	0.0	0.0	1.3	0.1
	339	80,473.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	354	65,204.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.2**	**0.2**	**0.1**	**1.0**	**0.4**	**0.1**	**1.5**	**0.1**
184 - 274	355	14,168.8	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
	333	20,221.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	336	16,644.9	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
275 - 366	334	13,205.9	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
	335	7,978.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	356	8,391.2	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
367 - 549	717	22,835.1	0.0	.	.	0.0	0.0	0.0	.	0.0
	719	10,454.6	0.0	0.0	.	0.0	0.0	0.0	0.0	0.0
	721	10,454.6	.	0.0	.	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
550 - 731	718	18,433.2	.	.	.	0.0	0.0	0.0	.	0.0
	720	14,443.9	.	.	.	0.0	0.0	0.0	0.0	.
	722	12,793.2	.	0.0	.	0.0	0.0	0.0	0.0	0.0
TOTAL				**0.0**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Biomass ('000t)			**17.3**	**30.5**	**19.4**	**17.5**	**10.9**	**25.7**	**18.9**	**57.5**
Upper			**25.9**	**45.2**	**43.1**	**28.1**	**20.7**	**38.4**	**31.5**	**80.5**
Lower			**8.6**	**15.8**	**-4.3**	**6.8**	**1.2**	**13.1**	**6.2**	**34.5**

Table 25 Biomass ('000t) of yellowtail by stratum, Div 3LN0

Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 101,102	1991 WT 113-115	1992 WT 128-130 GA 226	1993 WT 144-146	1994 WT 160-162	1995 WT 176-179,181 TEL 22,23	1996 WT 188-191	1997 WT 204-208
30 - 56	784	36,866.4							0.0	0.0
TOTAL									0.0	0.0
<=56	375	219,134.8	3.2	5.1		8.0	31.1	14.8	12.0	15.4
	376	206,204.1	20.1	10.9	10.8	31.3	10.2	24.4	24.2	32.5
TOTAL			23.3	16.0	10.8	39.3	41.3	39.2	36.2	47.9
57 - 92	330	287,365.1	0.2	0.0	0.2	0.5	0.0	1.1	0.0	0.8
	331	62,727.9	0.2	0.9	0.3	0.5	0.0	0.0	0.0	0.0
	338	261,090.9	1.0	2.0	0.2	1.1	0.1	7.2	0.0	5.7
	340	236,054.8	0.6	4.0	0.0	0.3	0.2	0.5	0.0	2.6
	350	284,889.0	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	351	346,653.9	5.5	2.3	0.3	5.0	1.0	2.2	1.3	14.5
	352	354,907.6	7.0	21.0	18.2	8.3	9.3	13.7	15.2	26.5
	353	176,353.3	2.4	0.0	0.0	0.6	0.0	0.8	0.7	7.3
	360	411,582.8	6.7	8.3	8.0	24.8	11.2	16.3	36.8	47.2
	361	254,900.7	9.5	19.6	24.3	29.8	41.0	34.1	31.2	36.4
	362	346,653.9	6.8	6.4	1.0	0.3	1.0	12.1	8.0	27.6
	363	244,858.7	0.7	0.1	0.2	0.0	0.0	0.6	0.4	0.2
	371	154,206.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	372	338,400.3	0.6	0.8	0.6	1.1	0.0	0.6	1.8	1.1
	373	346,653.9	0.2	0.5	0.0	0.0	0.9	1.0	0.0	4.2
	374	128,069.4	0.0	0.1		0.0	0.0	0.0	1.1	0.8
	383	92,716.2	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	384	154,068.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	785	63,965.9							0.0	0.0
TOTAL			42.2	66.1	53.4	72.3	64.7	90.2	96.5	174.9
93 - 183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	329	236,742.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	332	144,026.5	0.1	0.0	0.1	1.0	0.4	0.1	0.2	0.0
	337	130,407.9	0.0	0.1	0.0	0.0	0.0	0.0	1.3	0.1
	339	80,473.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5	0.0	0.0	0.0		0.0	0.0	0.0	0.0
	349	290,804.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	354	65,204.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	364	387,509.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	365	143,201.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	377	13,756.1	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	390	203,728.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	786	11,555.1							0.0	0.0
	787	84,325.0							0.0	0.0
	788	35,903.4							0.0	0.0
	790	12,242.9							0.0	0.0
	793	9,904.4							0.0	0.0
	794	29,713.2							0.0	0.0
	797	13,481.0							0.0	0.0
	799	9,904.4							0.0	0.0
TOTAL			0.2	0.2	0.2	1.0	0.4	0.1	1.5	0.1
184 - 274	333	20,221.5	0.0	0.0	0.0	0.0	0.0	0.0		0.0
	336	16,644.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	344	217,621.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	355	14,168.8		0.0	0.0	0.0	0.0	0.0	0.0	0.0
	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	369	132,196.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	381	25,036.1		0.0		0.0	0.0	0.0	0.0	0.0
	386	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	389	112,937.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	795	22,560.0							0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 28. Biomass ('000t) of yellowtail by stratum, Div 3LN0 Fall

Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 101,102	1991 WT 113-115	1992 WT 128-130 GA 226	1993 WT 144-146	1994 WT 160-162	1995 WT 176-179,181 TEL 22,23	1996 WT 188-191	1997 WT 204-208
30 - 56	784	36,866.4	.	.	.	.	.	.	0.0	0.0
TOTAL									**0.0**	**0.0**
<=56	375	219,134.8	3.2	5.1	.	8.0	31.1	14.8	12.0	15.4
	376	206,204.1	20.1	10.9	10.8	31.3	10.2	24.4	24.2	32.5
TOTAL			**23.3**	**16.0**	**10.8**	**39.3**	**41.3**	**39.2**	**36.2**	**47.9**
57 - 92	330	287,365.1	0.2	0.0	0.2	0.5	0.0	1.1	0.0	0.8
	331	62,727.9	0.2	0.9	0.3	0.5	0.0	0.0	0.0	0.0
	338	261,090.9	1.0	2.0	0.2	1.1	0.1	7.2	0.0	5.7
	340	236,054.8	0.6	4.0	0.0	0.3	0.2	0.5	0.0	2.6
	350	284,889.0	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	351	346,653.9	5.5	2.3	0.3	5.0	1.0	2.2	1.3	14.5
	352	354,907.6	7.0	21.0	18.2	8.3	9.3	13.7	15.2	26.5
	353	176,353.3	2.4	0.0	0.0	0.6	0.0	0.8	0.7	7.3
	360	411,582.8	6.7	8.3	8.0	24.8	11.2	16.3	36.8	47.2
	361	254,900.7	9.5	19.6	24.3	29.8	41.0	34.1	31.2	36.4
	362	346,653.9	6.8	6.4	1.0	0.3	1.0	12.1	8.0	27.6
	363	244,858.7	0.7	0.1	0.2	0.0	0.0	0.6	0.4	0.2
	371	154,206.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	372	338,400.3	0.6	0.8	0.6	1.1	0.0	0.6	1.8	1.1
	373	346,653.9	0.2	0.5	0.0	0.0	0.9	1.0	0.0	4.2
	374	128,069.4	0.0	0.1	.	0.0	0.0	0.0	1.1	0.8
	383	92,716.2	0.0	0.0	.	0.0	0.0	0.0	0.0	0.0
	384	154,068.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	785	63,965.9	.	.	.	.	.	.	0.0	0.0
TOTAL			**42.2**	**66.1**	**53.4**	**72.3**	**64.7**	**90.2**	**96.5**	**174.9**
93 - 183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	329	236,742.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	332	144,026.5	0.1	0.0	0.1	1.0	0.4	0.1	0.2	0.0
	337	130,407.9	0.0	0.1	0.0	0.0	0.0	0.0	1.3	0.1
	339	80,473.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5	0.0	0.0	0.0	.	0.0	0.0	0.0	0.0
	349	290,804.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	354	65,204.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	364	387,509.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	365	143,201.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	377	13,756.1	0.0	.	0.0	0.0	0.0	0.0	0.0	0.0
	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	390	203,728.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	786	11,555.1	.	.	.	.	.	.	0.0	0.0
	787	84,325.0	.	.	.	.	.	.	0.0	0.0
	788	35,903.4	.	.	.	.	.	.	0.0	0.0
	790	12,242.9	.	.	.	.	.	.	0.0	0.0
	793	9,904.4	.	.	.	.	.	.	0.0	0.0
	794	29,713.2	.	.	.	.	.	.	0.0	0.0
	797	13,481.0	.	.	.	.	.	.	0.0	0.0
	799	9,904.4	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.2**	**0.2**	**0.2**	**1.0**	**0.4**	**0.1**	**1.5**	**0.1**
184 - 274	333	20,221.5	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
	336	16,644.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	344	217,621.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	355	14,168.8	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	369	132,196.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
184 - 274	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	381	25,036.1	.	0.0	.	0.0	0.0	0.0	0.0	0.0
	386	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	389	112,937.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	795	22,560.0	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 28 Cont'd

Depth Range (m)	Stratum	No. of trawlable Units	1990 WT 101,102	1991 WT 113-115	1992 WT 128-130 GA 226	1993 WT 144-146	1994 WT 160-162	1995 WT 176-179,181 TEL 22,23	1996 WT 188-191	1997 WT 204-208
184 - 366	789	9,904.4	.	.	.	.	.	.	0.0	0.0
	791	31,226.4	.	.	.	.	.	.	0.0	0.0
	798	13,756.1	.	.	.	.	.	.	0.0	0.0
TOTAL									**0.0**	**0.0**
275 - 366	334	13,205.9	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
	335	7,978.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	345	196,987.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	346	118,990.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	356	8,391.2	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	357	22,560.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	368	45,945.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	379	14,581.5	0.0	.	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	380	15,957.1	.	0.0	.	0.0	0.0	0.0	0.0	0.0
	387	98,768.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	388	49,659.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	392	19,946.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	796	24,073.2	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
367 - 549	717	22,835.1	0.0	.	.	0.0	0.0	0.0	.	0.0
	719	10,454.6	0.0	0.0	.	0.0	0.0	0.0	0.0	0.0
	721	10,454.6	.	0.0	.	0.0	0.0	0.0	0.0	0.0
	723	21,322.0	.	0.0	.	0.0	0.0	0.0	0.0	0.0
	725	14,443.9	.	.	0.0	0.0	0.0	0.0	0.0	0.0
	727	22,009.8	.	.	.	0.0	0.0	0.0	0.0	0.0
	729	25,586.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	731	29,713.2	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
	733	64,378.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	735	37,416.6	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	792	6,878.1	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
550 - 731	718	18,433.2	.	.	.	0.0	0.0	0.0	.	0.0
	720	14,443.9	.	.	.	0.0	0.0	0.0	0.0	.
	722	12,793.2	.	0.0	.	0.0	0.0	0.0	0.0	0.0
	724	17,057.6	.	0.0	.	0.0	0.0	0.0	0.0	0.0
	726	9,904.4	.	.	.	0.0	0.0	0.0	0.0	0.0
	728	21,459.5	.	.	.	.	0.0	0.0	0.0	0.0
	730	23,385.4	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	732	31,776.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	734	31,363.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	736	24,073.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
732 - 914	737	31,226.4	.	.	.	.	.	0.0	0.0	0.0
	741	30,676.1	.	.	.	.	.	.	0.0	0.0
	745	47,871.3	.	.	.	.	.	.	0.0	0.0
	748	21,872.2	.	.	.	.	.	.	0.0	0.0
TOTAL								**0.0**	**0.0**	**0.0**
915 -1097	738	30,401.0	.	.	.	.	.	0.0	0.0	0.0
	742	28,337.6	.	.	.	.	.	.	0.0	0.0
	746	53,924.0	.	.	.	.	.	.	0.0	0.0
	749	17,332.7	.	.	.	.	.	.	0.0	0.0
TOTAL								**0.0**	**0.0**	**0.0**
1098 -1280	739	34,940.5	.	.	.	.	.	.	0.0	0.0
	743	29,025.4	.	.	.	.	.	.	0.0	0.0
	747	99,594.2	.	.	.	.	.	.	0.0	0.0
	750	76,484.0	.	.	.	.	.	.	0.0	0.0
TOTAL									0.0	0.0
1281 -1463	740	36,316.1	.	.	.	.	.	.	0.0	0.0
	744	38,517.1	.	.	.	.	.	.	0.0	0.0
	751	31,501.5	.	.	.	.	.	.	0.0	0.0
TOTAL									**0.0**	**0.0**
Biomass ('000t)			**65.8**	**82.4**	**64.5**	**112.8**	**106.5**	**129.8**	**134.3**	**222.9**
Upper			**99.8**	**117.5**	**103.8**	**168.0**	**171.0**	**164.3**	**178.3**	**272.5**
Lower			**31.9**	**47.3**	**25.2**	**57.6**	**41.9**	**95.2**	**90.3**	**173.4**

Table 29. Abundance (millions) of yellowtail by stratum, Div 3L - Fall

Depth Range (m)	Strat	No. of trawlable Units	1990 WT 101	1991 WT 114,115	1992 WT 128-130 GA 226	1993 WT 145,146	1994 WT 161,162	1995 WT 176-179,181 TEL 22,23	1996 WT 196-198 TEL 41	1997 WT 213-217 TEL 57,58
30 - 56	784	36,866.4	.	.	.	.	.	.	0.0	0.0
TOTAL									**0.0**	**0.0**
57 - 92	350	284,889.0	1.7	0.2	0.1	0.0	0.0	0.1	0.1	0.0
	363	244,858.7	1.3	0.3	0.5	0.0	0.1	1.3	0.9	0.3
	371	154,206.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	372	338,400.3	1.3	1.6	1.3	2.6	0.0	2.2	5.7	5.8
	384	154,068.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	785	63,965.9							0.0	0.0
TOTAL			**4.3**	**2.1**	**1.9**	**2.6**	**0.1**	**3.6**	**6.7**	
93 - 183	328	208,955.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	341	216,521.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	342	80,473.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	343	72,219.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	348	291,629.5	0.0	0.0	0.0	.	0.0	0.0	0.0	0.0
	349	290,804.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	364	387,509.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	365	143,201.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	370	181,580.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	385	324,093.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	390	203,728.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	786	11,555.1	.	.	.	.	.	.	0.0	0.0
	787	84,325.0	.	.	.	.	.	.	0.0	0.0
	788	35,903.4	.	.	.	.	.	.	0.0	0.0
	790	12,242.9	.	.	.	.	.	.	0.0	0.0
	793	9,904.4	.	.	.	.	.	.	0.0	0.0
	794	29,713.2	.	.	.	.	.	.	0.0	0.0
	797	13,481.0	.	.	.	.	.	.	0.0	0.0
	799	9,904.4	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
184 - 274	344	217,621.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	347	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	366	191,760.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	369	132,196.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	386	135,222.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	389	112,937.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	391	38,792.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	795	22,560.0	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
184 - 366	789	9,904.4	.	.	.	.	.	.	0.0	0.0
	791	31,226.4	.	.	.	.	.	.	0.0	0.0
	798	13,756.1	.	.	.	.	.	.	0.0	0.0
									0.0	**0.0**
275 - 366	345	196,987.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	346	118,990.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	368	45,945.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	387	98,768.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	388	49,659.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	392	19,946.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	796	24,073.2							0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
367 - 549	729	25,586.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	731	29,713.2	0.0	0.0	0.0	0.0	0.0	0.0	.	0.0
	733	64,378.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	735	37,416.6	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	792	6,878.1	.	.	.	.	.	.	0.0	0.0
TOTAL			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
550 - 731	730	23,385.4	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	732	31,776.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	734	31,363.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	736	24,073.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			0.0	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 29. (cont'd) Abundance (millions) of yellowtail by stratum, Div 3L - Fall

Depth Range (m)	Strat	No. of trawlable Units	1990 WT 101	1991 WT 114,115	1992 WT 128-130 GA 226	1993 WT 145,146	1994 WT 161,162	1995 WT 176-179,181 TEL 22,23	1996 WT 196-198 TEL 41	1997 WT 213-217 TEL 57,58
732 - 914	737	31,226.4						0.0	0.0	0.0
	741	30,676.1							0.0	0.0
	745	47,871.3							0.0	0.0
	748	21,872.2							0.0	0.0
TOTAL								1,995.0	1,996.0	1,997.0
915 -1097	738	30,401.0						0.0	0.0	0.0
	742	28,337.6							0.0	0.0
	746	53,924.0							0.0	0.0
	749	17,332.7							0.0	0.0
TOTAL								0.0	0.0	0.0
1098 -1280	739	34,940.5							0.0	0.0
	743	29,025.4							0.0	0.0
	747	99,594.2							0.0	0.0
	750	76,484.0							0.0	0.0
TOTAL									0.0	0.0
1281 -1463	740	36,316.1							0.0	0.0
	744	38,517.1							0.0	0.0
	751	31,501.5							0.0	0.0
TOTAL									0.0	0.0
Abundance (millions)			4.4	2.1	2.0	2.6	0.1	3.6	6.7	6.1
Upper			8.7	3.3	3.1	6.6	0.3	6.8	14.1	16.9
Lower			0.1	1.0	0.9	-1.4	-0.1	0.3	-0.7	-4.7

Table 3 a Abundance (millions) of yellowtail by stratum, Div 3N - Fall										
Depth	Strat	No. of	1990	1991	1992	1993	1994	1995	1996	1997
Range		trawlable	WT 102	WT 113,114	WT 128,129	WT 144,145	WT 160,161	WT 176,177	TEL 41,42	WT 212-214
(m)		Units							AN 253	
<=56	375	219,134.8	8.9	12.7		16.8	72.3	87.3	47.5	46.6
	376	206,204.1	66.7	70.7	66.6	139.1	42.5	146.7	171.4	180.1
TOTAL			75.9	83.4	66.6	155.9	114.8	234.0	218.9	226.7
57 - 92	360	411,582.8	34.3	38.2	20.4	90.4	41.5	70.5	161.4	167.2
	361	254,900.7	21.8	68.7	68.8	80.7	98.2	114.7	106.0	101.3
	362	346,653.9	16.5	21.0	2.3	0.6	2.3	84.9	26.2	106.5
	373	346,653.9	0.4	0.9	0.0	0.0	2.5	4.8	0.0	12.2
	374	128,069.4	0.0	0.1		0.0	0.0	0.0	3.8	2.3
	383	92,716.2	0.0	0.0		0.0	0.0	0.0	0.0	0.0
TOTAL			73.0	128.9	91.5	171.7	144.5	274.9	297.4	389.5
93 - 183	359	57,913.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	377	13,756.1	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	382	89,002.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
184 - 274	358	30,951.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	378	19,121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	381	25,036.1		0.0		0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	357	22,560.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	379	14,581.5	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	380	15,957.1		0.0		0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	723	21,322.0		0.0		0.0	0.0	0.0	0.0	0.0
	725	14,443.9			0.0	0.0	0.0	0.0	0.0	0.0
	727	22,009.8				0.0	0.0	0.0	0.0	0.0
TOTAL				0.0	0.0	0.0	0.0	0.0	0.0	0.0
550 - 731	724	17,057.6		0.0		0.0	0.0	0.0	0.0	0.0
	726	9,904.4				0.0	0.0	0.0	0.0	0.0
	728	21,459.5					0.0	0.0	0.0	0.0
TOTAL				0.0		0.0	0.0	0.0	0.0	0.0
Abundance (millions)			148.5	212.3	158.1	327.7	259.3	509.0	516.3	616.2
Upper			243.8	349.7	363.3	540.0	430.5	706.4	727.2	771.6
Lower			53.3	74.9	-47.2	115.3	88.2	311.6	305.4	460.8

Table 3/ Abundance (millions) of yellowtail by stratum, Div 30 - Fall										
Depth	Strat	No. of	1990	1991	1992	1993	1994	1995	1996	1997
Range		trawlable	WT 102	WT113,114	WT 128	WT 144	WT 160,161	WT 176,177	WT 200	WT 212,213
(m)		Units							AN 253, TEL 42	
57 - 92	330	287,365.0	0.4	0.0	0.4	1.0	0.0	2.4	0.0	2.1
	331	62,728.0	0.4	1.8	0.5	1.0	0.0	0.1	0.0	0.1
	338	261,091.0	2.2	5.2	0.5	2.3	0.1	25.3	0.1	10.0
	340	236,055.0	1.3	8.5	0.1	1.2	0.4	1.1	0.0	6.7
	351	346,654.0	12.8	5.5	0.6	12.2	2.4	5.5	4.0	37.2
	352	354,908.0	17.0	61.2	53.4	20.1	24.7	43.3	47.7	88.4
	353	176,353.0	4.9	0.0	0.0	1.5	0.0	1.5	1.2	14.6
TOTAL			39.0	82.2	55.5	39.3	27.6	79.2	53.0	159.1
93 - 183	329	236,743.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	332	144,026.0	0.1	0.0	0.3	2.3	0.7	0.5	0.4	0.0
	337	130,408.0	0.0	0.1	0.0	0.0	0.0	0.0	2.5	0.2
	339	80,473.0	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0
	354	65,204.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
TOTAL			0.5	0.3	0.3	2.3	0.8	0.5	3.0	0.2
184 - 274	333	20,221.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
	336	16,645.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	355	14,169.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
275 - 366	334	13,206.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
	335	7,979.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	356	8,391.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
367 - 549	717	22,835.0	0.0			0.0	0.0	0.0		0.0
	719	10,455.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	721	10,455.0		0.0		0.0	0.0	0.0	0.0	0.0
TOTAL			0.0	0.0		0.0	0.0	0.0	0.0	0.0
550 - 731	718	18,433.0				0.0	0.0	0.0		0.0
	720	14,443.9				0.0	0.0	0.0	0.0	
	722	12,793.0		0.0		0.0	0.0	0.0	0.0	0.0
TOTAL				0.0		0.0	0.0	0.0	0.0	0.0
Abundance (millions)			39.6	82.7	55.8	41.6	28.5	79.7	56.2	159.2
Upper			59.0	130.4	126.9	69.3	54.5	128.9	93.5	214.2
Lower			20.1	34.9	-15.3	13.9	2.5	30.4	18.8	104.1

Table 32 Abundance (millions) at age (sexes combined) for fall data by year, Div 3LNO yellowtail

Age	1990	1991	1992	1993	1994	1995	1996	1997
0								
1						8.8	0.9	2.7
2	1.3	1.6	1.2	0.9	2.3	83.9	17.8	7.9
3	11.3	37.2	18.6	6.6	5.9	122.4	63.6	44.4
4	28.9	64.5	53.5	74.4	38.5	89.7	132.6	125.7
5	44.3	46.9	34.0	104.5	48.4	70.6	145.1	204.9
6	38.5	61.2	33.7	77.5	70.9	87.7	97.9	178.9
7	45.0	52.4	45.6	67.3	69.8	84.4	82.7	142.5
8	19.9	29.8	25.0	36.4	50.5	43.7	37.7	71.4
9	2.2	3.4	4.2	3.8	1.7	0.8	0.9	3.2
Total (millions)	192.5	297.1	215.9	372.0	288.0	592.1	579.2	781.5
Upper	289.0	438.7	410.7	586.3	460.6	793.2	791.7	945.2
Lower	95.9	155.5	21.1	157.7	115.3	391.0	366.6	617.8

Table 35 Biomass ('000t) at age (sexes combined) for fall data by year, Div. 3LNO Yellowtail

Age	1990	1991	1992	1993	1994	1995	1996	1997
0								
1						0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	1.2	0.2	0.1
3	1.0	1.9	1.0	0.3	0.3	4.9	2.6	1.8
4	3.7	5.8	5.3	8.5	4.1	8.4	12.6	12.2
5	9.0	8.5	6.0	19.6	9.1	12.8	24.5	35.0
6	13.8	18.3	10.2	24.2	22.4	27.6	29.3	51.4
7	22.1	24.4	20.6	32.2	32.8	39.0	37.9	62.3
8	13.5	19.9	16.8	25.4	35.5	30.7	26.6	47.3
9	2.1	3.2	3.9	3.8	1.8	0.9	1.0	3.0
10								
Total ('000t)	66.4	82.8	64.2	114.8	106.8	126.8	136.0	215.0

Table 34. Mean length at age (sexes combined) by year, Div. 3LNO yellowtail - Spring

Age	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
1													7.84	7.16
2	15.55	10.50		9.16	10.50	10.62	10.50	9.49	12.72	10.50			11.22	11.68
3	21.68	20.69	19.96	16.43	16.93	17.11	18.75	16.39	17.76	18.64	17.59	17.30	16.49	16.78
4	27.22	22.08	22.24	19.44	21.29	21.51	21.47	21.57	21.65	22.36	23.57	23.31	22.15	22.23
5	33.25	27.92	26.38	25.63	24.74	26.08	25.13	26.98	26.90	27.29	27.83	27.58	26.77	26.87
6	37.38	33.14	31.62	31.79	30.67	31.80	30.90	31.92	32.39	32.42	32.58	32.56	32.13	32.31
7	40.95	37.31	36.66	36.76	35.30	37.34	36.06	36.93	37.19	36.99	37.12	37.15	36.77	36.91
8	46.79	41.48	40.75	40.57	39.89	41.56	40.38	41.95	41.81	42.17	42.30	42.49	42.29	42.22
9	52.50	46.49	45.70	45.73	45.06	46.78	45.45	46.86	47.63	47.80	48.57	49.14	49.60	47.13
10		50.66	49.57	49.84	49.75	49.09	51.32							

Table 35. Mean length at age (sexes combined) by year, Div. 3LNO yellowtail - Fall

Age	1990	1991	1992	1993	1994	1995	1996	1997
0								
1						7.7	10.7	7.5
2	16.5	12.5	8.5	8.5	10.5	11.9	11.4	11.6
3	21.8	18.2	18.3	17.4	17.3	16.5	16.8	17.0
4	24.5	21.8	22.3	23.1	22.6	21.8	22.2	22.7
5	28.4	27.4	26.9	27.2	27.3	27.1	26.7	27.2
6	34.2	32.2	32.1	32.2	32.5	32.5	32.2	32.2
7	37.9	37.2	36.7	37.0	37.1	36.9	36.9	36.9
8	42.0	41.9	41.8	41.9	42.4	42.3	42.5	42.3
9	47.1	46.9	46.4	47.3	48.7	49.3	48.1	47.1

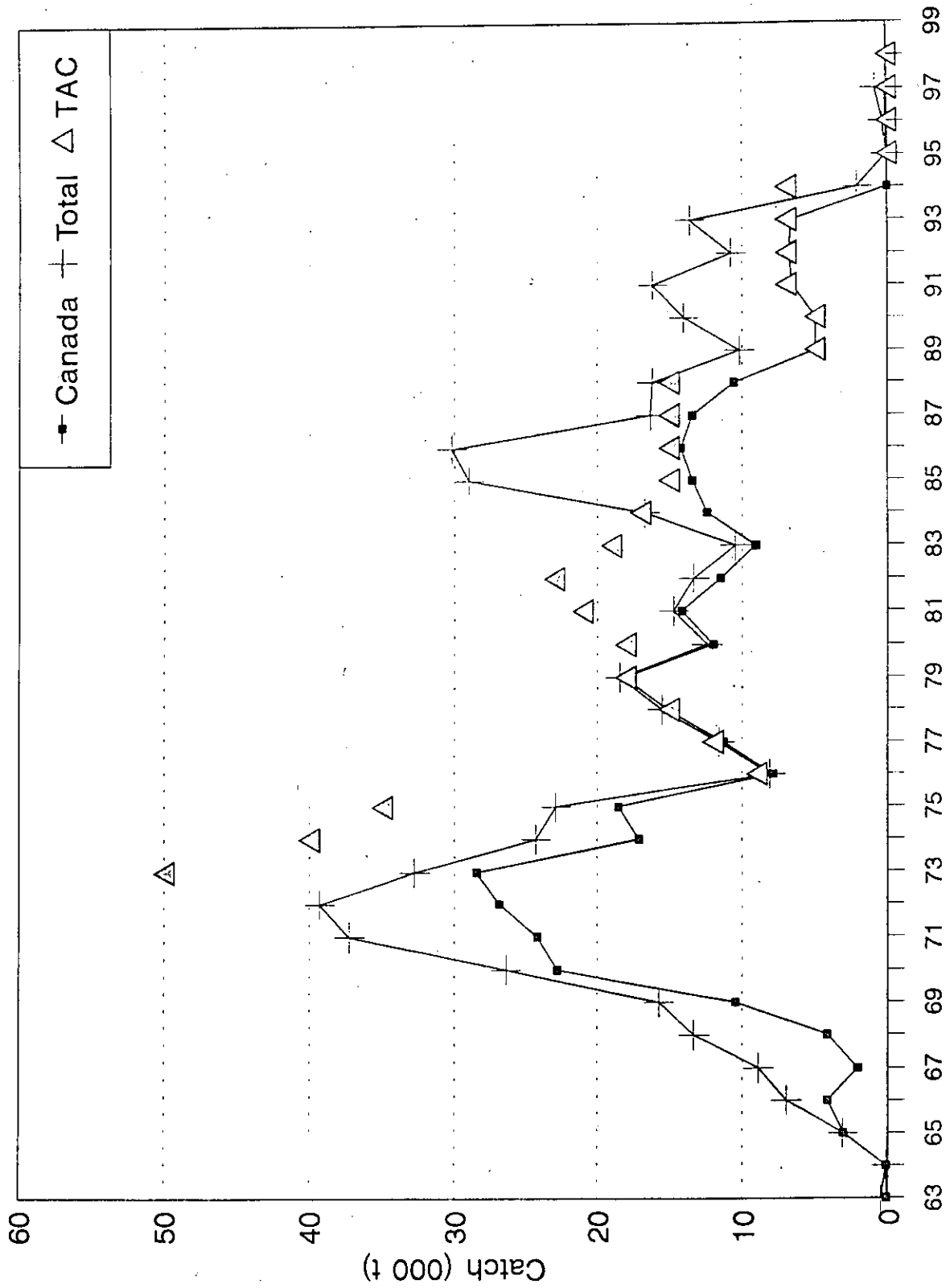

Fig. 1. Catches and TACs of yellowtail flounder in Div. 3LNO.

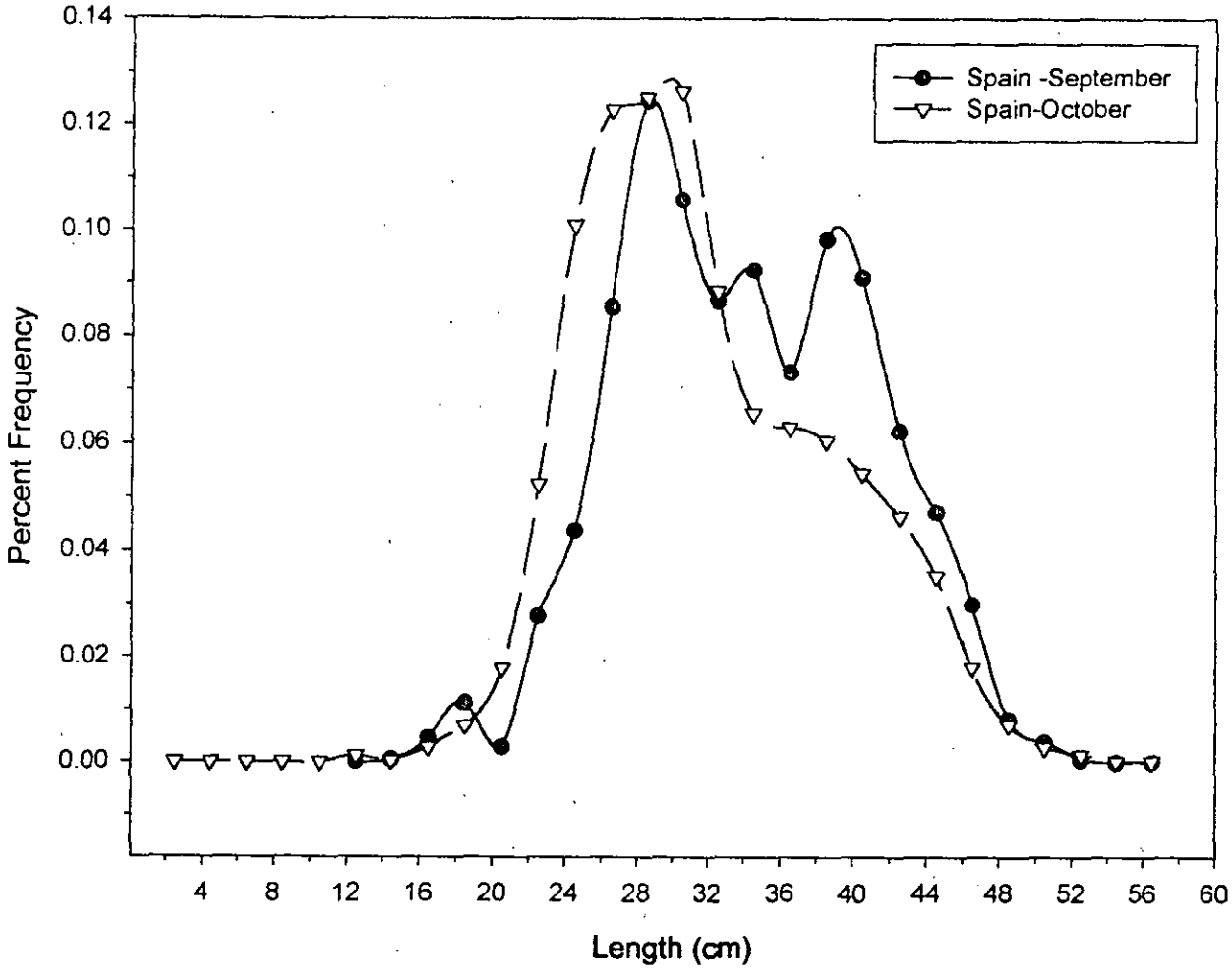

Fig. 2. Length frequency distribution of yellowtail flounder from the 1997 Spanish trawler catches.

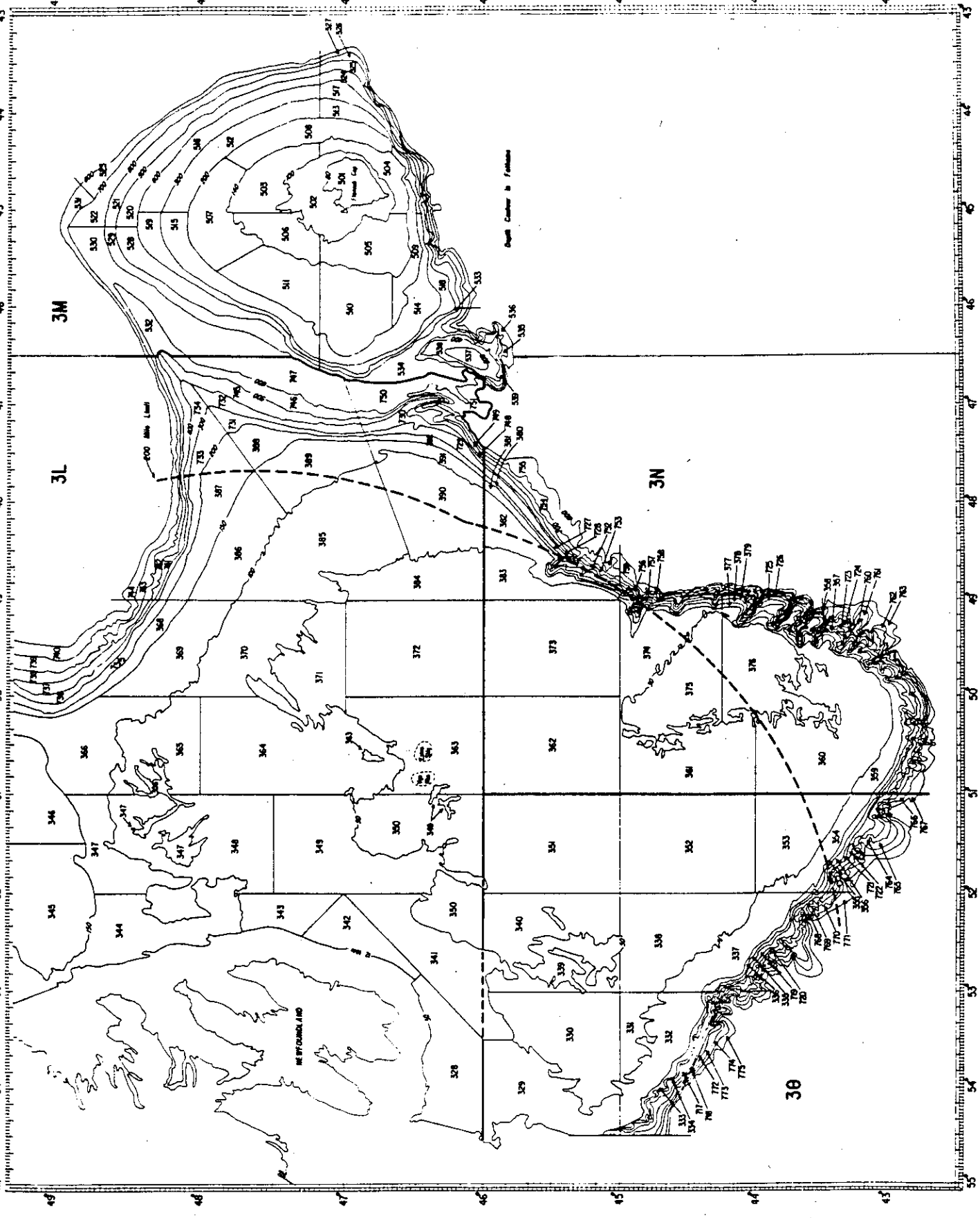

Fig. 3. Stratification design for the Grand Bank, NAFO Div. 3LNO.

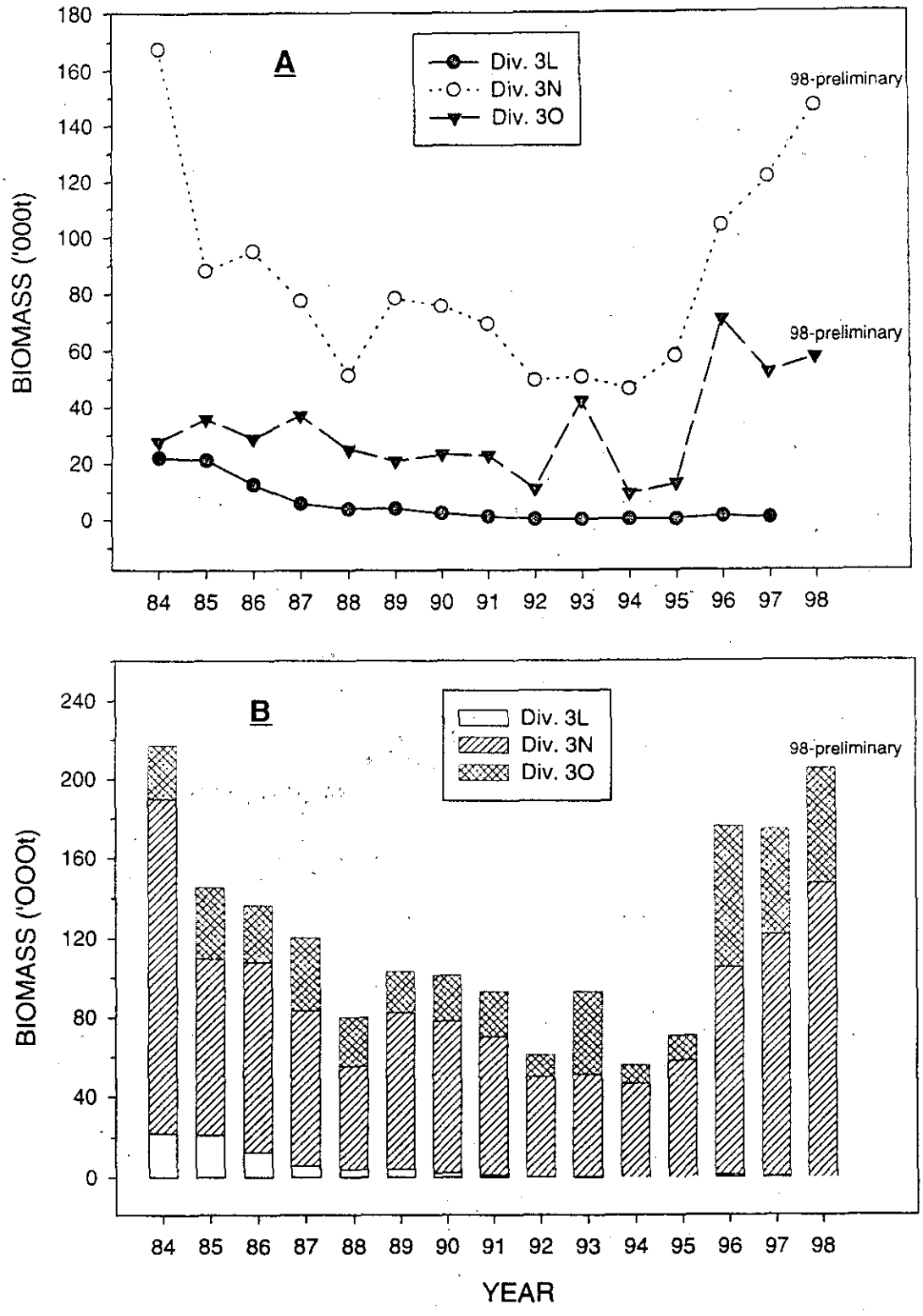

Fig. 4. A. Biomass estimates of yellowtail flounder by Division from the Canadian spring surveys from 1984-98 in Campelen trawl units. The 1998 estimate is preliminary for Div. 3NO only.
B. Cumulative biomass estimates of yellowtail flounder from Division 3LNO from the Canadian spring surveys from 1984-98 in Campelen trawl units. The 1998 estimate is preliminary for Div. 3NO only.

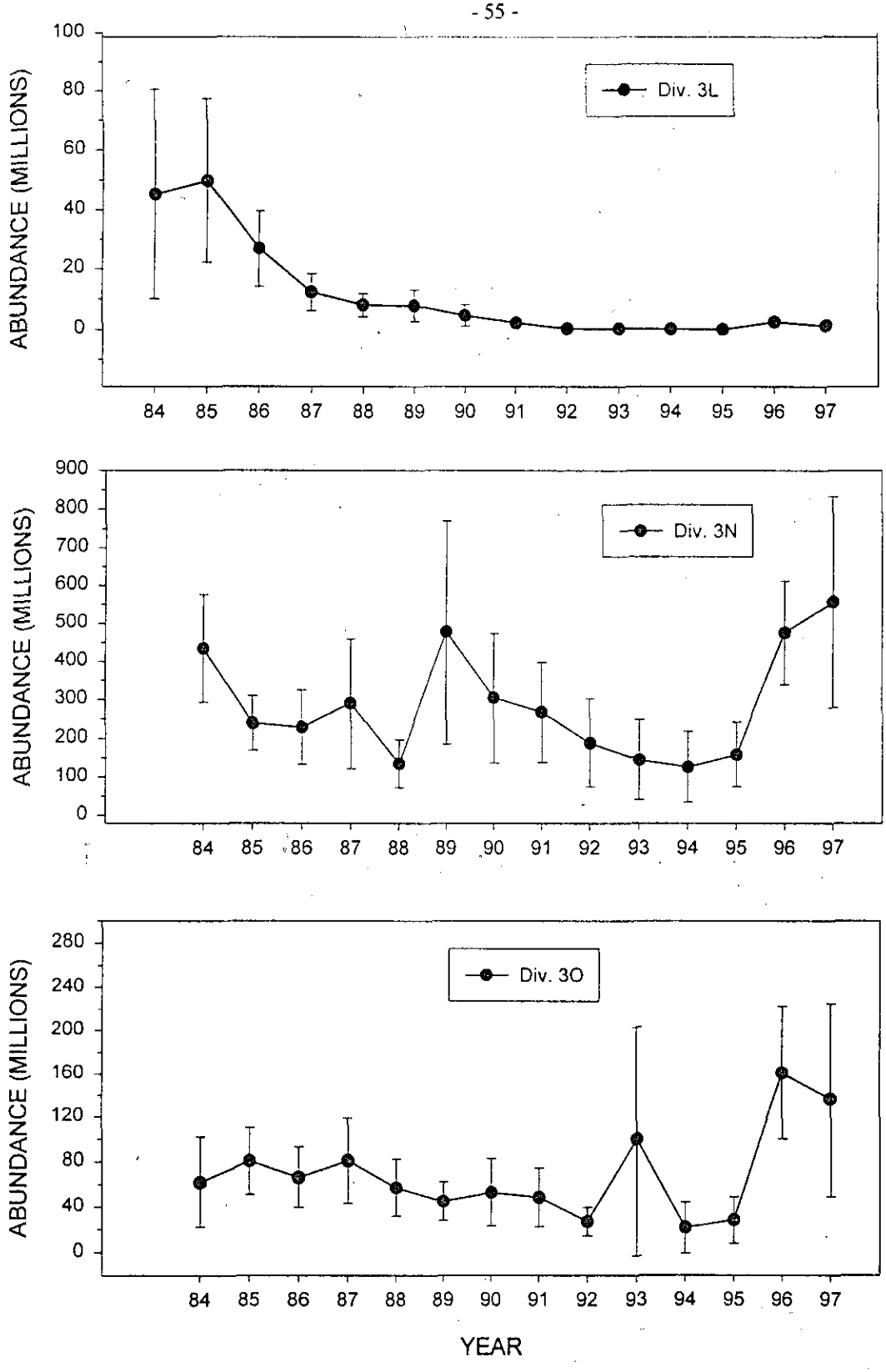

Fig. 5. Abundance estimates of yellowtail flounder (with approx. 95% CI) from Canadian spring surveys in Campelen trawl units, 1984-97, by NAFO Division.

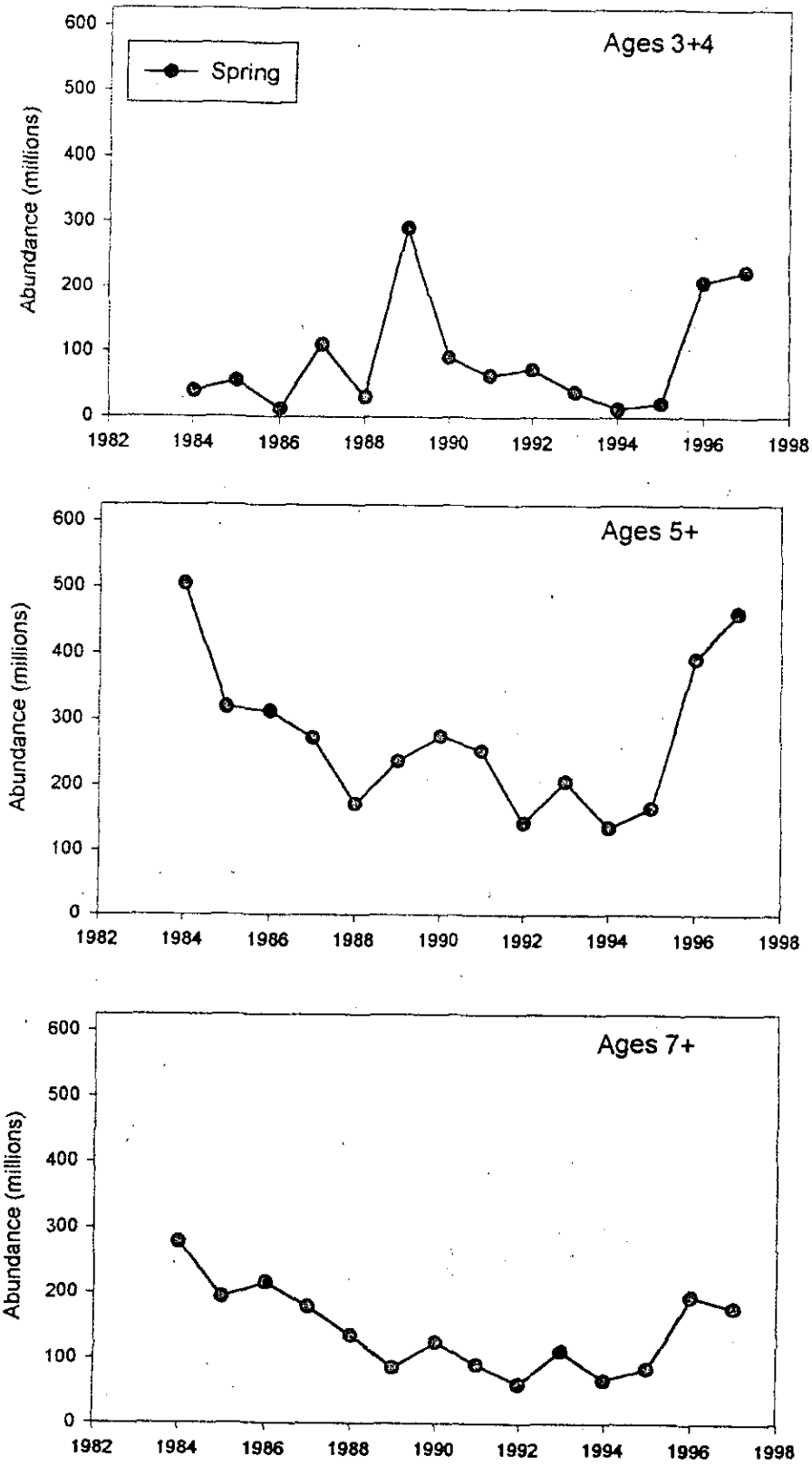

Fig. 6. 1984-97 spring survey estimates of pre-recruit, partially recruited and fully recruited ages of yellowtail flounder from Div. 3LNO in Campelen units.

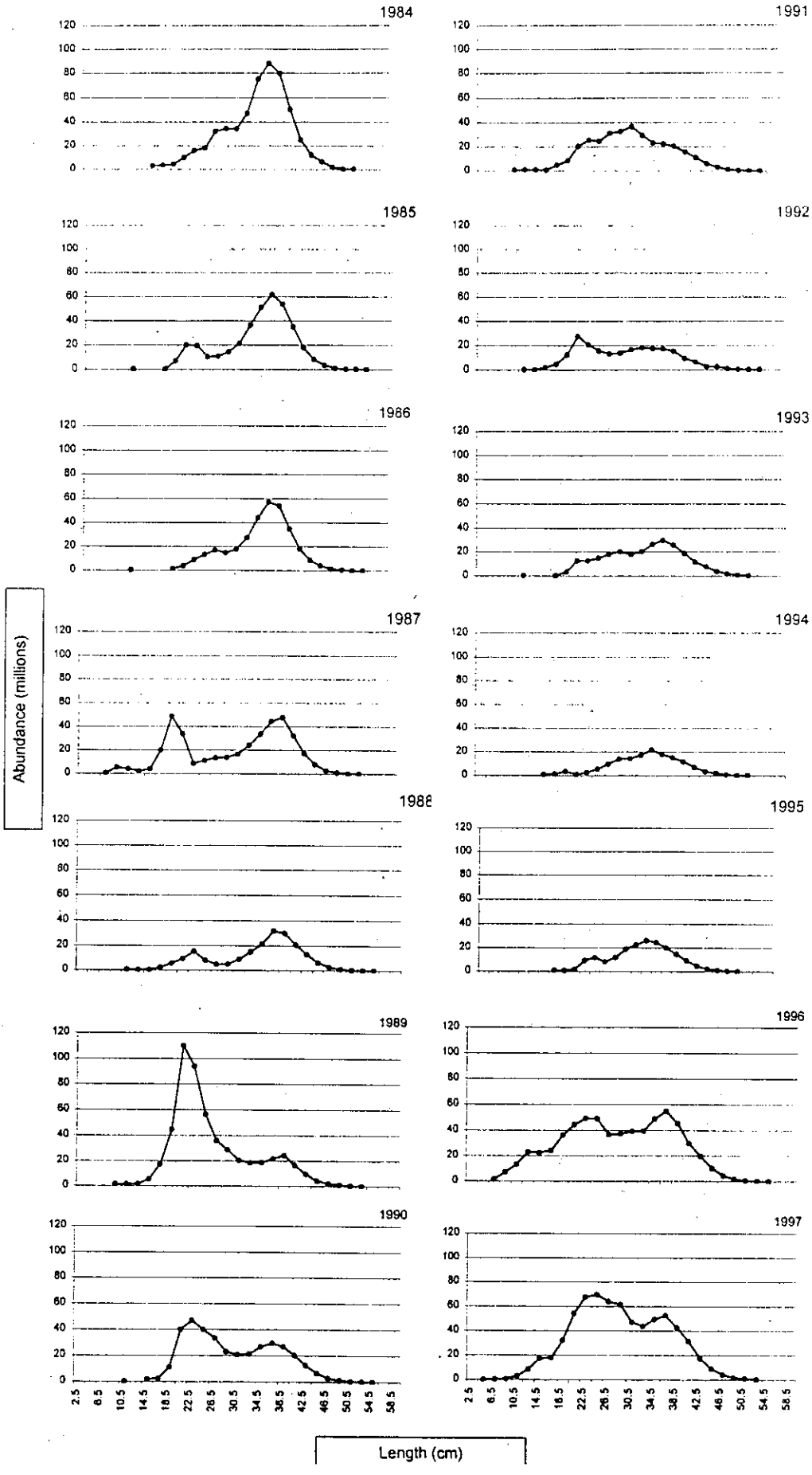

Fig. 7. Abundance of length of spring survey catches of Div. 3LNO.

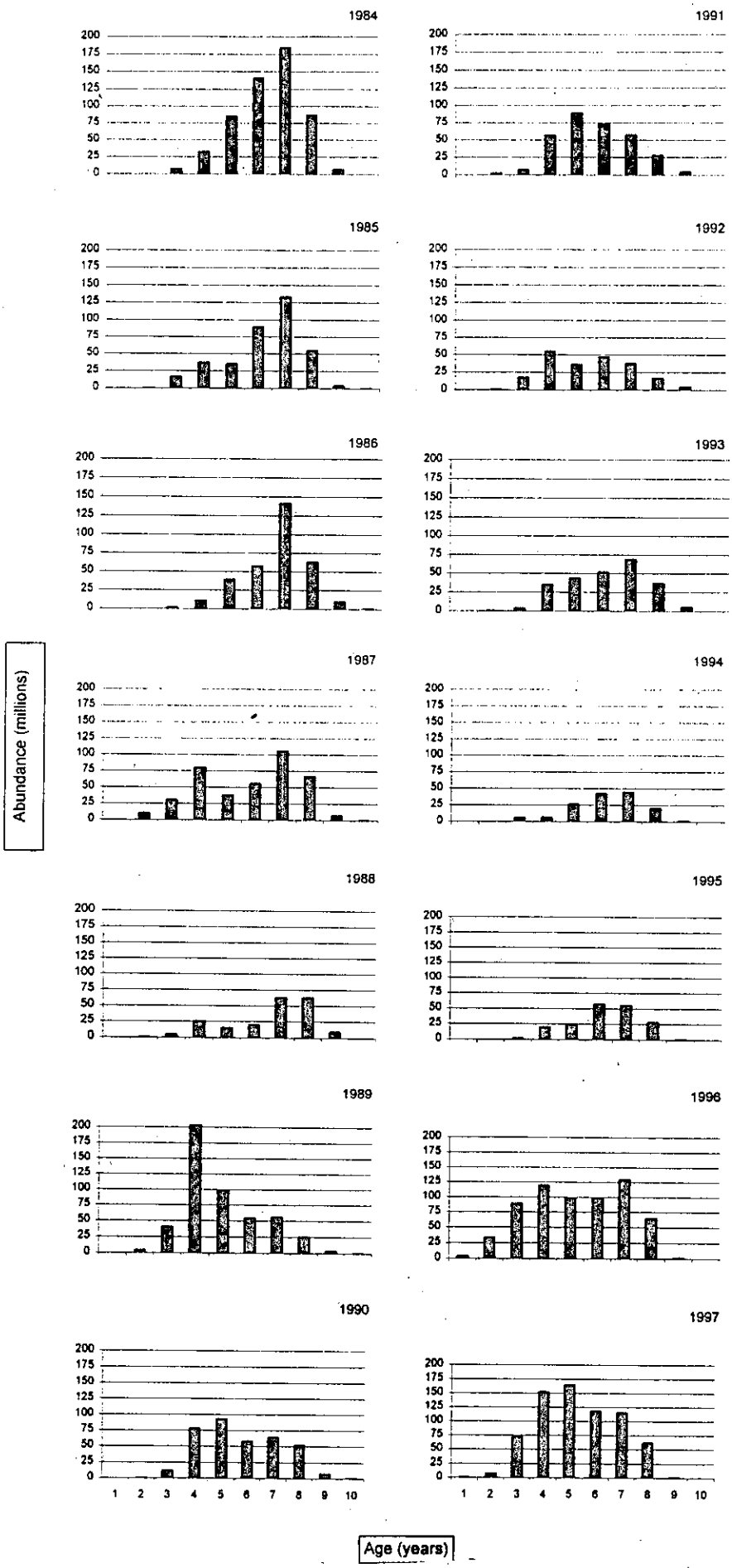

Fig. 8. Abundance-at-age of Div. 3LNO yellowtail flounder from 1984-97 spring surveys.

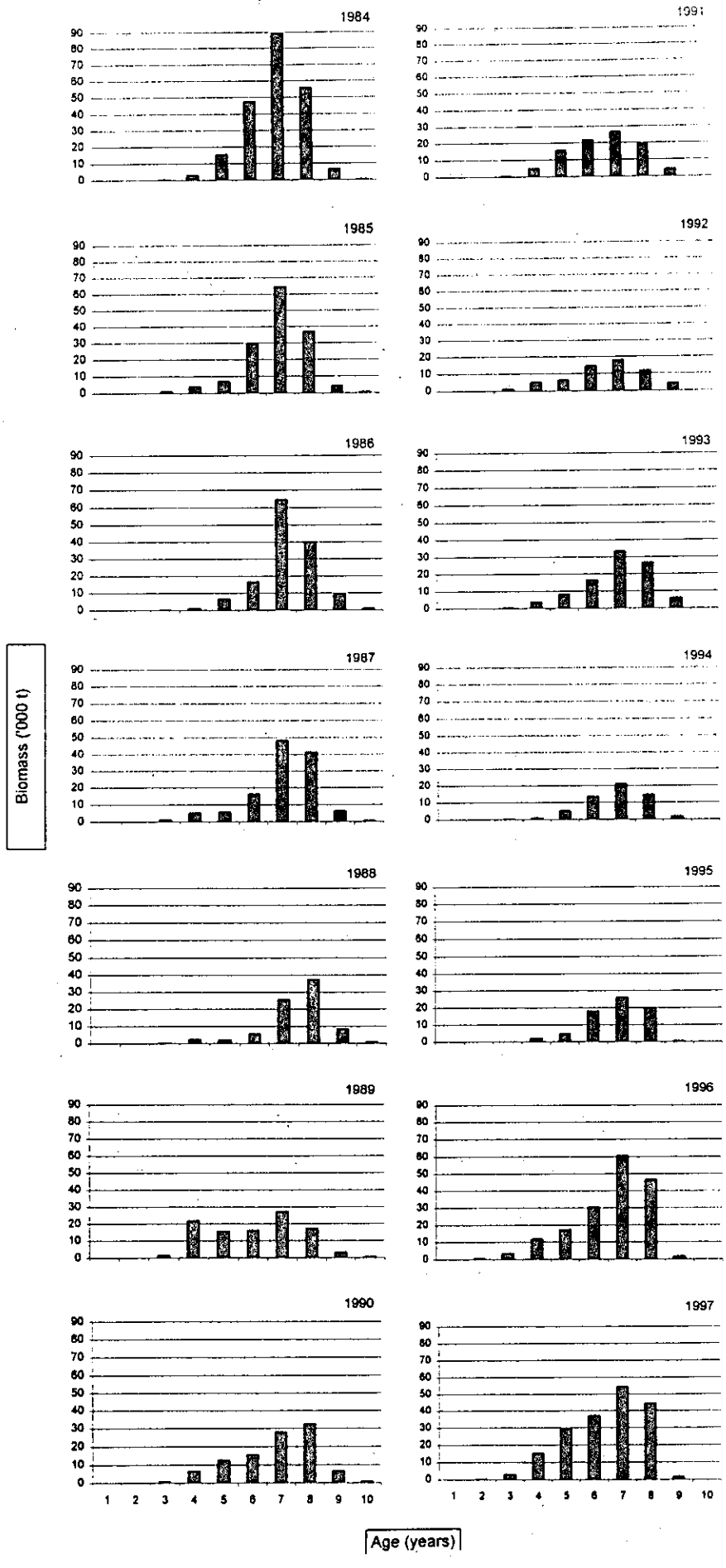

Fig. 9. Biomass-at-age of Div. 3LNO yellowtail flounder from 1984-97 spring surveys.

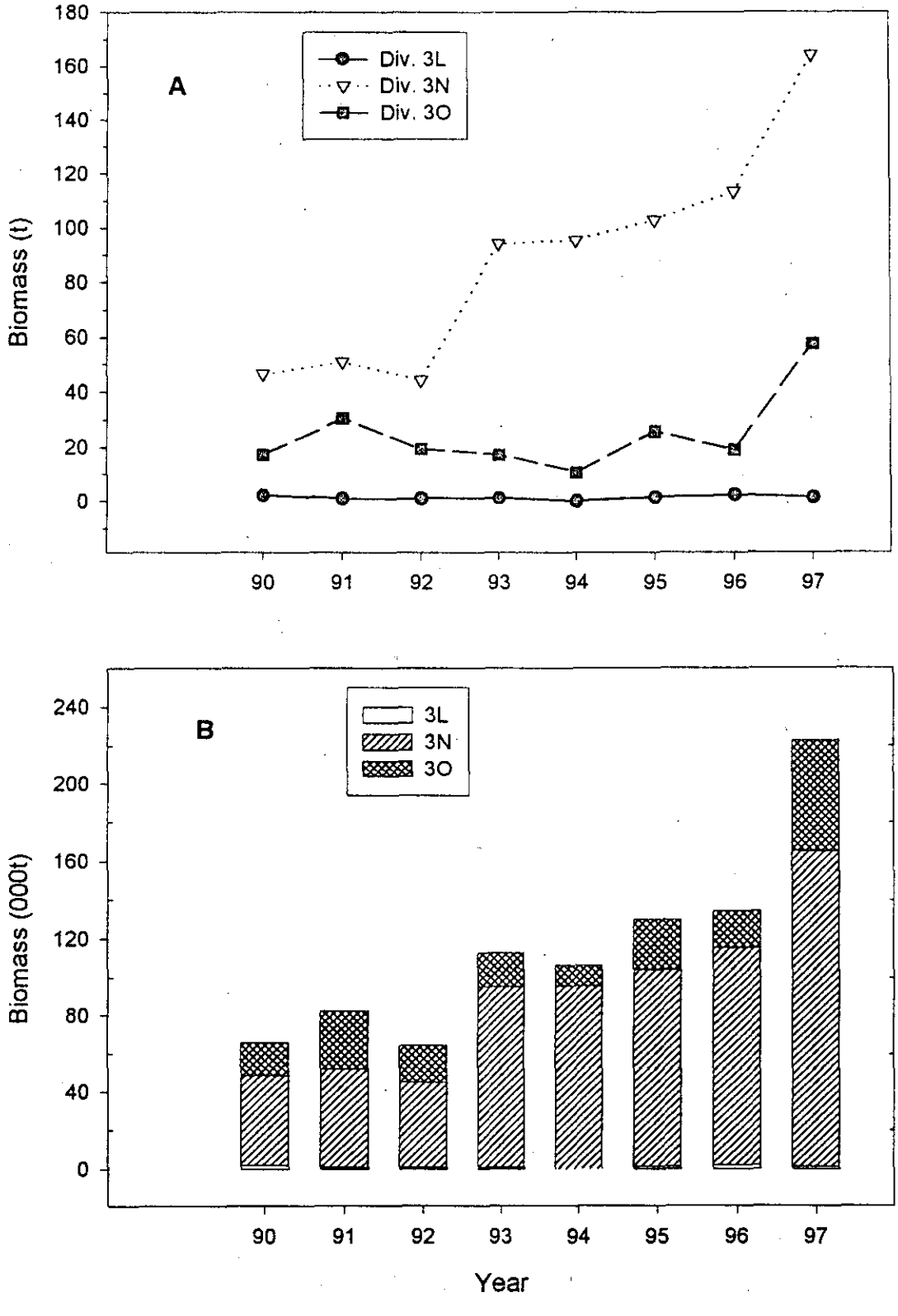

Fig. 10. A. Biomass estimates of yellowtail flounder from the Canadian fall surveys from 1990-97 in Campelen trawl units.
B. Cumulative biomass estimates of yellowtail flounder from Division 3LNO from the Canadian fall surveys from 1990-97 in Campelen trawl units.

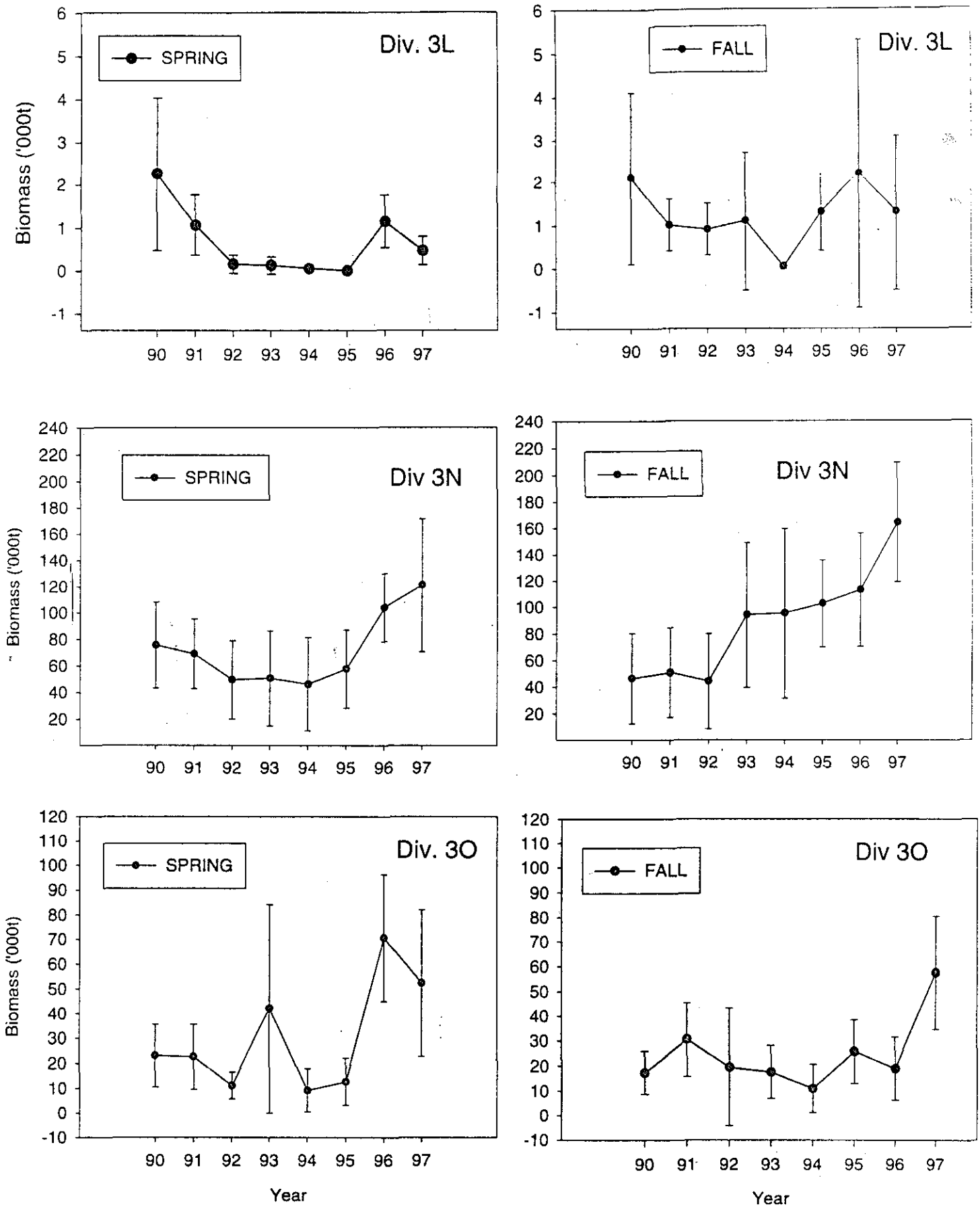

Fig. 11. Comparison of 1990-97 spring and fall estimates of biomass and associated variance (confidence intervals) using Campelen data.

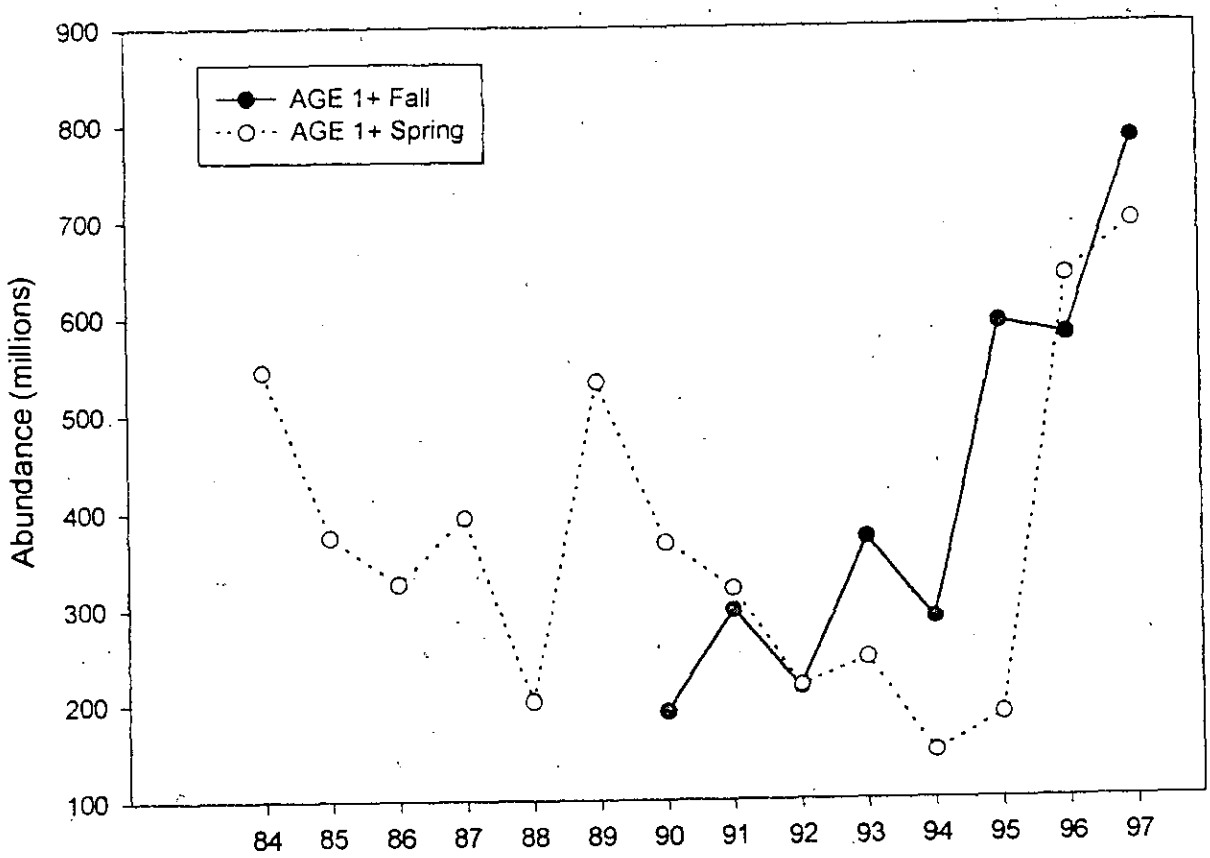

Fig. 12. Comparison of age 1 + abundance from spring and fall surveys in Div. 3LNO.

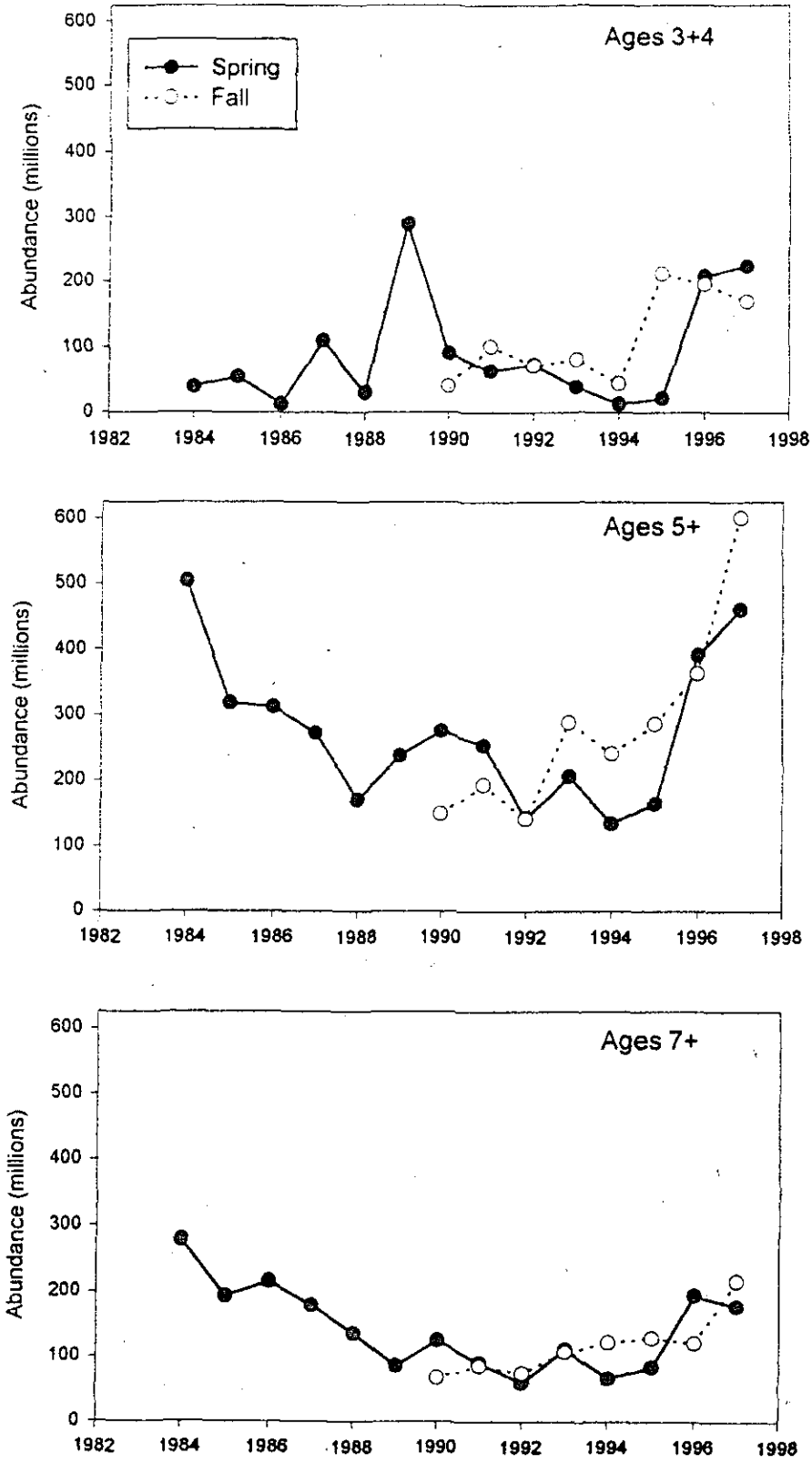

Fig. 13. Comparison of 1984-97 spring and fall survey estimates of pre-recruit, partially recruited and fully recruited ages of yellowtail flounder from Div. 3LNO in Campelen units.

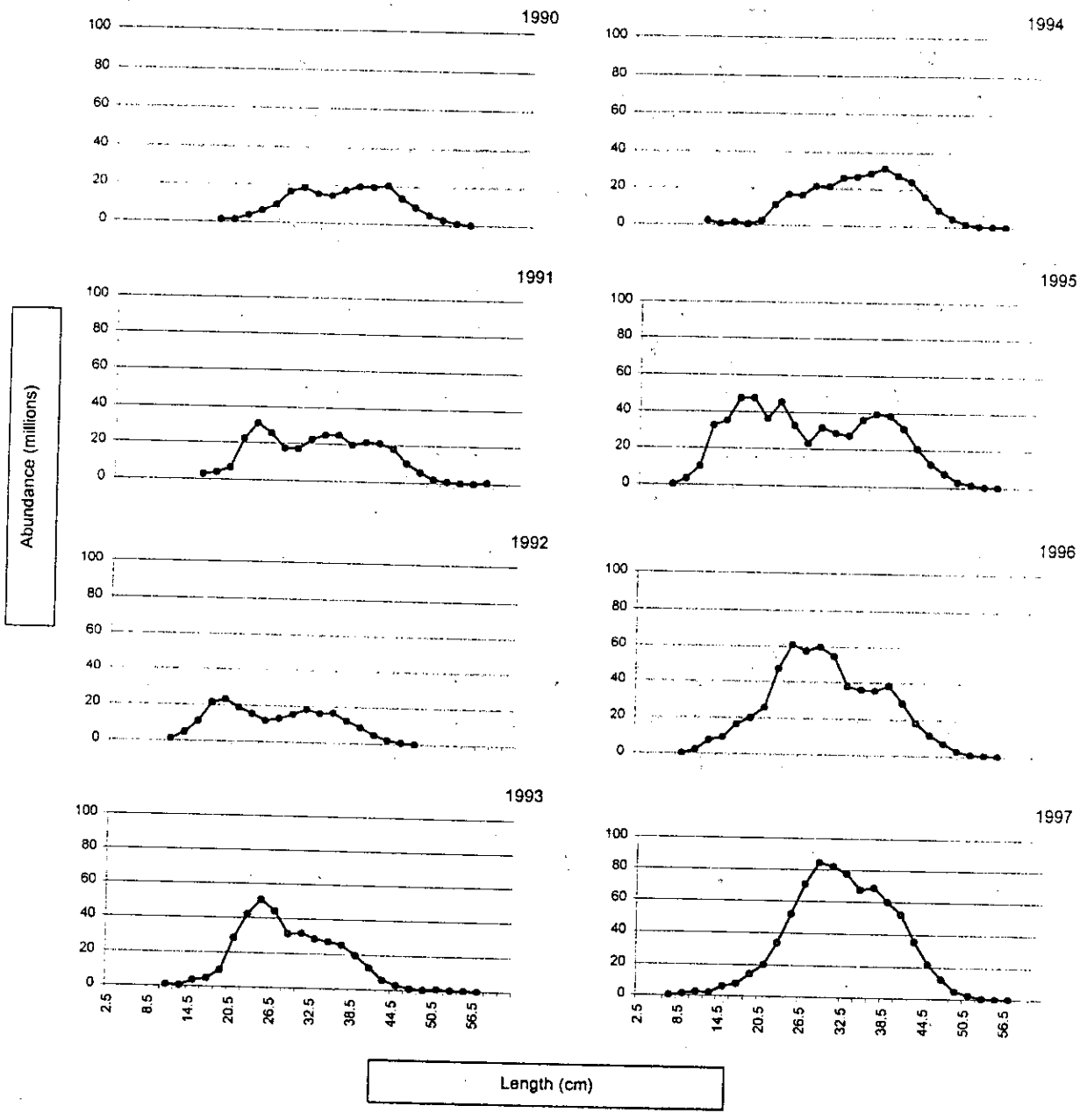

Fig. 14. Abundance-at-length of yellowtail flounder in the 1990-97 fall surveys of Div. 3LNO

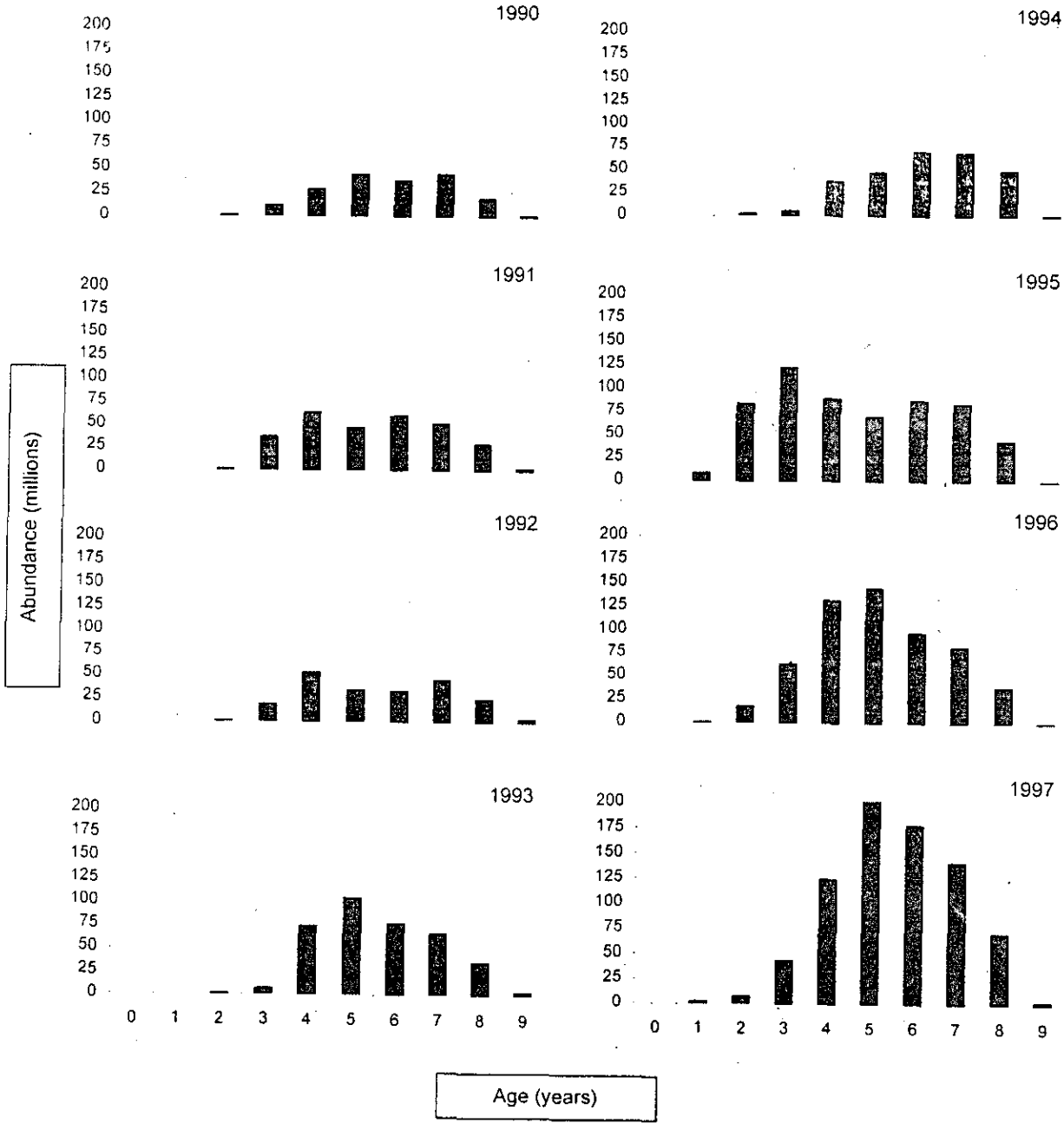

Fig. 15. Abundance-at-age of yellowtail flounder in the 1990-97 fall surveys of Div. 3LNO

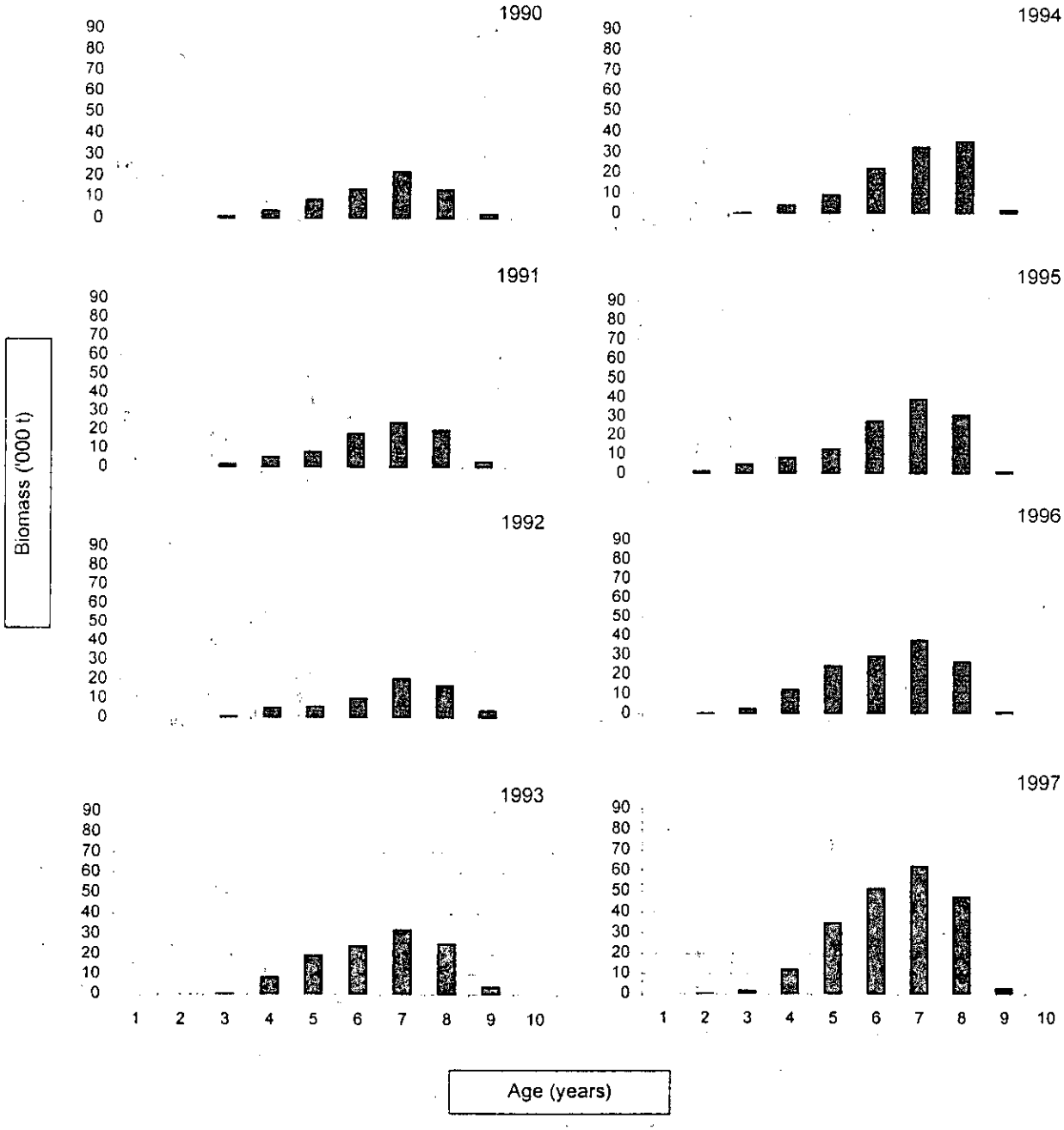

Fig. 16. Biomass-at-length of yellowtail flounder in the 1990-97 fall surveys of Div. 3LNO

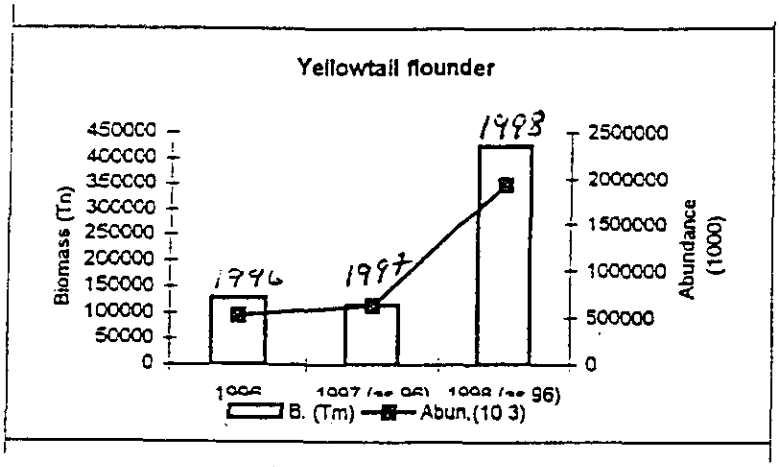

Fig. 17. Abundance and biomass indices from the Spanish surveys in the Regulatory Area in the spring of 1996-98.

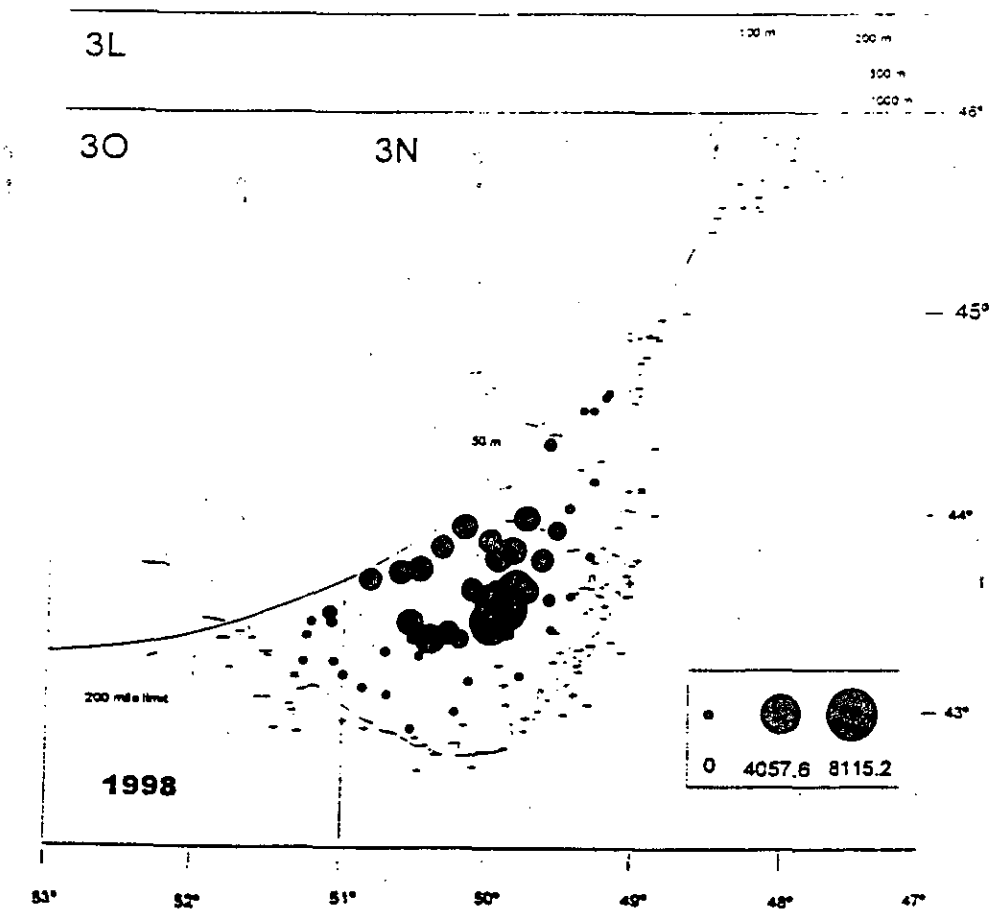

Fig. 18. Distribution of yellowtail flounder catches from the 1998 Spanish bottom trawl survey in NAFO Div. 3NO. Symbols represent catch in weight (Kg) per haul (square root scale).

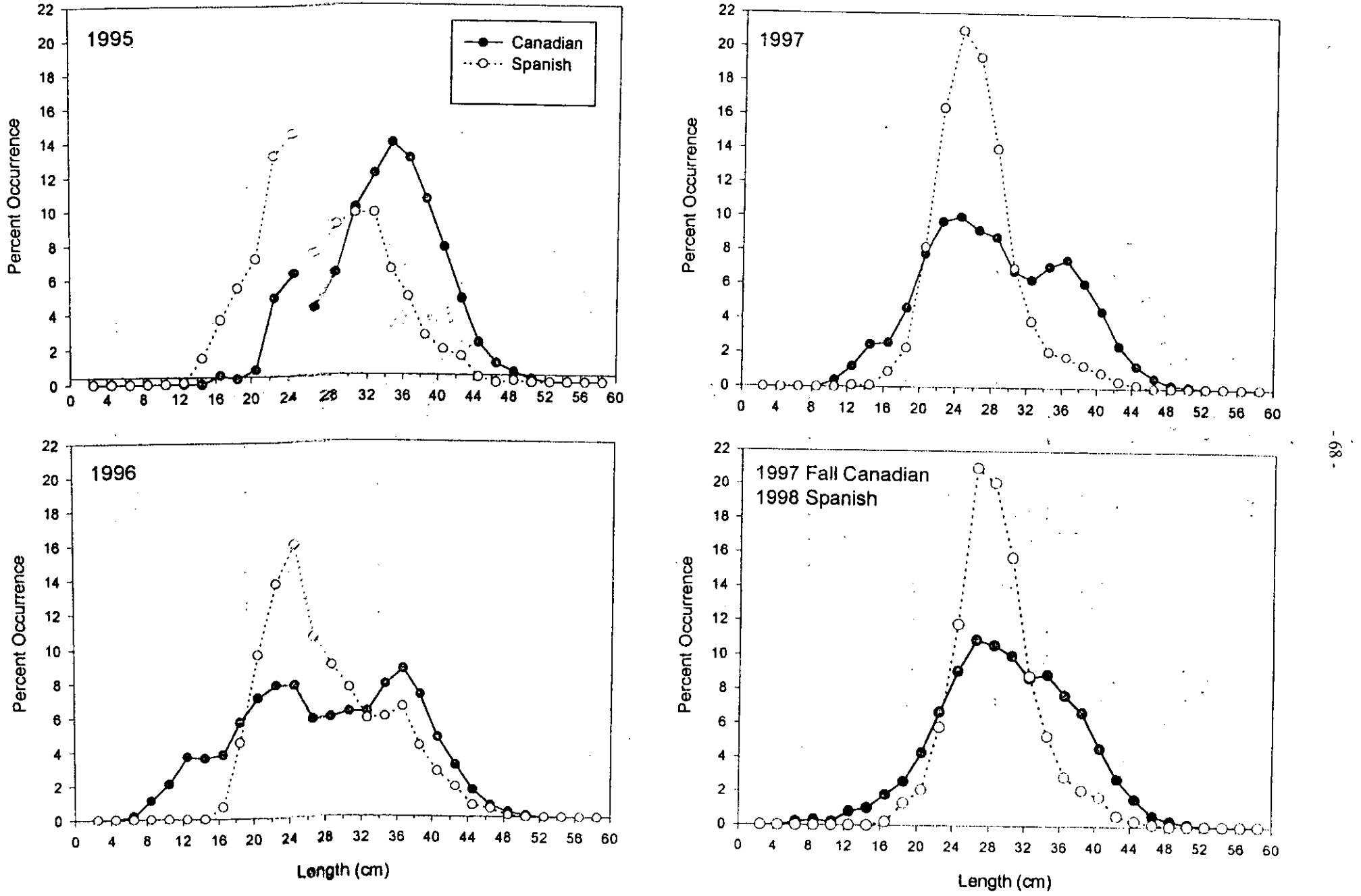

Fig. 19 Comparison of length frequencies of yellowtail flounder from Canadian surveys of Div. 3LNO and Spanish surveys of the Regulatory Area of Div. 3NO. 1995-98.

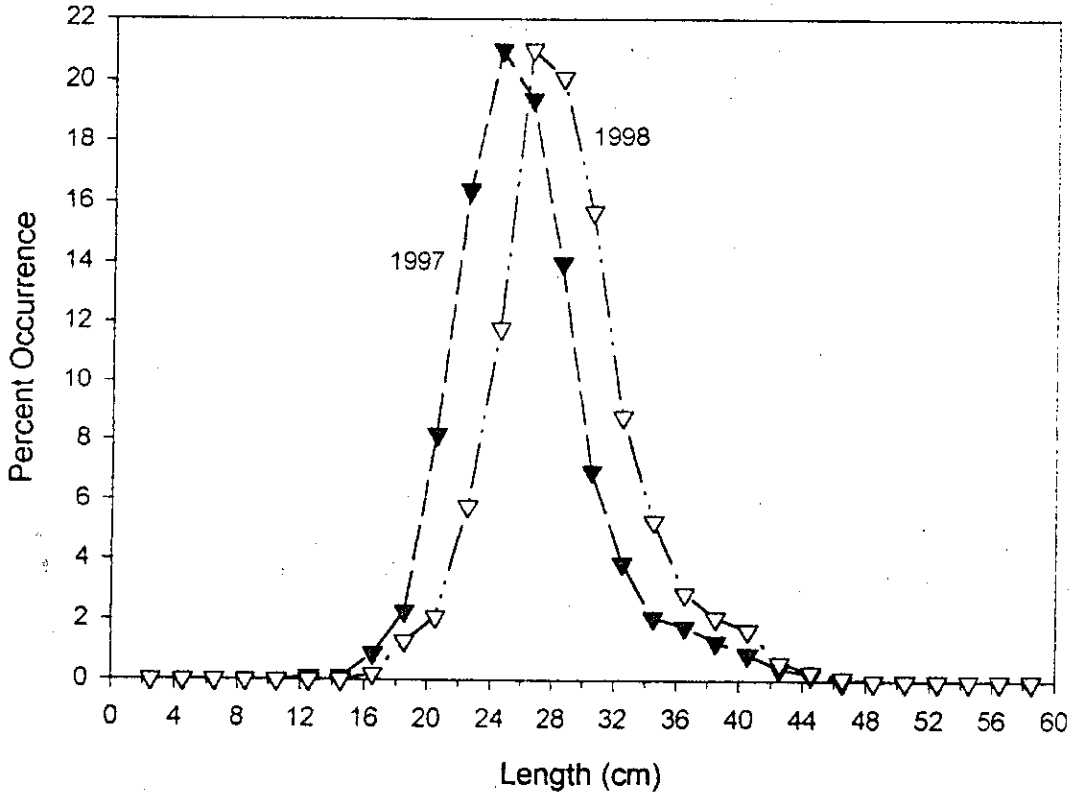

Fig. 20. Length frequencies of yellowtail flounder in Spanish spring surveys in the NAFO Regulatory Area of Div. 3NO.

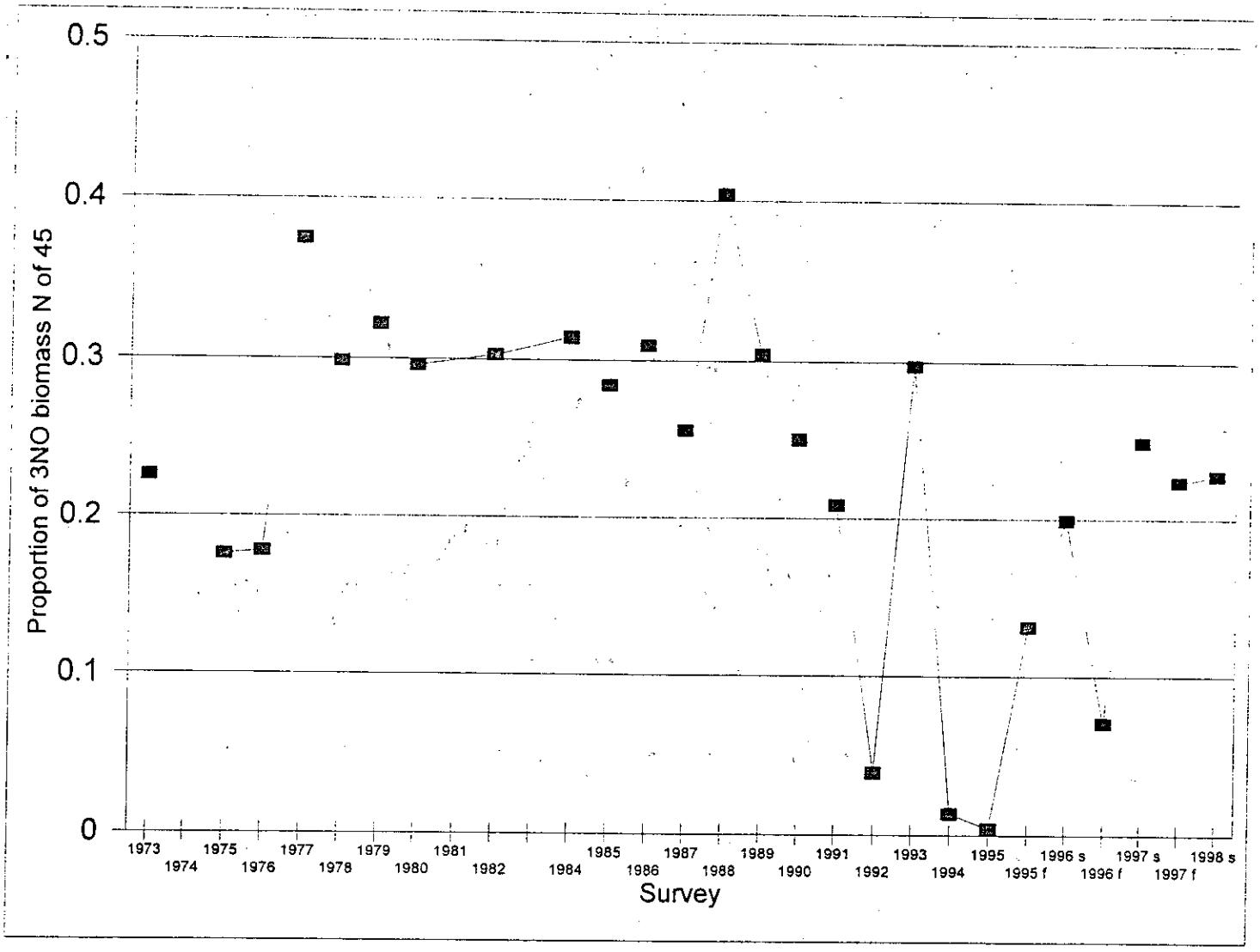

Fig. 21. The proportion of yellowtail flounder biomass distributed north of 45 N in The 1975-95 Engel trawl surveys during the spring and the 1995 (fall only) to 1998 (spring only) spring and fall surveys with the Campelen trawl.

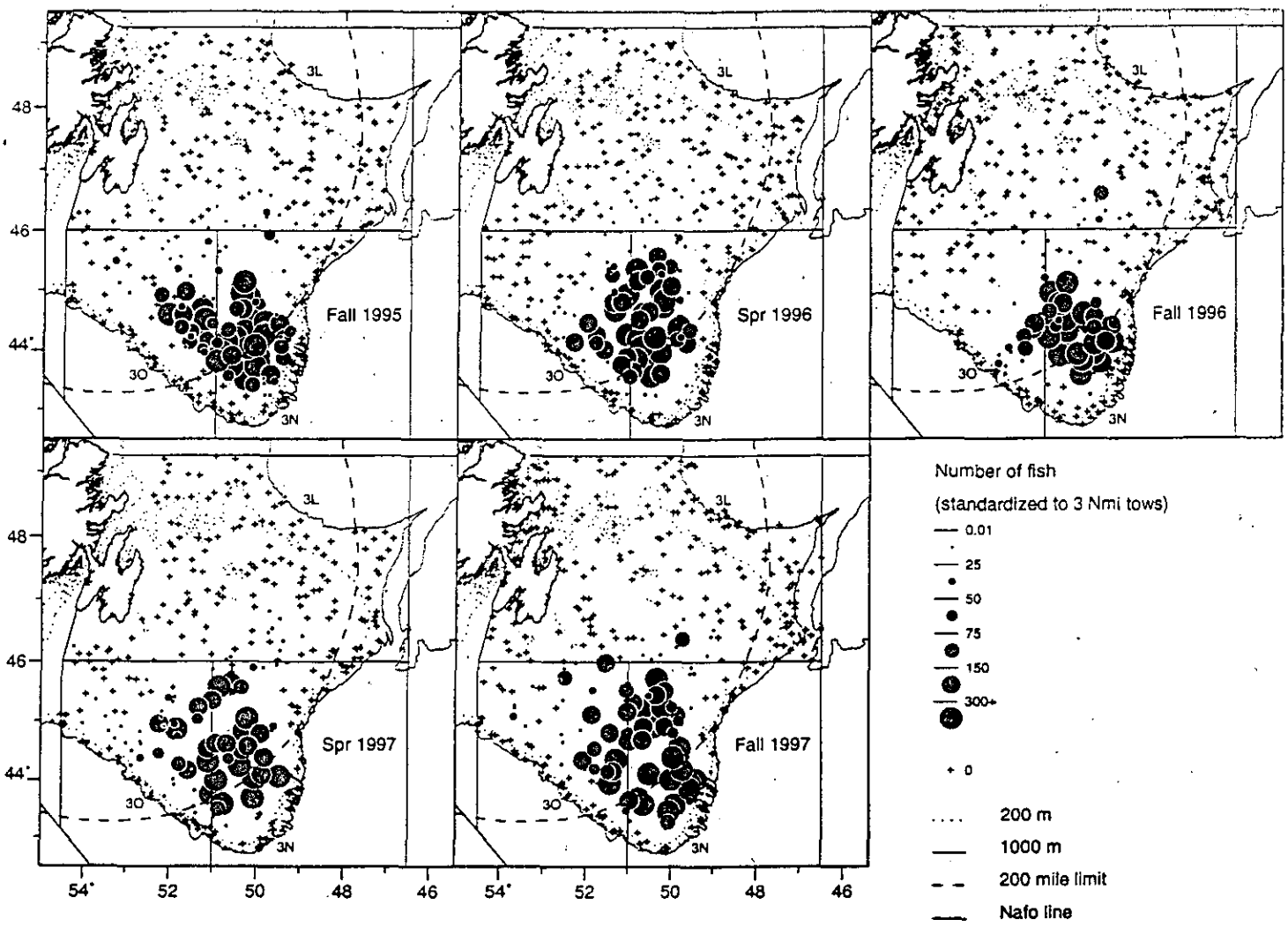

Fig. 22. Distribution of yellowtail flounder (number per set) from stratified random surveys in Div. 3LNO for fall 1995, spring/fall 1996, and spring/fall 1997.

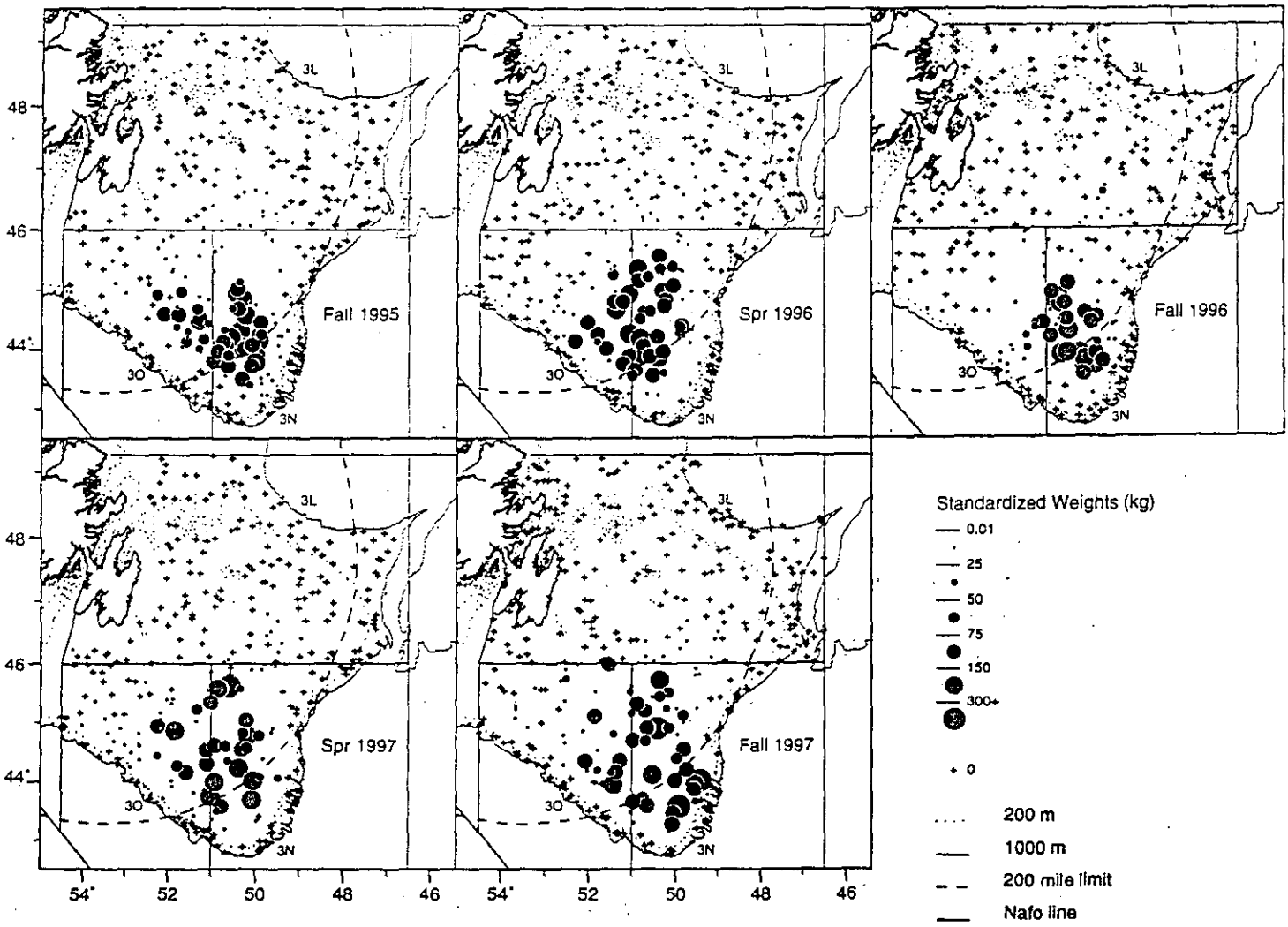

Fig. 23. Distribution of yellowtail flounder (kg per set) from stratified random surveys in Div. 3LNO for fall 1995, spring/fall 1996, and spring/fall 1997.

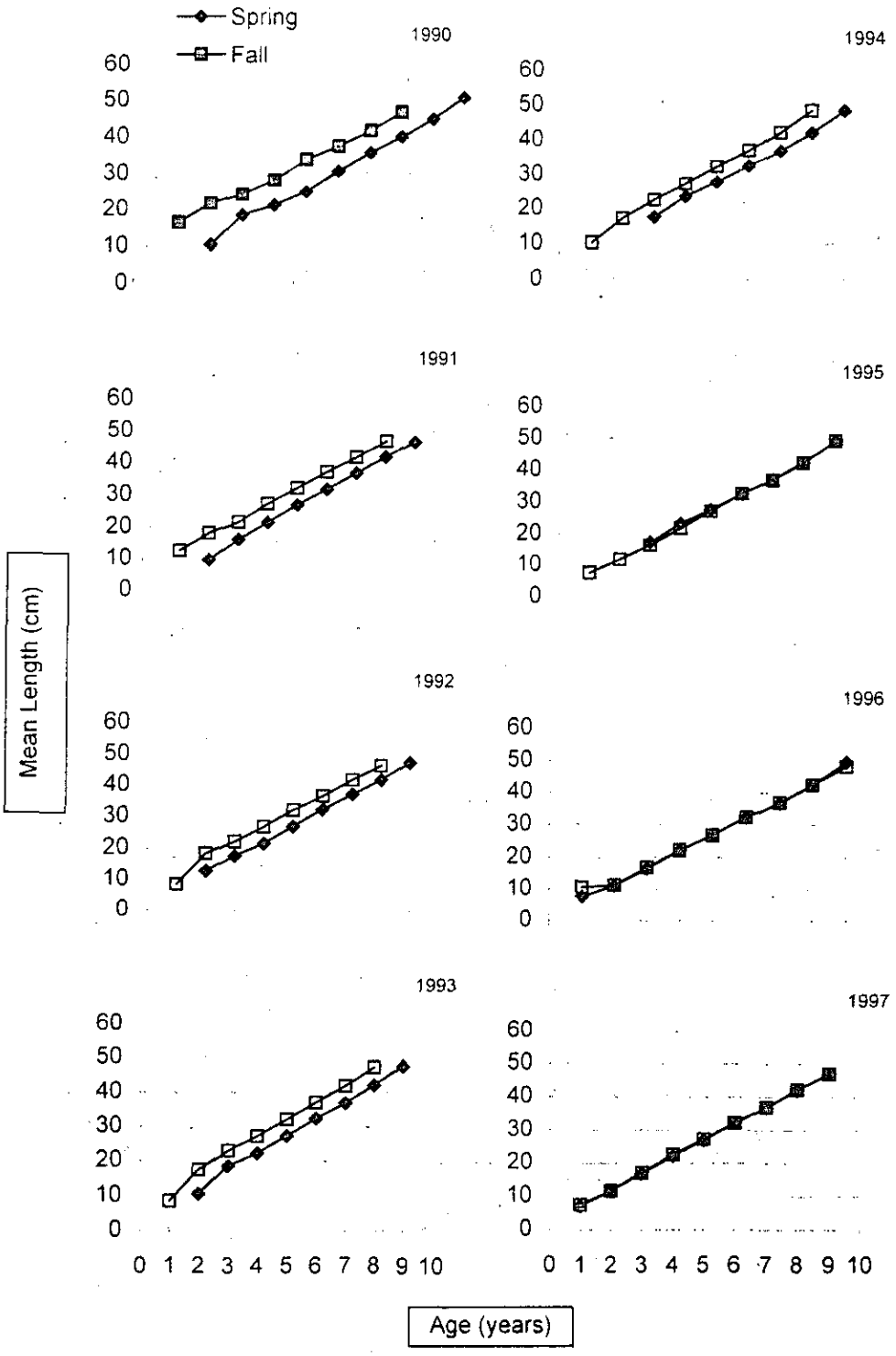

Fig. 24. Average length-at-age of yellowtail flounder from the spring and fall surveys, 1990-97.

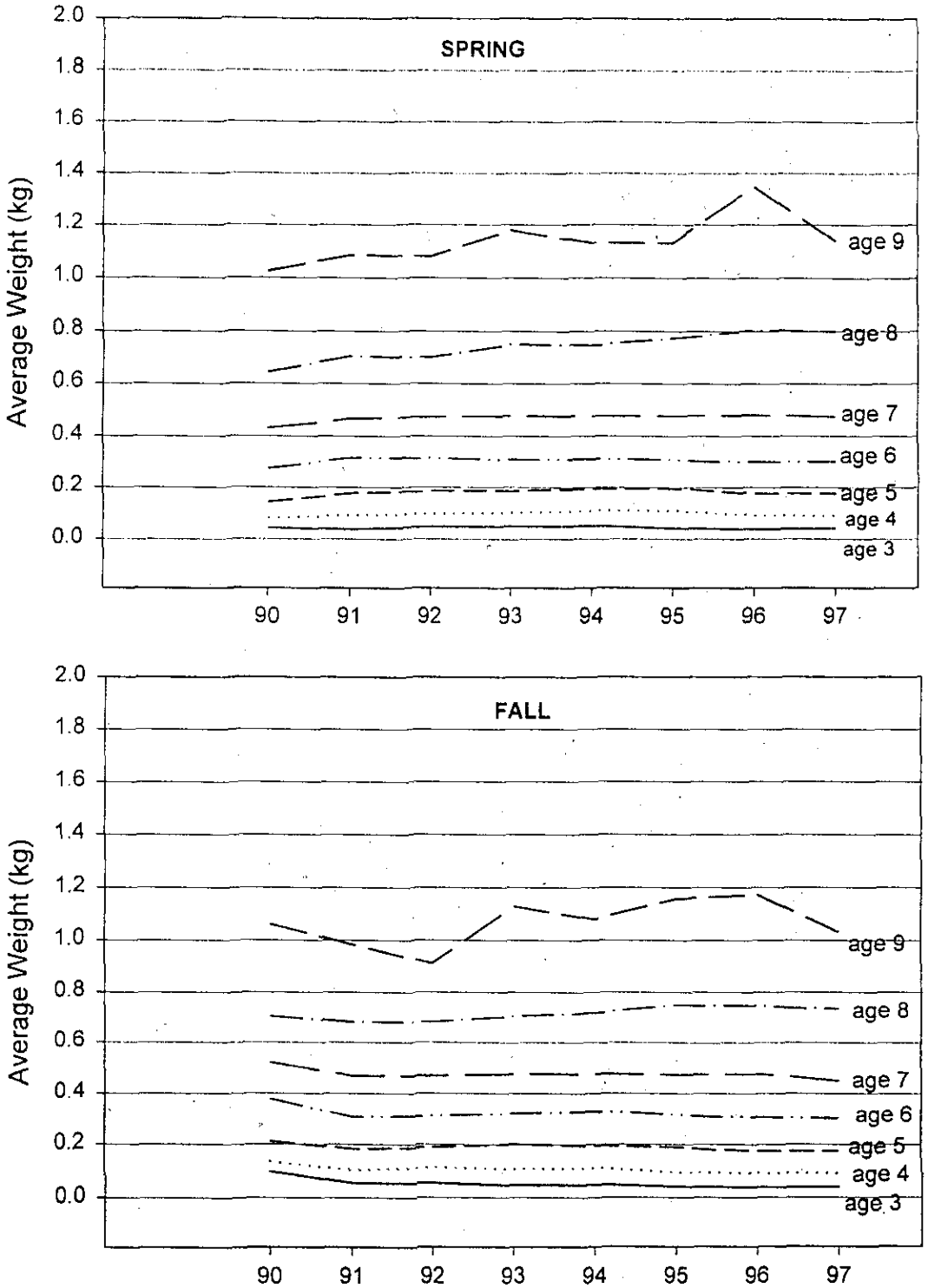

Fig. 25. Trends in average weight-at-age of yellowtail flounder from annual spring and fall groundfish surveys from 1990-97.

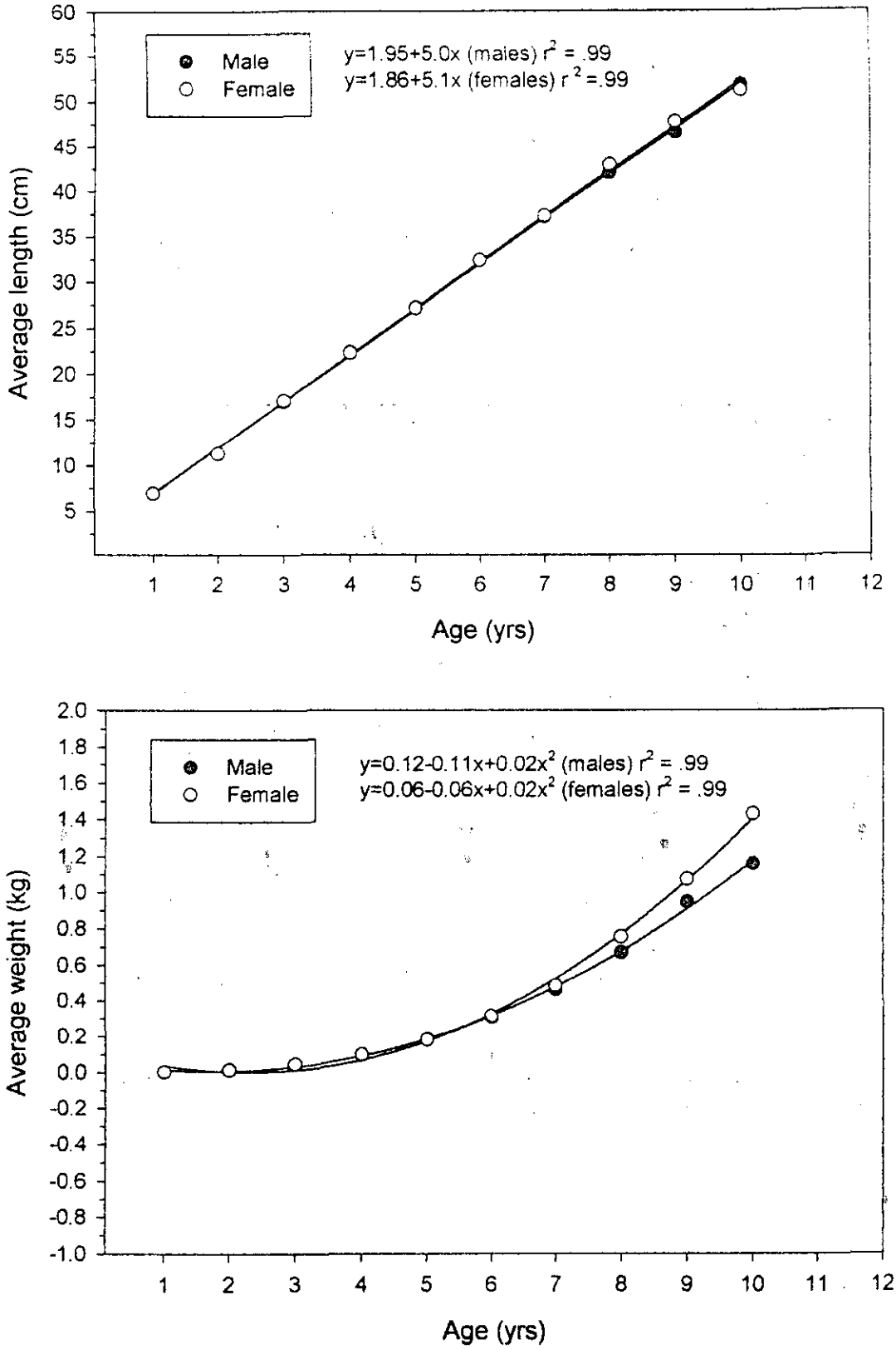

Fig. 26. Growth of yellowtail flounder on the Grand Bank based on average length- and weight-at-age data from annual spring, fall and juvenile research bottom trawl surveys.

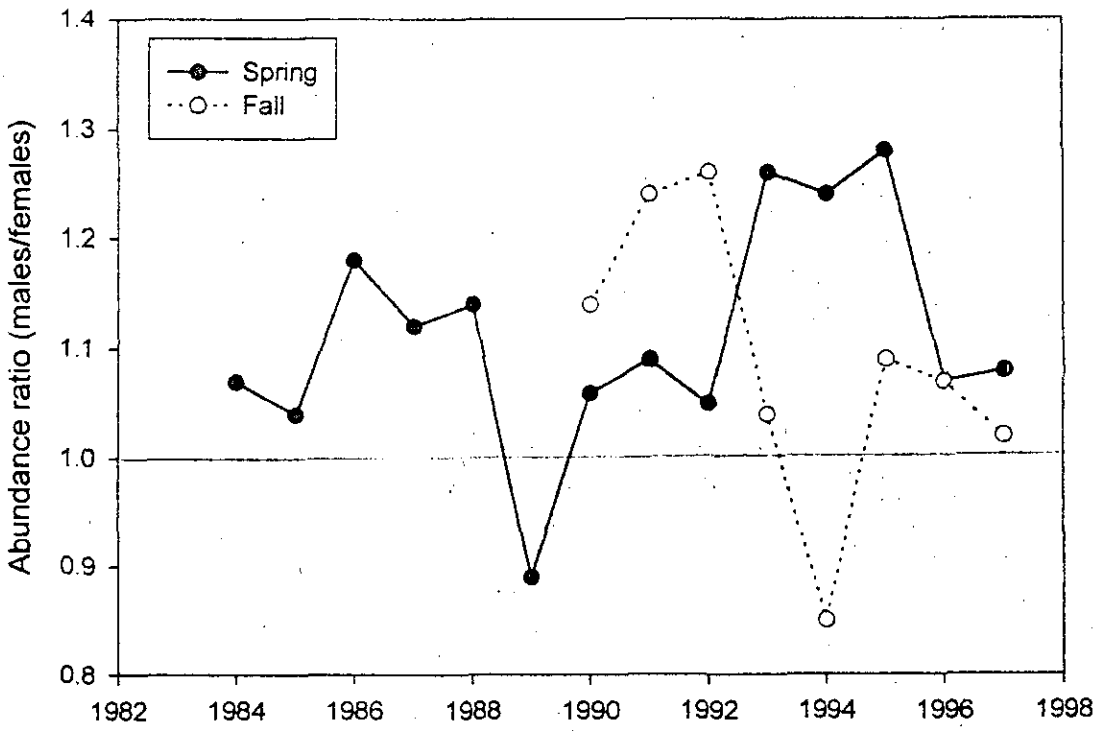

Fig. 27. Ratio of male to female yellowtail flounder from the 1984-97 spring and fall surveys of Div. 3LNO in Campelen units.

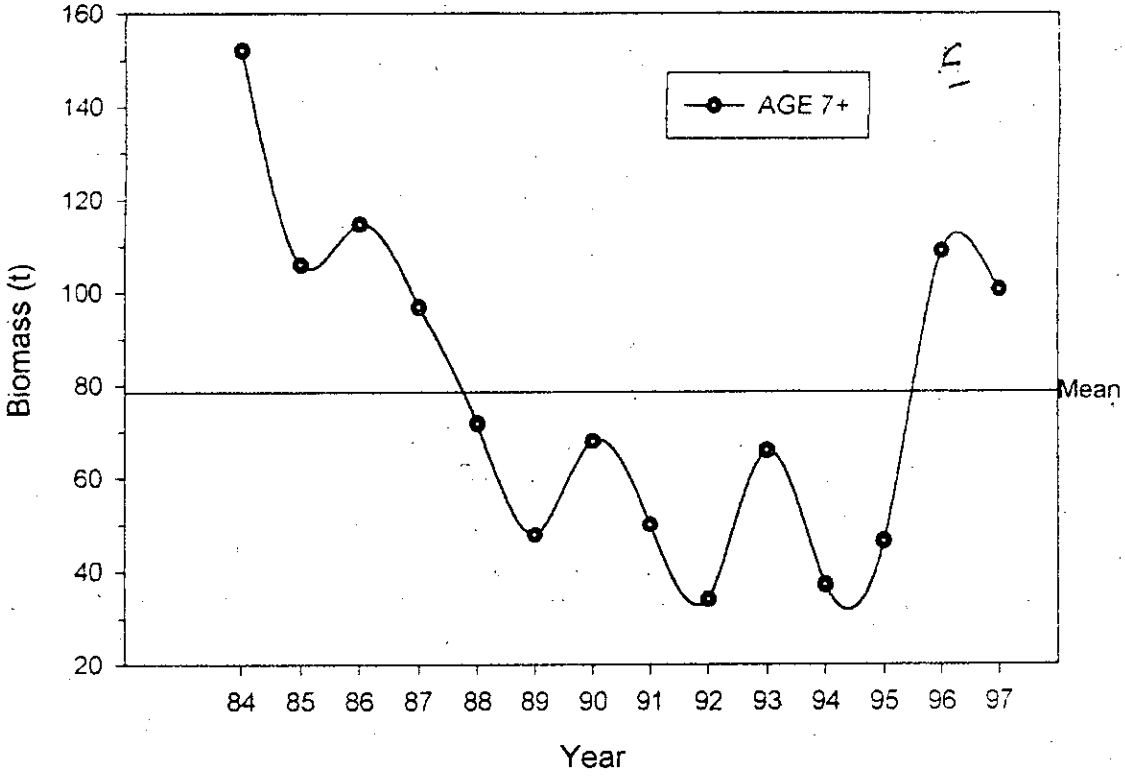

Fig. Age 7+ biomass (combined sex) trend

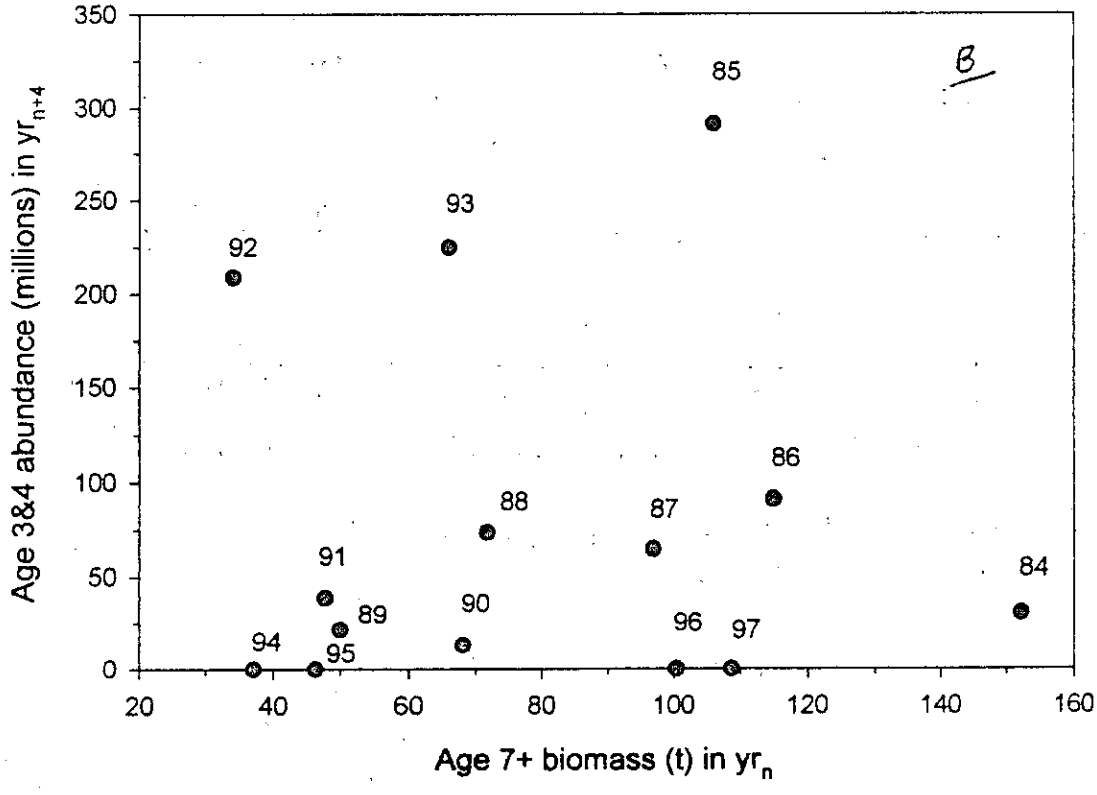

Fig. 28. Plot of age 3 and 4 abundance ($yr_{n+3\&4}$) from spring surveys against age 7+ biomass (yr_n 1984-97) from spring surveys of yellowtail flounder in Div. 3LNO.

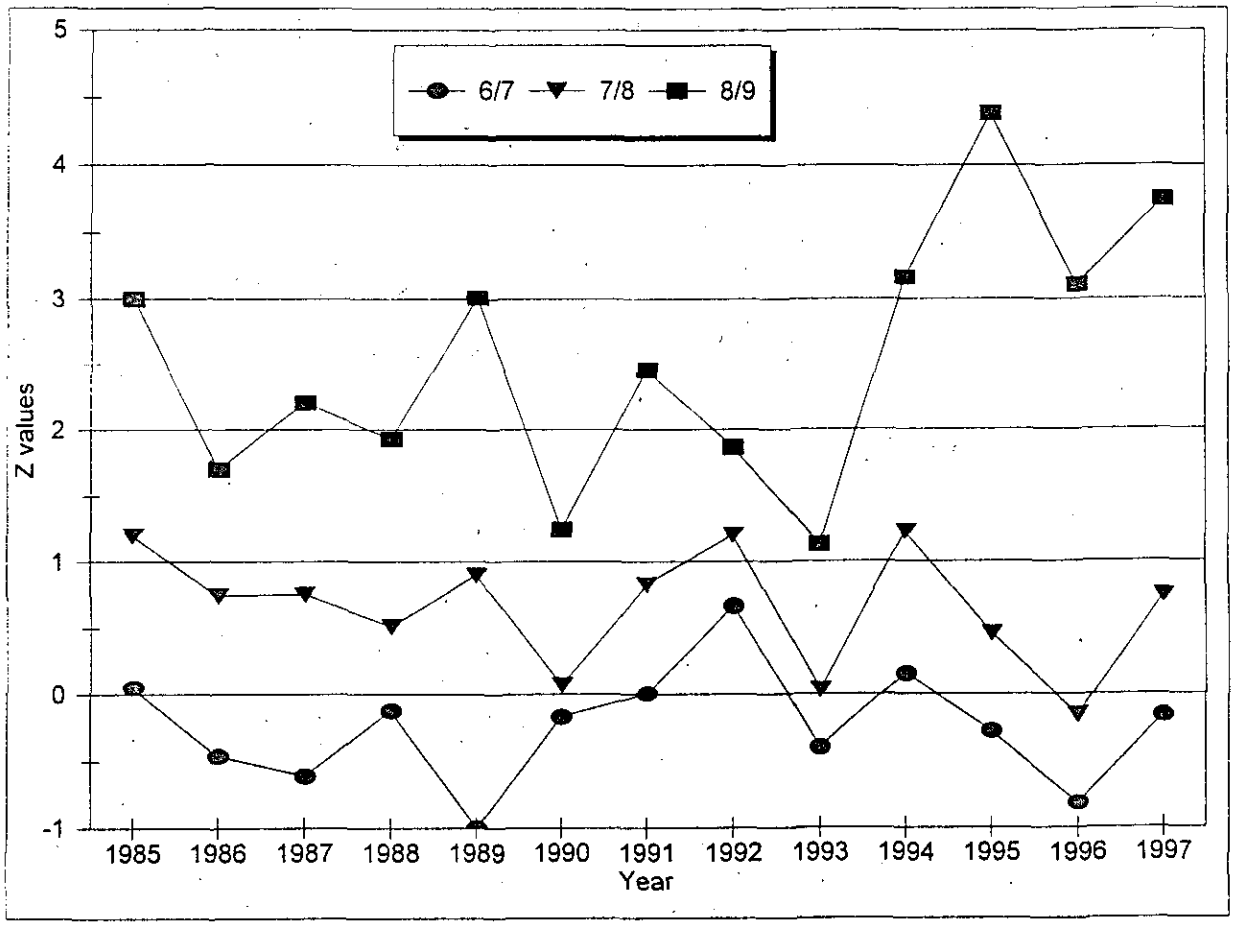

Fig. 29. Trends in total mortality (Z-values) in adult yellowtail flounder using data from the 1985-97 spring surveys of Div. 3LNO.