# REPORT OF THE AD-HOC MEETING ON PROGRESS IN THE ICCAT ALBACORE RESEARCH PROGRAM
## (Sukarrieta, 12-16 July, 1991)

## 1 - OPENING

This ad-hoc meeting was convened by F.X. Bard, chairman of the Albacore Research Program (PSG), at AZTI-SIO laboratory in Sukarrieta (Vizcaya), to the kind invitation of his Director, J.M. Odriozola. Excellent facilities were made available and the Group acknowledge AZTI-SIO for this particular effort.

Participants were: L. Antoine, F.X. Bard, J.L. Cort, P. Danel, M. Fernandez, V. Ortiz and J. Santiago.

F.X. Bard appointed himself as rapporteur.

## 2 - AGENDA

Main goal of this meeting was to examine the progress made in specific research tasks assigned during the last PSG meeting in November 1990 (Document COM-SCRS/90/16). Therefore a tentative agenda was proposed by F.X. Bard, and adopted. Main topics to be discussed were :

- Corrections made to the general catch at size tables (1975-1989) of the Report of the Second ICCAT Albacore Workshop, 1990 (Tables 3 and 4 of the 1990 WG report).
- Length frequency analysis using stochastic methods in order to improve the current catch at age table (Table 5 of the 1990 WG Report).
- Improvement of abundance indices.
- Possible future runs of VPA.
- Analysis of hard parts.
- Tagging data file availability and preliminary analysis.
- Examination of possible injuries caused by fishing gear on albacore and the use of this kind of information. (See document SCRS/90/69).
- Interaction between fisheries
- Others.
- Recommendations

## 3 - CORRECTION OF CATCH AT SIZE TABLE

ICCAT Secretariat, on request of PSG chairman, provided by the beginning of this year the 1975-1989 catch at size tables splitted by year, gear and country for north and south stocks of albacore. These tables were corrected by Secretariat, particularly those data corresponding to longline, in which some errors had been detected lately during SCRS 1990.

Data provided were checked, comparing the nominal catch declared by country with the catch estimates obtained as the sum of products of the mean weights at length with the numbers at length.

For north stock, it appeared that for major fisheries the differences between both catch figures was less than 10% (except 1979-Taiwan). In the case of some minor fisheries the differences were higher, due probably to rounding effects for catches less than 100 tons (Table 1).

Therefore, the new version of catch at size table for the north stock was accepted. Additional computations and merging of catch at size data corresponding to this stock were requested from the Secretariat which provided it in due time for further use at the present meeting.

For south stock, catch at size tables corresponding to Taiwanese longline fishery, which is the most important fishery in this area, appeared to be correct. However there were still some problems for minor fisheries (Table 2). Absence of catch at size data for surface fisheries was noticed. Secretariat confirmed that data from South African baitboat fishery, which is the only important surface fishery on this stock, are not available in the ICCAT data base.

## 4 - LENGTH FREQUENCY ANALYSIS BY STOCHASTIC METHODS FOR IMPROVING CATCH AT AGE TABLE.

4.1 During the 1990 Albacore WG it was pointed out that the method of "slicing out" the age classes from catch at size distribution was not completely satisfactory, particularly because the number of 1 cm classes included in each age group decreased when getting older, which is unlikely. Therefore it was decided that a particular task of the PSG was to explore the possibility of using stochastic methods for a better age decomposition of catch at size tables.

J. Santiago, who was in charge of this activity, after a review of the current methods of length frequency analysis, selected MULTIFAN, a Otter Research Ltd.'s length frequency analysis system (FOURNIER AND SIBERT, 1990), available as a package for computer use. This applies a likelihood-based technique that extends the methods of SCHNUTE & FOURNIER (1980) to simultaneously analyze several length frequency data sets.

Several runs were done prior to the meeting by J. Santiago with length frequency data sets corresponding to surface fisheries (Document PSG/91/1). After examination of this preliminary analysis, the group accepted the following conclusions:

- The analysis on a monthly basis proved useless as for surface fisheries some samples had been obviously substituted by samples of contiguous strata. Moreover, the use of this time unit would be impossible for longline data for which the sampling time unit is the quarter. And eventually, the analysis of the 1975-1989 data by gear on a monthly basis would be very time consuming.

- It appeared that some length sampling of the surface fisheries for years 1975-1989 could have been skewed by a strategy of sampling which had not properly taken into account the commercial strata. This point should be more thoroughly explored by the national scientists in charge of the sampling. If possible, corrections should be made and documented, and corrected data transmitted to ICCAT for further use by PSG. Anyway, the currently available data from surface fisheries had to be used, bearing in mind these problems.

For all the above reasons it was decided to use the quarter as the minimum unit of time for further analysis.

4.2 The group applied MULTIFAN to the following catch at size data sets:

- Longline, quarterly, 1975-1982.

- All gears combined, yearly, 1975-1989.

The results of the longline data analysis proved interesting but not completely satisfactory. Particularly, the standard deviation (SD) of length at age decreased with age when a length dependence in SD was introduced in the model, which seemed unrealistic. This effect could be due to mild quality of the sampling on some years, joint to the problem of overlapping between the age components, specially for oldest ages. Moreover, the probable differential growth by sex could contribute to blur the picture. Therefore the analysis of longline data alone was abandoned.

The results corresponding to the yearly catch at size data, all gear combined, appeared completely unrealistic. Therefore such analysis was abandoned.

4.3 The Group decided to analyze on a quarterly time basis the catch at size distributions of north Atlantic albacore for 1975-1989, all gears combined. The initial catch at size tables were provided by ICCAT Secretariat as ALBNORQ.DAT and ALBNORQ.TAB files (Annex 1).

Due to the requirements of the MULTIFAN version available, this set of 60 distributions had to be analyzed in 5 batches of 12 quarters: 75-77,78-80,81-83,84-86,87-89. Initial conditions selected for the analysis were:

- Recruitment was considered to occur in the second quarter of the year (Q2).

- Length distributions analyzed ranged from 46 cm to 128 cm, as the program allows up to 85 length classes.

MULTIFAN analysis provided multiple possible solutions, according to the initial inputs of von Bertalanffy K (0.2 and 0.3) and the number of possible age classes (8 to 12) and to the different models to be fitted. The initial model was built up assuming normality of the age components, von Bertalanffy growth and SD constant. Two additional models were tested introducing length dependent SD and size selectivity for the first age class.

The whole process is documented by a separate document to be submitted to next SCRS by J. Santiago.

The results of the optimal fit to each data set are provided as Annex 2. This selection of the best fit was done using the program 'SIGTEST' available in the MULTIFAN package.

Results of this analysis proved satisfactory, being fairly consistent over the different data sets. Main conclusions were:

- For every set, the computed growth curve appeared to be reasonable, and the computed K and $L_\infty$ estimates were consistent (Except for years 81-83).

- The models corresponding to the best fit to the different data sets included length dependent SD, which increased with age in all the sets (except 87-89 where SD remained stable). This result was considered as a major improvement over the "slicing out" method, as the increase of SD with age is quite a probable biological feature.

- The introduction of size selectivity for the first age class in the model, seemed less important and it only improved the fit to the 78-80 and 84-86 data sets.

Figure 1 compares in a synthetic way the estimates of mean length and SD of length at age in Q2 (as $\bar{L} \pm 1.96 \cdot SD$) for all the data sets. Mean length at age are similar for the younger ages up to about 5 years old. Afterwards, due to the slowering of the growth and increase of standard deviation, the picture becomes less precise.

Obviously the next step would be to analyze the whole set of 1975-1990 quarterly length distributions but, up to the time of this meeting, the suitable version of MULTIFAN was not available. It was agreed that the PSG should fund the purchase of such a version, which could be available at reasonable price. PSG entrusted J. Santiago to continue the analysis in that way.

Meanwhile, it was decided to combine the quarterly catch at age tables computed by MULTIFAN (Table 3) in order to built up a single catch at age table on yearly basis and see how it compares to the catch at age table issued by the 1990 WG. For this purpose, the quarterly values of Table 3 were added in two ways:

- Using calendar year (*i.e.* 75 is the sum of Q1 to Q4)

- Using biological year, assuming recruitment at the second quarter in the surface fishery. (*i.e.* 75 is the sum of Q2+Q3+Q4 of 1975, plus Q1 of 1976.) There is Q1-1975 left and Q1-1990 lacking (but there have been only few large fish caught by longline in Q1-1990, as Taiwan longlining sharply decreased, and no surface fishery

occurs at this time of the year). This second way of adding quarters was designed in order to try to match the conditions of building 1990 WG catch at age table (Problem of n or n+ age group).

In addition to this, numbers of fish smaller than 46 cm were considered as to be added to the age 1 group and number of fish bigger than 129 cm were considered as to be included in an age plus group.

Table 4 is the result of these two sets of additions. Comparing with 1990 WG Table 5 showed a reasonable agreement, with an increase of the number of fish at age 4 to 6, which seems logical. The problem of merging the oldest age class in a plus group was raised. It was agreed that the use of a 7+ age group would be convenient.

4.4 Another method, more systematic, was to run MULTIFAN with fixed condition for the five sets. The parameters held fixed were:

- von Bertalanffy K=0.2
- Minimum size: 45.56 (AGE 1 of Bard's growth equation)
- Maximum size: 114.6 (AGE 10 of Bard's growth equation)
- Number of age groups: 10
- Ratio of increase of first to last SD: 1.9 (Average value of optimal searches)

The results of this second method are displayed as Annex 3. Number of fish at age were compared with the homologous set of optimal search (Annex 2). General features of the two set are similar, with main bulk of the catch for young and medium age classes. However important differences appeared comparing the two sets, being higher the number of fish for medium age groups (ages 4-7) in the second run (with all fixed conditions). And conversely, number of fish were lower for old age classes. (See for instance the sample 4 of 75-77 set, ages 4-10.)

The source of this difference lies probably in the mechanical effect of the second run, which worked as a "stupid slicing machine", opposed to the more stochastic effects of the first run. Moreover graphical examination of the fits revealed inconsistencies for the same reason. An example of such an inconsistency is shown in Annex 3. Therefore the results of this systematic searches were rejected.

As conclusion to this particular point:

- The use a more powerful version of MULTIFAN, capable of analyzing the whole 75-89 set of data by quarters, would solve the problem of combining the different 12 quarters sets.
- There is a need of a method for direct ageing of large fish in order to provide extra information for such analysis in the future.
- The standard catch at age table to be used in the VPA is displayed in Table 4.

## 5 - IMPROVEMENT OF ABUNDANCE INDICES

No new indices were computed since the 1990 WG. Information was that J Mejuto is currently working on a possible standardisation of the spanish surface gears indices. However the lack of historical spatial-temporal data for CPUE (Task 2 on ICCAT required standards) seems to be still a problem for computing such standardised indices.

Another problem to face is the homogeneity of the indices at age, computed from separate fisheries catch at size data (for example baitboats) versus the overall catch at age table. It was pointed out, during the 1990 Working Group, that the indices by age should be computed as much as possible in the same way that the number of fish by age.

It was suggested that, as MULTIFAN computes general mean length at age and associated standard deviation, these data could be used to split catch at size table from a given gear into age groups and therefore computing CPUE by age.

A trial of this method should be carried out on surface fisheries data:

- As for the younger fish caught by the surface fisheries the reference period selected was the third quarter of any year, which is the time step used, and as the selected fleets were the Spanish troll and baitboat, which yield the major part of the catch in number, there is a reasonable chance that useful indices of abundance as CPUE by age could be computed for young age classes.
- For older fish caught by longline the question is still open. Moreover the recent sharp decrease of Taiwan effort will complicate the availability of such indices for old fish over a complete time series.

Conclusion is that the only indices of abundance available in the future over the whole time series will be one issued from the Spanish surface fleets. It is therefore emphasized that collection of basic relevant data (logbooks) is of paramount importance.

## 6 - FUTURE RUNS OF VPA

Possible use of various methods for running VPA (tuned, multicohort, constant recruitment,...) were discussed.

One problem is that the number of significant year classes in the demographic table is rather low (1 to 6/7 and a + group) which means that convergence will not be easily achieved. Moreover the evolution of the fisheries catching different ages groups, surface gears for youngs, longline for old ones, has been independent over the selected time series. Therefore the partial recruitment vector is not likely to be constant for the considered years. It could make the use of tuned VPA not easy, generating problems similar to the ones encountered for swordfish stock assessment.

It is believed that VPA methods taking advantage of the relatively better accuracy of the catch at age data for surface fisheries would be more suitable. For instance multicohort analysis (LAUREC and BARD, 1980) on age 2/3 or 3/4 could be appropriate.

Conclusion about this point, was that VPA's can be ran by individual scientist of the Group, submitted to next SCRS meeting and documented in a way that it can be discussed and, if possible, new runs of the selected method/program being made during rapporteurs discussion. The catch at age table used must be the one selected at the present meeting. (Table 4, or further version yielded by use of new MULTIFAN on overall time series of 60 quarters 75-89, if successfully computed and made available by J Santiago in due time).

## 7 - ANALYSIS OF HARD PARTS

The purpose of this particular study is to set up a reliable and easy method of ageing individual fish, in order to be able of ageing enough individual fish for a current strategy of double sampling (length frequency analysis plus ageing of a subsample). It seems only possible through the use of spines, as the use of other hard parts would imply the purchase of fish. Therefore it is important to derive a reliable method for reading spines section.

The number of spines collected in 1990 on a wide range of albacore amounted to 1200. This sampling was stratified by size class (1cm), time (month) and sea area (east and west of 10°W). Preliminary results are documented in Doc PSG/91/1. An orderly pattern of marks formation appeared in some time-area strata (for instance, September East of 10°W).

A more particular analysis, comparing different hard parts of the same fish, was carried out by M. Fernandez. Hard parts (spines, vertebrae and otoliths) of 21 albacores - ranging from 95 to 111 cm FL were collected in order to compare the pattern of growth marks formation in different pieces for establishing the most suitable hard part to be systematically sampled for age estimation.

Collection and preparation of otoliths is very time consuming and the first results obtained with polishing and acid decalcifying techniques seemed too complicated for a suitable interpretation.

The first ray of the first dorsal ray fin showed a very particular growth marks pattern, somewhat erratic, which is difficult to interpret as it is still unknown the time of hyaline band formation. In fact, there is no evidence of yearly double banding phenomena. Further analysis on a possible connection of the hyalin marks formation with biological events (spawning, migration) should be conducted.

The secondary regeneration occurring in the core of the first fin ray makes the identification of first growth marks somewhat difficult. However, a simultaneous reading of first and second first fin dorsal rays may lead to acceptable results, because regeneration in the second ray is not so notable.

Axial thin sections of vertebrae showed growth marks pattern similar to the one described for spines, and preliminary results indicated a good agreement between readings on vertebrae and on spines (14 cases). When there was not an agreement (7 cases) vertebrae tended to underestimate age in one year time, and this could be due to a higher degree of regeneration in vertebrae.

It is expected that a complete document about this particular study will be submitted to next SCRS meeting.

It was decided by the Group to continue with the spines sampling in order to try to complete a round-the-year series for all sizes, as it still seems essential to understand the seasonal pattern (if any) of the laying of the hyalin marks on spines sections. A whole year series of samples is expected to allow the understanding of the evolution of marginal increments.

Another future activity on spines will be the digitalization of the already prepared sections of spines in order to be studied with image analysis techniques and artificial intelligence at the Brest laboratory of IFREMER.

## 8 - TAGGING DATA

Status of the tagging-recapture data file was discussed. It appears that still there is not a complete file (historical from ISTPM plus recent from IEO) fully available. IEO scientists have been encouraged to complete this work, as taggings from 1988-1990 yielded 133 recoveries (Table 5).

It was suggested that much more analysis of these taggings should be carried out, particularly as a greater number of recoveries is expected during 1991 from the huge 1990 tagging experience.

Methods used during the ISYP should be considered for that purpose. Apart from the classical use of tagging recovery data for building up a growth curve, it could be of particular interest to examine the spatial-temporal evolution of recoveries together with the spatial-temporal evolutions of catch of fish of the same size.

Box model centred on possible exploited concentrations of schools could be also examined.

It was casually reported to the Group that tagging experiments are currently under preparation in the Mediterranean in order to clarify the stock structure. The EEC participation is promised and experiments will be carried out by Italy, Greece, Spain and France.

## 9 - EXAMINATION OF POSSIBLE INJURIES CAUSED BY FISHING GEAR

The possibility of recording occurrence of injured fish (especially by gillnet) has been given in the observers form defined by IEO and IFREMER for the EEC program. J CADDY (SCRS/90/69) also suggested to use this information as a "tagging" data. The results of observers campaigns do not provided any information on this topic, though observation of

injured fish has been reported unofficially. It is unfortunately too late now to use this kind of information as a tagging method but it has been suggested that fishermen or better qualified observers at sea should carefully monitor the occurrence of injured fish as an index of fishing gear interaction.

## 10 - INTERACTION BETWEEN FISHERIES. ANALYSIS OF OBSERVERS DATA

Observers campaigns were planned in 1989 in the IEO-IFREMER research program granted by EEC. Observers were put on board spanish BB and TROL boats and french GILL and MWT boats. This program was achieved in November 1990 and submitted to EEC DG XIV. The analysis and results concerned mainly in the interaction between these four types of gears.

The final report should be officially asked to DG XIV by ICCAT. A complement survey of observers at sea has been conducted during 1990, partially financed by ICCAT PSG program; the results of both campaigns should be analyzed by IEO and IFREMER both together, with the participation of AZTI-SIO as this Institute has developed a specific logbook for albacore BB fishery in the Basque Country which is currently correctly filled.

French logbooks for years 1989 and 1990 have been correctly filled and can also be used in term of interaction between fleets. Studies must be carried in the following topics :

- Mapping catch and effort data for each gear, and analysis of the fishing strategies which are still poorly known.
- Analysis spatial-temporal "windows" where and when different gears are close together, in terms of CPUE
- Study of the possible existence of concentration of schools as it has been demonstrated for tropical tuna in the eastern Atlantic.

## 11 - OTHERS

### 11.1 - Length-weight relationship

The 1989 Albacore Workshop reviewed the L/W relationships available at that time, and recommended continuing the use of the equation obtained by BEARDSLEY (1971). However, some problems were noticed concerning a possible bias of this relation for larger fish, and a possible dimorphism between males and females.

Document PSG/91/1 gives new data on L/W relationship after a systematic sampling carried out in the Bay of Biscay and Azores in 1990, stratified by quarter (3rd and 4th), length class (1cm) and sex (for individuals bigger than 80cm).

Results indicated that there were not significative differences of the L/W regression parameters neither between quarters nor between sexes. Therefore all the pairs of observations (713) were combined to get a single regression. This was significantly different from the one obtained by BEARDSLEY (1971), giving weight estimates significantly smaller for large fish (up to 7kg difference for a 130cm albacore).

### 11.2 - Maturity

Preliminary results on histological analysis of albacore gonads were presented at the meeting (PSG/91/1). The number of samples analyzed was 91, coming from individuals ranging between 78 and 107cm, fished in the Bay of Biscay in 1990.

- Females were either resting or in immature condition (the analysis did not allow the differentiation between both phases of gonad development). Almost 100% of the oocytes in the ovaries were unyolked; some oocytes partially yolked were observed but always in a very few number.
- 18 of the 31 males analyzed presented sperm in the sperm-duct indicating that they were in mature condition. Only 3 males showed clear signs of immaturity.

Further studies on this subject should be carried out in order to get estimates of length at first maturity.

## 12 - RECOMMENDATIONS

- A more powerful version of MULTIFAN should be used to simultaneously analyze the complete 75-89 set of 60 quarters; PSG funds are available for purchasing this new version.
- Abundance indices have to be computed and accurate data on spatial-temporal distribution of CPUE for the spanish fleets must be made available, if existing.
- Tag-recapture files must be completed.
- Hard parts and particularly fin rays must be collected in order to cover a complete annual cycle.
- Length weight relationship has to be complemented as it could be changed since Beardsley's one.
- The problem of discrepancies in length frequency data collected from baitboat fishery must be solved as it can change the catch at age table.

## 13 - CLOSURE

The meeting was adjourned on 17/7/91. J Santiago was entrusted of the task of polishing the report and disseminate it, ensuring that a copy is available in due time to ICCAT in order to be submitted officially to 1991 SCRS session.

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| | BB SPAIN | TR SPAIN | BB FRANCE | TR FRANCE | LL JAPAN | LL KOREA | BB PORTUG. | LL TAIWAN |
|---|---|---|---|---|---|---|---|---|
| C75 | 17.60 | 4.50 | 0.70 | 5.00 | 1.30 | 2.80 | 0.90 | 8.10 |
| P75 | 15.20 | 3.80 | 0.40 | 4.60 | 1.30 | 2.60 | 0.80 | 7.40 |
| R75 | 0.86 | 0.84 | 0.57 | 0.92 | 1.00 | 0.93 | 0.89 | 0.91 |
| C76 | 18.70 | 8.20 | 1.10 | 5.70 | 1.30 | 5.40 | 0.60 | 14.80 |
| P76 | 17.00 | 7.10 | 0.90 | 4.70 | 1.40 | 5.00 | 0.60 | 14.20 |
| R76 | 0.91 | 0.87 | 0.82 | 0.82 | 1.08 | 0.93 | 1.00 | 0.96 |
| C77 | 14.90 | 10.30 | 0.60 | 6.20 | 0.80 | 5.60 | 0.10 | 13.70 |
| P77 | 14.30 | 11.00 | 0.60 | 6.60 | 0.80 | 5.30 | 0.10 | 12.90 |
| R77 | 0.96 | 1.07 | 1.00 | 1.06 | 1.00 | 0.95 | 1.00 | 0.94 |
| C78 | 11.30 | 14.10 | 0.40 | 8.40 | 0.50 | 3.00 | 0.10 | 9.30 |
| P78 | 12.20 | 14.40 | 0.50 | 8.60 | 0.50 | 2.80 | 0.10 | 8.90 |
| R78 | 1.08 | 1.02 | 1.25 | 1.02 | 1.00 | 0.93 | 1.00 | 0.96 |
| C79 | 15.40 | 14.20 | 0.20 | 7.80 | 1.20 | 3.00 | 0.10 | 7.00 |
| P79 | 14.80 | 16.10 | 0.20 | 8.90 | 1.20 | 2.80 | 0.10 | 5.10 |
| R79 | 1.04 | 0.88 | 1.00 | 0.88 | 1.00 | 1.07 | 1.00 | 1.37 |
| C80 | 15.70 | 9.50 | 0.40 | 3.10 | 1.00 | 0.80 | 0.10 | 7.10 |
| P80 | 14.70 | 9.70 | 0.30 | 3.20 | 1.00 | 0.70 | 0.10 | 6.90 |
| R80 | 0.94 | 1.02 | 0.75 | 1.03 | 1.00 | 0.88 | 1.00 | 0.97 |
| C81 | 12.60 | 8.20 | 0.40 | 2.50 | 1.70 | 0.90 | 0.40 | 6.60 |
| P81 | 10.50 | 7.20 | 0.30 | 2.20 | 1.70 | 0.80 | 0.40 | 6.10 |
| R81 | 0.83 | 0.88 | 0.75 | 0.88 | 1.00 | 0.89 | 1.00 | 0.92 |
| C82 | 15.30 | 10.10 | 0.20 | 2.70 | 0.80 | 1.30 | 0.30 | 10.50 |
| P82 | 14.00 | 10.10 | 0.10 | 2.70 | 0.80 | 1.20 | 0.30 | 9.80 |
| R82 | 0.92 | 1.00 | 0.50 | 1.00 | 1.00 | 0.92 | 1.00 | 0.93 |
| C83 | 19.00 | 10.60 | 0.20 | 2.20 | 1.20 | 0.50 | 1.80 | 14.30 |
| P83 | 17.20 | 9.80 | 0.20 | 2.00 | 1.10 | 0.50 | 1.50 | 13.50 |
| R83 | 0.91 | 0.92 | 1.00 | 0.91 | 0.92 | 1.00 | 0.83 | 0.94 |
| C84 | 7.40 | 8.20 | 0.10 | 2.80 | 0.60 | 1.00 | 0.80 | 14.90 |
| P84 | 6.70 | 7.30 | 0.00 | 2.50 | 0.50 | 0.90 | 0.70 | 13.40 |
| R84 | 0.91 | 0.89 | 0.00 | 0.89 | 0.83 | 0.90 | 0.88 | 0.90 |
| C85 | 11.80 | 8.90 | 0.10 | 1.80 | 0.80 | 0.40 | 0.60 | 14.90 |
| P85 | 10.00 | 8.30 | 0.10 | 1.60 | 1.00 | 0.40 | 0.60 | 14.30 |
| R85 | 0.85 | 0.93 | 1.00 | 0.89 | 1.25 | 1.00 | 1.00 | 0.96 |
| C86 | 14.60 | 9.80 | 0.10 | 1.10 | 0.50 | 0.40 | 0.40 | 19.60 |
| P86 | 12.40 | 8.00 | 0.10 | 0.90 | 0.60 | 0.40 | 0.40 | 21.00 |
| R86 | 0.85 | 0.82 | 1.00 | 0.82 | 1.20 | 1.00 | 1.00 | 1.07 |
| C87 | 18.20 | 10.00 | 0.10 | 1.40 | 0.50 | 0.10 | 0.40 | 6.60 |
| P87 | 17.80 | 10.00 | 0.10 | 1.40 | 0.60 | 0.00 | 0.40 | 5.90 |
| R87 | 0.98 | 1.00 | 1.00 | 1.00 | 1.20 | 0.00 | 1.00 | 0.89 |
| C88 | 16.60 | 11.00 | 0.10 | 0.40 | 0.70 | 0.10 | 0.20 | 2.10 |
| P88 | 15.30 | 9.90 | 0.00 | 0.30 | 0.80 | 0.00 | 0.20 | 2.50 |
| R88 | 0.92 | 0.90 | 0.00 | 0.75 | 1.14 | 0.00 | 1.00 | 1.19 |
| C89 | 14.90 | 10.50 | 0.30 | 0.10 | 0.70 | 0.10 | 0.20 | 1.30 |
| P89 | 13.70 | 9.90 | 0.30 | 0.10 | 0.40 | 0.10 | 0.20 | 1.20 |
| R89 | 0.92 | 0.94 | 1.00 | 1.00 | 0.57 | 1.00 | 1.00 | 0.92 |

Cyy = nominal catch in year 'yy'
Pyy = computed amount of fish in year 'yy'
Ryy = Pyy/Cyy

Table 1. Comparison between the nominal catch of albacore (North Stock) declared by country and the catch estimates computed as the sum of products of the mean weights at length with the numbers at length.

| | LL S.AFRC. | LL BRAZIL | LL TAIWAN | LL JAPAN | LL KOREA | LL PANAMA | LL URUG. |
|---|---|---|---|---|---|---|---|
| C75 | 0,00 | 0,10 | 13,40 | 0,30 | 3,20 | 0,30 | 0,00 |
| P75 | 0,00 | 0,10 | 16,00 | 3,70 | 3,00 | 0,20 | 0,00 |
| R75 | - | 1,00 | 1,19 | 12,33 | 0,94 | 0,67 | - |
| C76 | 0,00 | 0,30 | 14,60 | 0,10 | 3,40 | 0,80 | 0,00 |
| P76 | 0,00 | 0,20 | 13,90 | 0,10 | 3,10 | 0,70 | 0,00 |
| R76 | - | 0,67 | 0,95 | 1,00 | 0,91 | 0,88 | - |
| C77 | 0,00 | 0,50 | 16,10 | 0,10 | 3,80 | 0,40 | 0,00 |
| P77 | 0,00 | 0,20 | 15,40 | 0,10 | 3,50 | 0,30 | 0,00 |
| R77 | - | 0,40 | 0,96 | 1,00 | 0,92 | 0,75 | - |
| C78 | 0,00 | 0,40 | 20,50 | 0,10 | 1,40 | 0,40 | 0,00 |
| P78 | 0,00 | 0,10 | 19,50 | 0,10 | 1,30 | 0,30 | 0,00 |
| R78 | - | 0,25 | 0,95 | 1,00 | 0,93 | 0,75 | - |
| C79 | 0,10 | 0,40 | 20,30 | 0,10 | 0,90 | 0,10 | 0,00 |
| P79 | 0,00 | 0,10 | 15,10 | 0,10 | 0,80 | 0,10 | 0,00 |
| R79 | 0,00 | 0,25 | 0,74 | 1,00 | 0,89 | 1,00 | - |
| C80 | 0,30 | 0,40 | 18,70 | 0,30 | 0,70 | 0,20 | 0,00 |
| P80 | 0,30 | 0,20 | 22,00 | 0,40 | 0,60 | 0,20 | 0,00 |
| R80 | 1,00 | 0,50 | 1,18 | 1,33 | 0,86 | 1,00 | - |
| C81 | 0,40 | 0,30 | 18,20 | 0,60 | 0,70 | 0,10 | 0,10 |
| P81 | 0,40 | 0,10 | 16,10 | 0,70 | 0,60 | 0,10 | 0,00 |
| R81 | 1,00 | 0,33 | 0,88 | 1,17 | 0,86 | 1,00 | 0,00 |
| C82 | 0,10 | 0,70 | 22,80 | 0,60 | 0,60 | 0,20 | 0,20 |
| P82 | 0,10 | 0,20 | 20,80 | 0,80 | 2,10 | 0,20 | 0,20 |
| R82 | 1,00 | 0,29 | 0,91 | 1,33 | 3,50 | 1,00 | 1,00 |
| C83 | 0,50 | 0,70 | 9,50 | 0,20 | 0,60 | 0,00 | 0,40 |
| P83 | 0,40 | 0,20 | 8,50 | 0,20 | 0,60 | 0,00 | 0,30 |
| R83 | 0,80 | 0,29 | 0,89 | 1,00 | 1,00 | - | 0,75 |
| C84 | 0,20 | 0,50 | 7,90 | 0,20 | 0,30 | 0,00 | 0,50 |
| P84 | 0,20 | 0,20 | 7,00 | 0,20 | 0,30 | 0,00 | 0,60 |
| R84 | 1,00 | 0,40 | 0,89 | 1,00 | 1,00 | - | 1,20 |
| C85 | 0,10 | 0,30 | 19,60 | 0,60 | 0,50 | 0,00 | 1,50 |
| P85 | 0,00 | 0,10 | 17,50 | 0,50 | 0,50 | 0,00 | 1,50 |
| R85 | 0,00 | 0,33 | 0,89 | 0,83 | 1,00 | - | 1,00 |
| C86 | 0,10 | 0,10 | 27,60 | 0,70 | 0,30 | 0,30 | 0,30 |
| P86 | 0,10 | 0,00 | 28,80 | 1,10 | 0,30 | 0,30 | 0,30 |
| R86 | 1,00 | 0,00 | 1,04 | 1,57 | 1,00 | 1,00 | 1,00 |
| C87 | 0,00 | 0,30 | 28,80 | 0,40 | 0,40 | 0,90 | 0,20 |
| P87 | 0,00 | 0,00 | 29,50 | 0,40 | 0,40 | 0,90 | 0,20 |
| R87 | - | 0,00 | 1,02 | 1,00 | 1,00 | 1,00 | 1,00 |
| C88 | 0,10 | 0,40 | 20,70 | 0,40 | 0,20 | 0,00 | 0,10 |
| P88 | 0,10 | 0,00 | 24,70 | 0,50 | 0,20 | 0,00 | 0,10 |
| R88 | 1,00 | 0,00 | 1,19 | 1,25 | 1,00 | - | 1,00 |
| C89 | 0,00 | 0,40 | 18,40 | 0,40 | 0,10 | 0,00 | 0,10 |
| P89 | 0,00 | 0,10 | 20,60 | 0,70 | 0,00 | 0,00 | 0,10 |
| R89 | - | 0,25 | 1,12 | 1,75 | 0,00 | - | 1,00 |

Cyy = nominal catch in year 'yy'
Pyy = computed amount of fish in year 'yy'
Ryy = Pyy/Cyy

Table 2. Comparison between the nominal catch of albacore (South Stock) declared by country and the catch estimates computed as the sum of products of the mean weights at length with the numbers at length.

Numbers at age (x100)

| Year | 75 | 75 | 75 | 75 | 76 | 76 | 76 | 76 | 77 | 77 | 77 | 77 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quart | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Age | | | | | | | | | | | | |
| 1 | 4 | 376 | 814 | 379 | 12 | 2073 | 2384 | 1863 | 9 | 673 | 1024 | 1974 |
| 2 | 17 | 919 | 6454 | 36 | 20 | 6106 | 15862 | 239 | 98 | 4422 | 18433 | 469 |
| 3 | 375 | 715 | 11362 | 173 | 167 | 365 | 4493 | 259 | 192 | 722 | 10152 | 642 |
| 4 | 574 | 364 | 2758 | 1064 | 876 | 219 | 7358 | 1450 | 576 | 439 | 5108 | 1925 |
| 5 | 659 | 147 | 285 | 578 | 1924 | 177 | 1821 | 228 | 310 | 83 | 312 | 127 |
| 6 | 95 | 195 | 87 | 1166 | 717 | 312 | 1035 | 2092 | 1517 | 680 | 351 | 1600 |
| 7 | 297 | 156 | 103 | 869 | 322 | 256 | 521 | 1384 | 960 | 435 | 170 | 756 |
| 8 | 82 | 353 | 309 | 2273 | 186 | 327 | 480 | 444 | 178 | 252 | 177 | 461 |
| 9 | 32 | 103 | 179 | 212 | 89 | 327 | 320 | 303 | 96 | 152 | 193 | 265 |
| 10 | 120 | 227 | 143 | 29 | 112 | 195 | 146 | 93 | 111 | 312 | 171 | 38 |
| Year | 78 | 78 | 78 | 78 | 79 | 79 | 79 | 79 | 80 | 80 | 80 | 80 |
| Quart | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Age | | | | | | | | | | | | |
| 1 | 6 | 215 | 20323 | 5841 | 6 | 6 | 2283 | 2683 | 6 | 28 | 13704 | 1875 |
| 2 | 10 | 1081 | 23181 | 1415 | 70 | 836 | 32738 | 616 | 29 | 1496 | 11711 | 112 |
| 3 | 292 | 30 | 10215 | 1530 | 265 | 457 | 19081 | 1526 | 642 | 407 | 16593 | 2909 |
| 4 | 943 | 612 | 6031 | 1038 | 334 | 175 | 2163 | 873 | 572 | 214 | 2590 | 1331 |
| 5 | 1345 | 109 | 277 | 859 | 557 | 239 | 171 | 210 | 339 | 225 | 179 | 139 |
| 6 | 508 | 994 | 348 | 299 | 693 | 462 | 145 | 201 | 285 | 87 | 150 | 43 |
| 7 | 11 | 310 | 170 | 42 | 161 | 68 | 123 | 47 | 51 | 99 | 132 | 19 |
| 8 | 8 | 15 | 132 | 28 | 60 | 308 | 129 | 131 | 119 | 169 | 114 | 15 |
| Year | 81 | 81 | 81 | 81 | 82 | 82 | 82 | 82 | 83 | 83 | 83 | 83 |
| Quart | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Age | | | | | | | | | | | | |
| 1 | 80 | 183 | 8065 | 116 | 3 | 37 | 462 | 56 | 5 | 4 | 3093 | 4437 |
| 2 | 512 | 1989 | 6548 | 190 | 24 | 422 | 9880 | 168 | 46 | 5 | 7099 | 900 |
| 3 | 233 | 497 | 11543 | 244 | 211 | 333 | 14177 | 706 | 254 | 17 | 12588 | 1360 |
| 4 | 348 | 163 | 6162 | 612 | 772 | 167 | 9561 | 1178 | 931 | 85 | 9381 | 2200 |
| 5 | 700 | 122 | 799 | 524 | 280 | 192 | 241 | 525 | 773 | 535 | 1276 | 1547 |
| 6 | 389 | 19 | 80 | 274 | 141 | 254 | 158 | 210 | 485 | 501 | 745 | 402 |
| 7 | 57 | 163 | 296 | 273 | 107 | 620 | 486 | 316 | 130 | 1218 | 452 | 145 |
| 8 | 8 | 215 | 218 | 23 | 102 | 247 | 160 | 221 | 60 | 103 | 128 | 119 |
| 9 | 5 | 95 | 135 | 5 | 4 | 157 | 91 | 14 | 17 | 138 | 99 | 38 |
| Year | 84 | 84 | 84 | 84 | 85 | 85 | 85 | 85 | 86 | 86 | 86 | 86 |
| Quart | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Age | | | | | | | | | | | | |
| 1 | 37 | 34 | 2849 | 184 | 18 | 5 | 8012 | 2813 | 97 | 109 | 5649 | 1829 |
| 2 | 317 | 579 | 11017 | 153 | 164 | 382 | 9763 | 1532 | 93 | 1461 | 10268 | 2377 |
| 3 | 420 | 410 | 8531 | 481 | 371 | 671 | 8410 | 1175 | 718 | 683 | 8600 | 4389 |
| 4 | 807 | 262 | 1070 | 590 | 580 | 308 | 827 | 750 | 1154 | 283 | 1678 | 1749 |
| 5 | 525 | 184 | 123 | 523 | 707 | 156 | 249 | 563 | 616 | 378 | 285 | 1133 |
| 6 | 408 | 298 | 634 | 302 | 332 | 578 | 354 | 470 | 853 | 655 | 820 | 139 |
| 7 | 158 | 1096 | 603 | 268 | 182 | 528 | 226 | 101 | 270 | 402 | 119 | 59 |
| 8 | 63 | 13 | 92 | 26 | 60 | 80 | 100 | 142 | 185 | 415 | 152 | 60 |
| 9 | 136 | 10 | 76 | 26 | 61 | 137 | 93 | 71 | 31 | 180 | 127 | 44 |
| 10 | 143 | 272 | 74 | 33 | 126 | 118 | 88 | 27 | 15 | 14 | 80 | 31 |
| Year | 87 | 87 | 87 | 87 | 88 | 88 | 88 | 88 | 89 | 89 | 89 | 89 |
| Quart | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Age | | | | | | | | | | | | |
| 1 | 280 | 17 | 1572 | 1047 | 1 | 88 | 12559 | 7767 | 1 | 78 | 4629 | 4485 |
| 2 | 449 | 1580 | 12371 | 2597 | 7 | 503 | 13675 | 3959 | 1 | 1200 | 12276 | 1014 |
| 3 | 206 | 410 | 11395 | 2418 | 24 | 242 | 5611 | 1829 | 2 | 343 | 7557 | 2527 |
| 4 | 487 | 193 | 5322 | 501 | 111 | 503 | 5349 | 1386 | 478 | 162 | 4604 | 3449 |
| 5 | 290 | 49 | 475 | 113 | 20 | 133 | 1111 | 174 | 115 | 6 | 112 | 152 |
| 6 | 148 | 60 | 95 | 154 | 184 | 27 | 322 | 255 | 24 | 72 | 95 | 111 |
| 7 | 88 | 79 | 93 | 112 | 79 | 169 | 107 | 74 | 7 | 119 | 69 | 37 |
| 8 | 265 | 84 | 110 | 44 | 67 | 68 | 93 | 60 | 2 | 42 | 56 | 39 |
| 9 | 26 | 75 | 94 | 22 | 23 | 47 | 78 | 46 | 1 | 46 | 53 | 34 |
| 10 | 35 | 10 | 78 | 15 | 2 | 10 | 70 | 36 | 1 | 8 | 52 | 29 |
| 11 | 45 | 196 | 78 | 13 | 1 | 5 | 70 | 31 | 1 | 4 | 53 | 27 |

Table 3. Quarterly catch at age table computed by MULTIFAN.

Numbers at age (x1000)

Standard years

| Year | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | | | | | | | | | | | | | | | |
| 1 | 172 | 669 | 370 | 2648 | 455 | 1574 | 861 | 56 | 755 | 312 | 1088 | 776 | 292 | 2044 | 920 |
| 2 | 743 | 2223 | 2342 | 2569 | 3426 | 1335 | 924 | 1049 | 805 | 1207 | 1184 | 1420 | 1700 | 1814 | 1449 |
| 3 | 1263 | 528 | 1171 | 1207 | 2133 | 2055 | 1252 | 1543 | 1422 | 984 | 1063 | 1439 | 1443 | 771 | 1043 |
| 4 | 476 | 990 | 805 | 862 | 355 | 471 | 729 | 1168 | 1260 | 273 | 247 | 486 | 650 | 735 | 869 |
| 5 | 167 | 415 | 83 | 259 | 118 | 88 | 215 | 124 | 413 | 136 | 168 | 241 | 93 | 144 | 39 |
| 6 | 154 | 416 | 415 | 215 | 150 | 57 | 76 | 76 | 213 | 164 | 173 | 247 | 46 | 79 | 30 |
| 7 | 143 | 248 | 232 | 53 | 40 | 30 | 79 | 153 | 195 | 213 | 104 | 85 | 37 | 43 | 23 |
| 8 | 302 | 144 | 107 | 18 | 64 | 42 | 46 | 73 | 41 | 19 | 38 | 81 | 50 | 29 | 14 |
| 9 | 53 | 104 | 71 | | | | 26 | 28 | 29 | 25 | 36 | 38 | 22 | 19 | 13 |
| 10 | 53 | 55 | 63 | | | | | | | 57 | 37 | 16 | 14 | 12 | 9 |
| Σ | 3524 | 5792 | 5658 | 7831 | 6840 | 5651 | 4207 | 4270 | 5133 | 3389 | 4137 | 4829 | 4346 | 5689 | 4409 |

Biological years

| | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | | | | | | | | | | | | | | | |
| 1 | 173 | 669 | 371 | 2647 | 455 | 1582 | 854 | 56 | 758 | 311 | 1098 | 793 | 264 | 2044 | 920 |
| 2 | 743 | 2231 | 2333 | 2575 | 3422 | 1383 | 875 | 1052 | 832 | 1191 | 1177 | 1456 | 1656 | 1814 | 1449 |
| 3 | 1242 | 531 | 1181 | 1204 | 2171 | 2014 | 1250 | 1547 | 1439 | 979 | 1097 | 1388 | 1425 | 768 | 1043 |
| 4 | 506 | 960 | 842 | 802 | 378 | 448 | 771 | 1184 | 1247 | 250 | 304 | 420 | 613 | 772 | 822 |
| 5 | 293 | 254 | 187 | 180 | 96 | 124 | 173 | 173 | 388 | 154 | 158 | 209 | 66 | 153 | 27 |
| 6 | 217 | 496 | 314 | 233 | 109 | 67 | 51 | 111 | 206 | 157 | 226 | 176 | 49 | 63 | 28 |
| 7 | 145 | 312 | 137 | 68 | 29 | 31 | 84 | 155 | 197 | 215 | 113 | 67 | 36 | 36 | 23 |
| 8 | 312 | 143 | 90 | 24 | 70 | 31 | 56 | 69 | 41 | 19 | 51 | 89 | 31 | 22 | 14 |
| 9 | 58 | 105 | 61 | | | 1 | 26 | 29 | 41 | 17 | 33 | 38 | 21 | 17 | 13 |
| 10 | 52 | 55 | 52 | | | | | | 16 | 54 | 27 | 17 | 11 | 12 | 9 |
| Σ | 3741 | 5754 | 5567 | 7732 | 6830 | 5680 | 4138 | 4376 | 5165 | 3346 | 4283 | 4651 | 4170 | 5701 | 4346 |

Table 4. Catch at age table computed by MULTIFAN. These values have been obtained adding the quarterly estimates of Table 3 as Q1+Q2+Q3+Q4 of year n, in the case of "standard" years; and as Q2+Q3+Q4 of year n, plus Q1 of year n+1, in the case of "biological" years.

| RELEASES | | | | | |
|---|---|---|---|---|---|
| Year | | 1988 | 1989 | 1990 | TOTAL |
| No fish | | 486 | 2969 | 4481 | 7936 |
| Gear | | TROL | BB | BB | |
| **RECAPTURES** | | | | | |
| TROL | 88 | 0 | - | * | 0 |
| | 89 | 0 | 0 | * | 0 |
| | 90 | 0 | 11 | 9 | 20 |
| | Σ | **0** | **11** | **9** | **20** |
| BB | 88 | 22 | - | - | 22 |
| | 89 | 5 | 14 | - | 19 |
| | 90 | 7 | 39 | 14 | 60 |
| | Σ | **34** | **53** | **14** | **101** |
| MWTD | 88 | 0 | - | - | 0 |
| | 89 | 1 | 5 | - | 6 |
| | 90 | * | * | 2 | 2 |
| | Σ | **1** | **5** | **2** | **8** |
| GILL | 88 | 0 | - | - | 0 |
| | 89 | 1 | 0 | - | 1 |
| | 90 | * | 3 | * | 3 |
| | Σ | **1** | **3** | * | **4** |
| ALL | 88 | 22 | - | - | 22 |
| | 89 | 7 | 19 | - | 26 |
| | 90 | 7 | 53 | 25 | 85 |
| | Σ | **36** | **72** | **25** | **133** |

"-" Not applicable

Table 5. Tag release-recapture for North Atlantic albacore, 1988-90.

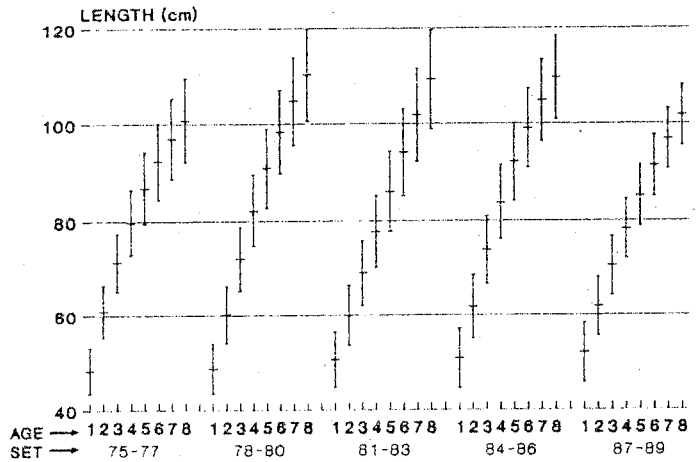



Figure 1. Estimates of mean length and standard deviation of length at age (±1.96·SD) for the different data sets.

# ANNEXES

1 - Length frequency distributions of North Atlantic Albacore for 1975-1989, by quarter, all gears combined. These data were provided by ICCAT Secretariat as ALBNORQ.TAB.

2 - Results of the application of MULTIFAN, in an 'objective' way, to the different data sets of quarterly length frequency distributions of North Atlantic albacore. Data sets are: 1975-77, 1978-80, 1981-83, 1984-86 and 1987-89.

For the best fit of each set, the following information is displayed:

- General information about the fit.
- Growth parameters estimates.
- Proportions at age.
- Numbers at age.
- Graphical representation of the adjustment.
- Results of the test for the best fit (applying 'SIGTEST').

3 - Results of the application of MULTIFAN as an 'slicing machine', to the different data sets. As an example of the inconsistency of this analysis, graphical representation of the adjustement for the set 1987-89 is also displayed.

| SPECIES | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB |
|---|---|---|---|---|---|---|---|---|---|---|
| GEAR | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| COUNTRY | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| YEAR | 75 | 75 | 75 | 75 | 76 | 76 | 76 | 76 | 77 | 77 |
| ICCAT AREA | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH |
| TIME STRATA | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 |
| 29 | 0 | 0 | 0 | 0 | 4 | 7 | 0 | 0 | 0 | 0 |
| 36 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| 38 | 0 | 0 | 0 | 822 | 0 | 0 | 0 | 0 | 0 | 0 |
| 39 | 0 | 0 | 0 | 274 | 4 | 0 | 362 | 0 | 0 | 0 |
| 40 | 0 | 0 | 0 | 548 | 0 | 432 | 18 | 0 | 0 | 0 |
| 41 | 0 | 0 | 0 | 274 | 0 | 0 | 743 | 0 | 0 | 0 |
| 42 | 0 | 0 | 875 | 300 | 39 | 0 | 24 | 0 | 0 | 0 |
| 43 | 0 | 0 | 1436 | 78 | 39 | 6642 | 1789 | 0 | 0 | 0 |
| 44 | 0 | 524 | 3205 | 626 | 4 | 7736 | 1081 | 956 | 0 | 0 |
| 45 | 0 | 2256 | 2908 | 574 | 0 | 11421 | 4492 | 0 | 0 | 1690 |
| 46 | 0 | 6221 | 2338 | 1148 | 0 | 30901 | 3901 | 956 | 0 | 10978 |
| 47 | 0 | 6877 | 3140 | 979 | 0 | 44990 | 6817 | 0 | 0 | 6757 |
| 48 | 0 | 4866 | 3025 | 1637 | 0 | 38437 | 7585 | 0 | 0 | 16045 |
| 49 | 0 | 4010 | 2574 | 600 | 0 | 27537 | 9193 | 3 | 0 | 3378 |
| 50 | 0 | 4300 | 4531 | 1693 | 0 | 18722 | 17221 | 0 | 69 | 5911 |
| 51 | 0 | 769 | 6600 | 3847 | 0 | 12449 | 21645 | 13943 | 69 | 5911 |
| 52 | 0 | 2228 | 14566 | 3029 | 4 | 8587 | 36462 | 15191 | 69 | 4223 |
| 53 | 0 | 1984 | 27629 | 7345 | 0 | 5308 | 48376 | 16319 | 69 | 5911 |
| 54 | 0 | 1696 | 32199 | 7094 | 4 | 3623 | 59276 | 60293 | 0 | 6004 |
| 55 | 0 | 2240 | 34940 | 5508 | 4 | 5697 | 66634 | 35463 | 0 | 6004 |
| 56 | 0 | 1303 | 26763 | 3267 | 0 | 8059 | 64437 | 29123 | 0 | 15201 |
| 57 | 0 | 3476 | 23674 | 1174 | 4 | 22269 | 63483 | 9316 | 0 | 20269 |
| 58 | 0 | 7857 | 24878 | 1598 | 213 | 52852 | 66246 | 1030 | 0 | 27868 |
| 59 | 0 | 15107 | 28984 | 169 | 244 | 80495 | 83005 | 435 | 27 | 46478 |
| 60 | 0 | 14318 | 40486 | 923 | 39 | 109181 | 109386 | 1994 | 95 | 76191 |
| 61 | 0 | 12306 | 40623 | 0 | 52 | 98102 | 158170 | 569 | 100 | 73695 |
| 62 | 0 | 10864 | 55884 | 346 | 469 | 89412 | 201489 | 921 | 198 | 63389 |
| 63 | 0 | 7540 | 79250 | 1059 | 430 | 65619 | 224482 | 562 | 216 | 43997 |
| 64 | 251 | 7147 | 82085 | 874 | 324 | 34556 | 199928 | 1866 | 301 | 25408 |
| 65 | 251 | 5787 | 94403 | 415 | 202 | 24474 | 167835 | 5778 | 252 | 18608 |
| 66 | 32 | 5822 | 70310 | 527 | 132 | 10910 | 112611 | 2500 | 1084 | 10271 |
| 67 | 236 | 4721 | 83700 | 39 | 155 | 7127 | 77481 | 1657 | 1115 | 10371 |
| 68 | 353 | 2799 | 69741 | 188 | 469 | 4134 | 60321 | 12649 | 1476 | 11238 |
| 69 | 353 | 5326 | 61440 | 1168 | 710 | 4552 | 45537 | 3217 | 1606 | 7229 |
| 70 | 998 | 7625 | 87035 | 461 | 490 | 3205 | 38712 | 1415 | 1404 | 5220 |
| 71 | 794 | 8998 | 102919 | 780 | 499 | 5274 | 43204 | 943 | 1454 | 7941 |
| 72 | 1399 | 21018 | 121026 | 2396 | 648 | 5172 | 49134 | 3894 | 2065 | 7928 |
| 73 | 990 | 9670 | 150080 | 1447 | 609 | 3889 | 52711 | 7945 | 2184 | 14003 |
| 74 | 2309 | 8565 | 140290 | 2195 | 1013 | 5031 | 59552 | 1932 | 1269 | 7343 |
| 75 | 2105 | 5371 | 114942 | 3250 | 988 | 6142 | 79843 | 2376 | 1276 | 5630 |
| 76 | 4630 | 4145 | 96065 | 3297 | 2671 | 5483 | 70052 | 4181 | 2242 | 8539 |
| 77 | 5346 | 3559 | 78038 | 6038 | 2802 | 3040 | 98575 | 9507 | 2285 | 5997 |
| 78 | 6612 | 6150 | 77388 | 6046 | 5409 | 2955 | 91014 | 9321 | 4500 | 3477 |
| 79 | 7225 | 5673 | 55451 | 9346 | 6000 | 3206 | 73014 | 10031 | 4813 | 6204 |
| 80 | 7859 | 2781 | 48362 | 12000 | 8448 | 2193 | 91205 | 10982 | 4265 | 6164 |
| 81 | 7552 | 5435 | 32192 | 11185 | 8634 | 1607 | 66561 | 19209 | 4488 | 2905 |
| 82 | 6672 | 2623 | 25346 | 11737 | 10438 | 2808 | 76767 | 16949 | 7459 | 6574 |
| 83 | 6427 | 3271 | 30833 | 12543 | 10321 | 3148 | 61025 | 13874 | 7375 | 4853 |
| 84 | 8707 | 4344 | 18170 | 14272 | 14651 | 3472 | 57854 | 18710 | 8291 | 2358 |
| 85 | 7889 | 1834 | 19130 | 13177 | 13921 | 3393 | 61263 | 13545 | 8126 | 2309 |
| 86 | 7900 | 2249 | 14166 | 13569 | 18776 | 4579 | 51328 | 18587 | 9058 | 5514 |
| 87 | 8433 | 3268 | 14605 | 12952 | 19217 | 4731 | 42779 | 15502 | 8822 | 5548 |
| 88 | 12038 | 3360 | 8897 | 15871 | 25469 | 4424 | 38084 | 12730 | 7162 | 5067 |
| 89 | 12078 | 4452 | 7721 | 15165 | 26679 | 4679 | 34393 | 12906 | 8000 | 5094 |
| 90 | 9532 | 3149 | 3357 | 26272 | 26741 | 6011 | 31339 | 21019 | 13439 | 9124 |
| 91 | 9883 | 4342 | 4061 | 13024 | 27717 | 6427 | 23763 | 14500 | 14212 | 9144 |
| 92 | 5776 | 3171 | 2860 | 16928 | 23696 | 5706 | 22961 | 23861 | 20975 | 13562 |
| 93 | 6064 | 3563 | 2235 | 24064 | 23350 | 6028 | 22016 | 27100 | 21179 | 13599 |
| 94 | 7916 | 4313 | 2607 | 21621 | 20129 | 6415 | 18814 | 28114 | 19895 | 10550 |
| 95 | 7817 | 5147 | 3711 | 49354 | 20315 | 6939 | 17136 | 40867 | 19667 | 10550 |
| 96 | 4240 | 4832 | 3105 | 38775 | 15322 | 7996 | 16867 | 36422 | 20214 | 7839 |
| 97 | 4528 | 5602 | 2775 | 27131 | 16281 | 8330 | 14131 | 30979 | 19896 | 7808 |
| 98 | 4487 | 4956 | 4174 | 14032 | 11527 | 8661 | 12492 | 24758 | 23407 | 10039 |
| 99 | 4917 | 5990 | 5160 | 25845 | 12452 | 9065 | 14969 | 28807 | 23754 | 10042 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 5710 | 7386 | 7843 | 35821 | 9703 | 8749 | 14413 | 26929 | 15200 | 8412 |
| 101 | 4644 | 6222 | 5157 | 13251 | 9431 | 8275 | 11548 | 16437 | 15406 | 8412 |
| 102 | 4736 | 7008 | 5869 | 19246 | 7186 | 8136 | 12207 | 18005 | 16301 | 8407 |
| 103 | 4408 | 6441 | 6266 | 28739 | 6795 | 7891 | 12509 | 17834 | 16158 | 8406 |
| 104 | 3238 | 4537 | 4966 | 13061 | 4799 | 7509 | 8700 | 11387 | 7966 | 6521 |
| 105 | 2358 | 3949 | 4792 | 26328 | 4362 | 7354 | 8516 | 13721 | 7848 | 6521 |
| 106 | 2464 | 3408 | 2627 | 9652 | 3607 | 5560 | 6074 | 6758 | 5294 | 4037 |
| 107 | 2362 | 3580 | 3062 | 17911 | 3656 | 5545 | 6426 | 7865 | 5317 | 4037 |
| 108 | 1865 | 3014 | 3596 | 21025 | 2945 | 4453 | 4431 | 7480 | 2933 | 3717 |
| 109 | 1372 | 2347 | 3454 | 2370 | 2864 | 4162 | 4213 | 1624 | 3033 | 3716 |
| 110 | 1304 | 1881 | 3032 | 11205 | 1687 | 3027 | 3423 | 6931 | 2081 | 1976 |
| 111 | 1140 | 1650 | 2831 | 2675 | 1682 | 2915 | 3160 | 1736 | 2059 | 1974 |
| 112 | 1021 | 1048 | 1199 | 2195 | 1149 | 1146 | 980 | 1302 | 642 | 2115 |
| 113 | 693 | 507 | 1205 | 1066 | 927 | 923 | 906 | 612 | 647 | 2115 |
| 114 | 547 | 960 | 842 | 371 | 666 | 404 | 450 | 319 | 1060 | 1332 |
| 115 | 711 | 1274 | 837 | 346 | 752 | 515 | 500 | 286 | 1051 | 1337 |
| 116 | 558 | 499 | 124 | 43 | 313 | 377 | 270 | 9 | 445 | 517 |
| 117 | 189 | 285 | 146 | 132 | 246 | 265 | 238 | 3 | 436 | 517 |
| 118 | 64 | 209 | 62 | 152 | 376 | 0 | 0 | 67 | 142 | 280 |
| 119 | 228 | 440 | 105 | 204 | 434 | 112 | 45 | 67 | 142 | 283 |
| 120 | 251 | 37 | 219 | 1403 | 171 | 110 | 0 | 713 | 52 | 166 |
| 121 | 251 | 67 | 219 | 240 | 140 | 110 | 0 | 23 | 52 | 165 |
| 122 | 251 | 37 | 68 | 17 | 48 | 110 | 0 | 0 | 0 | 0 |
| 123 | 251 | 37 | 73 | 0 | 39 | 110 | 0 | 0 | 0 | 2 |
| 124 | 0 | 13 | 130 | 0 | 9 | 0 | 0 | 0 | 0 | 0 |
| 125 | 0 | 0 | 135 | 1157 | 4 | 0 | 0 | 687 | 0 | 2 |
| 126 | 0 | 0 | 0 | 0 | 106 | 0 | 0 | 0 | 0 | 93 |
| 127 | 0 | 0 | 0 | 0 | 106 | 0 | 0 | 3 | 0 | 93 |
| 128 | 0 | 0 | 124 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129 | 0 | 0 | 124 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 130 | 0 | 0 | 62 | 107 | 0 | 0 | 0 | 0 | 0 | 0 |
| 131 | 0 | 0 | 62 | 107 | 0 | 0 | 0 | 0 | 0 | 0 |
| 142 | 126 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 143 | 126 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 144 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 |
| 145 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 |
| 160 | 0 | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 0 |
| 161 | 0 | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 0 |
| 162 | 0 | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 163 | 0 | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 186 | 0 | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 187 | 0 | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 194 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72 |
| 195 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72 |
| TOTAL N | 225465 | 358671 | 2258367 | 681718 | 443043 | 1062094 | 3450592 | 836500 | 404182 | 819243 |
| MEAN | 90 | 77 | 72 | 93 | 92 | 66 | 71 | 84 | 94 | 71 |

| SPECIES | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB |
|---|---|---|---|---|---|---|---|---|---|---|
| GEAR | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| COUNTRY | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| YEAR | 77 | 77 | 78 | 78 | 78 | 78 | 79 | 79 | 79 | 79 |
| ICCAT AREA | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH |
| TIME STRATA | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 |
| 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1292 | 0 |
| 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 517 | 0 |
| 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3721 | 4890 |
| 41 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 84 | 1430 | 4033 |
| 42 | 0 | 0 | 268 | 3 | 1542 | 0 | 0 | 84 | 1430 | 1055 |
| 43 | 0 | 0 | 268 | 0 | 0 | 0 | 0 | 253 | 4287 | 1692 |
| 44 | 0 | 0 | 0 | 511 | 1795 | 0 | 4 | 1093 | 19128 | 1601 |
| 45 | 0 | 0 | 0 | 511 | 4556 | 0 | 0 | 257 | 4287 | 6263 |
| 46 | 481 | 0 | 134 | 2554 | 12731 | 0 | 0 | 169 | 2858 | 4083 |
| 47 | 759 | 791 | 134 | 1538 | 39439 | 0 | 0 | 84 | 1648 | 5481 |
| 48 | 1482 | 4200 | 0 | 4626 | 130700 | 9182 | 0 | 0 | 1014 | 4776 |
| 49 | 3377 | 6694 | 12 | 3112 | 295776 | 31632 | 59 | 0 | 3327 | 19078 |
| 50 | 7569 | 10103 | 0 | 3116 | 392303 | 125304 | 0 | 30 | 16288 | 15875 |
| 51 | 16101 | 33842 | 0 | 1629 | 363266 | 151733 | 12 | 18 | 24592 | 13684 |
| 52 | 16477 | 48023 | 0 | 3125 | 266184 | 114294 | 8 | 42 | 31272 | 28694 |
| 53 | 17259 | 19170 | 0 | 33 | 159873 | 51990 | 4 | 71 | 51089 | 36362 |
| 54 | 13452 | 8276 | 0 | 1060 | 140114 | 62036 | 12 | 409 | 44949 | 45715 |
| 55 | 21770 | 4744 | 0 | 2584 | 103897 | 27844 | 19 | 1051 | 84986 | 35298 |
| 56 | 21400 | 2495 | 0 | 2608 | 92641 | 6642 | 4 | 728 | 67189 | 27353 |
| 57 | 29893 | 3285 | 6 | 2564 | 59810 | 2272 | 8 | 1230 | 77014 | 6640 |
| 58 | 52063 | 1581 | 0 | 21989 | 79443 | 1696 | 4 | 4295 | 142011 | 3926 |
| 59 | 81746 | 4216 | 19 | 15853 | 121982 | 2884 | 94 | 4965 | 153976 | 7401 |
| 60 | 142869 | 4284 | 13 | 28132 | 280631 | 5086 | 105 | 13640 | 371279 | 8396 |
| 61 | 176319 | 1789 | 19 | 19478 | 316423 | 2286 | 148 | 14264 | 395876 | 2013 |
| 62 | 266542 | 5205 | 19 | 9265 | 382101 | 9498 | 363 | 15815 | 471553 | 9008 |
| 63 | 267782 | 6786 | 0 | 6695 | 323579 | 19771 | 359 | 13415 | 437403 | 8942 |
| 64 | 202001 | 999 | 101 | 3142 | 245770 | 12654 | 464 | 6340 | 322993 | 8527 |
| 65 | 192991 | 4400 | 38 | 59 | 181204 | 10465 | 441 | 4957 | 306654 | 7952 |
| 66 | 143669 | 7896 | 63 | 2099 | 144864 | 16387 | 412 | 2461 | 188090 | 6334 |
| 67 | 147907 | 5353 | 114 | 546 | 111359 | 14767 | 467 | 2532 | 155063 | 4999 |
| 68 | 98826 | 2908 | 375 | 529 | 56696 | 25604 | 989 | 2775 | 134257 | 5079 |
| 69 | 85973 | 7218 | 614 | 20 | 38834 | 7367 | 1250 | 2139 | 97491 | 3969 |
| 70 | 82910 | 3049 | 222 | 172 | 45916 | 16041 | 608 | 2933 | 143936 | 6492 |
| 71 | 80752 | 11591 | 266 | 167 | 61178 | 7161 | 740 | 2606 | 93035 | 4384 |
| 72 | 108938 | 21356 | 296 | 1235 | 80421 | 5696 | 954 | 5479 | 156000 | 4638 |
| 73 | 121951 | 8501 | 270 | 1242 | 79840 | 6200 | 1233 | 4815 | 147581 | 8553 |
| 74 | 104279 | 4694 | 865 | 1235 | 93078 | 12488 | 1753 | 5326 | 184997 | 4749 |
| 75 | 132686 | 6416 | 944 | 1136 | 127018 | 15365 | 1952 | 6161 | 260536 | 5860 |
| 76 | 130333 | 9438 | 1589 | 622 | 122567 | 11467 | 1856 | 4450 | 227556 | 9822 |
| 77 | 135036 | 11654 | 1759 | 1924 | 123824 | 22450 | 2347 | 3805 | 198424 | 20551 |
| 78 | 126278 | 17390 | 3085 | 753 | 145107 | 14429 | 2674 | 2504 | 140148 | 22513 |
| 79 | 84624 | 19116 | 3672 | 3461 | 120112 | 19308 | 3093 | 2035 | 139398 | 19451 |
| 80 | 104673 | 33030 | 6662 | 8957 | 125935 | 18961 | 2964 | 2376 | 111796 | 18871 |
| 81 | 48081 | 21380 | 6978 | 7451 | 104077 | 20943 | 3183 | 1989 | 60449 | 17116 |
| 82 | 49567 | 31526 | 5885 | 11784 | 76934 | 13204 | 1792 | 1684 | 37182 | 16294 |
| 83 | 36328 | 21133 | 5708 | 5014 | 71594 | 7868 | 1602 | 1550 | 33641 | 16890 |
| 84 | 29568 | 17139 | 8543 | 6595 | 51846 | 12387 | 4171 | 1903 | 32299 | 11340 |
| 85 | 24944 | 18192 | 9034 | 4906 | 49599 | 10121 | 4875 | 2321 | 25570 | 8705 |
| 86 | 24253 | 15522 | 8567 | 2330 | 19125 | 8399 | 3490 | 2833 | 21652 | 7021 |
| 87 | 22894 | 16535 | 8337 | 980 | 27869 | 5803 | 3489 | 2337 | 11376 | 5286 |
| 88 | 11846 | 10743 | 10649 | 1985 | 20072 | 11445 | 2990 | 2130 | 17694 | 6382 |
| 89 | 10072 | 10745 | 11351 | 1126 | 28595 | 10479 | 3464 | 1932 | 4819 | 7927 |
| 90 | 16328 | 20882 | 13771 | 3719 | 13949 | 22600 | 4663 | 4931 | 7770 | 6170 |
| 91 | 5882 | 12733 | 14318 | 3739 | 9383 | 13298 | 5064 | 3724 | 4280 | 5207 |
| 92 | 5617 | 17176 | 17913 | 8292 | 13420 | 17134 | 14017 | 3857 | 6678 | 4331 |
| 93 | 5664 | 19868 | 18034 | 8325 | 11427 | 11866 | 13940 | 4726 | 2695 | 5102 |
| 94 | 6419 | 22848 | 13582 | 5248 | 8785 | 5731 | 5728 | 5002 | 2905 | 5785 |
| 95 | 6372 | 36160 | 13529 | 4964 | 6324 | 4336 | 5666 | 6091 | 3273 | 5068 |
| 96 | 4712 | 26447 | 9185 | 8607 | 9892 | 7382 | 6528 | 5593 | 1045 | 1832 |
| 97 | 4871 | 24361 | 9198 | 6569 | 7124 | 5941 | 6659 | 5946 | 3247 | 2111 |
| 98 | 6270 | 14148 | 15879 | 11608 | 11974 | 12057 | 9906 | 5220 | 2732 | 3024 |
| 99 | 6375 | 17659 | 16236 | 9550 | 12777 | 8218 | 10611 | 3841 | 2341 | 4115 |
| 100 | 5790 | 20296 | 13063 | 7914 | 8108 | 5977 | 6748 | 4204 | 2649 | 2965 |
| 101 | 5848 | 13126 | 12840 | 10018 | 6454 | 3739 | 6713 | 2622 | 1293 | 2870 |
| 102 | 5724 | 15621 | 11936 | 11343 | 5368 | 1921 | 5238 | 4622 | 873 | 3469 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 103 | 5648 | 11193 | 11121 | 9267 | 5338 | 1445 | 5082 | 3259 | 2425 | 3209 |
| 104 | 6421 | 9659 | 5810 | 5378 | 5295 | 6672 | 10035 | 4541 | 731 | 2697 |
| 105 | 6383 | 11238 | 5449 | 4971 | 5115 | 6193 | 9338 | 3391 | 1681 | 3105 |
| 106 | 4269 | 6908 | 3789 | 3341 | 2353 | 2245 | 6324 | 2420 | 471 | 1354 |
| 107 | 4269 | 5430 | 3739 | 3341 | 2364 | 2258 | 6240 | 2180 | 533 | 1357 |
| 108 | 3324 | 4821 | 1659 | 2386 | 1414 | 600 | 1911 | 1999 | 429 | 1963 |
| 109 | 3342 | 1424 | 1683 | 2294 | 1591 | 728 | 2171 | 2460 | 606 | 2106 |
| 110 | 2736 | 5776 | 1046 | 1058 | 900 | 658 | 3265 | 2810 | 524 | 1566 |
| 111 | 2745 | 373 | 977 | 996 | 927 | 632 | 3245 | 2807 | 524 | 1566 |
| 112 | 1023 | 1440 | 284 | 1119 | 675 | 307 | 2337 | 3370 | 699 | 2136 |
| 113 | 1023 | 665 | 246 | 996 | 675 | 267 | 2294 | 3130 | 617 | 2081 |
| 114 | 825 | 231 | 260 | 663 | 499 | 307 | 1377 | 2946 | 244 | 1107 |
| 115 | 816 | 215 | 190 | 101 | 294 | 172 | 724 | 1483 | 405 | 1051 |
| 116 | 284 | 87 | 134 | 167 | 174 | 151 | 614 | 781 | 336 | 899 |
| 117 | 274 | 87 | 141 | 167 | 163 | 162 | 614 | 789 | 336 | 886 |
| 118 | 221 | 0 | 57 | 167 | 96 | 84 | 534 | 892 | 82 | 373 |
| 119 | 221 | 0 | 75 | 167 | 97 | 95 | 509 | 892 | 0 | 376 |
| 120 | 47 | 773 | 0 | 234 | 40 | 118 | 646 | 416 | 121 | 2124 |
| 121 | 47 | 0 | 6 | 234 | 38 | 110 | 650 | 413 | 121 | 2124 |
| 122 | 0 | 0 | 0 | 101 | 167 | 36 | 226 | 339 | 0 | 504 |
| 123 | 10 | 0 | 0 | 101 | 167 | 36 | 226 | 339 | 0 | 504 |
| 124 | 47 | 0 | 6 | 101 | 38 | 31 | 226 | 339 | 0 | 275 |
| 125 | 47 | 773 | 0 | 43 | 0 | 8 | 32 | 162 | 0 | 275 |
| 126 | 157 | 0 | 0 | 43 | 0 | 8 | 32 | 88 | 0 | 0 |
| 127 | 157 | 0 | 0 | 43 | 0 | 8 | 32 | 88 | 0 | 0 |
| 128 | 0 | 0 | 0 | 43 | 65 | 10 | 32 | 88 | 0 | 0 |
| 129 | 0 | 0 | 6 | 43 | 65 | 10 | 32 | 88 | 0 | 0 |
| 130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 |
| 131 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 |
| 132 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 |
| 133 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 |
| 134 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 |
| 166 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 173 | 0 | 0 |
| 167 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 173 | 0 | 0 |
| TOTAL N | 3608925 | 825825 | 313034 | 337912 | 6075782 | 1105151 | 214684 | 257603 | 5719710 | 647917 |
| MEAN | 70 | 82 | 94 | 80 | 64 | 66 | 96 | 82 | 68 | 70 |

| SPECIES | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB |
|---|---|---|---|---|---|---|---|---|---|---|
| GEAR | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| COUNTRY | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| YEAR | 80 | 80 | 80 | 80 | 81 | 81 | 81 | 81 | 82 | 82 |
| ICCAT AREA | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH |
| TIME STRATA | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 |
| 24 | 0 | 0 | 3 | 0 | 17 | 0 | 0 | 0 | 0 | 0 |
| 34 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 37 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 40 | 0 | 0 | 6216 | 0 | 0 | 0 | 807 | 20 | 0 | 0 |
| 41 | 0 | 0 | 609 | 0 | 1 | 0 | 696 | 13 | 0 | 0 |
| 42 | 0 | 0 | 319 | 0 | 1 | 2 | 1459 | 302 | 0 | 4 |
| 43 | 0 | 0 | 78 | 0 | 0 | 0 | 3089 | 315 | 0 | 4 |
| 44 | 0 | 0 | 39 | 0 | 0 | 370 | 1651 | 7 | 0 | 0 |
| 45 | 0 | 0 | 3149 | 2299 | 0 | 1667 | 6458 | 306 | 0 | 0 |
| 46 | 0 | 0 | 2901 | 700 | 0 | 2112 | 6518 | 39 | 0 | 644 |
| 47 | 0 | 1014 | 41907 | 1736 | 0 | 3284 | 18615 | 2222 | 0 | 0 |
| 48 | 0 | 0 | 67358 | 3228 | 60 | 2807 | 28746 | 1780 | 0 | 0 |
| 49 | 0 | 0 | 116425 | 5575 | 60 | 1398 | 64896 | 2869 | 0 | 430 |
| 50 | 0 | 1011 | 194455 | 10855 | 15 | 1678 | 130984 | 1913 | 0 | 862 |
| 51 | 0 | 1011 | 182895 | 17643 | 141 | 4872 | 109784 | 1845 | 0 | 647 |
| 52 | 0 | 0 | 174467 | 12485 | 102 | 2147 | 103978 | 3331 | 0 | 862 |
| 53 | 18 | 3 | 172821 | 16202 | 444 | 2792 | 91703 | 1374 | 0 | 214 |
| 54 | 0 | 14 | 139478 | 9469 | 429 | 4694 | 74287 | 1453 | 0 | 1933 |
| 55 | 3 | 109 | 132029 | 28460 | 456 | 7729 | 78916 | 1395 | 0 | 2338 |
| 56 | 0 | 1014 | 105955 | 17176 | 1320 | 18565 | 76726 | 694 | 0 | 1696 |
| 57 | 21 | 3140 | 67166 | 11672 | 1014 | 34604 | 72068 | 668 | 0 | 1429 |
| 58 | 6 | 16391 | 84480 | 23800 | 1477 | 32499 | 67433 | 415 | 0 | 3837 |
| 59 | 3 | 17341 | 102037 | 12570 | 2028 | 37531 | 66932 | 453 | 0 | 4146 |
| 60 | 24 | 25501 | 141469 | 26262 | 1711 | 28725 | 111072 | 1879 | 0 | 9216 |
| 61 | 6 | 17411 | 136717 | 6987 | 3075 | 18521 | 73841 | 1308 | 0 | 7824 |
| 62 | 6 | 12393 | 123212 | 211 | 3897 | 13291 | 78956 | 2439 | 962 | 8918 |
| 63 | 47 | 8543 | 103404 | 1632 | 3705 | 4552 | 67465 | 2473 | 962 | 5352 |
| 64 | 220 | 11912 | 83253 | 363 | 4490 | 3284 | 71382 | 1813 | 285 | 3950 |
| 65 | 220 | 6799 | 96644 | 3033 | 4974 | 2587 | 94314 | 1507 | 345 | 3142 |
| 66 | 66 | 2357 | 86816 | 165 | 5246 | 2542 | 91673 | 1981 | 504 | 3180 |
| 67 | 119 | 6028 | 77148 | 316 | 5410 | 2311 | 127841 | 2886 | 473 | 3097 |
| 68 | 81 | 5908 | 105313 | 1587 | 4923 | 6162 | 114633 | 3112 | 673 | 3262 |
| 69 | 146 | 4059 | 101598 | 1703 | 5645 | 6501 | 121294 | 3851 | 670 | 2384 |
| 70 | 311 | 5305 | 161689 | 3083 | 6021 | 5803 | 160668 | 1937 | 886 | 4251 |
| 71 | 2178 | 1999 | 169507 | 4361 | 4592 | 5558 | 110670 | 2411 | 886 | 3966 |
| 72 | 1985 | 6357 | 184542 | 19441 | 3645 | 4752 | 130925 | 3382 | 2576 | 3402 |
| 73 | 1937 | 2494 | 184931 | 23268 | 3510 | 3087 | 95799 | 3040 | 2576 | 3422 |
| 74 | 675 | 2734 | 164496 | 18394 | 2801 | 2174 | 87023 | 3269 | 2603 | 2276 |
| 75 | 7808 | 2079 | 165949 | 33310 | 3286 | 2038 | 91662 | 3461 | 2603 | 1869 |
| 76 | 2677 | 1356 | 127574 | 35354 | 3111 | 2101 | 84108 | 3875 | 4215 | 2308 |
| 77 | 4867 | 1149 | 109112 | 34741 | 2904 | 1585 | 66832 | 5250 | 4555 | 1289 |
| 78 | 6196 | 1020 | 96218 | 32065 | 2582 | 1495 | 75873 | 3323 | 3590 | 1606 |
| 79 | 5866 | 1544 | 65218 | 33386 | 2513 | 2031 | 74127 | 4675 | 3953 | 1587 |
| 80 | 11119 | 4015 | 73656 | 22458 | 4325 | 2272 | 80100 | 6381 | 7278 | 2579 |
| 81 | 4856 | 2121 | 49566 | 9272 | 4315 | 2565 | 51248 | 6868 | 7313 | 2353 |
| 82 | 4838 | 2540 | 46399 | 7853 | 4243 | 2358 | 41462 | 8665 | 7987 | 2467 |
| 83 | 4459 | 1285 | 44885 | 13843 | 4328 | 1852 | 50694 | 6042 | 7948 | 2466 |
| 84 | 2345 | 2590 | 31215 | 19593 | 4145 | 1713 | 34386 | 9412 | 8702 | 2777 |
| 85 | 12317 | 5582 | 30604 | 26415 | 4987 | 1190 | 41070 | 6182 | 8681 | 2525 |
| 86 | 7483 | 2661 | 29234 | 13259 | 7065 | 994 | 21385 | 5661 | 7653 | 2717 |
| 87 | 6703 | 3622 | 26478 | 18366 | 7594 | 962 | 27104 | 6184 | 7110 | 1784 |
| 88 | 3094 | 6474 | 15902 | 6954 | 7209 | 663 | 11108 | 4603 | 4332 | 2197 |
| 89 | 2215 | 2109 | 13291 | 8557 | 7766 | 796 | 12134 | 6763 | 4334 | 2087 |
| 90 | 23978 | 7906 | 12131 | 13807 | 6418 | 807 | 2975 | 4226 | 3820 | 2236 |
| 91 | 3977 | 1655 | 5374 | 6966 | 6838 | 832 | 2089 | 5114 | 3576 | 1946 |
| 92 | 1053 | 1527 | 5844 | 2430 | 8226 | 1078 | 4182 | 5840 | 4077 | 4367 |
| 93 | 2145 | 649 | 3118 | 2034 | 8397 | 1018 | 2232 | 5464 | 3864 | 4298 |
| 94 | 3904 | 511 | 2709 | 1739 | 5640 | 785 | 1416 | 6949 | 3598 | 5088 |
| 95 | 15078 | 9389 | 5001 | 966 | 6749 | 794 | 1541 | 5076 | 3403 | 4975 |
| 96 | 2259 | 2084 | 4310 | 916 | 5259 | 886 | 2249 | 3891 | 2263 | 5242 |
| 97 | 2440 | 2137 | 4646 | 3496 | 6451 | 910 | 2353 | 4212 | 2395 | 5442 |
| 98 | 6421 | 1088 | 5644 | 3874 | 3186 | 1673 | 1616 | 2397 | 2159 | 4198 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 99 | 939 | 451 | 3240 | 1036 | 5532 | 1717 | 2086 | 4637 | 2604 | 4699 |
| 100 | 12455 | 7801 | 3147 | 2740 | 5303 | 1666 | 3348 | 2454 | 1858 | 5355 |
| 101 | 4108 | 1379 | 4658 | 690 | 4430 | 1694 | 2959 | 2761 | 1950 | 5405 |
| 102 | 4832 | 4812 | 1907 | 426 | 3419 | 1957 | 4036 | 2782 | 1563 | 6053 |
| 103 | 795 | 284 | 2354 | 446 | 3062 | 1912 | 3933 | 2304 | 1167 | 5992 |
| 104 | 1912 | 1260 | 721 | 440 | 2457 | 2817 | 4819 | 3673 | 1662 | 6381 |
| 105 | 5096 | 7441 | 11347 | 1532 | 2324 | 2781 | 4565 | 2888 | 1606 | 6155 |
| 106 | 1083 | 1021 | 600 | 232 | 1754 | 2916 | 4065 | 2519 | 1215 | 5179 |
| 107 | 1528 | 1933 | 542 | 279 | 1288 | 2917 | 4048 | 2553 | 1249 | 5250 |
| 108 | 1911 | 2851 | 2040 | 184 | 1048 | 2497 | 3369 | 1767 | 1374 | 3902 |
| 109 | 1053 | 1120 | 433 | 313 | 666 | 2523 | 3536 | 2245 | 1633 | 4176 |
| 110 | 2039 | 2062 | 393 | 148 | 703 | 2258 | 3226 | 1434 | 1453 | 4134 |
| 111 | 2555 | 2932 | 882 | 860 | 427 | 2259 | 3256 | 1434 | 1415 | 4134 |
| 112 | 485 | 55 | 2434 | 94 | 713 | 1749 | 1661 | 994 | 1689 | 1596 |
| 113 | 1007 | 956 | 1332 | 77 | 701 | 1720 | 1675 | 892 | 1482 | 1784 |
| 114 | 814 | 317 | 719 | 115 | 345 | 1224 | 2222 | 789 | 1028 | 1578 |
| 115 | 1747 | 2136 | 702 | 62 | 266 | 1199 | 2198 | 789 | 1047 | 1460 |
| 116 | 206 | 61 | 144 | 87 | 121 | 1331 | 3491 | 217 | 863 | 1664 |
| 117 | 171 | 61 | 150 | 84 | 142 | 1327 | 3507 | 217 | 846 | 1673 |
| 118 | 1427 | 2756 | 105 | 26 | 19 | 699 | 1271 | 95 | 751 | 909 |
| 119 | 46 | 6 | 96 | 53 | 12 | 698 | 1283 | 129 | 732 | 909 |
| 120 | 722 | 921 | 0 | 7 | 33 | 686 | 1995 | 12 | 408 | 1179 |
| 121 | 1189 | 1830 | 534 | 0 | 14 | 686 | 1993 | 12 | 408 | 1179 |
| 122 | 0 | 0 | 0 | 3 | 54 | 756 | 867 | 26 | 70 | 820 |
| 123 | 0 | 0 | 0 | 0 | 71 | 756 | 867 | 26 | 70 | 820 |
| 124 | 57 | 128 | 0 | 7 | 1 | 206 | 320 | 0 | 8 | 535 |
| 125 | 57 | 122 | 0 | 0 | 0 | 199 | 320 | 0 | 8 | 531 |
| 126 | 0 | 0 | 3 | 0 | 1 | 480 | 203 | 0 | 0 | 945 |
| 127 | 0 | 0 | 0 | 0 | 1 | 480 | 203 | 0 | 0 | 945 |
| 128 | 0 | 0 | 0 | 0 | 3 | 120 | 76 | 9 | 0 | 290 |
| 129 | 0 | 0 | 3 | 0 | 3 | 121 | 76 | 9 | 0 | 290 |
| 130 | 0 | 0 | 0 | 0 | 0 | 85 | 15 | 0 | 0 | 105 |
| 131 | 0 | 0 | 0 | 0 | 0 | 85 | 15 | 0 | 0 | 105 |
| 132 | 0 | 0 | 0 | 0 | 0 | 309 | 59 | 34 | 0 | 66 |
| 133 | 0 | 0 | 0 | 0 | 0 | 309 | 59 | 34 | 0 | 66 |
| 134 | 0 | 0 | 0 | 0 | 0 | 54 | 10 | 0 | 0 | 4 |
| 135 | 0 | 0 | 0 | 0 | 0 | 54 | 10 | 0 | 0 | 4 |
| 136 | 0 | 0 | 0 | 0 | 7 | 69 | 3 | 0 | 7 | 9 |
| 137 | 0 | 0 | 0 | 0 | 7 | 69 | 3 | 0 | 7 | 9 |
| 138 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 |
| 139 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 |
| 140 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| 141 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| 142 | 0 | 0 | 0 | 0 | 0 | 23 | 3 | 0 | 0 | 42 |
| 143 | 0 | 0 | 0 | 0 | 0 | 23 | 3 | 0 | 0 | 42 |
| | 204400 | 272634 | 4528085 | 646291 | 233671 | 347462 | 3398896 | 226947 | 163977 | 243462 |
| | 91 | 77 | 66 | 73 | 84 | 69 | 68 | 84 | 89 | 87 |

| SPECIES | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB |
|---|---|---|---|---|---|---|---|---|---|---|
| GEAR | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| COUNTRY | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| YEAR | 82 | 82 | 83 | 83 | 83 | 83 | 84 | 84 | 84 | 84 |
| ICCAT AREA | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH |
| TIME STRATA | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 |
| 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 39 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 198 | 0 |
| 42 | 0 | 30 | 0 | 6 | 0 | 142 | 83 | 51 | 68 | 40 |
| 43 | 0 | 30 | 0 | 6 | 0 | 142 | 83 | 51 | 62 | 40 |
| 44 | 0 | 6 | 19 | 0 | 0 | 32 | 19 | 76 | 62 | 47 |
| 45 | 216 | 0 | 7 | 0 | 129 | 32 | 19 | 76 | 655 | 47 |
| 46 | 322 | 12 | 7 | 0 | 648 | 97 | 109 | 520 | 2439 | 51 |
| 47 | 322 | 12 | 7 | 0 | 1219 | 83 | 109 | 330 | 5005 | 115 |
| 48 | 645 | 69 | 7 | 0 | 2206 | 270 | 80 | 425 | 6300 | 239 |
| 49 | 1818 | 135 | 44 | 0 | 2442 | 153 | 63 | 194 | 4324 | 193 |
| 50 | 3209 | 79 | 12 | 0 | 27863 | 24686 | 65 | 99 | 8308 | 392 |
| 51 | 4901 | 97 | 0 | 0 | 28747 | 29504 | 102 | 255 | 17324 | 768 |
| 52 | 8562 | 89 | 14 | 6 | 43432 | 41906 | 225 | 1184 | 34840 | 1679 |
| 53 | 13496 | 89 | 14 | 6 | 52773 | 55833 | 226 | 1084 | 39010 | 2034 |
| 54 | 15661 | 907 | 0 | 0 | 44233 | 44621 | 164 | 1018 | 52858 | 2253 |
| 55 | 27090 | 1256 | 0 | 0 | 54620 | 60000 | 166 | 705 | 52437 | 2189 |
| 56 | 28314 | 1372 | 7 | 0 | 45501 | 48621 | 266 | 1205 | 64002 | 2472 |
| 57 | 31013 | 754 | 32 | 17 | 50936 | 48886 | 305 | 856 | 59626 | 2393 |
| 58 | 34232 | 668 | 76 | 0 | 43007 | 39931 | 282 | 1067 | 26774 | 522 |
| 59 | 39660 | 1084 | 101 | 15 | 40568 | 21328 | 358 | 3025 | 33566 | 536 |
| 60 | 101228 | 774 | 83 | 17 | 70307 | 15225 | 564 | 7261 | 75006 | 1251 |
| 61 | 110153 | 979 | 95 | 33 | 47660 | 12254 | 656 | 7124 | 99227 | 840 |
| 62 | 133032 | 1080 | 333 | 45 | 82373 | 11964 | 712 | 8683 | 123537 | 724 |
| 63 | 139707 | 2065 | 308 | 85 | 101368 | 15486 | 623 | 7106 | 128814 | 856 |
| 64 | 139764 | 2995 | 807 | 91 | 124025 | 10409 | 1497 | 5757 | 122367 | 1203 |
| 65 | 162812 | 5010 | 783 | 200 | 143390 | 10722 | 1523 | 3862 | 125098 | 2419 |
| 66 | 118352 | 3970 | 811 | 123 | 104477 | 12841 | 3429 | 2636 | 75073 | 1346 |
| 67 | 139793 | 3468 | 824 | 241 | 129945 | 15213 | 3758 | 2602 | 58871 | 1679 |
| 68 | 135987 | 3498 | 730 | 315 | 128585 | 12044 | 2711 | 1854 | 40588 | 1135 |
| 69 | 141911 | 3697 | 843 | 382 | 132521 | 20324 | 2518 | 1688 | 40654 | 1143 |
| 70 | 186399 | 7175 | 1732 | 177 | 162028 | 10447 | 2122 | 2883 | 54813 | 2200 |
| 71 | 164781 | 6895 | 1846 | 513 | 143393 | 18495 | 2231 | 3565 | 54860 | 2169 |
| 72 | 149429 | 8247 | 2743 | 479 | 116286 | 11896 | 2897 | 2949 | 81287 | 2349 |
| 73 | 134850 | 8804 | 2807 | 739 | 123730 | 16039 | 3496 | 4063 | 82747 | 2885 |
| 74 | 149153 | 9737 | 3409 | 1375 | 125066 | 11872 | 3034 | 4283 | 75811 | 2127 |
| 75 | 161068 | 9709 | 3397 | 1233 | 114403 | 25225 | 2477 | 5004 | 95424 | 3512 |
| 76 | 113029 | 10094 | 4869 | 1151 | 120338 | 19104 | 3424 | 4722 | 78144 | 3974 |
| 77 | 109242 | 11391 | 5135 | 1741 | 127911 | 26533 | 3364 | 5100 | 97092 | 5214 |
| 78 | 112588 | 11828 | 5505 | 1095 | 114200 | 18002 | 4143 | 3821 | 90270 | 5914 |
| 79 | 111964 | 14821 | 6773 | 1973 | 89036 | 18481 | 4253 | 3435 | 72420 | 5090 |
| 80 | 108905 | 12248 | 6609 | 2801 | 127020 | 27298 | 4207 | 4020 | 40060 | 5202 |
| 81 | 95637 | 9990 | 8118 | 2194 | 76352 | 17725 | 4315 | 2396 | 44295 | 5572 |
| 82 | 90077 | 11401 | 11222 | 3765 | 76224 | 23466 | 6292 | 2777 | 40282 | 5633 |
| 83 | 52309 | 11794 | 8289 | 5061 | 76542 | 26650 | 6171 | 2290 | 34773 | 5642 |
| 84 | 42386 | 12094 | 12755 | 5862 | 53541 | 26183 | 6317 | 2666 | 26874 | 6728 |
| 85 | 38711 | 11133 | 11765 | 6322 | 47760 | 28284 | 5511 | 2643 | 22754 | 6260 |
| 86 | 22247 | 9891 | 9937 | 5797 | 29523 | 19923 | 8094 | 2681 | 9003 | 6847 |
| 87 | 17186 | 9697 | 10786 | 6653 | 27878 | 23692 | 7919 | 2812 | 5433 | 6840 |
| 88 | 11409 | 7615 | 10754 | 7959 | 18481 | 19391 | 8411 | 2783 | 6413 | 8233 |
| 89 | 7840 | 8629 | 14799 | 7589 | 20541 | 22429 | 10026 | 2553 | 6589 | 8252 |
| 90 | 6397 | 4121 | 5904 | 6064 | 16470 | 15694 | 8177 | 2701 | 7119 | 5128 |
| 91 | 3070 | 4366 | 6849 | 6787 | 14019 | 13692 | 8050 | 2740 | 5263 | 5289 |
| 92 | 3045 | 5274 | 10435 | 8220 | 13696 | 13372 | 9986 | 3687 | 5842 | 6900 |
| 93 | 2578 | 5050 | 9689 | 7546 | 12261 | 12070 | 10445 | 3662 | 5210 | 6930 |
| 94 | 3515 | 6057 | 8302 | 8869 | 12872 | 10689 | 9448 | 3880 | 4442 | 8134 |
| 95 | 3318 | 4070 | 8188 | 8578 | 10262 | 9207 | 8323 | 3380 | 5617 | 7140 |
| 96 | 4242 | 3657 | 6790 | 9201 | 8309 | 7556 | 8247 | 5926 | 7654 | 7716 |
| 97 | 4896 | 4124 | 7769 | 8151 | 11766 | 12228 | 7794 | 5900 | 7252 | 8691 |
| 98 | 2920 | 2385 | 3834 | 10435 | 6634 | 5227 | 7866 | 5406 | 6358 | 6013 |
| 99 | 3321 | 3878 | 7224 | 10041 | 7457 | 5420 | 6495 | 5323 | 6326 | 6607 |
| 100 | 4657 | 3009 | 5286 | 12706 | 7830 | 4541 | 8497 | 10217 | 12350 | 4519 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 101 | 4306 | 3027 | 5785 | 12616 | 6319 | 3684 | 6613 | 10211 | 11055 | 4371 |
| 102 | 5483 | 3915 | 3578 | 12242 | 6736 | 3430 | 6256 | 12386 | 10341 | 4804 |
| 103 | 5437 | 3815 | 3357 | 12409 | 6573 | 3250 | 5678 | 12397 | 9563 | 4776 |
| 104 | 5478 | 4087 | 4252 | 8584 | 6552 | 3143 | 6581 | 11599 | 10630 | 6201 |
| 105 | 5148 | 3883 | 3106 | 8454 | 5435 | 3123 | 6326 | 11582 | 10848 | 5464 |
| 106 | 5044 | 3841 | 2711 | 5621 | 4389 | 2750 | 4347 | 11104 | 9002 | 5064 |
| 107 | 5058 | 3805 | 2707 | 5566 | 4546 | 2615 | 4391 | 11098 | 9152 | 5151 |
| 108 | 3885 | 3084 | 2354 | 4641 | 4341 | 1813 | 4790 | 6583 | 7367 | 3065 |
| 109 | 4271 | 3232 | 2520 | 4815 | 4456 | 1977 | 4846 | 6589 | 7340 | 3637 |
| 110 | 4066 | 2954 | 1230 | 3203 | 2850 | 1449 | 3092 | 3594 | 4304 | 1706 |
| 111 | 4066 | 2976 | 1221 | 3193 | 2685 | 1455 | 3084 | 3594 | 4304 | 1616 |
| 112 | 2033 | 1699 | 804 | 2172 | 1545 | 1389 | 3045 | 3101 | 3960 | 1570 |
| 113 | 1936 | 1715 | 821 | 2128 | 1461 | 1374 | 3049 | 3101 | 3960 | 1497 |
| 114 | 1737 | 2567 | 594 | 1659 | 1763 | 1304 | 2895 | 2134 | 2904 | 1335 |
| 115 | 1675 | 2602 | 547 | 1659 | 1761 | 1287 | 2899 | 2128 | 2904 | 1195 |
| 116 | 1360 | 1940 | 1066 | 1471 | 1754 | 1943 | 3206 | 2680 | 2273 | 1230 |
| 117 | 1324 | 1898 | 1053 | 1471 | 1754 | 1959 | 3206 | 2680 | 2273 | 1282 |
| 118 | 834 | 996 | 461 | 876 | 1200 | 777 | 2589 | 2375 | 1259 | 512 |
| 119 | 834 | 1044 | 473 | 876 | 1200 | 770 | 2589 | 2375 | 1259 | 678 |
| 120 | 872 | 582 | 366 | 630 | 892 | 832 | 2080 | 1284 | 754 | 245 |
| 121 | 825 | 547 | 379 | 630 | 892 | 832 | 2080 | 1284 | 754 | 213 |
| 122 | 676 | 353 | 438 | 792 | 763 | 252 | 1290 | 1860 | 581 | 503 |
| 123 | 676 | 324 | 412 | 792 | 763 | 252 | 1290 | 1860 | 581 | 515 |
| 124 | 256 | 190 | 97 | 231 | 187 | 30 | 534 | 1236 | 79 | 27 |
| 125 | 252 | 173 | 97 | 231 | 187 | 30 | 534 | 1236 | 79 | 59 |
| 126 | 367 | 159 | 213 | 404 | 120 | 20 | 501 | 1715 | 125 | 24 |
| 127 | 367 | 159 | 213 | 404 | 120 | 20 | 501 | 1715 | 125 | 5 |
| 128 | 125 | 83 | 68 | 50 | 82 | 0 | 516 | 1062 | 93 | 26 |
| 129 | 125 | 83 | 68 | 50 | 80 | 0 | 516 | 1062 | 93 | 32 |
| 130 | 50 | 0 | 7 | 11 | 10 | 0 | 298 | 348 | 35 | 3 |
| 131 | 50 | 0 | 7 | 11 | 10 | 0 | 298 | 348 | 35 | 3 |
| 132 | 22 | 8 | 7 | 25 | 0 | 18 | 261 | 194 | 12 | 5 |
| 133 | 22 | 8 | 7 | 25 | 0 | 18 | 261 | 194 | 12 | 5 |
| 134 | 0 | 6 | 0 | 0 | 6 | 0 | 32 | 18 | 0 | 0 |
| 135 | 0 | 6 | 0 | 0 | 6 | 0 | 32 | 18 | 0 | 0 |
| 136 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 16 | 0 | 0 |
| 137 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 16 | 0 | 0 |
| 138 | 0 | 18 | 0 | 0 | 0 | 0 | 5 | 18 | 0 | 15 |
| 139 | 0 | 18 | 0 | 0 | 0 | 0 | 5 | 18 | 0 | 15 |
| 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 13 |
| 141 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 13 |
| 142 | 19 | 12 | 32 | 15 | 17 | 0 | 28 | 15 | 30 | 22 |
| 143 | 19 | 12 | 32 | 15 | 17 | 0 | 28 | 15 | 30 | 22 |
| 154 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| TOTAL N | 3522057 | 339221 | 270588 | 260632 | 3486276 | 1115366 | 303390 | 317921 | 2507977 | 259276 |
| MEAN | 72 | 86 | 90 | 97 | 72 | 72 | 94 | 92 | 71 | 89 |

| SPECIES | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB |
|---|---|---|---|---|---|---|---|---|---|---|
| GEAR | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| COUNTRY | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| YEAR | 85 | 85 | 85 | 85 | 86 | 86 | 86 | 86 | 87 | 87 |
| ICCAT AREA | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH |
| TIME STRATA | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 |
| 31 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 |
| 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 |
| 35 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 |
| 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 |
| 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 |
| 40 | 0 | 0 | 232 | 0 | 106 | 0 | 0 | 0 | 0 | 0 |
| 41 | 0 | 0 | 33 | 0 | 458 | 0 | 0 | 0 | 13 | 0 |
| 42 | 68 | 0 | 0 | 84 | 154 | 0 | 0 | 346 | 13 | 0 |
| 43 | 68 | 0 | 49 | 84 | 373 | 0 | 10 | 607 | 0 | 0 |
| 44 | 11 | 0 | 25 | 40 | 525 | 0 | 142 | 1551 | 25 | 0 |
| 45 | 11 | 0 | 1312 | 1049 | 740 | 0 | 164 | 2596 | 38 | 0 |
| 46 | 11 | 0 | 1638 | 4732 | 239 | 227 | 533 | 5091 | 176 | 0 |
| 47 | 11 | 0 | 733 | 1458 | 567 | 681 | 1907 | 7466 | 301 | 60 |
| 48 | 21 | 0 | 5532 | 6917 | 397 | 1451 | 8816 | 8920 | 401 | 60 |
| 49 | 21 | 0 | 24620 | 3396 | 467 | 925 | 13969 | 10443 | 527 | 0 |
| 50 | 43 | 8 | 72396 | 10128 | 826 | 2164 | 57800 | 20665 | 539 | 303 |
| 51 | 121 | 8 | 89589 | 26300 | 925 | 2025 | 75365 | 24104 | 827 | 730 |
| 52 | 11 | 106 | 85884 | 29521 | 624 | 926 | 59022 | 30781 | 1066 | 819 |
| 53 | 11 | 193 | 92666 | 28782 | 653 | 504 | 60962 | 20795 | 1003 | 721 |
| 54 | 30 | 0 | 93568 | 34886 | 519 | 3903 | 51562 | 20781 | 1680 | 763 |
| 55 | 30 | 175 | 107819 | 31987 | 783 | 994 | 52221 | 14960 | 890 | 611 |
| 56 | 237 | 106 | 71390 | 20548 | 394 | 2593 | 55132 | 14993 | 840 | 414 |
| 57 | 158 | 793 | 78874 | 17545 | 707 | 7119 | 47946 | 6789 | 1680 | 844 |
| 58 | 109 | 1478 | 21899 | 5731 | 1037 | 11302 | 33525 | 1279 | 1857 | 2759 |
| 59 | 266 | 1831 | 32039 | 3405 | 792 | 12235 | 64722 | 3496 | 1099 | 9836 |
| 60 | 393 | 6206 | 63085 | 6322 | 1502 | 28942 | 113966 | 7620 | 4075 | 17217 |
| 61 | 471 | 7749 | 76643 | 12618 | 509 | 29043 | 149920 | 9835 | 3056 | 23623 |
| 62 | 207 | 5908 | 89288 | 8692 | 467 | 19312 | 163305 | 17545 | 4829 | 26335 |
| 63 | 443 | 3667 | 98769 | 15338 | 571 | 17478 | 137739 | 16703 | 5069 | 26685 |
| 64 | 318 | 5192 | 109994 | 8621 | 1004 | 10931 | 98707 | 21762 | 5826 | 21770 |
| 65 | 553 | 3316 | 118187 | 21112 | 1312 | 5756 | 111608 | 15542 | 6071 | 10789 |
| 66 | 584 | 2660 | 93912 | 17563 | 582 | 2008 | 84459 | 19805 | 4527 | 10356 |
| 67 | 584 | 2893 | 88859 | 14302 | 821 | 922 | 63642 | 24578 | 5506 | 2744 |
| 68 | 449 | 1977 | 78780 | 14013 | 1157 | 5335 | 67339 | 20973 | 5603 | 6420 |
| 69 | 684 | 1926 | 73724 | 18814 | 712 | 3262 | 46536 | 18037 | 4017 | 6142 |
| 70 | 1501 | 1569 | 104914 | 13511 | 1405 | 2601 | 50366 | 32004 | 4288 | 6031 |
| 71 | 1894 | 2885 | 73895 | 13229 | 578 | 2676 | 44050 | 19119 | 2254 | 5092 |
| 72 | 3056 | 5793 | 63986 | 18294 | 1588 | 6124 | 64904 | 31430 | 3179 | 5105 |
| 73 | 2664 | 5571 | 78925 | 13852 | 1259 | 9652 | 63046 | 29746 | 2915 | 2943 |
| 74 | 3754 | 10064 | 69907 | 11001 | 1655 | 8081 | 56730 | 29882 | 3562 | 7680 |
| 75 | 4723 | 9598 | 102360 | 11783 | 2661 | 11457 | 95156 | 33813 | 4445 | 3778 |
| 76 | 4633 | 7683 | 72607 | 14507 | 2543 | 6218 | 84307 | 40498 | 3519 | 5125 |
| 77 | 3179 | 5853 | 79857 | 13959 | 2233 | 2226 | 77207 | 34525 | 3325 | 1501 |
| 78 | 2929 | 4595 | 69275 | 8399 | 4402 | 5653 | 84986 | 48470 | 3456 | 2087 |
| 79 | 4249 | 2624 | 71498 | 12209 | 4426 | 3548 | 81095 | 41211 | 3012 | 2846 |
| 80 | 3614 | 3671 | 55448 | 14659 | 10909 | 5336 | 60899 | 45900 | 7522 | 2435 |
| 81 | 3661 | 3557 | 43371 | 6843 | 6886 | 3002 | 40830 | 27236 | 5981 | 1508 |
| 82 | 3584 | 5198 | 28765 | 11378 | 10177 | 3500 | 50099 | 33667 | 4896 | 883 |
| 83 | 3353 | 2808 | 26867 | 9018 | 12142 | 3316 | 28465 | 41168 | 4924 | 469 |
| 84 | 5783 | 3808 | 22327 | 11443 | 11372 | 2561 | 31096 | 27744 | 9858 | 2020 |
| 85 | 5080 | 3252 | 11078 | 9636 | 19289 | 3446 | 23600 | 26541 | 5432 | 913 |
| 86 | 5814 | 3133 | 11080 | 10362 | 10844 | 3570 | 18528 | 15260 | 5862 | 838 |
| 87 | 6565 | 2540 | 8004 | 9725 | 11642 | 4397 | 13510 | 23249 | 5223 | 783 |
| 88 | 8048 | 2935 | 7918 | 11835 | 9527 | 2746 | 6846 | 20435 | 7534 | 1250 |
| 89 | 7532 | 2650 | 6523 | 10673 | 8335 | 4021 | 8783 | 20199 | 3585 | 840 |
| 90 | 6813 | 2339 | 7943 | 8437 | 19951 | 9144 | 11491 | 20808 | 6544 | 1604 |
| 91 | 7032 | 2430 | 6177 | 6463 | 6549 | 5563 | 7575 | 19025 | 3137 | 808 |
| 92 | 6890 | 3943 | 4940 | 8131 | 14926 | 6980 | 7550 | 17471 | 3242 | 1142 |
| 93 | 7304 | 6674 | 5872 | 8582 | 10034 | 6679 | 7408 | 20352 | 2394 | 1009 |
| 94 | 8812 | 4966 | 5162 | 8589 | 11703 | 5475 | 6405 | 15112 | 2722 | 1653 |
| 95 | 9325 | 5196 | 4274 | 8503 | 15190 | 7429 | 8398 | 14921 | 3275 | 1801 |
| 96 | 10726 | 8158 | 5360 | 9518 | 12015 | 7892 | 9118 | 14515 | 4551 | 2055 |
| 97 | 10650 | 7501 | 5500 | 10198 | 8119 | 5806 | 7597 | 9875 | 2617 | 1234 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 98 | 7723 | 6583 | 5245 | 7193 | 9218 | 8361 | 10554 | 12231 | 2501 | 1667 |
| 99 | 9108 | 6142 | 5614 | 8205 | 7625 | 5760 | 5559 | 7331 | 2087 | 1409 |
| 100 | 6997 | 8052 | 5665 | 9011 | 15990 | 11803 | 12525 | 4325 | 2796 | 1705 |
| 101 | 6642 | 8258 | 5734 | 7740 | 10948 | 7822 | 7298 | 4715 | 1743 | 1484 |
| 102 | 5832 | 8608 | 4648 | 5768 | 12983 | 10697 | 9993 | 4621 | 4716 | 1954 |
| 103 | 5564 | 9011 | 4451 | 5838 | 9957 | 9321 | 9533 | 5266 | 3390 | 1339 |
| 104 | 6342 | 8078 | 5114 | 5806 | 10053 | 8972 | 6147 | 3394 | 5298 | 2521 |
| 105 | 5788 | 7928 | 5026 | 5729 | 12273 | 10922 | 6891 | 2765 | 3632 | 2686 |
| 106 | 5371 | 6913 | 6222 | 4881 | 9424 | 4728 | 1759 | 1952 | 2954 | 1846 |
| 107 | 5149 | 7005 | 6267 | 5049 | 8653 | 4592 | 1471 | 2438 | 2957 | 1279 |
| 108 | 3380 | 5377 | 3797 | 3019 | 7488 | 5674 | 2168 | 1455 | 3552 | 1458 |
| 109 | 3556 | 5555 | 3688 | 3274 | 5856 | 3040 | 1251 | 1574 | 919 | 700 |
| 110 | 2922 | 3196 | 2489 | 3075 | 6263 | 5554 | 3012 | 1378 | 1406 | 1870 |
| 111 | 2883 | 3223 | 2464 | 3104 | 3963 | 6279 | 4216 | 1155 | 1227 | 1367 |
| 112 | 2425 | 2722 | 2369 | 2344 | 4220 | 11610 | 7370 | 753 | 1094 | 2462 |
| 113 | 2358 | 2694 | 2358 | 2361 | 3647 | 8117 | 5644 | 1637 | 1226 | 1150 |
| 114 | 2566 | 2806 | 1719 | 2762 | 3835 | 5775 | 3336 | 1652 | 913 | 2712 |
| 115 | 2538 | 2792 | 1731 | 2745 | 4201 | 5028 | 2972 | 3562 | 2541 | 3266 |
| 116 | 2344 | 3733 | 2781 | 2555 | 1633 | 1739 | 1432 | 636 | 773 | 2308 |
| 117 | 2388 | 3733 | 2781 | 2572 | 1071 | 970 | 1132 | 469 | 801 | 1239 |
| 118 | 1521 | 1480 | 2591 | 759 | 568 | 1008 | 1359 | 59 | 584 | 1652 |
| 119 | 1537 | 1507 | 2603 | 767 | 267 | 332 | 236 | 188 | 86 | 413 |
| 120 | 959 | 906 | 949 | 478 | 2244 | 616 | 1293 | 76 | 90 | 704 |
| 121 | 959 | 906 | 949 | 478 | 641 | 100 | 235 | 44 | 13 | 253 |
| 122 | 1797 | 408 | 423 | 413 | 0 | 15 | 0 | 0 | 0 | 56 |
| 123 | 1797 | 408 | 423 | 413 | 67 | 46 | 11 | 5 | 0 | 19 |
| 124 | 195 | 168 | 43 | 81 | 72 | 116 | 32 | 16 | 0 | 206 |
| 125 | 195 | 168 | 43 | 81 | 22 | 116 | 9 | 0 | 0 | 94 |
| 126 | 214 | 189 | 111 | 156 | 103 | 31 | 0 | 0 | 0 | 0 |
| 127 | 214 | 203 | 111 | 156 | 22 | 31 | 1 | 5 | 13 | 9 |
| 128 | 165 | 30 | 52 | 96 | 20 | 46 | 0 | 0 | 0 | 0 |
| 129 | 165 | 30 | 52 | 96 | 0 | 8 | 0 | 0 | 0 | 0 |
| 130 | 11 | 19 | 0 | 31 | 100 | 23 | 0 | 0 | 0 | 9 |
| 131 | 11 | 19 | 0 | 31 | 126 | 0 | 0 | 0 | 0 | 0 |
| 132 | 7 | 6 | 0 | 66 | 0 | 8 | 0 | 0 | 0 | 9 |
| 133 | 7 | 6 | 0 | 66 | 0 | 0 | 0 | 0 | 0 | 0 |
| 134 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 |
| 135 | 0 | 0 | 0 | 18 | 0 | 15 | 0 | 0 | 0 | 0 |
| 136 | 0 | 0 | 0 | 66 | 13 | 0 | 0 | 0 | 0 | 0 |
| 137 | 0 | 0 | 0 | 66 | 0 | 0 | 0 | 0 | 0 | 0 |
| 138 | 0 | 0 | 0 | 18 | 0 | 8 | 0 | 0 | 0 | 0 |
| 139 | 0 | 0 | 0 | 18 | 0 | 8 | 0 | 0 | 0 | 0 |
| 140 | 0 | 0 | 0 | 0 | 779 | 92 | 0 | 0 | 0 | 0 |
| 141 | 0 | 0 | 0 | 0 | 6 | 8 | 0 | 0 | 0 | 0 |
| 142 | 9 | 8 | 6 | 79 | 0 | 0 | 0 | 0 | 0 | 0 |
| 143 | 9 | 8 | 6 | 79 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | |
| 145 | 0 | 0 | 0 | 0 | 0 | 54 | 37 | 0 | 0 | 0 |
| 146 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 |
| 147 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| 148 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 |
| 149 | 0 | 0 | 0 | 0 | 0 | 39 | 9 | 0 | 0 | 0 |
| 150 | 0 | 0 | 0 | 0 | 67 | 108 | 28 | 0 | 0 | 0 |
| | | | | | | | | | | |
| TOTAL N | 260735 | 296061 | 2813884 | 766281 | 406705 | 458862 | 2778565 | 1185962 | 232139 | 275274 |
| MEAN | 95 | 90 | 68 | 74 | 93 | 83 | 69 | 76 | 83 | 74 |

| SPECIES | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB | ALB |
|---|---|---|---|---|---|---|---|---|---|---|
| GEAR | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| COUNTRY | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL | ALL |
| YEAR | 87 | 87 | 88 | 88 | 88 | 88 | 89 | 89 | 89 | 89 |
| ICCAT AREA | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH | NORTH |
| TIME STRATA | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 |
| 33 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 |
| 38 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 |
| 39 | 0 | 0 | 11 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41 | 0 | 0 | 0 | 0 | 108 | 0 | 0 | 0 | 6 | 75 |
| 42 | 0 | 0 | 0 | 0 | 166 | 0 | 0 | 0 | 23 | 7 |
| 43 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 11 | 22 |
| 44 | 0 | 0 | 0 | 0 | 224 | 45 | 0 | 30 | 12 | 24 |
| 45 | 0 | 0 | 11 | 202 | 995 | 417 | 0 | 82 | 39 | 347 |
| 46 | 0 | 0 | 0 | 0 | 1074 | 316 | 0 | 207 | 94 | 276 |
| 47 | 248 | 0 | 0 | 0 | 3508 | 756 | 0 | 264 | 880 | 2952 |
| 48 | 315 | 0 | 0 | 57 | 5160 | 1251 | 0 | 347 | 2347 | 4350 |
| 49 | 874 | 455 | 0 | 707 | 14231 | 2176 | 0 | 377 | 4454 | 8033 |
| 50 | 1243 | 4243 | 0 | 925 | 94298 | 47359 | 0 | 1043 | 12305 | 13526 |
| 51 | 1301 | 5176 | 0 | 3266 | 110797 | 73288 | 0 | 1525 | 21698 | 16288 |
| 52 | 9825 | 6476 | 0 | 1660 | 120851 | 82397 | 0 | 1681 | 33330 | 33303 |
| 53 | 15244 | 11778 | 0 | 1611 | 172781 | 131664 | 0 | 1774 | 47457 | 45907 |
| 54 | 38802 | 9406 | 0 | 1243 | 162235 | 89640 | 0 | 1466 | 62454 | 35102 |
| 55 | 34301 | 14176 | 0 | 884 | 167207 | 93545 | 0 | 1932 | 78060 | 67819 |
| 56 | 36182 | 13059 | 0 | 2134 | 145481 | 82731 | 0 | 3486 | 83946 | 48521 |
| 57 | 30164 | 9184 | 0 | 2501 | 155524 | 77818 | 0 | 4913 | 89144 | 56018 |
| 58 | 28656 | 581 | 0 | 1331 | 67818 | 13782 | 0 | 5971 | 71169 | 21238 |
| 59 | 36927 | 662 | 0 | 1760 | 66447 | 6937 | 0 | 11590 | 65747 | 17330 |
| 60 | 79663 | 3264 | 0 | 2045 | 95608 | 12408 | 0 | 14736 | 81774 | 16616 |
| 61 | 105716 | 7545 | 0 | 3619 | 137712 | 31521 | 0 | 18588 | 95268 | 14636 |
| 62 | 151137 | 16883 | 0 | 5720 | 169133 | 40830 | 0 | 17323 | 128588 | 11794 |
| 63 | 188174 | 18354 | 0 | 5598 | 190371 | 52613 | 0 | 13403 | 150994 | 9725 |
| 64 | 162637 | 34430 | 54 | 7477 | 183109 | 52847 | 0 | 11381 | 160779 | 14310 |
| 65 | 141078 | 30583 | 0 | 8148 | 177868 | 59386 | 0 | 9786 | 172823 | 14231 |
| 66 | 138867 | 38011 | 0 | 7577 | 131985 | 54731 | 0 | 6145 | 135208 | 17159 |
| 67 | 133313 | 31263 | 5 | 4720 | 136128 | 45475 | 0 | 3392 | 131305 | 18589 |
| 68 | 130016 | 40083 | 44 | 6764 | 97786 | 39958 | 0 | 4689 | 109939 | 18168 |
| 69 | 146652 | 31425 | 952 | 4272 | 86323 | 36733 | 0 | 4540 | 88231 | 25960 |
| 70 | 139224 | 36980 | 91 | 1557 | 88595 | 35058 | 0 | 5143 | 96631 | 26249 |
| 71 | 131424 | 28838 | 246 | 2487 | 74114 | 27422 | 0 | 3650 | 78245 | 24896 |
| 72 | 119205 | 28866 | 56 | 2005 | 68028 | 22820 | 0 | 5357 | 88445 | 25545 |
| 73 | 125624 | 25432 | 267 | 2699 | 75307 | 28758 | 0 | 4077 | 94363 | 28185 |
| 74 | 138928 | 21985 | 1248 | 2556 | 66075 | 20815 | 0 | 2977 | 87820 | 27167 |
| 75 | 136904 | 35079 | 149 | 6912 | 80768 | 24839 | 0 | 3844 | 107882 | 34051 |
| 76 | 110880 | 22533 | 416 | 5314 | 82817 | 21799 | 0 | 2763 | 93004 | 36223 |
| 77 | 117019 | 29629 | 352 | 6038 | 84049 | 22965 | 0 | 2317 | 94696 | 46114 |
| 78 | 108024 | 25036 | 411 | 4835 | 85256 | 27461 | 42 | 2096 | 82512 | 54459 |
| 79 | 111352 | 29217 | 1146 | 7861 | 96337 | 33893 | 42 | 1903 | 74103 | 58881 |
| 80 | 45013 | 7798 | 429 | 3949 | 65106 | 23548 | 4771 | 1893 | 60210 | 56167 |
| 81 | 29912 | 5169 | 300 | 11475 | 40837 | 12562 | 4688 | 1608 | 38983 | 42014 |
| 82 | 29877 | 9625 | 1371 | 4888 | 44972 | 16206 | 8463 | 601 | 32536 | 44419 |
| 83 | 23490 | 4771 | 1456 | 2002 | 41190 | 14411 | 4066 | 152 | 25292 | 31936 |
| 84 | 34572 | 6053 | 1954 | 3837 | 37801 | 11560 | 5725 | 134 | 13935 | 32074 |
| 85 | 49761 | 6091 | 482 | 2093 | 27328 | 9088 | 5933 | 218 | 16478 | 15461 |
| 86 | 9130 | 3907 | 692 | 870 | 18441 | 7059 | 9943 | 214 | 7538 | 13291 |
| 87 | 12293 | 2378 | 992 | 776 | 19122 | 3968 | 4042 | 71 | 6165 | 9508 |
| 88 | 12515 | 1475 | 818 | 579 | 16170 | 3566 | 1211 | 465 | 4860 | 6022 |
| 89 | 6353 | 3417 | 2203 | 1946 | 26047 | 6282 | 2593 | 839 | 4240 | 3458 |
| 90 | 6369 | 2624 | 711 | 537 | 9428 | 2728 | 4483 | 1212 | 3772 | 7908 |
| 91 | 2224 | 2759 | 1126 | 847 | 15469 | 4020 | 1499 | 1352 | 2251 | 2195 |
| 92 | 1658 | 2935 | 1890 | 1599 | 8477 | 9618 | 1458 | 2735 | 2320 | 3525 |
| 93 | 1158 | 1974 | 1581 | 1124 | 5829 | 2527 | 818 | 2028 | 1283 | 1624 |
| 94 | 2532 | 3461 | 2626 | 2150 | 4954 | 3351 | 592 | 1422 | 1543 | 2405 |
| 95 | 2082 | 2584 | 3425 | 3036 | 2854 | 2846 | 632 | 1630 | 1944 | 2327 |
| 96 | 2497 | 2697 | 2006 | 1581 | 3570 | 1898 | 700 | 2764 | 2281 | 2506 |
| 97 | 1813 | 3136 | 1991 | 1853 | 3030 | 3643 | 355 | 1436 | 1240 | 965 |
| 98 | 2551 | 2735 | 2571 | 2046 | 804 | 2081 | 356 | 1617 | 1146 | 1435 |
| 99 | 2354 | 2277 | 3667 | 3510 | 3426 | 4619 | 234 | 1135 | 413 | 677 |
| 100 | 2147 | 2087 | 1885 | 1630 | 2821 | 1730 | 308 | 1112 | 645 | 1521 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 101 | 2235 | 2167 | 1588 | 1344 | 1351 | 1767 | 108 | 693 | 239 | 656 |
| 102 | 4663 | 1607 | 1605 | 1372 | 2822 | 2111 | 182 | 2004 | 242 | 955 |
| 103 | 2775 | 1067 | 1454 | 1339 | 1376 | 1454 | 49 | 1918 | 181 | 1479 |
| 104 | 3525 | 1678 | 1708 | 1802 | 3033 | 2704 | 66 | 316 | 157 | 1049 |
| 105 | 3497 | 1397 | 1004 | 721 | 467 | 1641 | 53 | 316 | 267 | 2135 |
| 106 | 3008 | 1183 | 760 | 699 | 1238 | 677 | 7 | 630 | 0 | 940 |
| 107 | 1809 | 876 | 1302 | 1125 | 634 | 2138 | 66 | 614 | 1 | 1302 |
| 108 | 2703 | 463 | 367 | 254 | 399 | 711 | 40 | 1076 | 4 | 667 |
| 109 | 1169 | 621 | 1120 | 1033 | 283 | 1570 | 46 | 1076 | 7 | 574 |
| 110 | 3094 | 453 | 411 | 332 | 79 | 1979 | 7 | 154 | 0 | 1096 |
| 111 | 1710 | 449 | 338 | 265 | 275 | 354 | 33 | 154 | 1 | 751 |
| 112 | 1919 | 258 | 263 | 198 | 296 | 229 | 0 | 0 | 0 | 921 |
| 113 | 1092 | 87 | 143 | 167 | 48 | 118 | 0 | 0 | 19 | 791 |
| 114 | 1300 | 92 | 84 | 88 | 2 | 462 | 0 | 0 | 0 | 236 |
| 115 | 2311 | 179 | 52 | 100 | 4 | 94 | 0 | 0 | 0 | 1192 |
| 116 | 714 | 5 | 10 | 50 | 5 | 81 | 0 | 0 | 0 | 333 |
| 117 | 147 | 0 | 11 | 0 | 6 | 45 | 0 | 0 | 0 | 499 |
| 118 | 41 | 19 | 2 | 0 | 9 | 34 | 7 | 0 | 0 | 0 |
| 119 | 212 | 23 | 16 | 46 | 5 | 121 | 0 | 0 | 0 | 0 |
| 120 | 33 | 5 | 0 | 0 | 4 | 10 | 0 | 0 | 0 | 0 |
| 121 | 32 | 0 | 0 | 0 | 17 | 17 | 0 | 0 | 0 | 0 |
| 122 | 16 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 0 |
| 123 | 0 | 5 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 0 |
| 124 | 203 | 0 | 0 | 0 | 3 | 11 | 0 | 0 | 0 | 0 |
| 125 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 |
| 126 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 128 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 |
| 134 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 |
| 144 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| TOTAL N | 3168442 | 703226 | 51868 | 179751 | 3906357 | 1562153 | 63614 | 208387 | 2955974 | 1191108 |
| MEAN | 71 | 72 | 94 | 76 | 66 | 65 | 86 | 69 | 68 | 70 |

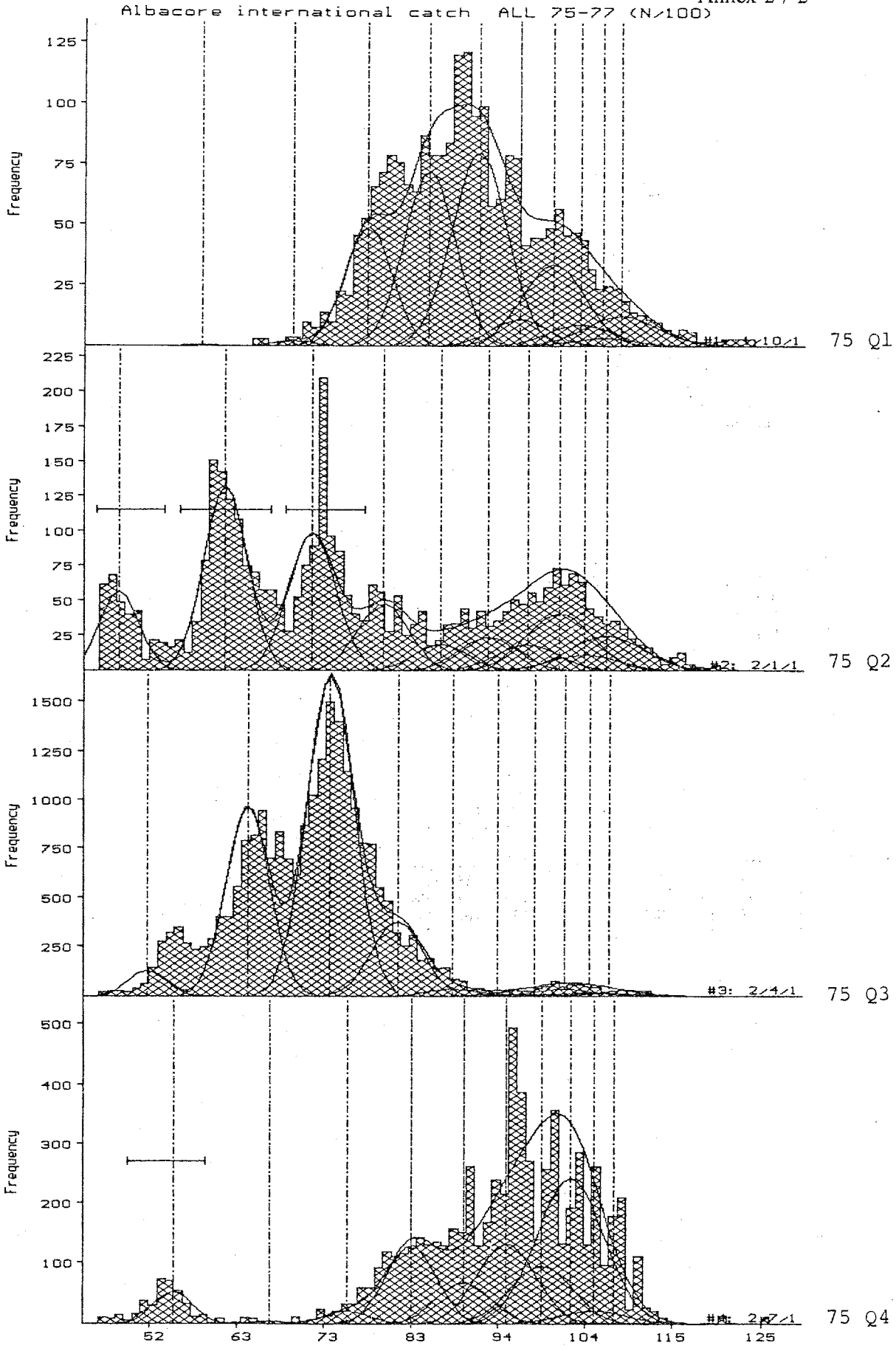
MultiFan v3.15.c Length-Frequency Analyzer Copyright 1990 Otter Research Ltd.
File: all7577: Albacore international catch ALL 75-77 (N/100)

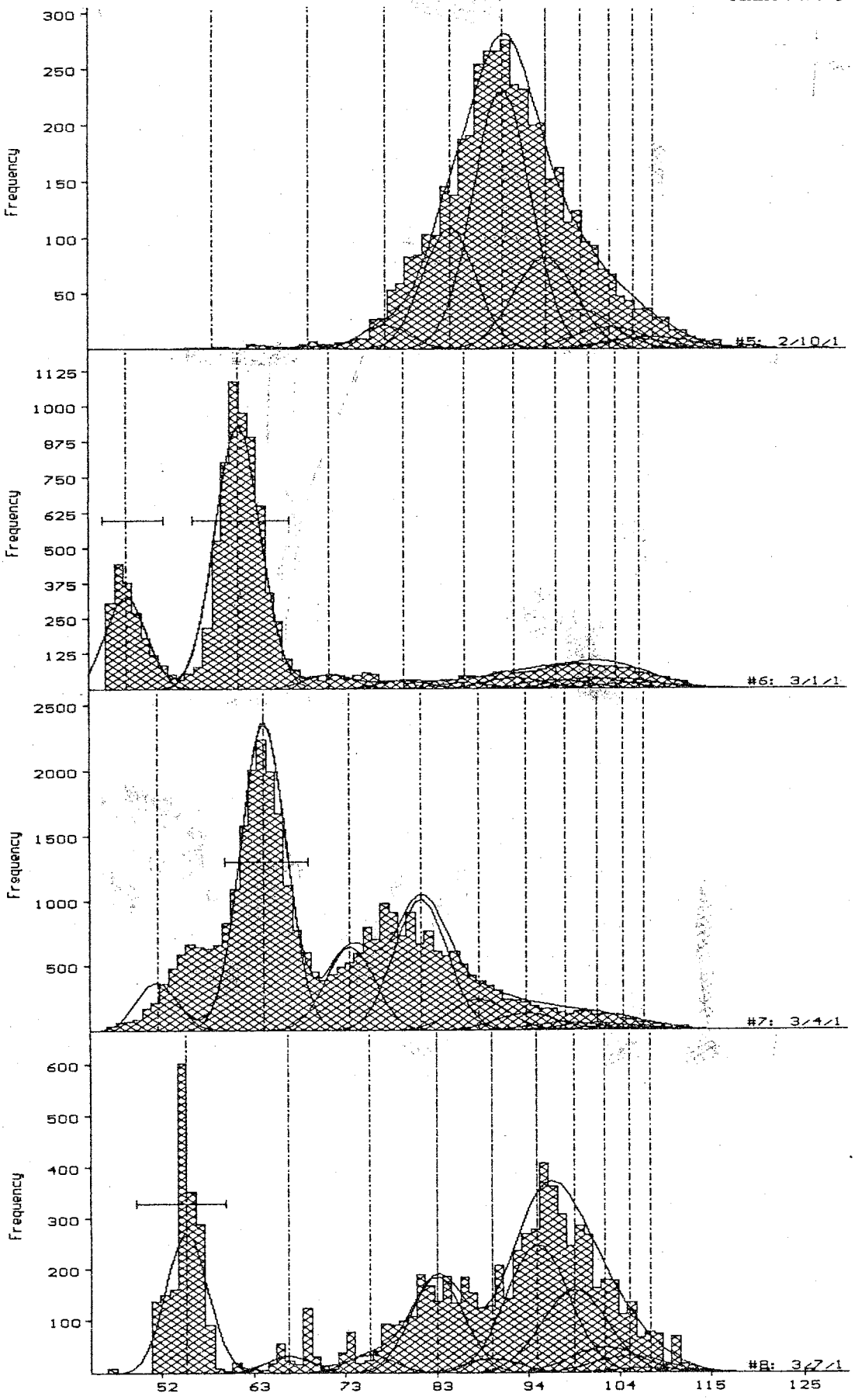
Fit: 17
Objective function value =16454.33008; total penalty = 2.51096
Maximum gradient component = 0.10850
Number of non-empty length intervals: 866; Number of estimated parameters: 113
Approximate number of degrees of freedom: 753

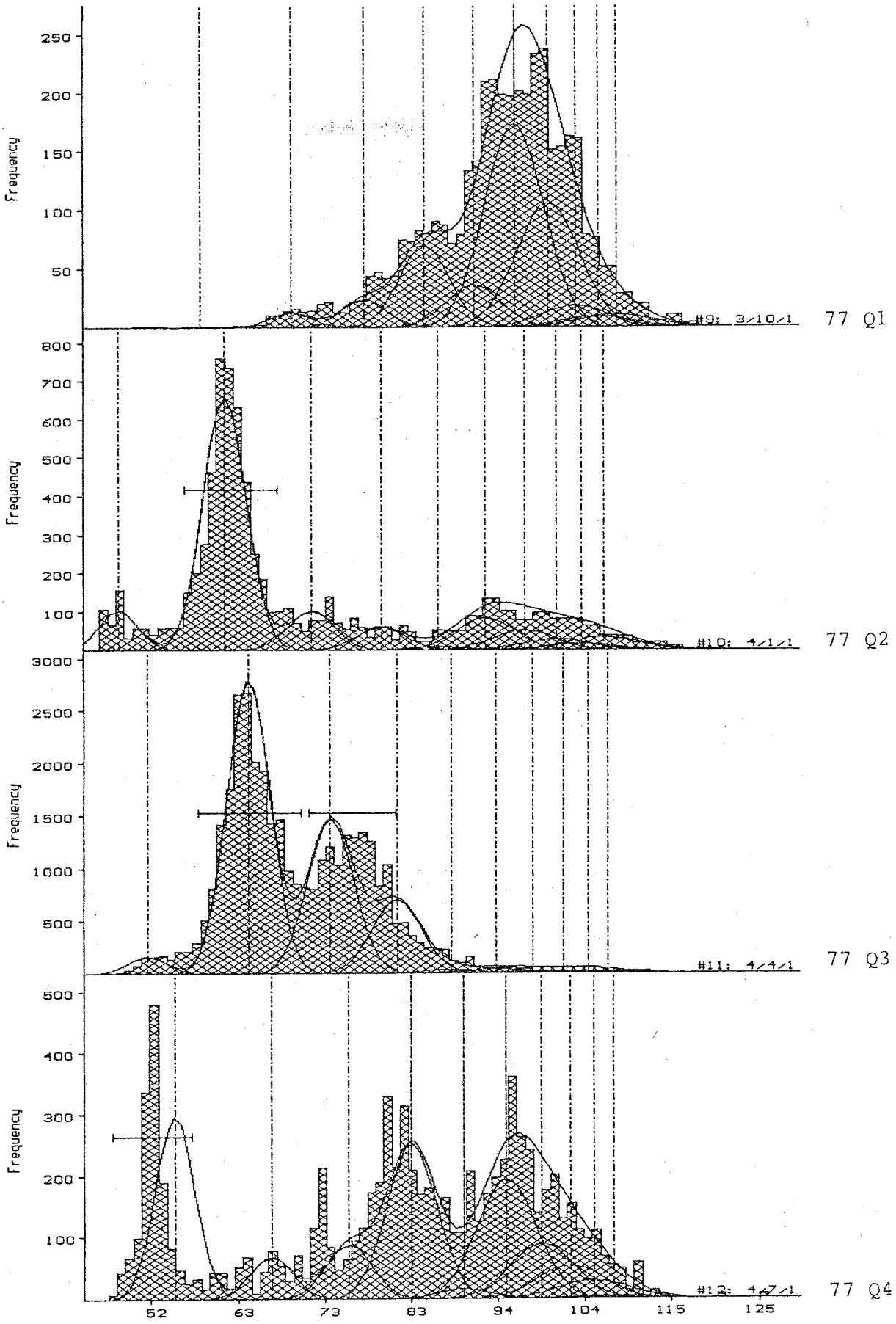
Number of age classes: 10
Parameter Estimates:
von Bertalanffy K = 0.200 (1/year); L infinity = 117.9
First Length = 48.309; Last Length = 106.446; Brody rho = 0.819 (1/year).
Estimated age of the first age class = 2.63 years.
Mean length at age in month 1:
48.31 60.94 71.28 79.74 86.67 92.34 96.99 100.79 103.90 106.45
Standard Deviations of length at age in month 1:
2.44 2.81 3.16 3.48 3.76 4.01 4.23 4.42 4.58 4.71
Average Standard Deviation = 3.388; ratio of first to last S.D.= 1.932

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 0.00 | 0.11 | 0.04 | 0.06 | 0.00 | 0.20 | 0.07 | 0.22 | 0.00 | 0.08 | 0.03 | 0.24 |
| 2 | 0.01 | 0.26 | 0.29 | 0.01 | 0.00 | 0.59 | 0.46 | 0.03 | 0.02 | 0.54 | 0.51 | 0.06 |
| 3 | 0.17 | 0.20 | 0.51 | 0.03 | 0.04 | 0.04 | 0.13 | 0.03 | 0.05 | 0.09 | 0.28 | 0.08 |
| 4 | 0.25 | 0.10 | 0.12 | 0.16 | 0.20 | 0.02 | 0.21 | 0.17 | 0.14 | 0.05 | 0.14 | 0.23 |
| 5 | 0.29 | 0.04 | 0.01 | 0.09 | 0.43 | 0.02 | 0.05 | 0.03 | 0.08 | 0.01 | 0.01 | 0.02 |
| 6 | 0.04 | 0.05 | 0.00 | 0.17 | 0.16 | 0.03 | 0.03 | 0.25 | 0.37 | 0.08 | 0.01 | 0.19 |
| 7 | 0.13 | 0.04 | 0.00 | 0.13 | 0.07 | 0.02 | 0.02 | 0.17 | 0.24 | 0.05 | 0.00 | 0.09 |
| 8 | 0.04 | 0.10 | 0.01 | 0.34 | 0.04 | 0.03 | 0.01 | 0.05 | 0.04 | 0.03 | 0.00 | 0.06 |
| 9 | 0.01 | 0.03 | 0.01 | 0.03 | 0.02 | 0.03 | 0.01 | 0.04 | 0.02 | 0.02 | 0.01 | 0.03 |
| 10 | 0.05 | 0.06 | 0.01 | 0.00 | 0.03 | 0.02 | 0.00 | 0.01 | 0.03 | 0.04 | 0.00 | 0.00 |

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 4 | 376 | 814 | 379 | 12 | 2073 | 2384 | 1863 | 9 | 673 | 1024 | 1974 |
| 2 | 17 | 919 | 6454 | 36 | 20 | 6106 | 15862 | 239 | 98 | 4422 | 18433 | 469 |
| 3 | 375 | 715 | 11362 | 173 | 167 | 365 | 4493 | 259 | 192 | 722 | 10152 | 642 |
| 4 | 574 | 364 | 2758 | 1064 | 876 | 219 | 7358 | 1450 | 576 | 439 | 5108 | 1925 |
| 5 | 659 | 147 | 285 | 578 | 1924 | 177 | 1821 | 228 | 310 | 83 | 312 | 127 |
| 6 | 95 | 195 | 87 | 1166 | 717 | 312 | 1035 | 2092 | 1517 | 680 | 351 | 1600 |
| 7 | 297 | 156 | 103 | 869 | 322 | 256 | 521 | 1384 | 960 | 435 | 170 | 756 |
| 8 | 82 | 353 | 309 | 2273 | 186 | 327 | 480 | 444 | 178 | 252 | 177 | 461 |
| 9 | 32 | 103 | 179 | 212 | 89 | 327 | 320 | 303 | 96 | 152 | 193 | 265 |
| 10 | 120 | 227 | 143 | 29 | 112 | 195 | 146 | 93 | 111 | 312 | 171 | 38 |
| n | 2254 | 3556 | 22493 | 6779 | 4425 | 10356 | 34419 | 8353 | 4046 | 8170 | 36090 | 8256 |


Albacore international catch ALL 75-77 (N/100)
Frequency
75 Q1
75 Q2
75 Q3
75 Q4
52
63
73
83
94
104
115
125


Frequency
#5: 2/10/1
76 Q1
#6: 3/1/1
76 Q2
#7: 3/4/1
76 Q3
#8: 3/7/1
76 Q4
52
63
73
83
94
104
115
125


Frequency
#9: 3/10/1
77 Q1
Frequency
#10: 4/1/1
77 Q2
Frequency
#11: 4/4/1
77 Q3
Frequency
#12: 4/7/1
77 Q4
52
63
73
83
94
104
115
125

```
The hypothesis flags for search B00 are
   1    1    0    1    0    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B01 are
   1    1    1    1    0    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B02 are
   1    1    0    1    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B03 are
   1    1    1    1    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B04 are
   1    1    0    1    1    0    1    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B05 are
   1    1    1    1    1    0    1    0    0    0    0    0    0    0    0    0
          **** The Hypothesis Tree ****

        B01    B03    B05
 B01     *      1      1

 B03    -1      *      1

 B05    -1     -1      *

          **** The Reduced Hypothesis Tree ****

        B01    B03    B05
 B01     *      1      1

 B03    -1      *      1

 B05    -1     -1      *
```

| B00 | PAR | opt_flag | worse than | not_better than | function value | number of parameters |
|---|---|---|---|---|---|---|
| B01 | P07 | 0 | P09 | | 16210.49 | 88 |
| B01 | P08 | 0 | P0A | | 16203.12 | 88 |
| B01 | P09 | 0 | P0B | | 16295.65 | 100 |
| B01 | P0A | 0 | P0C | | 16290.06 | 100 |
| B01 | P0B | 0 | P17 | | 16345.44 | 112 |
| B01 | P0C | 0 | P0B | | 16343.30 | 112 |
| B03 | P13 | 0 | P15 | | 16410.57 | 89 |
| B03 | P14 | 0 | P16 | | 16399.08 | 89 |
| B03 | P15 | 0 | P17 | | 16432.73 | 101 |
| B03 | P16 | 0 | P15 | | 16430.68 | 101 |
| ** B03 | P17 | 1 | | | 16454.33 | 113 |
| B03 | P18 | 0 | | P16 | 16441.05 | 113 |
| B05 | P1F | 0 | P21 | | 16410.57 | 90 |
| B05 | P20 | 0 | P22 | | 16402.22 | 90 |
| B05 | P21 | 0 | P23 | | 16432.73 | 102 |
| B05 | P22 | 0 | P24 | | 16432.73 | 102 |
| B05 | P23 | 0 | | P15 | 16454.33 | 114 |
| B05 | P24 | 0 | P23 | | 16452.17 | 114 |

MultiFan v3.15.c Length-Frequency Analyzer Copyright 1990 Otter Research Ltd.
File: all7880: Albacore international catch ALL 78-80 (N/100)

Fit: 1F
Objective function value =15454.04980; total penalty = 8.40370
Maximum gradient component = 0.00056
Number of non-empty length intervals: 863; Number of estimated parameters: 90
Approximate number of degrees of freedom: 773

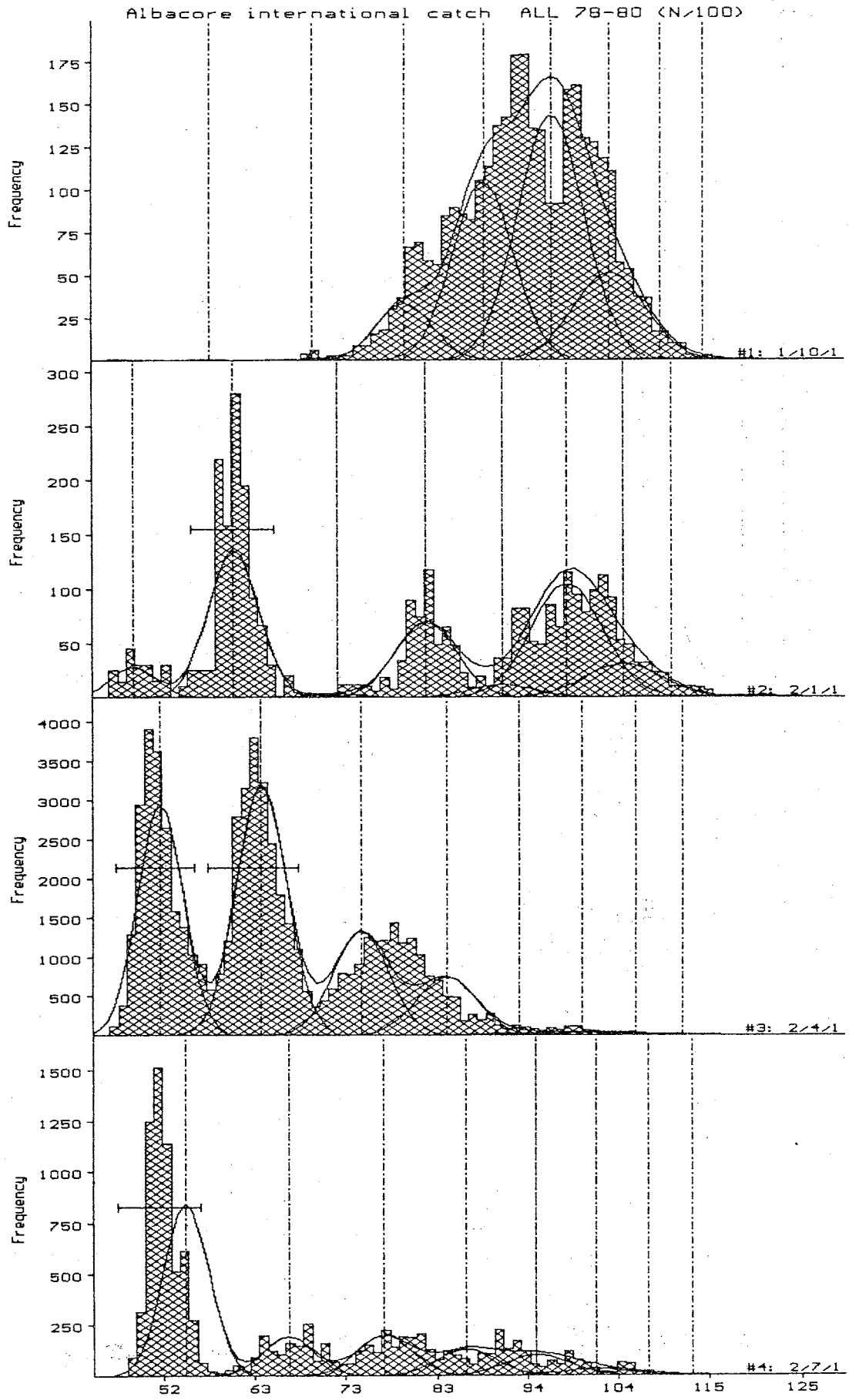
Number of age classes: 8
Parameter Estimates:
von Bertalanffy K = 0.153 (1/year); L infinity = 143.5
First Length = 46.412; Last Length = 110.255; Brody rho = 0.858 (1/year).
Estimated age of the first age class = 2.55 years.
First month mean length sampling bias for first age class: 2.604
Mean length at age in month 1:
48.80 60.19 72.02 82.16 90.87 98.34 104.75 110.25
Standard Deviations of length at age in month 1:
2.70 3.07 3.43 3.77 4.10 4.39 4.66 4.91
Average Standard Deviation = 3.642; ratio of first to last S.D.= 1.819

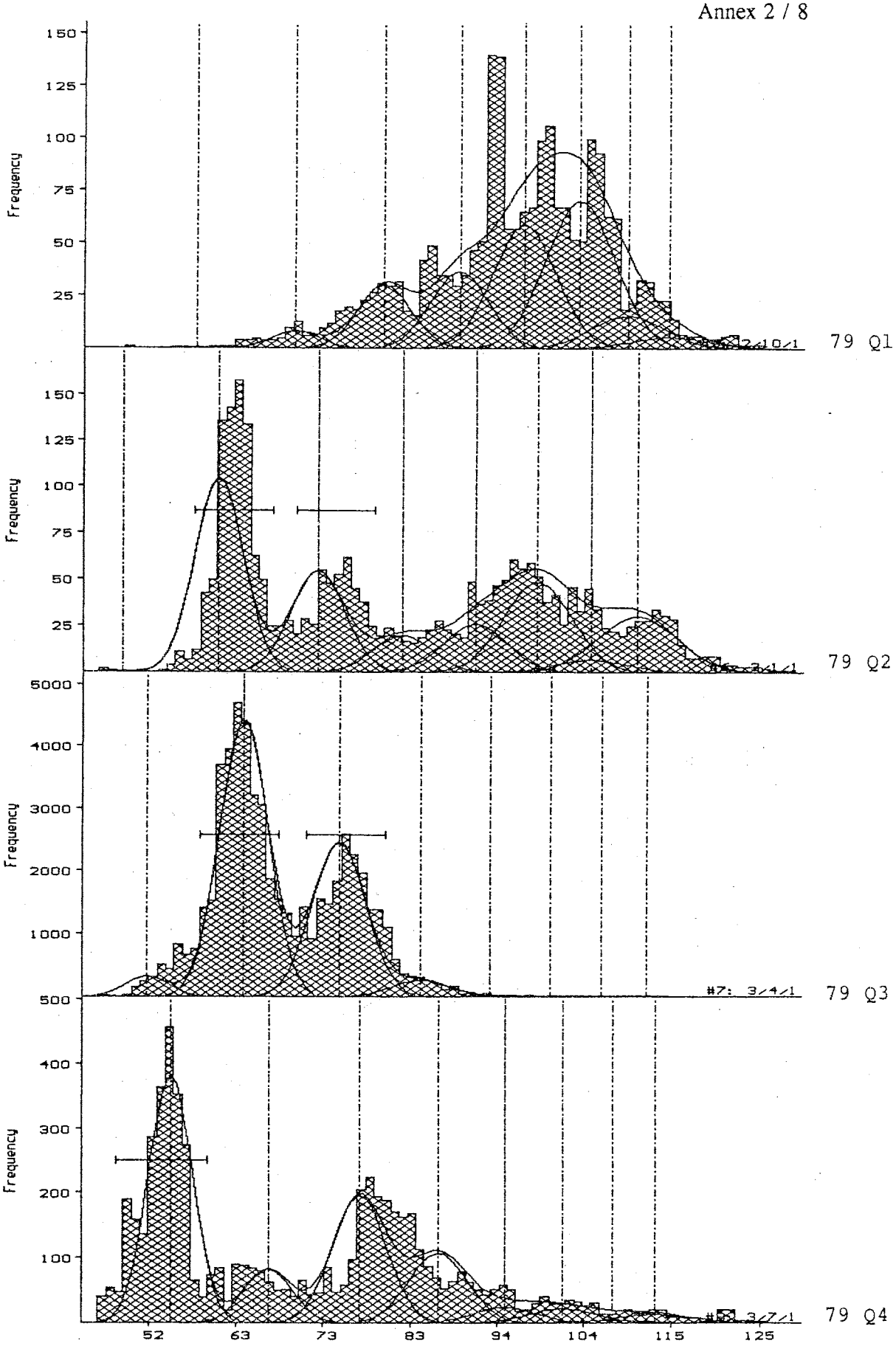
Proportions at Age:

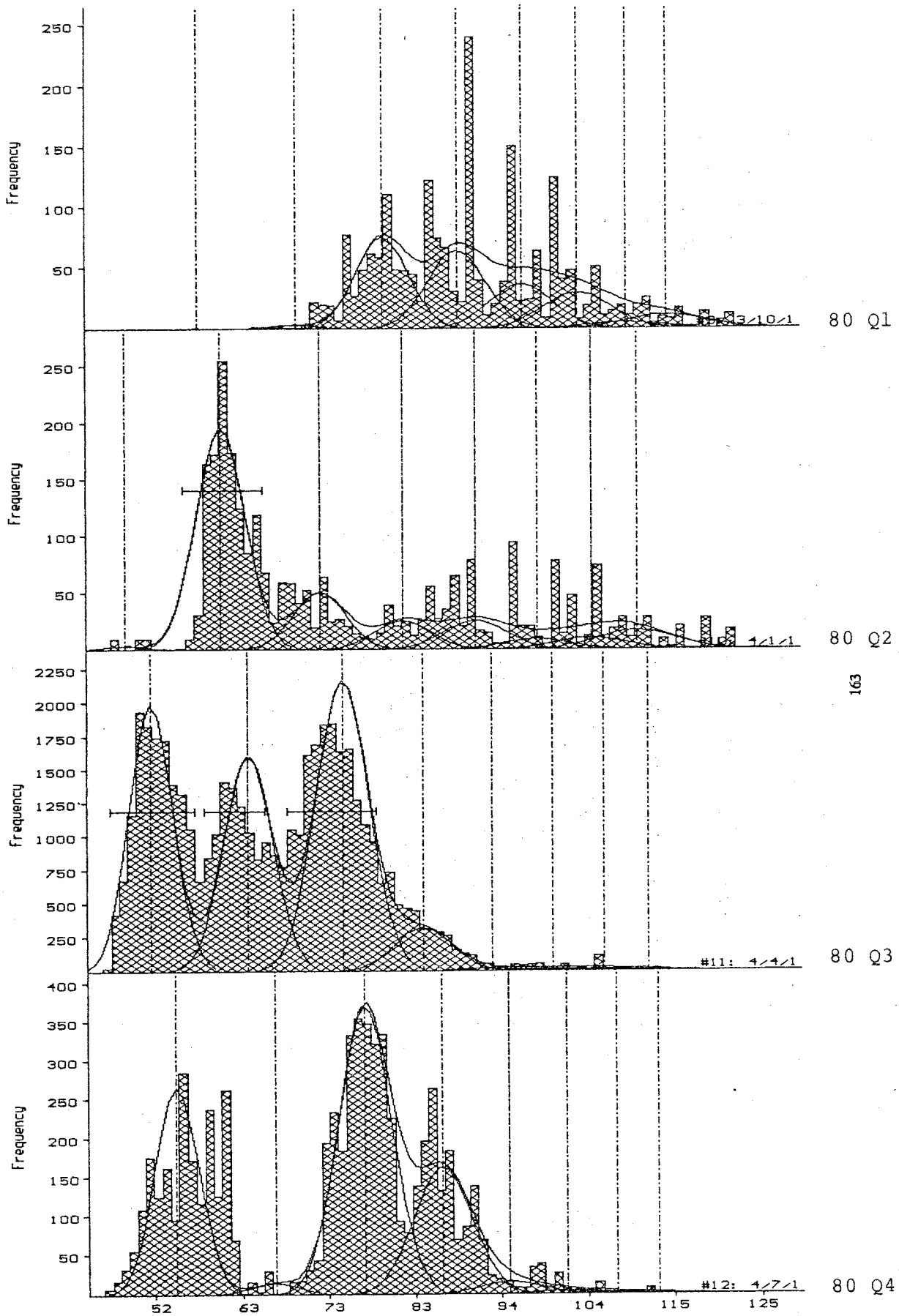
| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 0.00 | 0.06 | 0.33 | 0.53 | 0.00 | 0.00 | 0.04 | 0.43 | 0.00 | 0.01 | 0.30 | 0.29 |
| 2 | 0.00 | 0.32 | 0.38 | 0.13 | 0.03 | 0.33 | 0.58 | 0.10 | 0.01 | 0.55 | 0.26 | 0.02 |
| 3 | 0.09 | 0.01 | 0.17 | 0.14 | 0.12 | 0.18 | 0.34 | 0.24 | 0.31 | 0.15 | 0.37 | 0.45 |
| 4 | 0.30 | 0.18 | 0.10 | 0.09 | 0.16 | 0.07 | 0.04 | 0.14 | 0.28 | 0.08 | 0.06 | 0.21 |
| 5 | 0.43 | 0.03 | 0.00 | 0.08 | 0.26 | 0.09 | 0.00 | 0.03 | 0.17 | 0.08 | 0.00 | 0.02 |
| 6 | 0.16 | 0.30 | 0.01 | 0.03 | 0.32 | 0.18 | 0.00 | 0.03 | 0.14 | 0.03 | 0.00 | 0.01 |
| 7 | 0.00 | 0.09 | 0.00 | 0.00 | 0.07 | 0.03 | 0.00 | 0.01 | 0.03 | 0.04 | 0.00 | 0.00 |
| 8 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.12 | 0.00 | 0.02 | 0.06 | 0.06 | 0.00 | 0.00 |

Numbers at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 6 | 215 | 20323 | 5841 | 6 | 6 | 2283 | 2683 | 6 | 28 | 13704 | 1875 |
| 2 | 10 | 1081 | 23181 | 1415 | 70 | 836 | 32738 | 616 | 29 | 1496 | 11711 | 112 |
| 3 | 292 | 30 | 10215 | 1530 | 265 | 457 | 19081 | 1526 | 642 | 407 | 16593 | 2909 |
| 4 | 943 | 612 | 6031 | 1038 | 334 | 175 | 2163 | 873 | 572 | 214 | 2590 | 1331 |
| 5 | 1345 | 109 | 277 | 859 | 557 | 239 | 171 | 210 | 339 | 225 | 179 | 139 |
| 6 | 508 | 994 | 348 | 299 | 693 | 462 | 145 | 201 | 285 | 87 | 150 | 43 |
| 7 | 11 | 310 | 170 | 42 | 161 | 68 | 123 | 47 | 51 | 99 | 132 | 19 |
| 8 | 8 | 15 | 132 | 28 | 60 | 308 | 129 | 131 | 119 | 169 | 114 | 15 |
| n | 3123 | 3366 | 60678 | 11052 | 2145 | 2551 | 56834 | 6286 | 2043 | 2725 | 45172 | 6443 |

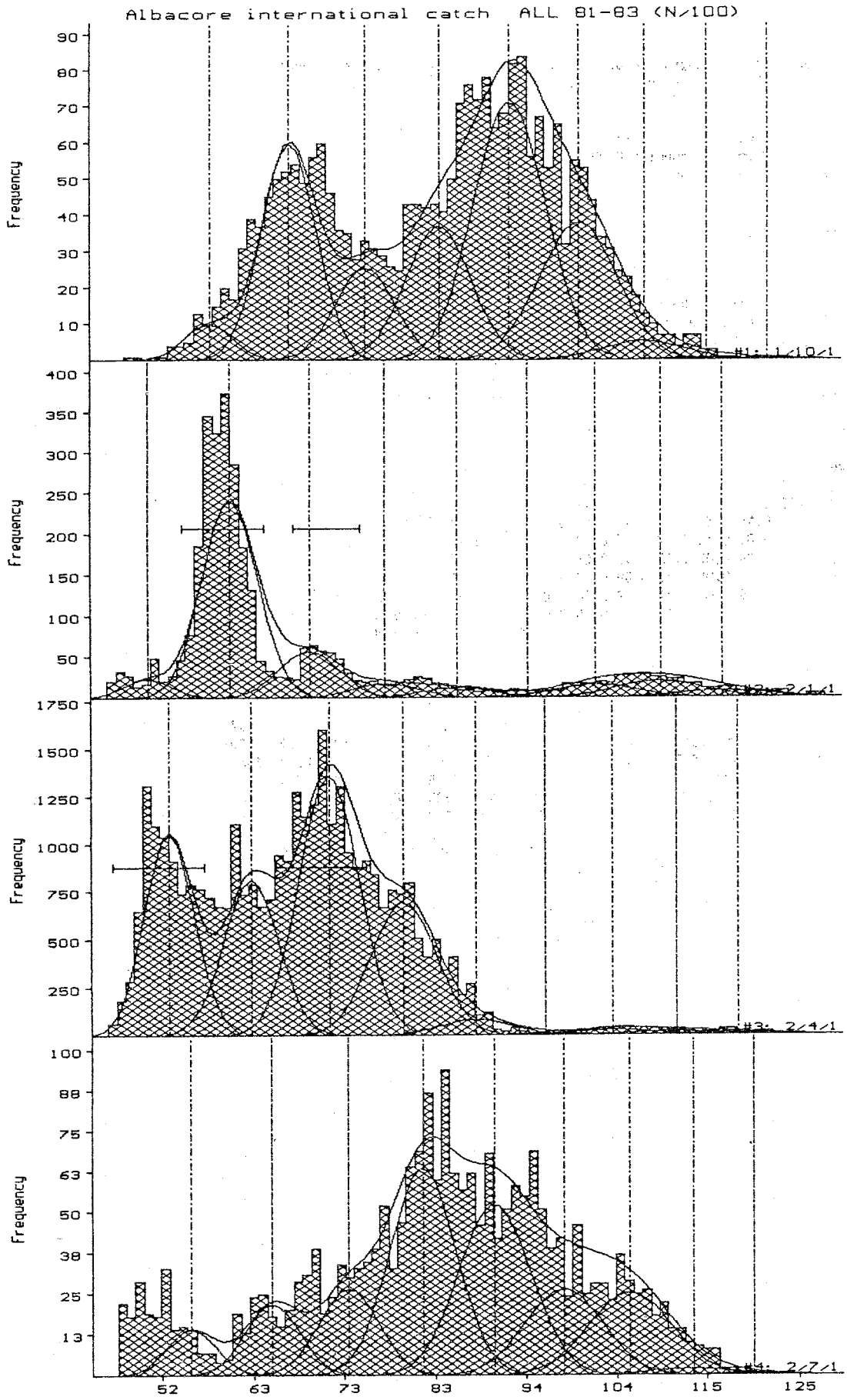

Albacore international catch ALL 78-80 (N/100)
Frequency
#1: 1/10/1
78 Q1
#2: 2/1/1
78 Q2
#3: 2/4/1
78 Q3
#4: 2/7/1
78 Q4
52
63
73
83
94
104
115
125


Frequency
150
125
100
75
50
25
79 Q1
Frequency
150
125
100
75
50
25
79 Q2
Frequency
5000
4000
3000
2000
1000
500
#7: 3/4/1
79 Q3
Frequency
400
300
200
100
52
63
73
83
94
104
115
125
79 Q4


Frequency
250
200
150
100
50
3/10/1
80 Q1
Frequency
250
200
150
100
50
4/1/1
80 Q2
Frequency
2250
2000
1750
1500
1250
1000
750
500
250
#11: 4/4/1
80 Q3
Frequency
400
350
300
250
200
150
100
50
#12: 4/7/1
80 Q4
52
63
73
83
94
104
115
125

```
The hypothesis flags for search B00 are
   1    1    0    1    0    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B01 are
   1    1    1    1    0    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B02 are
   1    1    0    1    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B03 are
   1    1    1    1    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B04 are
   1    1    0    1    1    0    1    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B05 are
   1    1    1    1    1    0    1    0    0    0    0    0    0    0    0    0
          **** The Hypothesis Tree ****

        B01    B03    B05
 B01     *      1      1

 B03    -1      *      1

 B05    -1     -1      *

          **** The Reduced Hypothesis Tree ****

        B01    B03    B05
 B01     *      1      1

 B03    -1      *      1

 B05    -1     -1      *
```

| B00 | PAR | opt_flag | worse than | not_better than | function value | number of parameters |
|---|---|---|---|---|---|---|
| B01 | P07 | 0 | P09 | | 15379.95 | 88 |
| B01 | P08 | 0 | P0A | | 15253.07 | 88 |
| B01 | P09 | 0 | P15 | | 15420.87 | 100 |
| B01 | P0A | 0 | P0C | | 15337.91 | 100 |
| B01 | P0B | 0 | | P09 | 15425.02 | 112 |
| B01 | P0C | 0 | | P07 | 15379.53 | 112 |
| B03 | P13 | 0 | P1F | | 15436.62 | 89 |
| B03 | P14 | 0 | P16 | | 15329.10 | 89 |
| B03 | P15 | 0 | | P13 | 15440.81 | 101 |
| B03 | P16 | 0 | P18 | | 15378.41 | 101 |
| B03 | P17 | 0 | | P13 | 15434.71 | 113 |
| B03 | P18 | 0 | | P13 | 15398.32 | 113 |
| ** B05 | P1F | 1 | | | 15454.05 | 90 |
| B05 | P20 | 0 | P22 | | 15434.98 | 90 |
| B05 | P21 | 0 | | P1F | 15464.18 | 102 |
| B05 | P22 | 0 | | P1F | 15459.36 | 102 |
| B05 | P23 | 0 | | P1F | 15463.63 | 114 |
| B05 | P24 | 0 | | P20 | 15458.49 | 114 |


Albacore international catch ALL 81-83 (N/100)
Frequency
81 Q1
81 Q2
81 Q3
81 Q4
52
63
73
83
94
104
115
125

MultiFan v3.15.c Length-Frequency Analyzer Copyright 1990 Otter Research Ltd.
File: all8183: Albacore international catch ALL 81-83 (N/100)

Fit: 23
Objective function value =16754.41992; total penalty = 8.60836
Maximum gradient component = 0.00062
Number of non-empty length intervals: 914; Number of estimated parameters: 101
Approximate number of degrees of freedom: 813

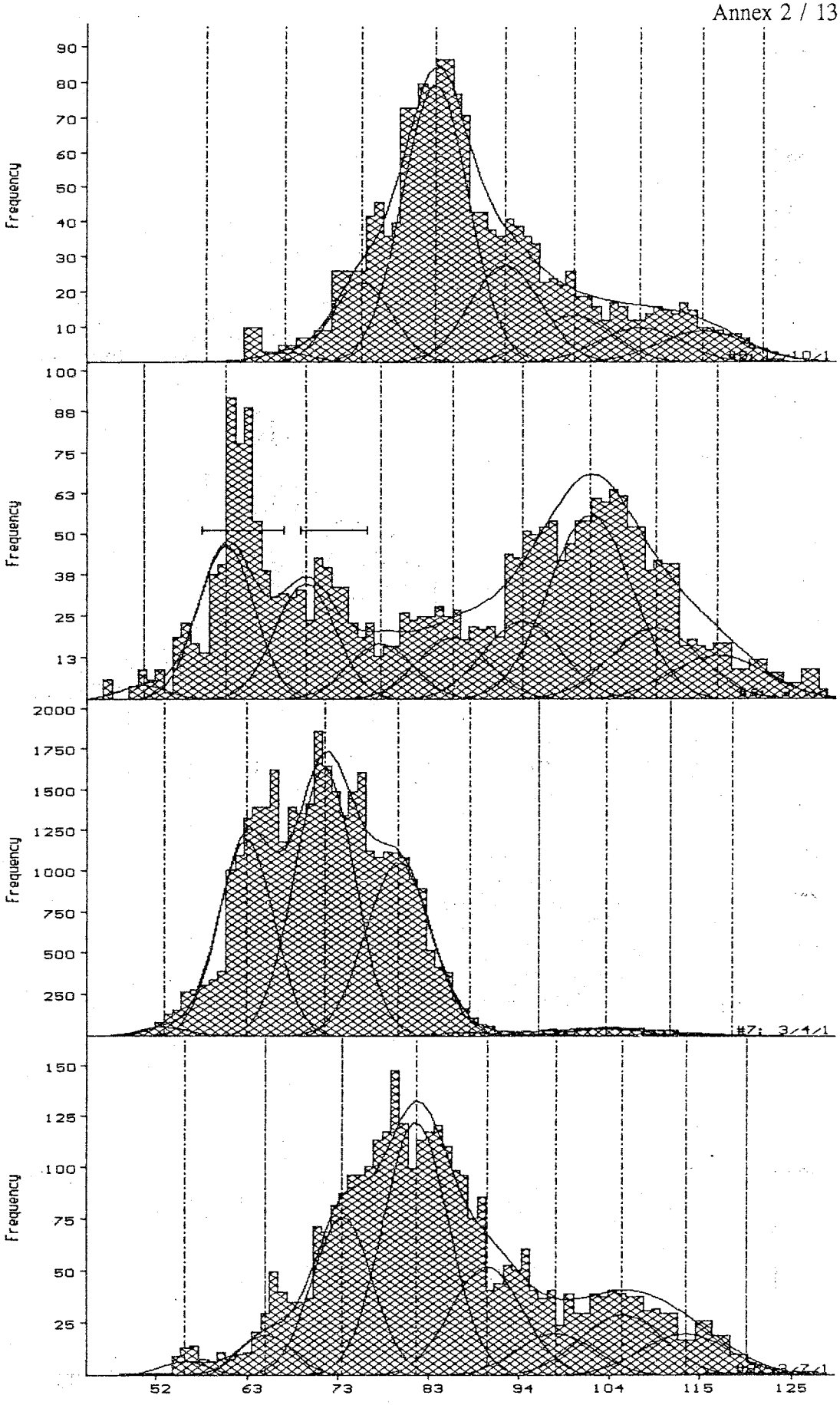
Number of age classes: 9
Parameter Estimates:
von Bertalanffy K = 0.038 (1/year); L infinity = 300.3
First Length = 50.622; Last Length = 116.414; Brody rho = 0.962 (1/year).
Estimated age of the first age class = 4.83 years.
Mean length at age in month 1:
50.62 59.99 69.00 77.68 86.03 94.07 101.80 109.25 116.41
Standard Deviations of length at age in month 1:
2.95 3.24 3.54 3.87 4.20 4.55 4.92 5.30 5.69
Average Standard Deviation = 4.098; ratio of first to last S.D.= 1.929

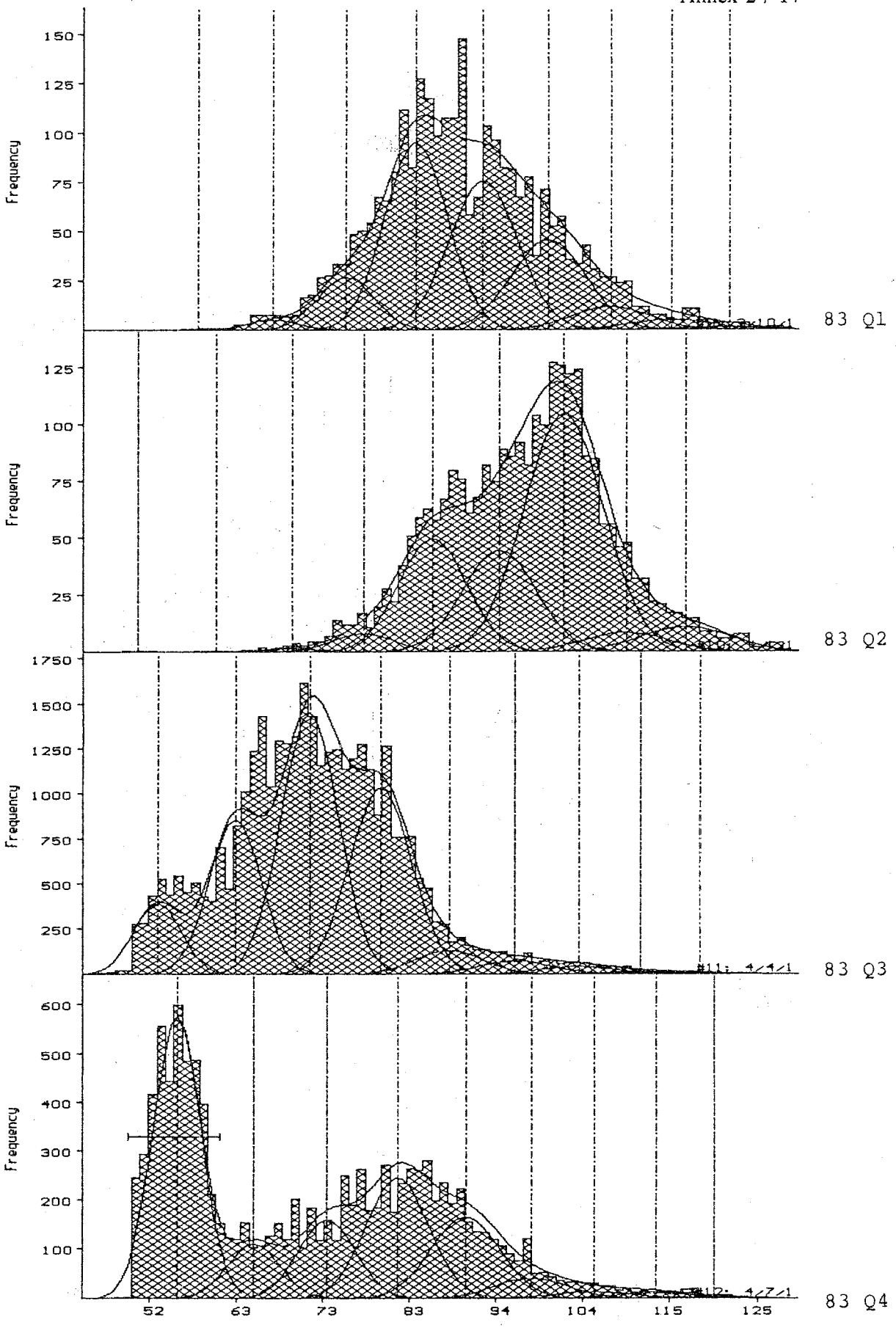
Proportions at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 0.03 | 0.05 | 0.24 | 0.05 | 0.00 | 0.02 | 0.01 | 0.02 | 0.00 | 0.00 | 0.09 | 0.40 |
| 2 | 0.22 | 0.58 | 0.19 | 0.08 | 0.01 | 0.17 | 0.28 | 0.05 | 0.02 | 0.00 | 0.20 | 0.08 |
| 3 | 0.10 | 0.14 | 0.34 | 0.11 | 0.13 | 0.14 | 0.40 | 0.21 | 0.09 | 0.01 | 0.36 | 0.12 |
| 4 | 0.15 | 0.05 | 0.18 | 0.27 | 0.47 | 0.07 | 0.27 | 0.35 | 0.34 | 0.03 | 0.27 | 0.20 |
| 5 | 0.30 | 0.04 | 0.02 | 0.23 | 0.17 | 0.08 | 0.01 | 0.15 | 0.29 | 0.21 | 0.04 | 0.14 |
| 6 | 0.17 | 0.01 | 0.00 | 0.12 | 0.09 | 0.10 | 0.00 | 0.06 | 0.18 | 0.19 | 0.02 | 0.04 |
| 7 | 0.02 | 0.05 | 0.01 | 0.12 | 0.07 | 0.26 | 0.01 | 0.09 | 0.05 | 0.47 | 0.01 | 0.01 |
| 8 | 0.00 | 0.06 | 0.01 | 0.01 | 0.06 | 0.10 | 0.00 | 0.07 | 0.02 | 0.04 | 0.00 | 0.01 |
| 9 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.01 | 0.05 | 0.00 | 0.00 |

Numbers at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 80 | 183 | 8065 | 116 | 3 | 37 | 462 | 56 | 5 | 4 | 3093 | 4437 |
| 2 | 512 | 1989 | 6548 | 190 | 24 | 422 | 9880 | 168 | 46 | 5 | 7099 | 900 |
| 3 | 233 | 497 | 11543 | 244 | 211 | 333 | 14177 | 706 | 254 | 17 | 12588 | 1360 |
| 4 | 348 | 163 | 6162 | 612 | 772 | 167 | 9561 | 1178 | 931 | 85 | 9381 | 2200 |
| 5 | 700 | 122 | 799 | 524 | 280 | 192 | 241 | 525 | 773 | 535 | 1276 | 1547 |
| 6 | 389 | 19 | 80 | 274 | 141 | 254 | 158 | 210 | 485 | 501 | 745 | 402 |
| 7 | 57 | 163 | 296 | 273 | 107 | 620 | 486 | 316 | 130 | 1218 | 452 | 145 |
| 8 | 8 | 215 | 218 | 23 | 102 | 247 | 160 | 221 | 60 | 103 | 128 | 119 |
| 9 | 5 | 95 | 135 | 5 | 4 | 157 | 91 | 14 | 17 | 138 | 99 | 38 |
| n | 2332 | 3446 | 33845 | 2260 | 1644 | 2427 | 35216 | 3394 | 2702 | 2605 | 34860 | 11147 |


Frequency
82 Q1
82 Q2
82 Q3
82 Q4
52
63
73
83
94
104
115
125


Frequency
150
125
100
75
50
25
83 Q1
Frequency
125
100
75
50
25
83 Q2
Frequency
1750
1500
1250
1000
750
500
250
83 Q3
Frequency
600
500
400
300
200
100
52
63
73
83
94
104
115
125
83 Q4

```
The hypothesis flags for search B00 are
   1    1    0    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B04 are
   1    1    0    1    1    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B03 are
   1    1    1    1    0    0    0    0    0    0    0    0    0    0    0
non standard search in PAR file P1A for search B03
This means that systematic search B03 will not
 be included in this analysis
different global hypothesis in PAR file 1A for search 03
The difference is at switch 42different global hypothesis in PAR file 1A for search 03
The hypothesis flags for search B01 are
   1    1    1    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B02 are
   1    1    0    1    0    0    0    0    0    0    0    0    0    0    0
non standard search in PAR file P10 for search B02
This means that systematic search B02 will not
 be included in this analysis
different global hypothesis in PAR file 10 for search 02
The difference is at switch 42different global hypothesis in PAR file 10 for search 02
The hypothesis flags for search B05 are
   1    1    1    1    1    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B06 are
   1    1    0    1    1    0    1    0    0    0    0    0    0    0    0
The hypothesis flags for search B07 are
   1    1    1    1    1    0    1    0    0    0    0    0    0    0    0
          **** The Hypothesis Tree ****

        B01    B05    B07
  B01    *      1      1

  B05   -1      *      1

  B07   -1     -1      *

          **** The Reduced Hypothesis Tree ****

        B01    B05    B07
  B01    *      1      1

  B05   -1      *      1

  B07   -1     -1      *
```

| B00 | PAR | opt_flag | worse than | not_better than | function value | number of parameters |
|---|---|---|---|---|---|---|
| B01 | P07 | 0 | P09 | | 16535.28 | 88 |
| B01 | P08 | 0 | P0A | | 16081.60 | 88 |
| B01 | P09 | 0 | P0B | | 16682.13 | 100 |
| B01 | P0A | 0 | P0C | | 16267.84 | 100 |
| B01 | P0B | 0 | P25 | | 16731.31 | 112 |
| B01 | P0C | 0 | | P07 | 16364.87 | 112 |
| B05 | P21 | 0 | P23 | | 16682.30 | 89 |
| B05 | P22 | 0 | P24 | | 16255.39 | 89 |
| ** B05 | P23 | 1 | | | 16754.42 | 101 |
| B05 | P24 | 0 | P26 | | 16368.71 | 101 |
| B05 | P25 | 0 | | P23 | 16770.70 | 113 |
| B05 | P26 | 0 | | P21 | 16457.04 | 113 |
| B07 | P2D | 0 | P2F | | 16682.30 | 90 |
| B07 | P2E | 0 | P30 | | 16345.55 | 90 |
| B07 | P2F | 0 | | P23 | 16754.42 | 102 |
| B07 | P30 | 0 | | P2D | 16434.78 | 102 |
| B07 | P31 | 0 | | P2F | 16770.00 | 114 |
| B07 | P32 | 0 | | P2E | 15917.58 | 112 |

MultiFan v3.15.c Length-Frequency Analyzer Copyright 1990 Otter Research Ltd.
File: all8486: Albacore international catch ALL 84-86 (N/100)

Fit: 25
Objective function value =16095.86035; total penalty = 3.85794
Maximum gradient component = 0.00133
Number of non-empty length intervals: 949; Number of estimated parameters: 114
Approximate number of degrees of freedom: 835

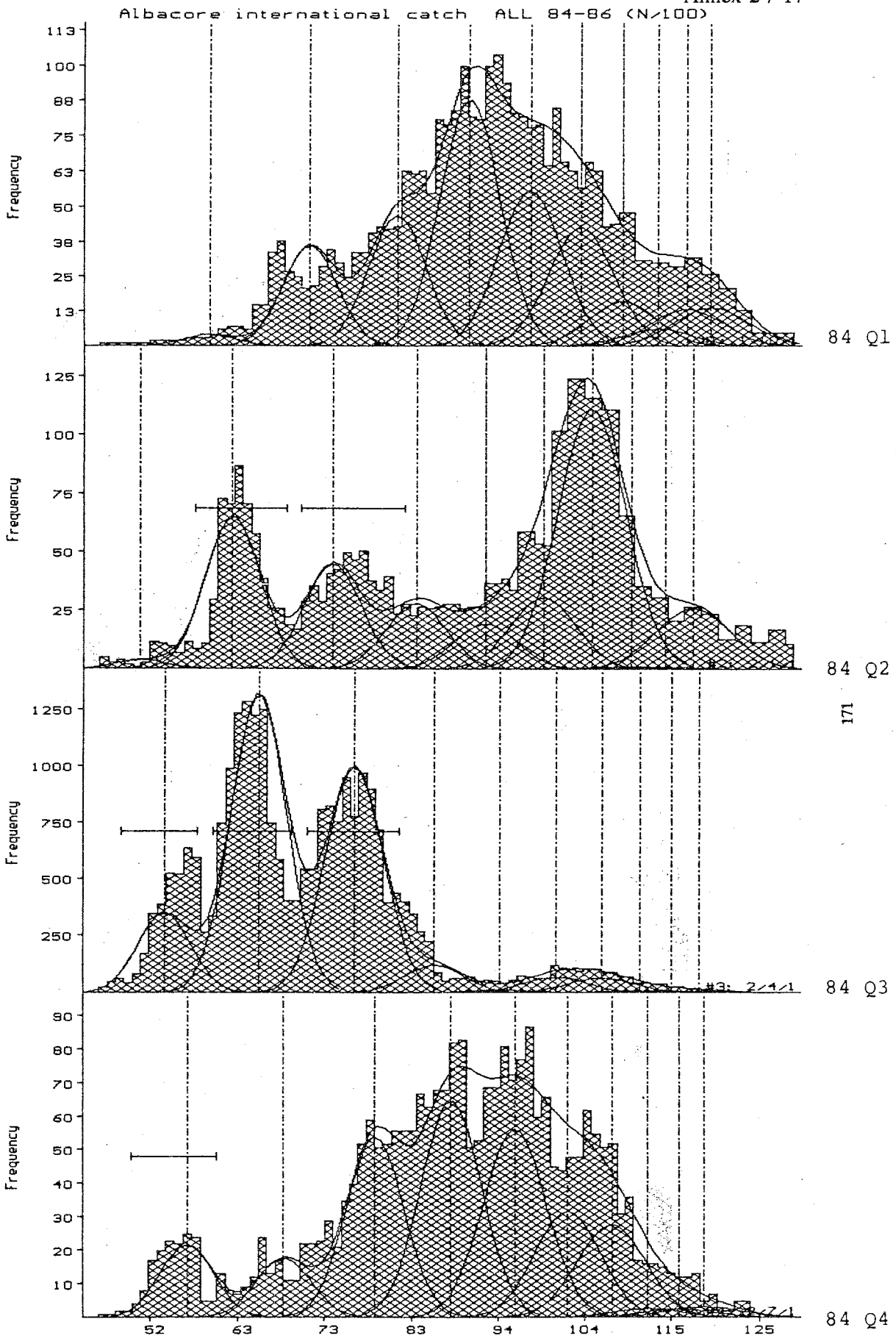
Number of age classes: 10
Parameter Estimates:
von Bertalanffy K = 0.183 (1/year); L infinity = 133.6
First Length = 47.316; Last Length = 117.009; Brody rho = 0.833 (1/year).
Estimated age of the first age class = 2.39 years.
First month mean length sampling bias for first age class: 3.870
Mean length at age in month 1:
50.86 61.76 73.79 83.80 92.14 99.08 104.86 109.67 113.67 117.01
Standard Deviations of length at age in month 1:
3.19 3.44 3.67 3.87 4.05 4.20 4.33 4.44 4.54 4.62
Average Standard Deviation = 3.838; ratio of first to last S.D.= 1.448

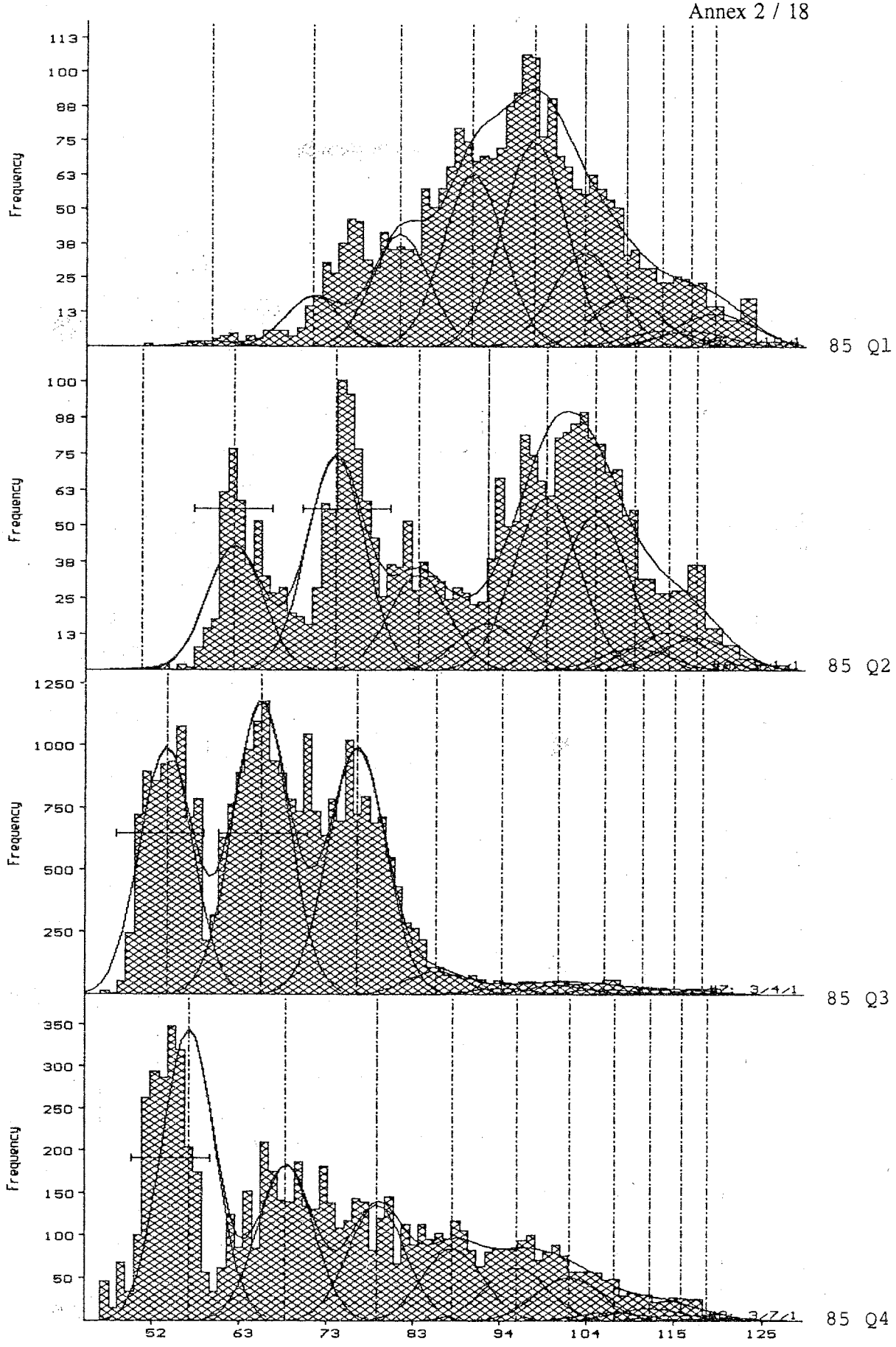
Proportions at Age:

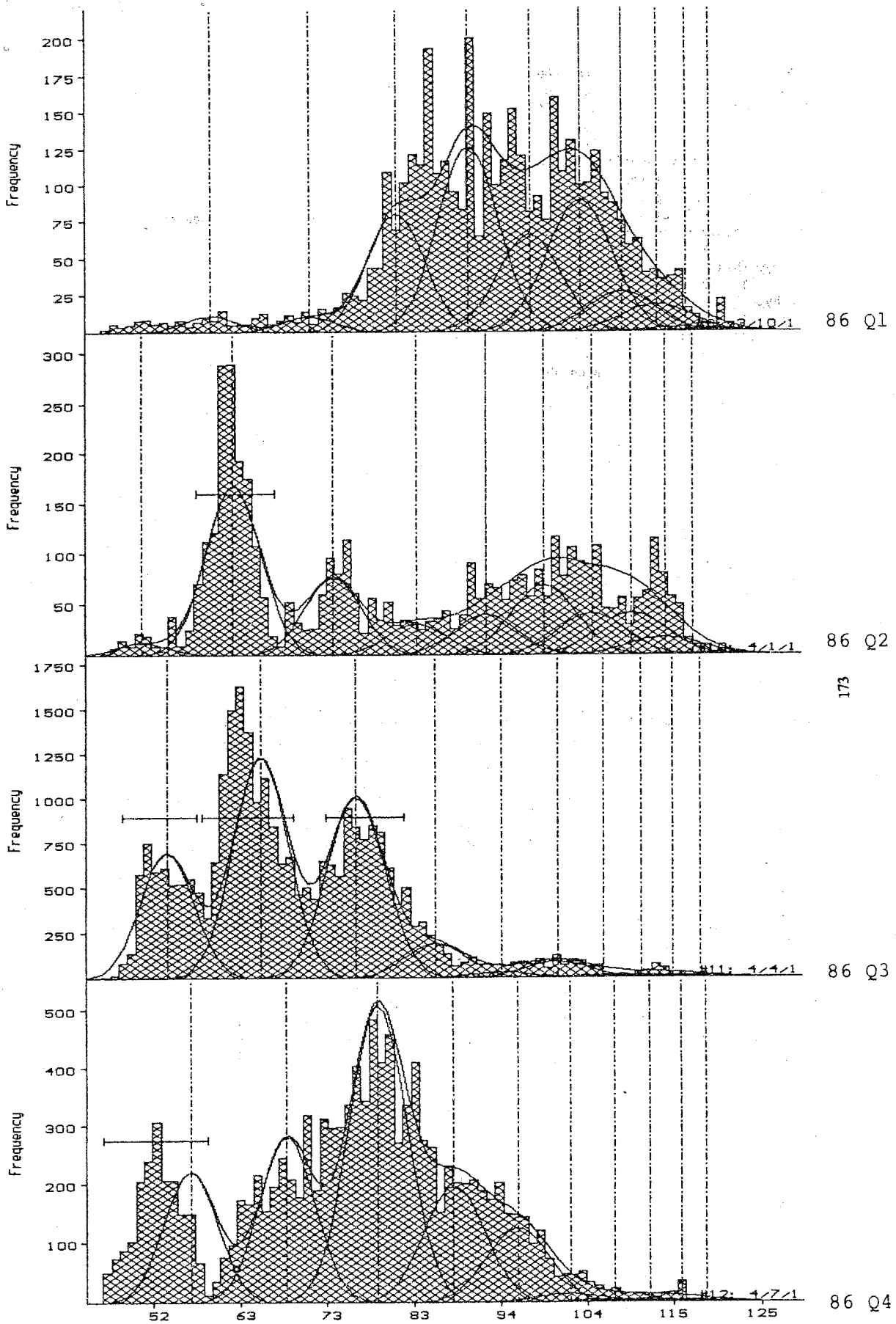
| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 0.01 | 0.01 | 0.11 | 0.07 | 0.01 | 0.00 | 0.28 | 0.37 | 0.02 | 0.02 | 0.20 | 0.15 |
| 2 | 0.11 | 0.18 | 0.44 | 0.06 | 0.06 | 0.13 | 0.35 | 0.20 | 0.02 | 0.32 | 0.37 | 0.20 |
| 3 | 0.14 | 0.13 | 0.34 | 0.19 | 0.14 | 0.23 | 0.30 | 0.15 | 0.18 | 0.15 | 0.31 | 0.37 |
| 4 | 0.27 | 0.08 | 0.04 | 0.23 | 0.22 | 0.10 | 0.03 | 0.10 | 0.29 | 0.06 | 0.06 | 0.15 |
| 5 | 0.17 | 0.06 | 0.00 | 0.20 | 0.27 | 0.05 | 0.01 | 0.07 | 0.15 | 0.08 | 0.01 | 0.10 |
| 6 | 0.14 | 0.09 | 0.03 | 0.12 | 0.13 | 0.20 | 0.01 | 0.06 | 0.21 | 0.14 | 0.03 | 0.01 |
| 7 | 0.05 | 0.35 | 0.02 | 0.10 | 0.07 | 0.18 | 0.01 | 0.01 | 0.07 | 0.09 | 0.00 | 0.00 |
| 8 | 0.02 | 0.00 | 0.00 | 0.01 | 0.02 | 0.03 | 0.00 | 0.02 | 0.05 | 0.09 | 0.01 | 0.01 |
| 9 | 0.05 | 0.00 | 0.00 | 0.01 | 0.02 | 0.05 | 0.00 | 0.01 | 0.01 | 0.04 | 0.00 | 0.00 |
| 10 | 0.05 | 0.09 | 0.00 | 0.01 | 0.05 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Numbers at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 37 | 34 | 2849 | 184 | 18 | 5 | 8012 | 2813 | 97 | 109 | 5649 | 1829 |
| 2 | 317 | 579 | 11017 | 153 | 164 | 382 | 9763 | 1532 | 93 | 1461 | 10268 | 2377 |
| 3 | 420 | 410 | 8531 | 481 | 371 | 671 | 8410 | 1175 | 718 | 683 | 8600 | 4389 |
| 4 | 807 | 262 | 1070 | 590 | 580 | 308 | 827 | 750 | 1154 | 283 | 1678 | 1749 |
| 5 | 525 | 184 | 123 | 523 | 707 | 156 | 249 | 563 | 616 | 378 | 285 | 1133 |
| 6 | 408 | 298 | 634 | 302 | 332 | 578 | 354 | 470 | 853 | 655 | 820 | 139 |
| 7 | 158 | 1096 | 603 | 268 | 182 | 528 | 226 | 101 | 270 | 402 | 119 | 59 |
| 8 | 63 | 13 | 92 | 26 | 60 | 80 | 100 | 142 | 185 | 415 | 152 | 60 |
| 9 | 136 | 10 | 76 | 26 | 61 | 137 | 93 | 71 | 31 | 180 | 127 | 44 |
| 10 | 143 | 272 | 74 | 33 | 126 | 118 | 88 | 27 | 15 | 14 | 80 | 31 |
| n | 3013 | 3157 | 25070 | 2586 | 2601 | 2962 | 28122 | 7643 | 4032 | 4580 | 27779 | 11809 |


Albacore international catch ALL 84-86 (N/100)
Frequency
84 Q1
84 Q2
84 Q3
84 Q4
171
52
63
73
83
94
104
115
125


Frequency
113
100
88
75
63
50
38
25
13
85 Q1
Frequency
100
88
75
63
50
38
25
13
85 Q2
Frequency
1250
1000
750
500
250
85 Q3
Frequency
350
300
250
200
150
100
50
85 Q4
52
63
73
83
94
104
115
125


Frequency
200
175
150
125
100
75
50
25
86 Q1
Frequency
300
250
200
150
100
50
86 Q2
Frequency
1750
1500
1250
1000
750
500
250
86 Q3
Frequency
500
400
300
200
100
52
63
73
83
94
104
115
125
86 Q4

```
The hypothesis flags for search B00 are
   1    1    0    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B01 are
   1    1    0    1    0    0    0    0    0    0    0    0    0    0    0
non standard search in PAR file P0A for search B01
This means that systematic search B01 will not
 be included in this analysis
different global hypothesis in PAR file 0A for search 01
The difference is at switch 42different global hypothesis in PAR file 0A for search 01
The hypothesis flags for search B02 are
   1    1    1    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B03 are
   1    1    0    1    1    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B04 are
   1    1    1    1    1    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B05 are
   1    1    0    1    1    0    1    0    0    0    0    0    0    0    0
The hypothesis flags for search B06 are
   1    1    1    1    1    0    1    0    0    0    0    0    0    0    0
         **** The Hypothesis Tree ****

        B02    B04    B06
 B02     *      1      1

 B04    -1      *      1

 B06    -1     -1      *

          **** The Reduced Hypothesis Tree ****

        B02    B04    B06
 B02     *      1      1

 B04    -1      *      1

 B06    -1     -1      *
```

| B00 | PAR | opt_flag | worse than | not_better than | function value | number of parameters |
|---|---|---|---|---|---|---|
| B02 | P0B | 0 | P0D | | 16008.38 | 100 |
| B02 | P0C | 0 | P0E | | 15955.23 | 100 |
| B02 | P0D | 0 | P25 | | 16039.67 | 112 |
| B02 | P0E | 0 | P10 | | 16023.43 | 112 |
| B02 | P0F | 0 | | P0D | 16049.41 | 124 |
| B02 | P10 | 0 | | P0D | 16046.10 | 124 |
| B04 | P17 | 0 | P19 | | 16006.29 | 101 |
| B04 | P18 | 0 | P1A | | 15957.76 | 101 |
| B04 | P19 | 0 | | P0D | 16040.03 | 113 |
| B04 | P1A | 0 | | P17 | 16023.81 | 113 |
| B04 | P1B | 0 | | P19 | 16052.58 | 125 |
| B04 | P1C | 0 | | P18 | 15668.42 | 123 |
| B06 | P23 | 0 | P25 | | 16062.18 | 102 |
| B06 | P24 | 0 | P26 | | 16054.41 | 102 |
| ** B06 | P25 | 1 | | | 16095.86 | 114 |
| B06 | P26 | 0 | P25 | | 16090.13 | 114 |
| B06 | P27 | 0 | | P25 | 16109.53 | 126 |
| B06 | P28 | 0 | | P24 | 15668.42 | 123 |

MultiFan v3.15.c Length-Frequency Analyzer Copyright 1990 Otter Research Ltd.
File: all8789: Albacore international catch ALL 87-89 (N/100)

Fit: 1D
Objective function value =16058.19043; total penalty =24.06070
Maximum gradient component = 0.01073
Number of non-empty length intervals: 771; Number of estimated parameters: 125
Approximate number of degrees of freedom: 646

Number of age classes: 11
Parameter Estimates:
von Bertalanffy K = 0.115 (1/year); L infinity = 142.1
First Length = 52.039; Last Length = 113.487; Brody rho = 0.892 (1/year).
Estimated age of the first age class = 3.98 years.
Mean length at age in month 1:
52.04 61.80 70.49 78.25 85.17 91.34 96.84 101.74 106.11 110.01 113.49

Standard Deviations of length at age in month 1:
3.19 3.19 3.19 3.19 3.19 3.19 3.19 3.19 3.19 3.19 3.19

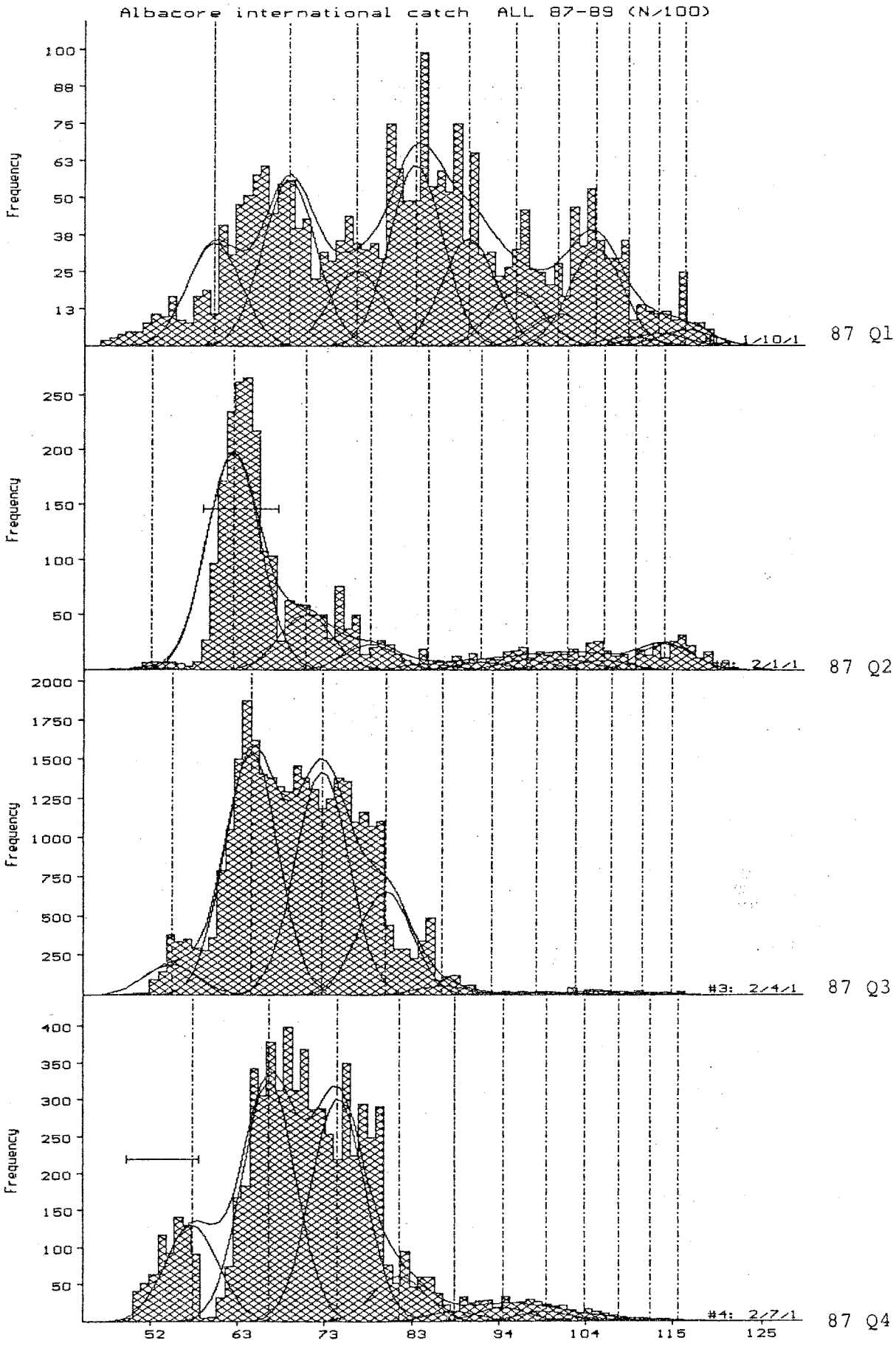
Average Standard Deviation = 3.187; ratio of first to last S.D.= 1.001

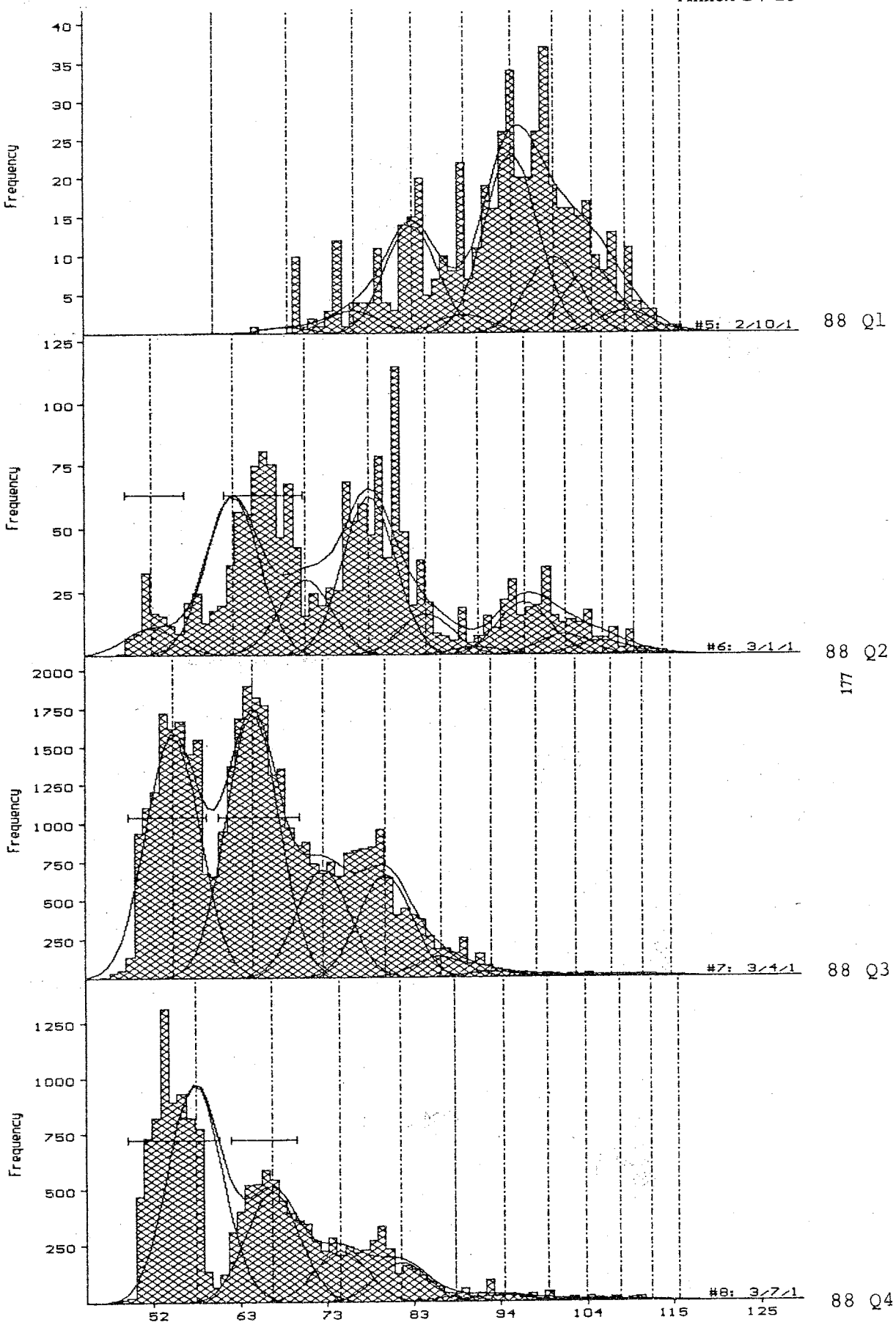
Proportions at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 0.12 | 0.01 | 0.05 | 0.15 | 0.00 | 0.05 | 0.32 | 0.50 | 0.00 | 0.04 | 0.16 | 0.38 |
| 2 | 0.19 | 0.57 | 0.39 | 0.37 | 0.01 | 0.28 | 0.35 | 0.25 | 0.00 | 0.58 | 0.42 | 0.09 |
| 3 | 0.09 | 0.15 | 0.36 | 0.34 | 0.05 | 0.13 | 0.14 | 0.12 | 0.00 | 0.16 | 0.26 | 0.21 |
| 4 | 0.21 | 0.07 | 0.17 | 0.07 | 0.21 | 0.28 | 0.14 | 0.09 | 0.75 | 0.08 | 0.16 | 0.29 |
| 5 | 0.13 | 0.02 | 0.01 | 0.02 | 0.04 | 0.07 | 0.03 | 0.01 | 0.18 | 0.00 | 0.00 | 0.01 |
| 6 | 0.06 | 0.02 | 0.00 | 0.02 | 0.35 | 0.02 | 0.01 | 0.02 | 0.04 | 0.03 | 0.00 | 0.01 |
| 7 | 0.04 | 0.03 | 0.00 | 0.02 | 0.15 | 0.09 | 0.00 | 0.00 | 0.01 | 0.06 | 0.00 | 0.00 |
| 8 | 0.11 | 0.03 | 0.00 | 0.01 | 0.13 | 0.04 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 |
| 9 | 0.01 | 0.03 | 0.00 | 0.00 | 0.05 | 0.03 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 |
| 10 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 0.02 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

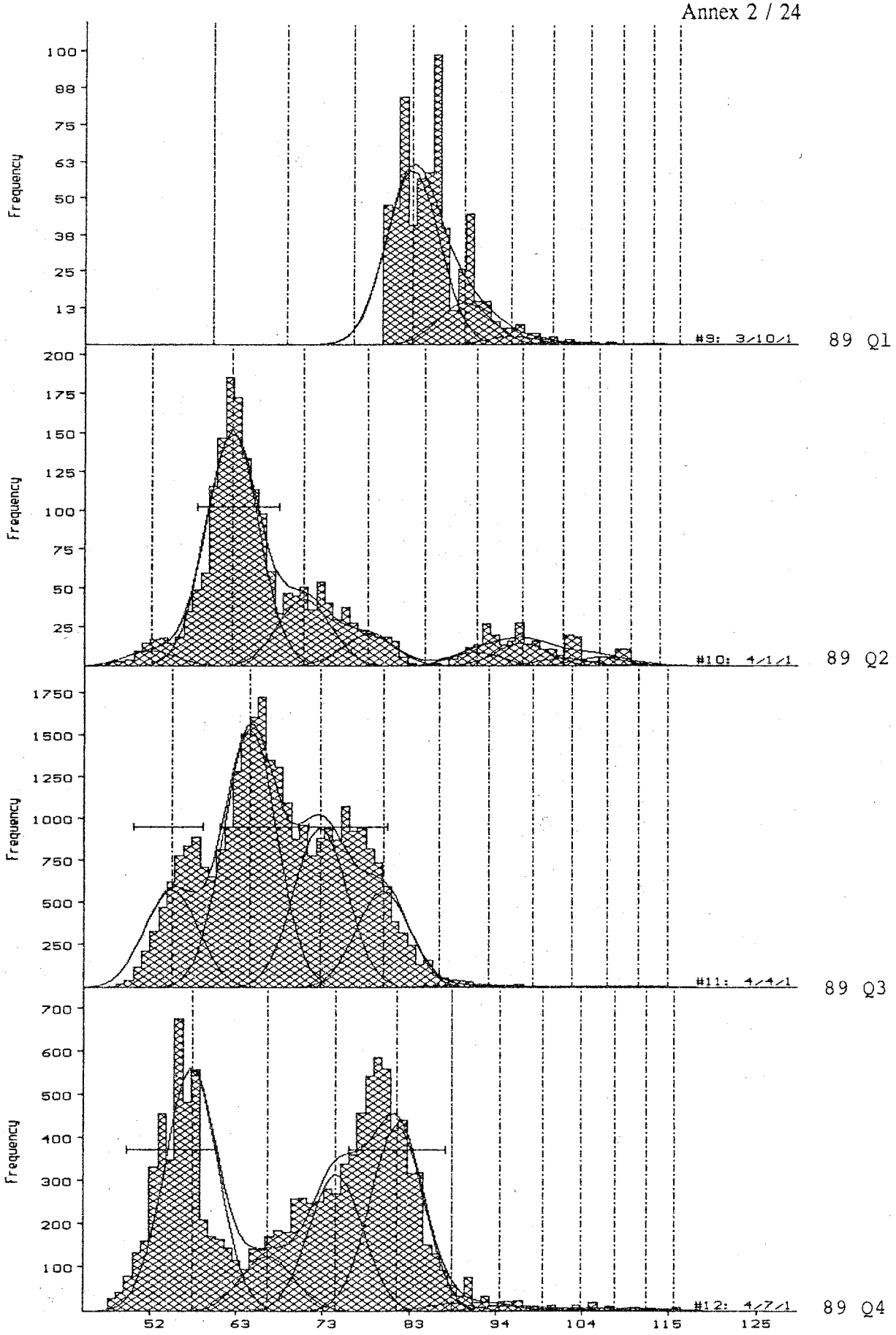
Numbers at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 280 | 17 | 1572 | 1047 | 1 | 88 | 12559 | 7767 | 1 | 78 | 4629 | 4485 |
| 2 | 449 | 1580 | 12371 | 2597 | 7 | 503 | 13675 | 3959 | 1 | 1200 | 12276 | 1014 |
| 3 | 206 | 410 | 11395 | 2418 | 24 | 242 | 5611 | 1829 | 2 | 343 | 7557 | 2527 |
| 4 | 487 | 193 | 5322 | 501 | 111 | 503 | 5349 | 1386 | 478 | 162 | 4604 | 3449 |
| 5 | 290 | 49 | 475 | 113 | 20 | 133 | 1111 | 174 | 115 | 6 | 112 | 152 |
| 6 | 148 | 60 | 95 | 154 | 184 | 27 | 322 | 255 | 24 | 72 | 95 | 111 |
| 7 | 88 | 79 | 93 | 112 | 79 | 169 | 107 | 74 | 7 | 119 | 69 | 37 |
| 8 | 265 | 84 | 110 | 44 | 67 | 68 | 93 | 60 | 2 | 42 | 56 | 39 |
| 9 | 26 | 75 | 94 | 22 | 23 | 47 | 78 | 46 | 1 | 46 | 53 | 34 |
| 10 | 35 | 10 | 78 | 15 | 2 | 10 | 70 | 36 | 1 | 8 | 52 | 29 |
| 11 | 45 | 196 | 78 | 13 | 1 | 5 | 70 | 31 | 1 | 4 | 53 | 27 |
| n | 2320 | 2753 | 31683 | 7037 | 520 | 1793 | 39046 | 15616 | 635 | 2081 | 29556 | 11905 |


Albacore international catch ALL 87-89 (N/100)
Frequency
1/10/1
87 Q1
2/1/1
87 Q2
#3: 2/4/1
87 Q3
#4: 2/7/1
87 Q4
52
63
73
83
94
104
115
125


Frequency
#5: 2/10/1
88 Q1
#6: 3/1/1
88 Q2
#7: 3/4/1
88 Q3
#8: 3/7/1
88 Q4
52
63
73
83
94
104
115
125

177


Frequency
100
88
75
63
50
38
25
13
#9: 3/10/1
89 Q1
Frequency
200
175
150
125
100
75
50
25
#10: 4/1/1
89 Q2
Frequency
1750
1500
1250
1000
750
500
250
#11: 4/4/1
89 Q3
Frequency
700
600
500
400
300
200
100
#12: 4/7/1
89 Q4
52
63
73
83
94
104
115
125

```
The hypothesis flags for search B00 are
   1    1    0    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B01 are
   1    1    1    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B02 are
   1    1    1    1    0    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B03 are
   1    1    0    1    1    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B04 are
   1    1    1    1    1    0    0    0    0    0    0    0    0    0    0
The hypothesis flags for search B05 are
   1    1    0    1    1    0    1    0    0    0    0    0    0    0    0
The hypothesis flags for search B06 are
   1    1    1    1    1    0    1    0    0    0    0    0    0    0    0
          **** The Hypothesis Tree ****

        B01    B02    B04    B06
  B01    *      2      1      1

  B02    2      *      1      1

  B04   -1     -1      *      1

  B06   -1     -1     -1      *

Systematic search B01 appears to be duplicate
 of search B02   ... removing it
          **** The Reduced Hypothesis Tree ****

        B02    B04    B06
  B02    *      1      1

  B04   -1      *      1

  B06   -1     -1      *
```

| B00 | PAR | opt_flag | worse than | not_better than | function value | number of parameters |
|---|---|---|---|---|---|---|
| B02 | P0D | 0 | P0F | | 15859.65 | 99 |
| B02 | P0E | 0 | P10 | | 15514.29 | 99 |
| B02 | P0F | 0 | P11 | | 15910.54 | 111 |
| B02 | P10 | 0 | P12 | | 15557.75 | 111 |
| B02 | P11 | 0 | P1D | | 15955.22 | 123 |
| B02 | P12 | 0 | | P0D | 15581.07 | 123 |
| B04 | P19 | 0 | P1B | | 16008.64 | 101 |
| B04 | P1A | 0 | P1C | | 15927.16 | 101 |
| B04 | P1B | 0 | P1D | | 16038.72 | 113 |
| B04 | P1C | 0 | P1E | | 15959.73 | 113 |
| ** B04 | P1D | 1 | | | 16058.19 | 125 |
| B04 | P1E | 0 | | P19 | 15981.34 | 125 |
| B06 | P25 | 0 | P27 | | 16008.26 | 102 |
| B06 | P26 | 0 | P28 | | 15938.36 | 102 |
| B06 | P27 | 0 | P29 | | 16032.65 | 114 |
| B06 | P28 | 0 | | P25 | 15970.30 | 114 |
| B06 | P29 | 0 | | P1B | 16058.19 | 126 |
| B06 | P2A | 0 | | P26 | 15581.07 | 123 |

MultiFan v3.15.c Length-Frequency Analyzer Copyright 1990 Otter Research Ltd.
File: all7577: Albacore international catch ALL 75-77 (N/100)

Fit: 11
Objective function value =16130.91992; total penalty =10.66502
Maximum gradient component = 0.00061
Number of non-empty length intervals: 866; Number of estimated parameters: 110
Approximate number of degrees of freedom: 756

Number of age classes: 10
Parameter Estimates:
von Bertalanffy K = 0.200 (1/year); L infinity = 128.3
First Length = 45.560; Last Length = 114.600; Brody rho = 0.819 (1/year).
Estimated age of the first age class = 2.19 years.
Mean length at age in month 1:
45.56 60.55 72.83 82.88 91.11 97.84 103.36 107.88 111.57 114.60
Standard Deviations of length at age in month 1:
2.95 3.36 3.74 4.08 4.38 4.64 4.87 5.07 5.23 5.37
Average Standard Deviation = 3.981; ratio of first to last S.D.= 1.819

Proportions at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 0.00 | 0.16 | 0.03 | 0.06 | 0.00 | 0.34 | 0.04 | 0.18 | 0.00 | 0.13 | 0.02 | 0.16 |
| 2 | 0.01 | 0.27 | 0.33 | 0.00 | 0.00 | 0.48 | 0.50 | 0.03 | 0.03 | 0.50 | 0.53 | 0.07 |
| 3 | 0.27 | 0.21 | 0.56 | 0.07 | 0.08 | 0.03 | 0.21 | 0.10 | 0.10 | 0.10 | 0.36 | 0.20 |
| 4 | 0.40 | 0.08 | 0.05 | 0.21 | 0.53 | 0.02 | 0.18 | 0.16 | 0.16 | 0.04 | 0.06 | 0.18 |
| 5 | 0.11 | 0.05 | 0.00 | 0.15 | 0.27 | 0.03 | 0.02 | 0.26 | 0.48 | 0.07 | 0.00 | 0.18 |
| 6 | 0.15 | 0.10 | 0.01 | 0.47 | 0.08 | 0.04 | 0.03 | 0.24 | 0.21 | 0.10 | 0.01 | 0.19 |
| 7 | 0.02 | 0.11 | 0.01 | 0.03 | 0.03 | 0.05 | 0.01 | 0.01 | 0.01 | 0.04 | 0.00 | 0.01 |
| 8 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 9 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |



Numbers at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 4 | 567 | 633 | 394 | 11 | 3503 | 1407 | 1524 | 9 | 1057 | 807 | 1293 |
| 2 | 30 | 950 | 7363 | 34 | 21 | 4987 | 17241 | 267 | 111 | 4048 | 19223 | 619 |
| 3 | 613 | 746 | 12545 | 485 | 375 | 358 | 7060 | 833 | 415 | 858 | 12841 | 1648 |
| 4 | 905 | 296 | 1093 | 1410 | 2336 | 177 | 6270 | 1378 | 637 | 319 | 2216 | 1476 |
| 5 | 255 | 175 | 89 | 1042 | 1176 | 311 | 745 | 2155 | 1930 | 580 | 178 | 1503 |
| 6 | 345 | 338 | 318 | 3163 | 339 | 407 | 1201 | 2015 | 858 | 781 | 381 | 1532 |
| 7 | 56 | 400 | 268 | 188 | 117 | 513 | 234 | 105 | 42 | 353 | 174 | 107 |
| 8 | 14 | 51 | 75 | 24 | 21 | 49 | 103 | 30 | 16 | 108 | 110 | 30 |
| 9 | 13 | 17 | 57 | 20 | 16 | 28 | 83 | 24 | 15 | 37 | 85 | 24 |
| 10 | 19 | 15 | 51 | 21 | 14 | 23 | 74 | 21 | 13 | 29 | 76 | 22 |
| n | 2254 | 3556 | 22493 | 6779 | 4425 | 10356 | 34419 | 8353 | 4046 | 8170 | 36090 | 8256 |

MultiFan v3.15.c Length-Frequency Analyzer Copyright 1990 Otter Research Ltd.
File: all8183: Albacore international catch ALL 81-83 (N/100)

Fit: 1F
Objective function value =16163.75977; total penalty = 9.18600
Maximum gradient component = 0.00471
Number of non-empty length intervals: 914; Number of estimated parameters: 109
Approximate number of degrees of freedom: 805

Number of age classes: 10
Parameter Estimates:
von Bertalanffy K = 0.200 (1/year); L infinity = 128.3
First Length = 45.560; Last Length = 114.600; Brody rho = 0.819 (1/year).
Estimated age of the first age class = 2.19 years.
Mean length at age in month 1:
45.56 60.55 72.83 82.88 91.11 97.84 103.36 107.88 111.57 114.60
Standard Deviations of length at age in month 1:
3.21 3.69 4.14 4.54 4.90 5.22 5.50 5.73 5.93 6.10
Average Standard Deviation >= 4.426; ratio of first to last S.D.= 1.900

Proportions at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 0.05 | 0.07 | 0.34 | 0.08 | 0.00 | 0.01 | 0.01 | 0.02 | 0.00 | 0.00 | 0.04 | 0.39 |
| 2 | 0.26 | 0.63 | 0.27 | 0.12 | 0.03 | 0.25 | 0.40 | 0.11 | 0.04 | 0.00 | 0.36 | 0.14 |
| 3 | 0.09 | 0.12 | 0.30 | 0.20 | 0.43 | 0.13 | 0.50 | 0.38 | 0.24 | 0.01 | 0.44 | 0.19 |
| 4 | 0.30 | 0.04 | 0.07 | 0.27 | 0.29 | 0.07 | 0.06 | 0.25 | 0.42 | 0.12 | 0.11 | 0.20 |
| 5 | 0.20 | 0.01 | 0.00 | 0.15 | 0.07 | 0.07 | 0.00 | 0.05 | 0.13 | 0.22 | 0.01 | 0.05 |
| 6 | 0.09 | 0.01 | 0.00 | 0.06 | 0.04 | 0.11 | 0.00 | 0.06 | 0.13 | 0.21 | 0.02 | 0.02 |
| 7 | 0.01 | 0.04 | 0.00 | 0.10 | 0.03 | 0.23 | 0.01 | 0.05 | 0.02 | 0.36 | 0.01 | 0.00 |
| 8 | 0.00 | 0.04 | 0.00 | 0.01 | 0.05 | 0.02 | 0.00 | 0.05 | 0.01 | 0.01 | 0.00 | 0.00 |
| 9 | 0.00 | 0.01 | 0.00 | 0.00 | 0.03 | 0.01 | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 | 0.01 |
| 10 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.01 | 0.01 | 0.05 | 0.00 | 0.00 |

Numbers at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 108 | 242 | 11609 | 188 | 3 | 25 | 283 | 52 | 5 | 6 | 1550 | 4306 |
| 2 | 612 | 2162 | 9054 | 279 | 53 | 613 | 14136 | 366 | 102 | 6 | 12565 | 1548 |
| 3 | 216 | 409 | 10136 | 457 | 710 | 326 | 17770 | 1285 | 652 | 36 | 15456 | 2102 |
| 4 | 692 | 150 | 2355 | 611 | 484 | 181 | 2135 | 865 | 1122 | 325 | 3808 | 2218 |
| 5 | 456 | 29 | 81 | 337 | 122 | 168 | 99 | 159 | 340 | 577 | 396 | 530 |
| 6 | 209 | 29 | 93 | 127 | 70 | 274 | 141 | 191 | 349 | 559 | 564 | 227 |
| 7 | 17 | 147 | 154 | 223 | 55 | 561 | 319 | 178 | 42 | 933 | 215 | 52 |
| 8 | 8 | 129 | 134 | 24 | 84 | 45 | 135 | 172 | 18 | 15 | 109 | 54 |
| 9 | 7 | 45 | 114 | 8 | 56 | 22 | 102 | 107 | 39 | 10 | 97 | 60 |
| 10 | 6 | 104 | 114 | 6 | 7 | 212 | 96 | 19 | 33 | 138 | 100 | 50 |
| n | 2332 | 3446 | 33845 | 2260 | 1644 | 2427 | 35216 | 3394 | 2702 | 2605 | 34860 | 11147 |

MultiFan v3.15.c Length-Frequency Analyzer Copyright 1990 Otter Research Ltd.
File: all7880: Albacore international catch ALL 78-80 (N/100)

Fit: 04
Objective function value =14084.50000; total penalty =15.48692
Maximum gradient component = 0.00182
Number of non-empty length intervals: 863; Number of estimated parameters: 109
Approximate number of degrees of freedom: 754

Number of age classes: 10
Parameter Estimates:
von Bertalanffy K = 0.200 (1/year); L infinity = 128.3
First Length = 45.560; Last Length = 114.600; Brody rho = 0.819 (1/year).
Estimated age of the first age class = 2.19 years.
Mean length at age in month 1:
45.56 60.55 72.83 82.88 91.11 97.84 103.36 107.88 111.57 114.60
Standard Deviations of length at age in month 1:
2.81 3.23 3.62 3.98 4.29 4.57 4.81 5.02 5.19 5.34
Average Standard Deviation = 3.874; ratio of first to last S.D.= 1.900

Proportions at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 0.00 | 0.11 | 0.40 | 0.48 | 0.00 | 0.00 | 0.03 | 0.43 | 0.00 | 0.01 | 0.28 | 0.26 |
| 2 | 0.00 | 0.30 | 0.35 | 0.15 | 0.04 | 0.34 | 0.61 | 0.11 | 0.02 | 0.54 | 0.29 | 0.02 |
| 3 | 0.10 | 0.01 | 0.16 | 0.15 | 0.13 | 0.18 | 0.33 | 0.26 | 0.35 | 0.14 | 0.36 | 0.50 |
| 4 | 0.29 | 0.18 | 0.07 | 0.09 | 0.14 | 0.06 | 0.02 | 0.11 | 0.25 | 0.09 | 0.04 | 0.19 |
| 5 | 0.38 | 0.02 | 0.00 | 0.08 | 0.22 | 0.09 | 0.00 | 0.03 | 0.11 | 0.07 | 0.00 | 0.02 |
| 6 | 0.20 | 0.25 | 0.00 | 0.03 | 0.31 | 0.17 | 0.00 | 0.03 | 0.17 | 0.03 | 0.00 | 0.01 |
| 7 | 0.00 | 0.12 | 0.00 | 0.00 | 0.11 | 0.04 | 0.00 | 0.01 | 0.03 | 0.05 | 0.00 | 0.00 |
| 8 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 |
| 9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.07 | 0.00 | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.02 | 0.05 | 0.00 | 0.00 |



Numbers at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 6 | 379 | 24241 | 5352 | 6 | 8 | 1489 | 2698 | 6 | 32 | 12709 | 1650 |
| 2 | 10 | 1003 | 21345 | 1626 | 78 | 867 | 34480 | 693 | 42 | 1477 | 13322 | 126 |
| 3 | 324 | 33 | 9954 | 1696 | 282 | 457 | 18732 | 1605 | 714 | 384 | 16457 | 3252 |
| 4 | 919 | 598 | 4118 | 1026 | 307 | 145 | 1314 | 710 | 515 | 233 | 1929 | 1196 |
| 5 | 1185 | 73 | 233 | 896 | 471 | 221 | 175 | 180 | 225 | 182 | 171 | 117 |
| 6 | 640 | 840 | 248 | 314 | 657 | 442 | 147 | 187 | 347 | 70 | 137 | 37 |
| 7 | 14 | 400 | 168 | 53 | 237 | 94 | 128 | 76 | 61 | 133 | 129 | 20 |
| 8 | 9 | 16 | 131 | 35 | 73 | 105 | 124 | 30 | 30 | 52 | 112 | 16 |
| 9 | 8 | 12 | 122 | 29 | 23 | 182 | 125 | 31 | 53 | 36 | 103 | 15 |
| 10 | 7 | 11 | 119 | 27 | 11 | 30 | 121 | 76 | 49 | 127 | 102 | 14 |
| n | 3123 | 3366 | 60678 | 11052 | 2145 | 2551 | 56834 | 6286 | 2043 | 2725 | 45172 | 6443 |

MultiFan v3.15.c Length-Frequency Analyzer Copyright 1990 Otter Research Ltd.
File: all8486: Albacore international catch ALL 84-86 (N/100)

Fit: 13
Objective function value =15885.28027; total penalty = 1.68827
Maximum gradient component = 0.00155
Number of non-empty length intervals: 949; Number of estimated parameters: 109
Approximate number of degrees of freedom: 840

Number of age classes: 10
Parameter Estimates:
von Bertalanffy K = 0.200 (1/year); L infinity = 127.6
First Length = 45.560; Last Length = 114.000; Brody rho = 0.819 (1/year).
Estimated age of the first age class = 2.21 years.
Mean length at age in month 1:
45.56 60.42 72.59 82.55 90.71 97.39 102.86 107.33 111.00 114.00
Standard Deviations of length at age in month 1:
3.18 3.65 4.09 4.49 4.85 5.17 5.44 5.67 5.87 6.04
Average Standard Deviation = 4.379; ratio of first to last S.D.= 1.900

Proportions at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 0.01 | 0.01 | 0.04 | 0.06 | 0.00 | 0.00 | 0.27 | 0.32 | 0.02 | 0.02 | 0.23 | 0.17 |
| 2 | 0.10 | 0.19 | 0.44 | 0.06 | 0.05 | 0.06 | 0.33 | 0.22 | 0.02 | 0.33 | 0.37 | 0.17 |
| 3 | 0.11 | 0.12 | 0.39 | 0.16 | 0.17 | 0.26 | 0.32 | 0.16 | 0.09 | 0.14 | 0.28 | 0.36 |
| 4 | 0.25 | 0.10 | 0.07 | 0.23 | 0.15 | 0.12 | 0.04 | 0.10 | 0.35 | 0.07 | 0.07 | 0.15 |
| 5 | 0.18 | 0.03 | 0.00 | 0.19 | 0.29 | 0.02 | 0.00 | 0.07 | 0.11 | 0.06 | 0.00 | 0.11 |
| 6 | 0.17 | 0.02 | 0.01 | 0.14 | 0.17 | 0.15 | 0.01 | 0.07 | 0.21 | 0.13 | 0.02 | 0.01 |
| 7 | 0.04 | 0.40 | 0.04 | 0.12 | 0.05 | 0.24 | 0.01 | 0.02 | 0.13 | 0.08 | 0.01 | 0.00 |
| 8 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.00 | 0.02 | 0.05 | 0.12 | 0.00 | 0.00 |
| 9 | 0.03 | 0.00 | 0.00 | 0.01 | 0.03 | 0.02 | 0.00 | 0.02 | 0.01 | 0.06 | 0.00 | 0.00 |
| 10 | 0.10 | 0.12 | 0.00 | 0.01 | 0.08 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Numbers at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 20 | 18 | 887 | 167 | 10 | 7 | 7731 | 2461 | 94 | 87 | 6408 | 1980 |
| 2 | 301 | 607 | 11129 | 143 | 119 | 186 | 9263 | 1677 | 90 | 1495 | 10205 | 2063 |
| 3 | 338 | 371 | 9681 | 414 | 442 | 759 | 9064 | 1250 | 377 | 639 | 7789 | 4295 |
| 4 | 754 | 318 | 1632 | 584 | 385 | 358 | 1052 | 738 | 1416 | 298 | 2050 | 1783 |
| 5 | 549 | 94 | 102 | 481 | 762 | 68 | 140 | 542 | 437 | 290 | 123 | 1344 |
| 6 | 498 | 67 | 275 | 356 | 430 | 449 | 316 | 539 | 831 | 582 | 661 | 148 |
| 7 | 115 | 1263 | 1046 | 305 | 126 | 714 | 238 | 148 | 525 | 373 | 220 | 52 |
| 8 | 35 | 38 | 129 | 64 | 49 | 99 | 113 | 119 | 192 | 528 | 123 | 52 |
| 9 | 98 | 13 | 91 | 33 | 75 | 66 | 103 | 132 | 52 | 267 | 111 | 50 |
| 10 | 305 | 367 | 98 | 38 | 203 | 254 | 101 | 37 | 18 | 20 | 89 | 43 |
| n | 3013 | 3157 | 25070 | 2586 | 2601 | 2962 | 28122 | 7643 | 4032 | 4580 | 27779 | 11809 |

MultiFan v3.15.c Length-Frequency Analyzer Copyright 1990 Otter Research Ltd.
File: all8789: Albacore international catch ALL 87-89 (N/100)

Fit: 15
Objective function value = 3512.54810; total penalty =22.37806
Maximum gradient component = 0.00099
Number of non-empty length intervals: 771; Number of estimated parameters: 109
Approximate number of degrees of freedom: 662

Number of age classes: 10
Parameter Estimates:
von Bertalanffy K = 0.200 (1/year); L infinity = 128.3
First Length = 45.560; Last Length = 114.600; Brody rho = 0.819 (1/year).
Estimated age of the first age class = 2.19 years.
Mean length at age in month 1:
45.56 60.55 72.83 82.88 91.11 97.84 103.36 107.88 111.57 114.60
Standard Deviations of length at age in month 1:
3.12 3.58 4.02 4.41 4.76 5.07 5.33 5.56 5.76 5.92
Average Standard Deviation >= 4.296; ratio of first to last S.D.= 1.900

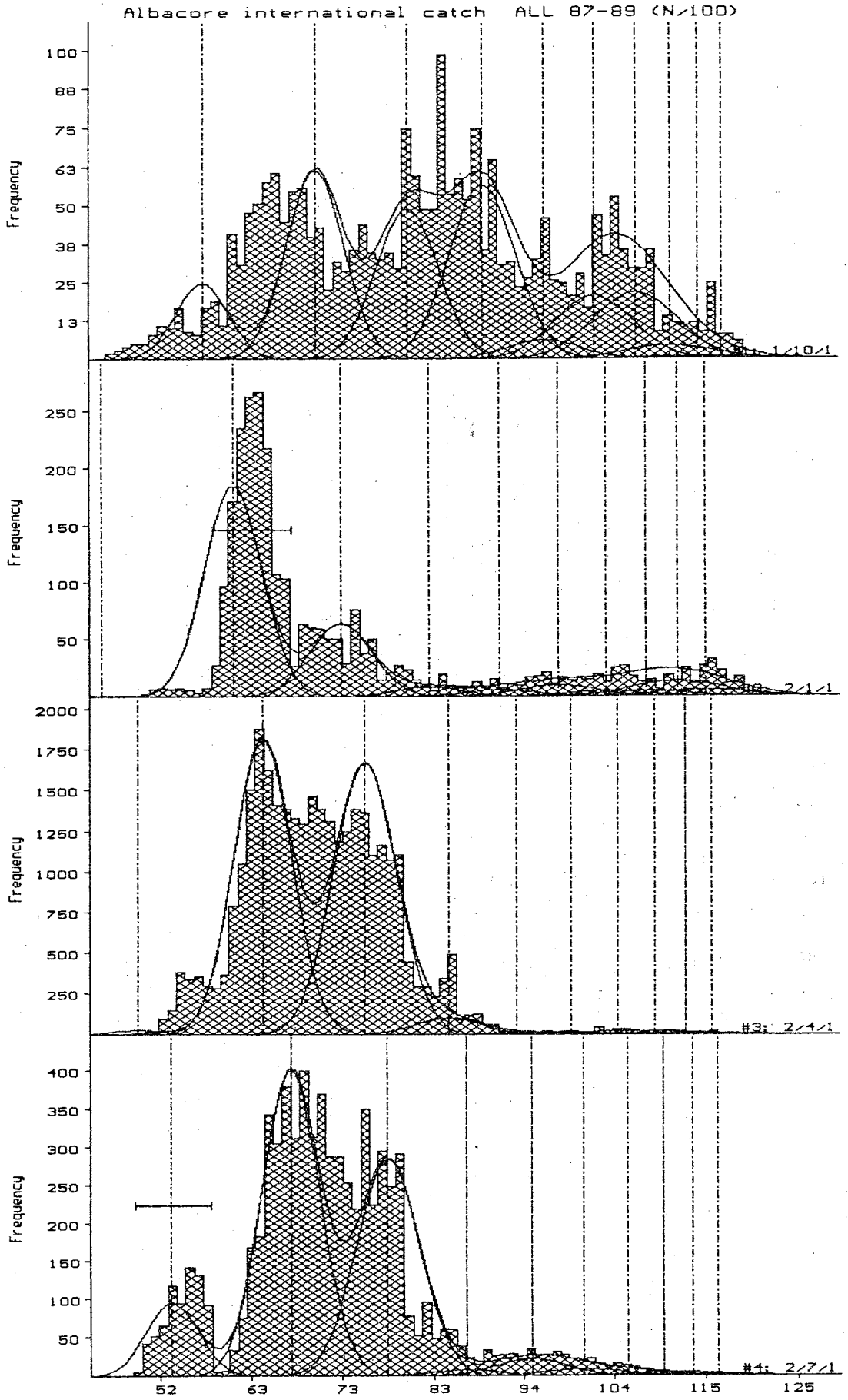
Proportions at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 0.09 | 0.00 | 0.01 | 0.11 | 0.00 | 0.02 | 0.28 | 0.49 | 0.00 | 0.01 | 0.05 | 0.30 |
| 2 | 0.23 | 0.58 | 0.48 | 0.48 | 0.02 | 0.22 | 0.42 | 0.31 | 0.00 | 0.63 | 0.54 | 0.15 |
| 3 | 0.19 | 0.21 | 0.46 | 0.35 | 0.15 | 0.39 | 0.22 | 0.15 | 0.62 | 0.21 | 0.38 | 0.48 |
| 4 | 0.23 | 0.03 | 0.03 | 0.01 | 0.11 | 0.19 | 0.06 | 0.03 | 0.35 | 0.01 | 0.02 | 0.05 |
| 5 | 0.03 | 0.02 | 0.00 | 0.03 | 0.41 | 0.01 | 0.00 | 0.01 | 0.01 | 0.02 | 0.00 | 0.00 |
| 6 | 0.09 | 0.04 | 0.00 | 0.01 | 0.28 | 0.12 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 |
| 7 | 0.10 | 0.02 | 0.00 | 0.00 | 0.02 | 0.04 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 |
| 8 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |



Numbers at Age:

| | Sample | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 208 | 8 | 241 | 752 | 1 | 39 | 10926 | 7585 | 1 | 18 | 1573 | 3537 |
| 2 | 542 | 1596 | 15271 | 3352 | 10 | 403 | 16414 | 4917 | 2 | 1316 | 15862 | 1838 |
| 3 | 451 | 578 | 14657 | 2487 | 80 | 707 | 8609 | 2326 | 395 | 446 | 11200 | 5676 |
| 4 | 541 | 82 | 973 | 74 | 56 | 332 | 2510 | 419 | 223 | 30 | 510 | 638 |
| 5 | 62 | 58 | 101 | 208 | 215 | 22 | 146 | 151 | 6 | 51 | 86 | 45 |
| 6 | 215 | 103 | 96 | 91 | 144 | 207 | 109 | 61 | 2 | 167 | 75 | 39 |
| 7 | 233 | 52 | 95 | 24 | 9 | 65 | 92 | 47 | 2 | 33 | 65 | 38 |
| 8 | 48 | 56 | 88 | 18 | 2 | 7 | 83 | 40 | 1 | 8 | 62 | 34 |
| 9 | 10 | 151 | 84 | 16 | 2 | 5 | 80 | 35 | 1 | 6 | 61 | 31 |
| 10 | 8 | 69 | 77 | 15 | 1 | 5 | 79 | 33 | 1 | 5 | 61 | 29 |
| n | 2320 | 2753 | 31683 | 7037 | 520 | 1793 | 39046 | 15616 | 635 | 2081 | 29556 | 11905 |


Albacore international catch ALL 87-89 (N/100)
Frequency
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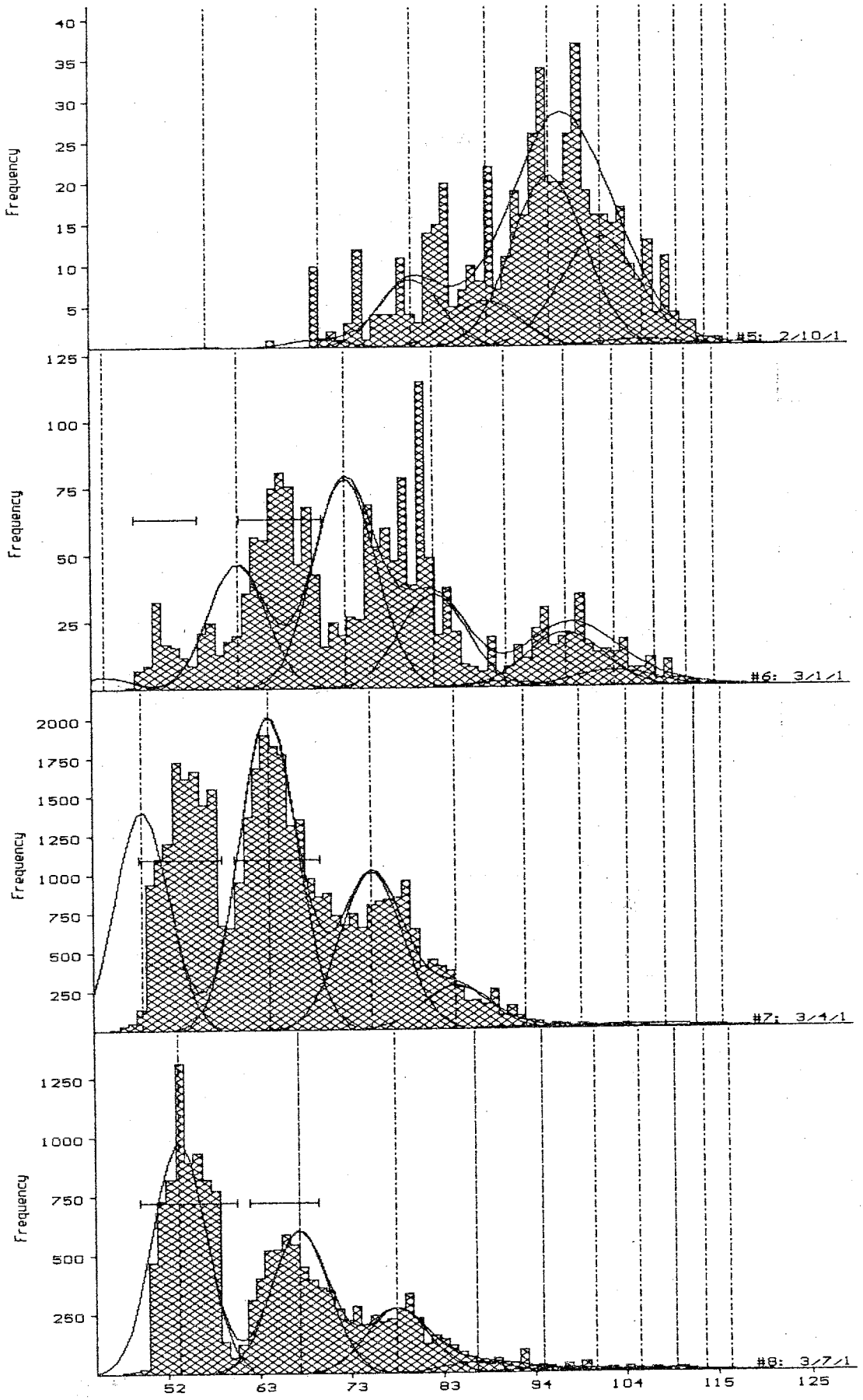
#3: 2/4/1
#4: 2/7/1
52
63
73
83
94
104
115
125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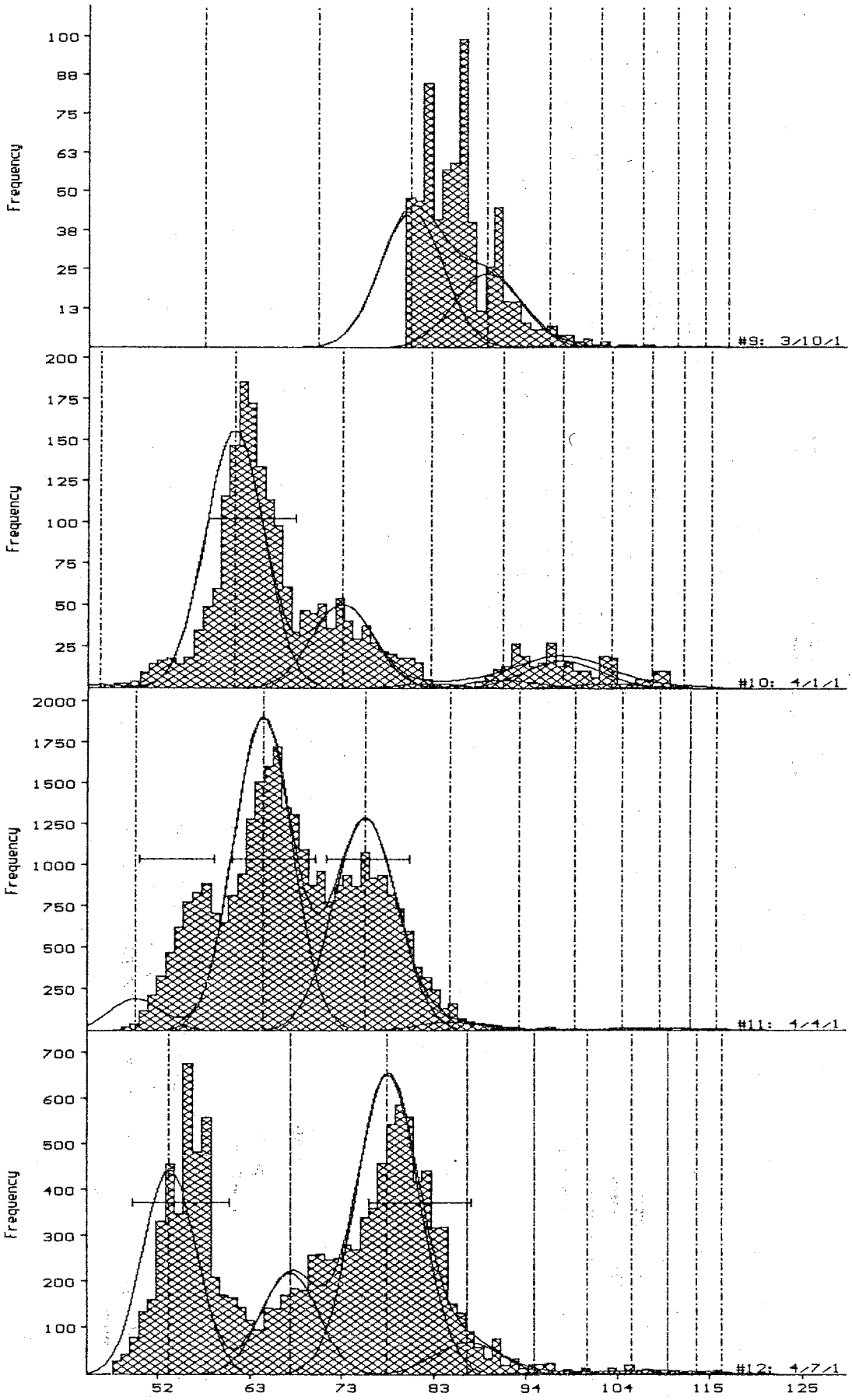
52
63
73
83
94
104
115
125


Frequency
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#10: 4/1/1
#11: 4/4/1
#12: 4/7/1
52
63
73
83
94
104
115
125