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*and freshwater science*

# Contents

# Introduction

Staff of the National Institute of Water and Atmospheric Research (NIWA) and, formerly, MAF Fisheries have sampled the length and age compositions of snapper from commercial landings in port (market sampling) intermittently since 1963 (Davies *et al.* 1993). In the 1988–89 fishing year, a structured sampling programme was designed to establish a time series of length and age composition data for the main snapper fisheries in the Auckland Fishery Management Area (AFMA). Snapper is managed in the AFMA as two separate stocks, SNA 1 and SNA 8. Because of heterogeneity in snapper biology and fishing patterns, the east coast stock (SNA 1) is often further subdivided into three substocks; east Northland, Hauraki Gulf, and the Bay of Plenty. The time series of length and age information has been summarised in two previous reports for the periods 1988–94 and 1994–95 (Davies & Walsh 1995, Walsh *et al.* 1995). This report presents the results of market sampling for the period 1995–96 (between October 1995 and February 1996), thus continuing the time series of snapper length and age compositions. Funding for this project (AKMS01) was provided by the Ministry of Fisheries, New Zealand.

# Objective

The objective of the market sampling programme has remained largely unchanged since the programme was established and is as follows.

> To continue the development and analysis of a comparative time series of age and length distributions of snapper in catches taken by the main fishing methods in the Auckland Fishery Management Area.

The programme also supports other snapper stock assessment programmes that require length and age composition information, e.g., daily egg production method and tagging studies for estimating stock biomass. However, no support function was necessary during the sampling programme in 1995–96.

# Methods

Landings from the snapper fishery were stratified hierarchically by stock or substock, fishing method, and quarterly season, e.g., east Northland – longline – spring. The stock and substocks correspond to the four areas: west coast, Hauraki Gulf, Bay of Plenty, and east Northland (Figure 1). Fishing methods sampled were longline (BLL), single trawl (BT), and Danish seine (DS). Quarterly season strata were defined as spring (September–November), summer (December–February), autumn (March–May), and winter (June–August). The percentages of the annual snapper catch taken by particular methods in each of the stock and substock strata for 1994–95 and October 1995 to February 1996 are given in Table 1, illustrating the dominant methods in respective stock and substock strata, before and during the period of sampling. Samples were collected in spring and summer when most of the snapper stock become vulnerable to fishing.

A two-stage sampling procedure was used to obtain length frequencies (West 1978). Landings, and bins within landings, represent the first and second stages respectively. The procedure for obtaining a simple random sample for length frequency was modified to account for the grading of fish by length and quality by fishermen before landing (Davies *et al.* 1993). All fish in bins making up the sample were measured to the nearest centimetre below the fork length. As snapper show no differential growth between sexes (Paul 1976), sex was not determined. A detailed description of the sampling design was given by Davies & Walsh (1995).

Two different methods were employed for the collection of otoliths from landings in particular stock and substock areas. Otoliths were subsampled randomly from length frequency samples taken from the west coast single trawl and Hauraki Gulf longline fisheries. Otoliths from the Bay of Plenty and east Northland substocks were collected by proportional allocation according to the longline length distribution as estimated for the previous year. To allow for annual variability in the abundance of fish in the smaller length intervals, a fixed sample size of about 20 otoliths was obtained per interval.

Otoliths from the Bay of Plenty were collected entirely from a research trawl survey carried out concurrently with the length frequency sampling, and otoliths from the west coast, Hauraki Gulf, and east Northland areas were collected from commercial landings (*see* Table 6). Previous comparisons of research and commercial length-at-age data have shown no obvious differences in growth rates. Research trawl surveys are thought to provide a sample that is more spatially representative of the stock than one derived from commercial landings. The otolith collections were processed to produce an age-length key to derive proportion at age estimates for snapper in commercial catches.

A standardised procedure for reading otoliths was followed (Davies & Walsh 1995). Age was defined as whole years from a nominal birth date of 1 January as described by Davies & Walsh (1995), e.g., the 1989 year class was 7 years old as sampled in 1995–96 (aged to 01/01/96). Age-length keys were assumed to be representative of each stock or substock for the seasonal strata within which the sample was collected.

The analytical approach for calculating stratum proportions at length and age from the length frequency samples and age-length keys followed that of Davies & Walsh (1995). Proportions at age were calculated for the range of age classes recruited to each stratum, with the maximum age being an aggregate of all age classes greater than 19 years. The variances for the proportion at length and age estimates were calculated as described by Davies & Walsh (1995).

Snapper length and age data were stored on the *market* and *age* databases respectively within the NIWA fisheries research database system.

# Results

## Sample collections

Summaries of the length frequency sample sizes for stock-method-season strata are given in Tables 2–5, and summaries of the otolith sample collections in Table 6. Catch data are provided in Tables 2–5 for all seasons from autumn 1995 to summer 1995–96 to present seasonal patterns in the fisheries.

## Length and age distributions

For comparing stock-method strata and identifying year class strengths, catch-at-age compositions were derived from the combined spring and summer length distributions (Figures 2–11). However, otoliths were not collected consistently in either spring or summer. In combining the seasonal data it is assumed that an age-length key collected from spring and/or summer can be applied to the combined spring and summer length data. Because the growth of snapper over 25 cm in length is not considerable between spring and summer, this assumption is probably valid for broad comparisons. This assumption has been accepted for other species with comparable growth rates to snapper (Westrheim & Ricker 1978).

Sample length and age distributions for the 1995–96 season are presented as histograms of length and age compositions for stock-method strata (Figures 2–11). These are ordered firstly by stock or substock and secondly by fishing method. The estimated proportions at length and age for the stock-method-season strata are shown in Appendices 1 and 2, respectively. The age-length keys for the stock and substocks are presented in Appendix 3.

The estimated total number of fish caught in a stock-method-season stratum was calculated from the reported total weight landed and the mean fish weight derived from stratum length composition. Because mean weight varies with season, the estimated total number of fish caught for the spring-summer combined stratum may not correspond exactly to the sum of the individual season estimates (*see* Appendix 1).

## West coast snapper (SNA 8)

The length distribution of the single trawl catch was characterised by two strong modes which peaked at 28 and 34 cm with a tail extending out to over 65 cm (Figure 2). The mode at 28 cm is mainly attributable to the 1993 year class, which does not appear to be fully recruited into the commercial fishery (Appendix 3). The 34 cm mode is predominantly of fish from the 1991 year class.

Relative year class strengths were discernible from the age composition with the 1993 and 1991 year classes (3 and 5 year olds, respectively) appearing extremely strong and the 1988 year class (8 year olds) particularly weak. The mean age of snapper from the west coast single trawl fishery was 4.8 years (Figure 3).

## East coast snapper (SNA 1)

## Hauraki Gulf

The length distributions of the Hauraki Gulf longline and Danish seine fisheries were both characterised by a strong mode between 27 and 35 cm with a long tail extending out to over 65 cm (Figures 4 and 6).

Hauraki Gulf longline and Danish seine age distributions were dominated by a strong 1989 year class (7 year olds) (Figures 5 and 7). The 1981 year class (15 year olds) was also clearly evident.

## Bay of Plenty

The length distribution of the Bay of Plenty longline fishery was characterised by a strong mode between 28 and 35 cm with a tail extending to over 60 cm (Figure 8). The mean length of snapper sampled from the fishery was 33.1 cm.

The Bay of Plenty longline age distribution consisted mainly of fish less than 12 years old and had a mean age of 7.2 years. Most evident were the strong 1989 and weak 1987 year classes (7 and 9 year olds, respectively) with the former making up 36% of fish in longline catches (Figure 9).

## East Northland

The east Northland longline length distribution showed a broad tail extending from a mode centred around 33 cm to over 70 cm with the mean length being 37.9 cm (Figure 10).

The age distribution was broad and characterised by a relatively high proportion of fish 20 years and older with a comparatively high mean age of 10.6 years (Figure 11). Several peaks in the age distribution indicate strong year classes from 1989, 1985, 1982, and 1981 which correspond to 7, 11, 14, and 15 year old fish, respectively.

# Discussion

The relative year class strengths inferred from the length and age distributions sampled from the AFMA snapper fisheries in the 1995–96 season are consistent with trends observed in previous years (McKenzie *et al.* 1992, Davies & Walsh 1995, Walsh *et al.* 1995). In 1995–96 however, it was not possible to sample from all sectors of the fishing industry, thus reducing the range of fisheries that could be monitored. Consequently, no length frequency samples were able to be collected from the Hauraki Gulf and Bay of Plenty single trawl fisheries and the west coast pair trawl fishery. Of the fisheries remaining, in some instances not all landings were accessible for sampling. Therefore, estimates of proportion at length and age may not be as representative of entire fisheries as those from previous years, especially in the east Northland longline, west coast single trawl, and Hauraki Gulf Danish seine fisheries. The Bay of Plenty and Hauraki Gulf longline fisheries were not affected.

The west coast single trawl length and age distributions show the strong recruitment of the 1993 year class (3 year olds) into the fishery. Combined with the fully recruited 1991 year class (5 year olds), these two year classes account for over 66% of snapper in single trawl landings in 1995–96. Inferred year class strengths of the older age classes (7–12 years of age) appear to have lessened in their respective dominance as a direct result of the relatively strong 1991 and 1993 year classes. The 1985 and 1986 year classes, which were dominant in previous years, now account for less than 4% of the 1995–96 single trawl catch. Mean length and age of snapper in the 1995–96 west coast single trawl fishery have reduced considerably from previous years. This is likely to be a direct result of recent high recruitment (Davies 1996).

The 1995–96 Hauraki Gulf longline and Danish seine length distributions appear to have changed little from recent years. Relative year class strengths inferred from the 1995–96

longline and Danish seine age distributions, and those of previous years (Davies & Walsh 1995, Walsh *et al.* 1995), are generally consistent with those predicted from the temperature-recruitment relationship and trawl surveys (Francis *et al.* 1995). Although not yet fully recruited, the strong 1989 year class now accounts for 29% and 32% of the Hauraki Gulf longline and Danish seine catch, respectively. The strong 1981 year class (15 year olds) is still clearly evident. Similarities between the Hauraki Gulf age distributions derived from the longline and Danish seine methods probably reflect the assumption that the age-length key is representative of each stock or substock stratum. Information on the presence of dominant or weak year classes is inherent in the age-length key and will therefore largely determine the age distribution irrespective of slight differences in the length distributions specific to particular fishing methods (Davies & Walsh 1995).

The Bay of Plenty length and age distributions displayed characteristically narrower ranges than those in the Hauraki Gulf and east Northland substocks. The 1989 year class now appears to be fully recruited and accounted for 36% of the snapper caught by longline in the Bay of Plenty in 1995–96.

As observed in previous years, the distribution at age of the east Northland longline landings in 1995–96 was characterised a comparatively high proportion of fish over 20 years of age and a broader distribution of fish in older age classes. This may be attributable to this substock's relatively healthy state in comparison to that of the other east coast substocks (Annala & Sullivan 1996). The strong 1989 year class evident in the age distribution does not appear to be fully recruited to the longline fishery (*see* Appendix 3).

Since 1989–90, broad similarities in relative year class strengths have been evident between the SNA 1 substocks, particularly with respect to extremely strong and weak year classes (Davies & Walsh 1995, Walsh *et al.* 1995). For example, the strong 1981 year class is evident in both the east Northland and Hauraki Gulf distributions and historically in the Bay of Plenty. This is also true for the very weak 1983 and recent strong 1989 year classes. Some exceptions are evident, however, with the strong 1982 year class visible only in the east Northland substock age distribution. In the Hauraki Gulf and east Northland substocks, the relative strength of the 1985 and 1986 year classes appear to have fluctuated over time.

# Conclusions

1. The length and age distributions sampled from the Auckland Fishery Management Area snapper fisheries in the 1995–96 season are generally consistent with trends observed in previous years.

2. A very strong 1993 year class appears to be recruiting into the exploitable west coast stock. The strong 1991 year class was also evident.

3. There are broad similarities in the recruitment patterns of the east coast substocks. The 1989 year class was particularly strong.

## Acknowledgments

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Leigh Fisheries Ltd. (Leigh): Greg Bishop,
Moana Pacific Ltd. (Pukekohe): Eddie Dodd and Jenny Tonkin,
Moana Pacific Bazaar. (Auckland): Gay Meha,
Ocean Products Columbia Ltd. (Whitianga): Dennis Camden,
Panpac Fisheries Ltd. (Auckland): Elisha Yahel, Gary Brown, and Mil Boscovic.

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**Table 1: Percentages of annual snapper catches by fishing method* for the stock and substocks in the AFMA for the 1994–95 and 1995–96† fishing years**

**West coast**

| | BPT | BT | Other |
|---|---|---|---|
| 1994–95 | 30 | 59 | 11 |
| 1995–96 | 41 | 54 | 5 |

**Hauraki Gulf**

| | BLL | BT | DS | BPT | Other |
|---|---|---|---|---|---|
| 1994–95 | 54 | 16 | 25 | 2 | 3 |
| 1995–96 | 62 | 20 | 13 | 0 | 5 |

**Bay of Plenty**

| | BLL | BT | DS | BPT | Other |
|---|---|---|---|---|---|
| 1994–95 | 39 | 17 | 28 | 12 | 4 |
| 1995–96 | 28 | 26 | 13 | 26 | 7 |

**East Northland**

| | BLL | BT | DS | BPT | Other |
|---|---|---|---|---|---|
| 1994–95 | 76 | 9 | 1 | 8 | 6 |
| 1995–96 | 75 | 12 | 0 | 8 | 5 |

* BLL, longline; BT, single trawl; BPT, pair trawl; DS, Danish seine.

† 1995–96 represents 01/10/95 to 28/02/96 only.

**Table 2: Summary of the total number and weight of landings in method*–season strata and the length frequency sample sizes (number and weight of landings that were sampled) for the west coast snapper fisheries from autumn 1995 to summer 1995–96**

| Method | Season | Number of landings | | | No. of fish measured | Weight of landings (t) | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Sampled | % of total | | Total | Sampled | % of total |
| PBT | Autumn | 30 | 0 | 0 | 0 | 7 | 0 | 0 |
| | Winter | 10 | 0 | 0 | 0 | 6 | 0 | 0 |
| | Spring | 40 | 0 | 0 | 0 | 154 | 0 | 0 |
| | Summer | 31 | 0 | 0 | 0 | 104 | 0 | 0 |
| BT | Autumn | 173 | 0 | 0 | 0 | 83 | 0 | 0 |
| | Winter | 92 | 0 | 0 | 0 | 25 | 0 | 0 |
| | Spring | 196 | 12 | 6.1 | 5 806 | 240 | 22 | 9.2 |
| | Summer | 214 | 0 | 0 | 0 | 154 | 0 | 0 |

* PBT, pair trawl; BT, single trawl.

**Table 3: Summary of the total number and weight of landings in method*–season strata and the length frequency sample sizes (number and weight of landings that were sampled) for the Hauraki Gulf snapper fisheries from autumn 1995 to summer 1995–96**

| Method | Season | Number of landings | | | No. of fish measured | Weight of landings (t) | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Sampled | % of total | | Total | Sampled | % of total |
| BLL | Autumn | 1 266 | 0 | 0 | 0 | 278 | 0 | 0 |
| | Winter | 775 | 0 | 0 | 0 | 136 | 0 | 0 |
| | Spring | 906 | 29 | 3.2 | 6 520 | 280 | 15 | 5.4 |
| | Summer | 1 028 | 37 | 3.6 | 6 229 | 270 | 14 | 5.2 |
| BT | Autumn | 84 | 0 | 0 | 0 | 75 | 0 | 0 |
| | Winter | 33 | 0 | 0 | 0 | 19 | 0 | 0 |
| | Spring | 34 | 0 | 0 | 0 | 39 | 0 | 0 |
| | Summer | 47 | 0 | 0 | 0 | 127 | 0 | 0 |
| DS | Autumn | 176 | 0 | 0 | 0 | 191 | 0 | 0 |
| | Winter | 66 | 0 | 0 | 0 | 47 | 0 | 0 |
| | Spring | 75 | 7 | 9.3 | 3 150 | 45 | 11 | 24.4 |
| | Summer | 70 | 11 | 15.7 | 4 520 | 59 | 13 | 22.0 |

* BLL, longline; BT, single trawl; DS, Danish seine.

**Table 4: Summary of the total number and weight of landings in method*–season strata and the length frequency sample sizes (number and weight of landings that were sampled) for the Bay of Plenty snapper fisheries from autumn 1995 to summer 1995–96**

| Method | Season | Number of landings | | | No. of fish measured | Weight of landings (t) | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Sampled | % of total | | Total | Sampled | % of total |
| BLL | Autumn | 391 | 0 | 0 | 0 | 85 | 0 | 0 |
| | Winter | 451 | 0 | 0 | 0 | 143 | 0 | 0 |
| | Spring | 236 | 12 | 5.1 | 2 038 | 50 | 2 | 4.0 |
| | Summer | 227 | 22 | 9.7 | 4 662 | 36 | 7 | 19.4 |
| BT | Autumn | 44 | 0 | 0 | 0 | 11 | 0 | 0 |
| | Winter | 61 | 0 | 0 | 0 | 36 | 0 | 0 |
| | Spring | 32 | 0 | 0 | 0 | 29 | 0 | 0 |
| | Summer | 26 | 0 | 0 | 0 | 32 | 0 | 0 |
| DS | Autumn | 181 | 0 | 0 | 0 | 87 | 0 | 0 |
| | Winter | 58 | 0 | 0 | 0 | 55 | 0 | 0 |
| | Spring | 111 | 0 | 0 | 0 | 75 | 0 | 0 |
| | Summer | 79 | 0 | 0 | 0 | 2 | 0 | 0 |

* BLL, longline; BT, single trawl; DS, Danish seine.

**Table 5: Summary of the total number and weight of landings in method*–season strata and the length frequency sample sizes (number and weight of landings that were sampled) for the east Northland snapper fishery from autumn 1995 to summer 1995–96**

| Method | Season | Number of landings | | | No. of fish measured | Weight of landings (t) | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Sampled | % of total | | Total | Sampled | % of total |
| BLL | Autumn | 891 | 0 | 0 | 0 | 191 | 0 | 0 |
| | Winter | 1 002 | 0 | 0 | 0 | 193 | 0 | 0 |
| | Spring | 764 | 24 | 3.1 | 3 157 | 182 | 6 | 3.3 |
| | Summer | 637 | 16 | 2.5 | 2 163 | 186 | 5 | 2.7 |

* BLL, longline.

**Table 6: Details of snapper otolith samples collected in 1995–96 from the stock and substocks in the AFMA***

| Area | Fishing method | Sampling period | Sample method | Length range (cm) | No. aged |
|---|---|---|---|---|---|
| WCNI | BT | Oct 95–Nov 95 | R | 24–58 | 638 |
| HAGU | BLL | Oct 95–Jan 96 | R | 23–65 | 815 |
| BPLE | RT | Feb 96 | SR | 25–74 | 625 |
| ENLD | BLL | Oct 95–Feb 96 | SR | 25–75 | 586 |

* BPLE, Bay of Plenty; ENLD, east Northland; HAGU, Hauraki Gulf; WCNI, west coast North Island;
BLL, longline; BT, single trawl; RT, research trawl;
R, random sample; SR, stratified random sample.

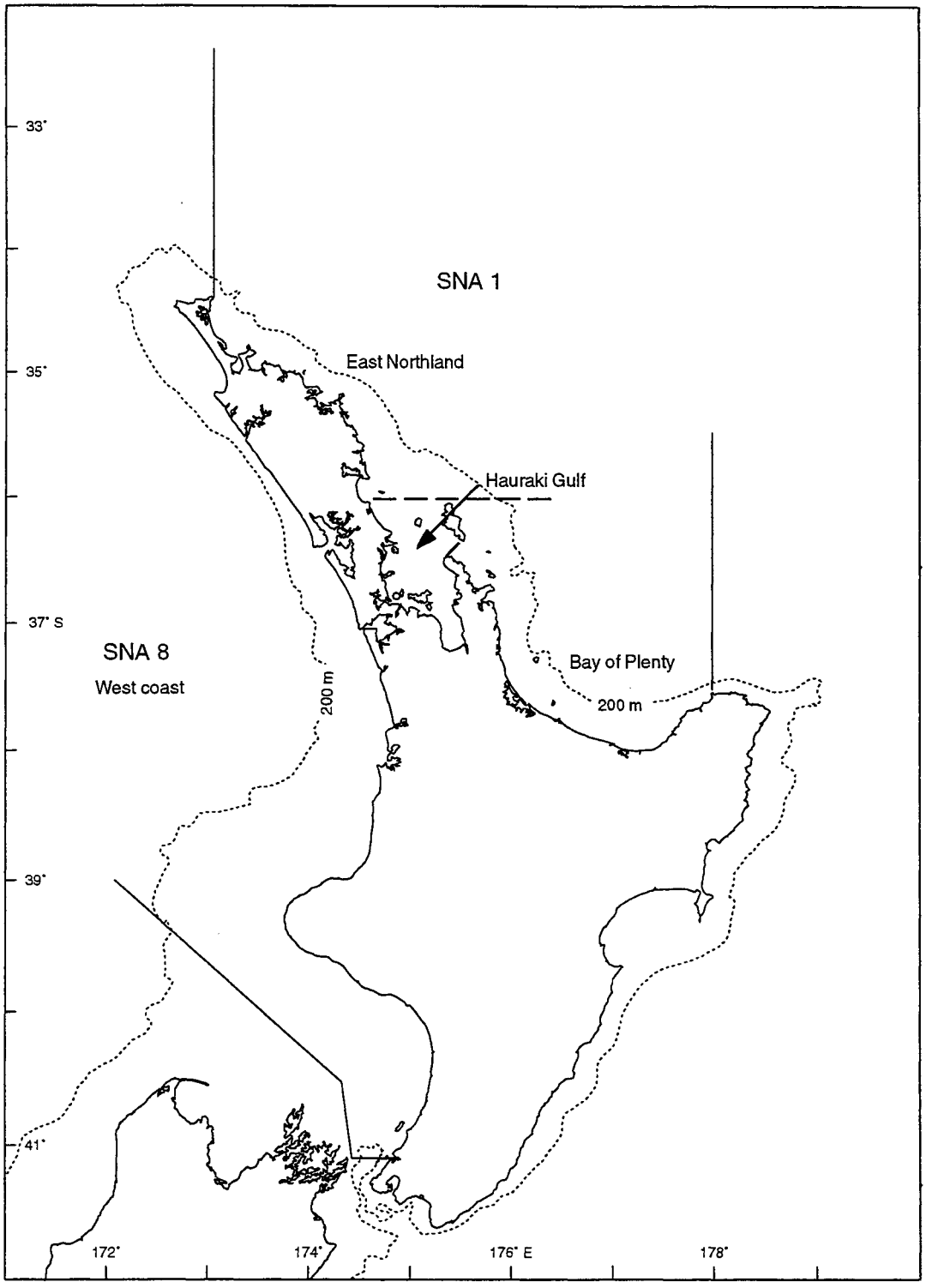


Figure 1: The quota management areas for the west and east coast snapper stocks (SNA 8 and SNA 1 respectively) and the range of the three SNA 1 substocks; east Northland, Hauraki Gulf, and Bay of Plenty.

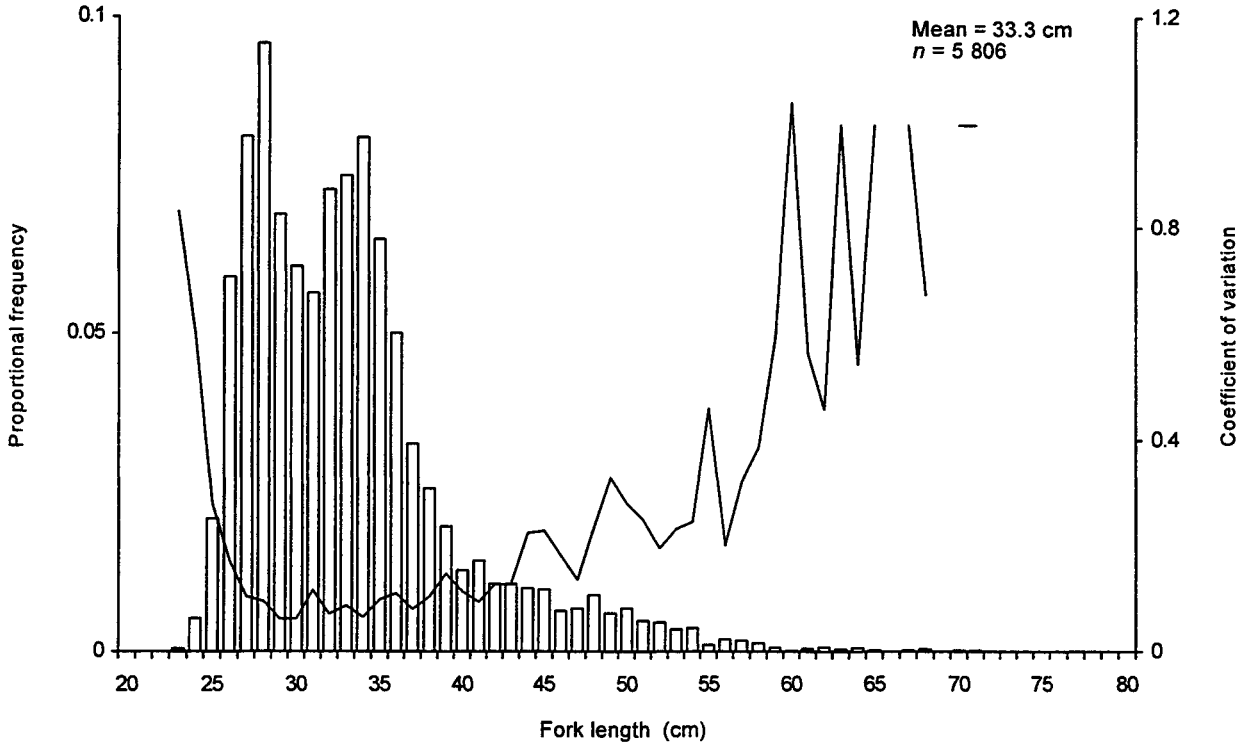


Figure 2: Proportion at length distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the west coast single trawl fishery in 1995–96 (*n* denotes length sample size).

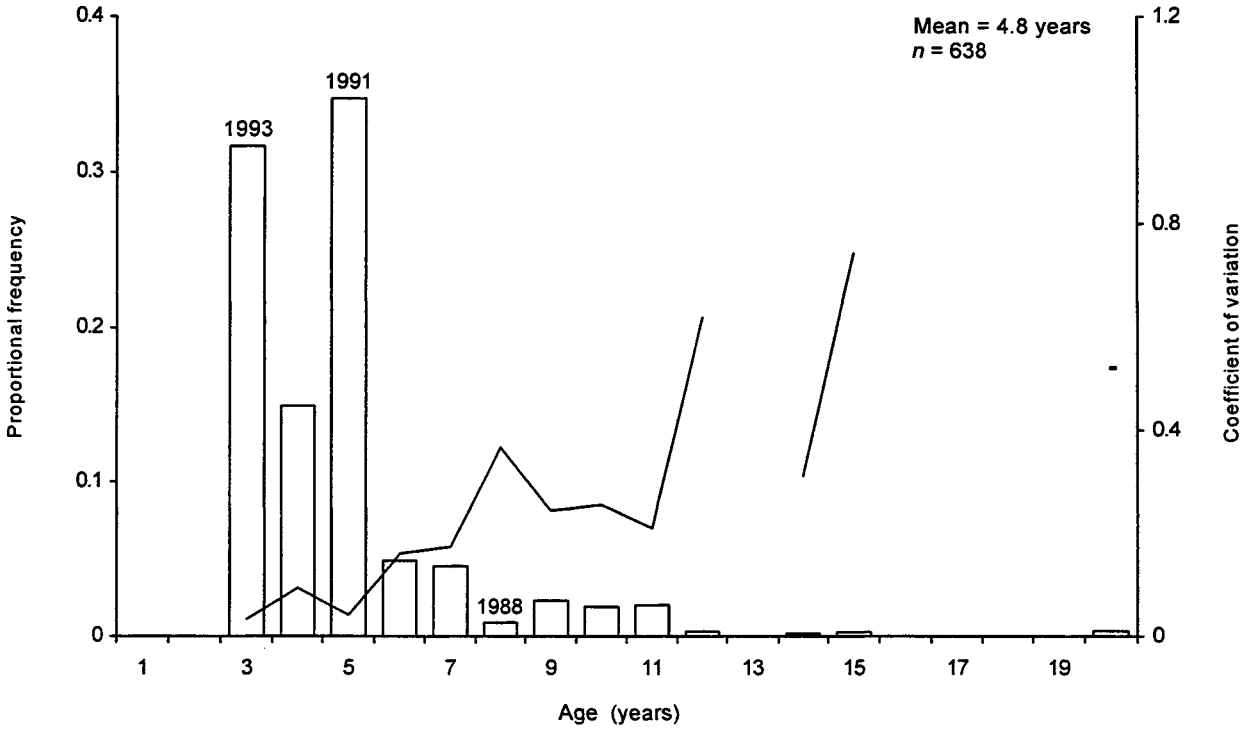


Figure 3: Proportion at age distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the west coast single trawl fishery in 1995–96 (*n* denotes otolith sample size).

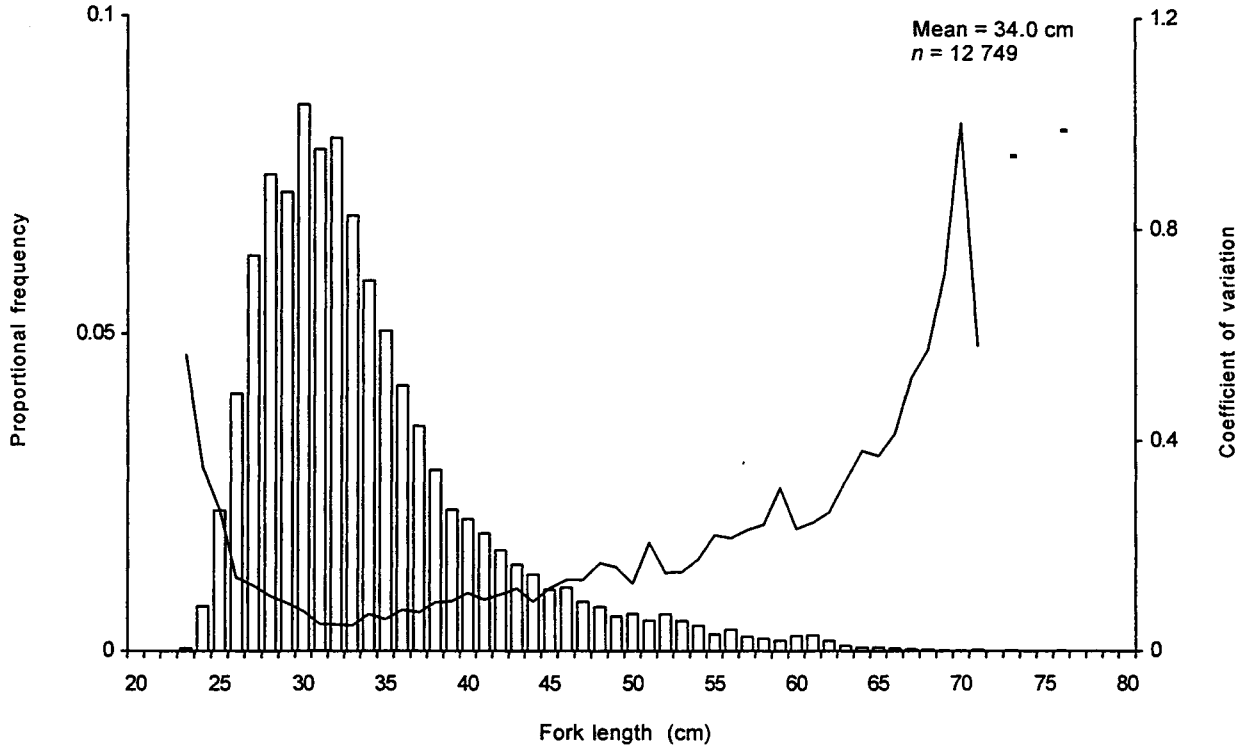


Figure 4: Proportion at length distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the Hauraki Gulf longline fishery in 1995–96 (*n* denotes length sample size).

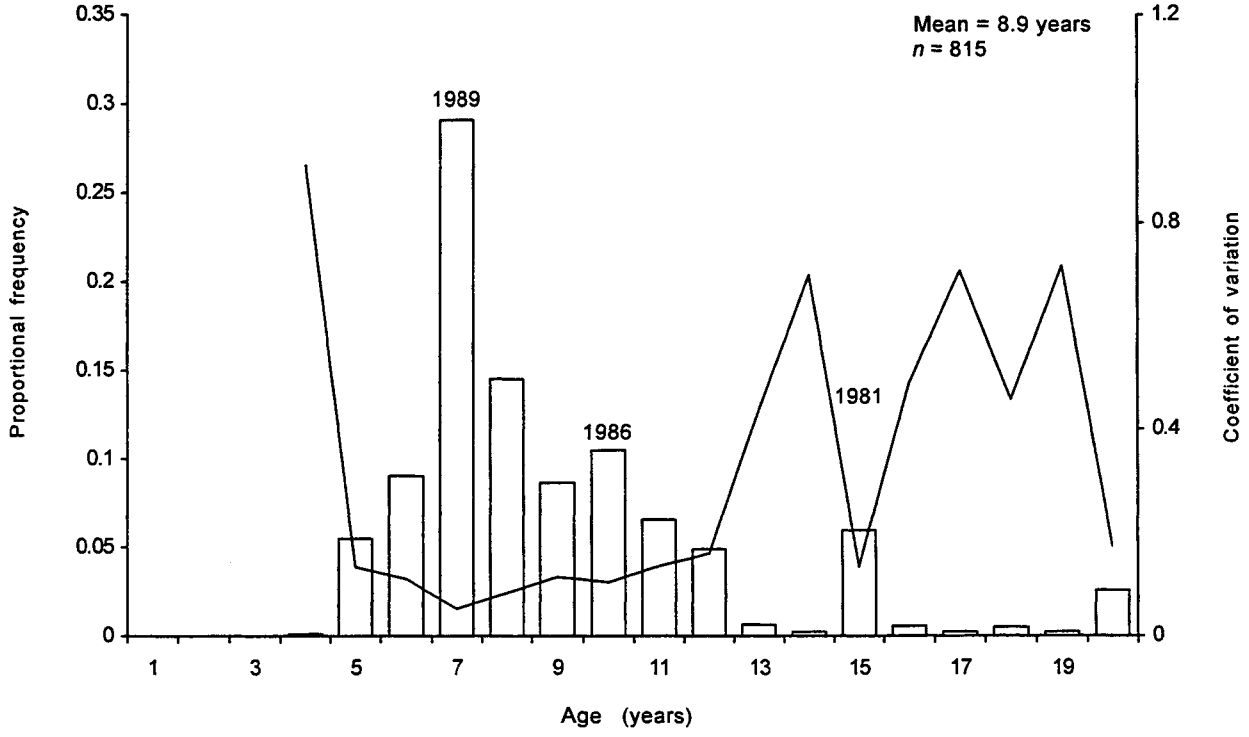


Figure 5: Proportion at age distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the Hauraki Gulf longline fishery in 1995–96 (*n* denotes otolith sample size).

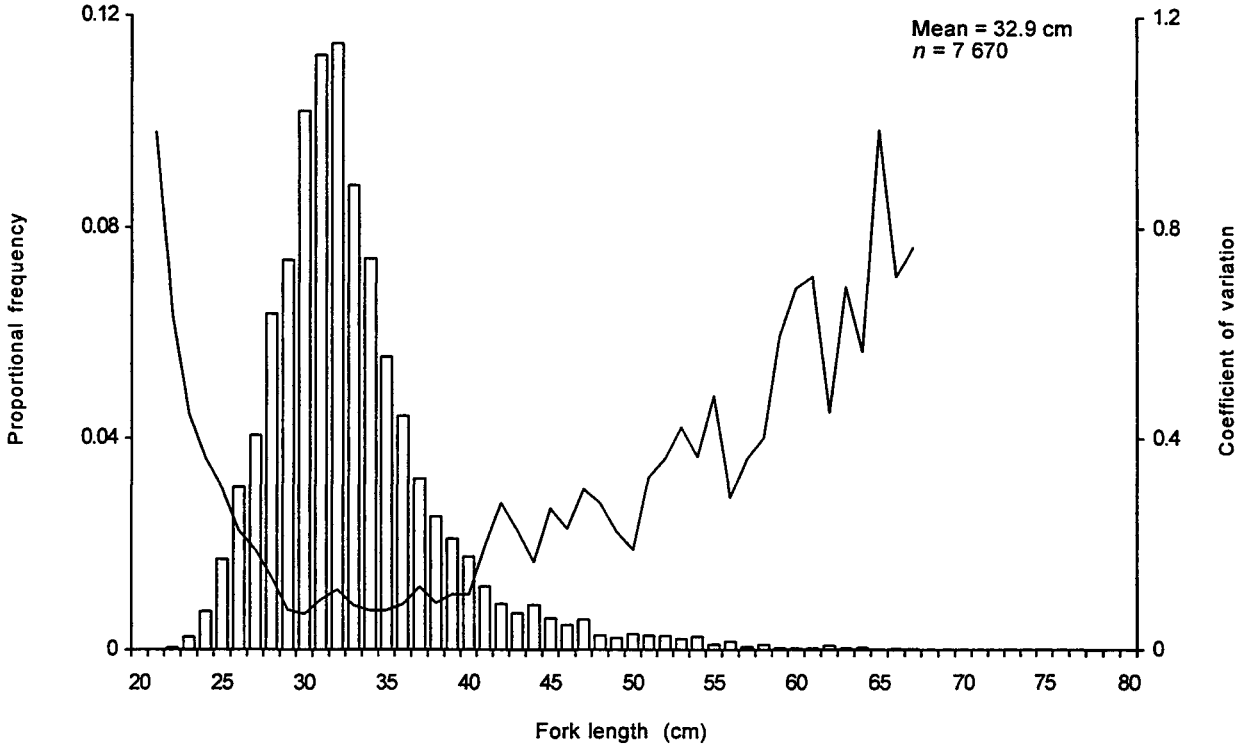


Figure 6: Proportion at length distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the Hauraki Gulf Danish seine fishery in 1995–96 (*n* denotes length sample size).

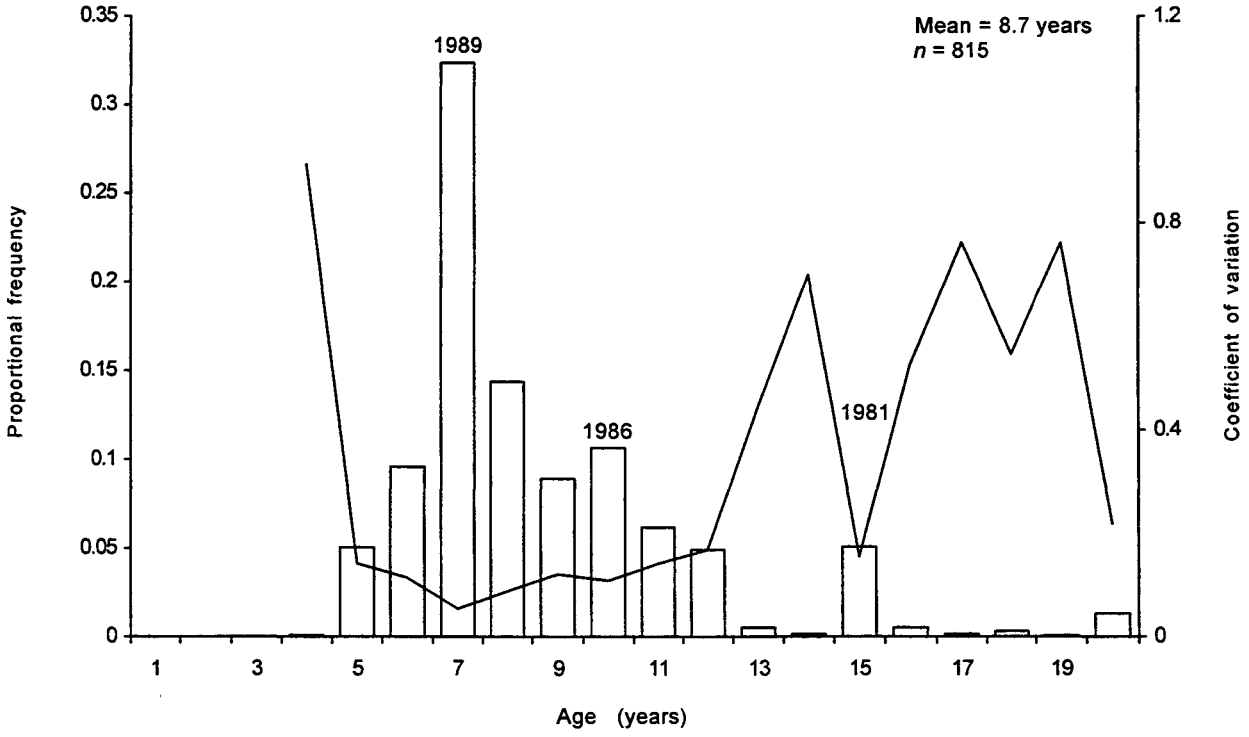


Figure 7: Proportion at age distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the Hauraki Gulf Danish seine fishery in 1995–96 (*n* denotes otolith sample size).

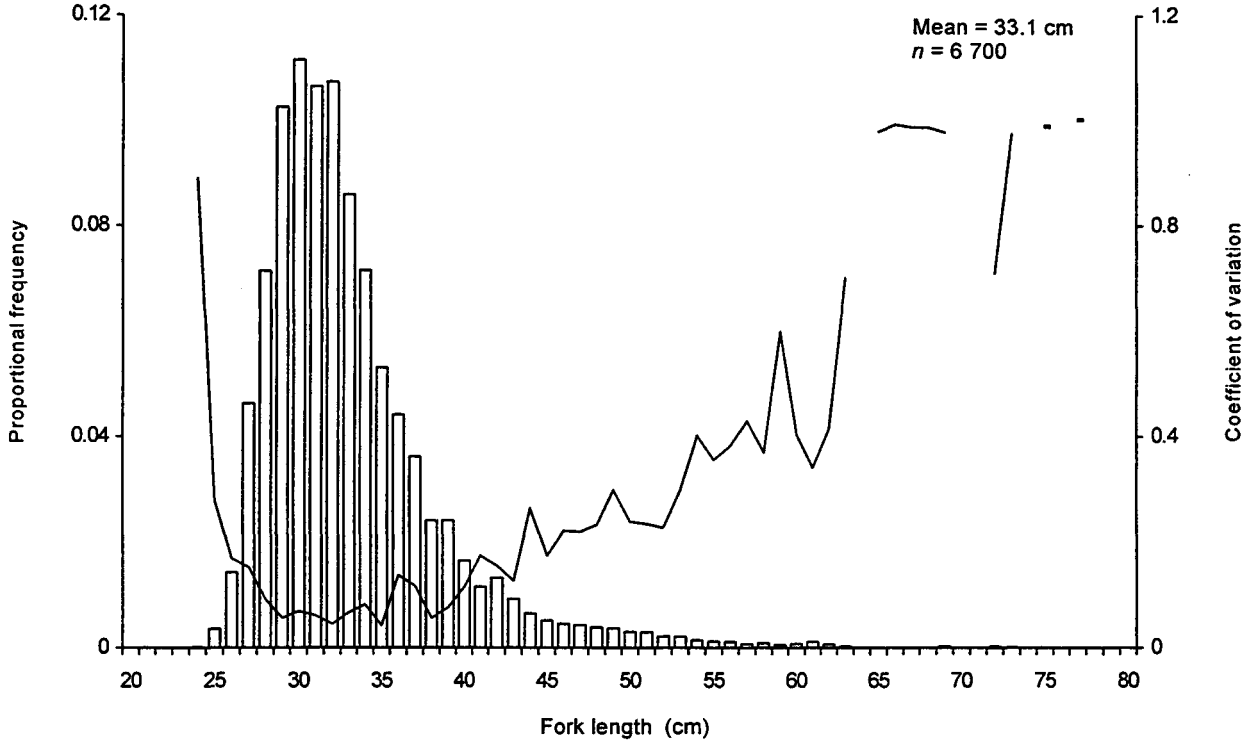


Figure 8: Proportion at length distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the Bay of Plenty longline fishery in 1995–96 (*n* denotes length sample size).

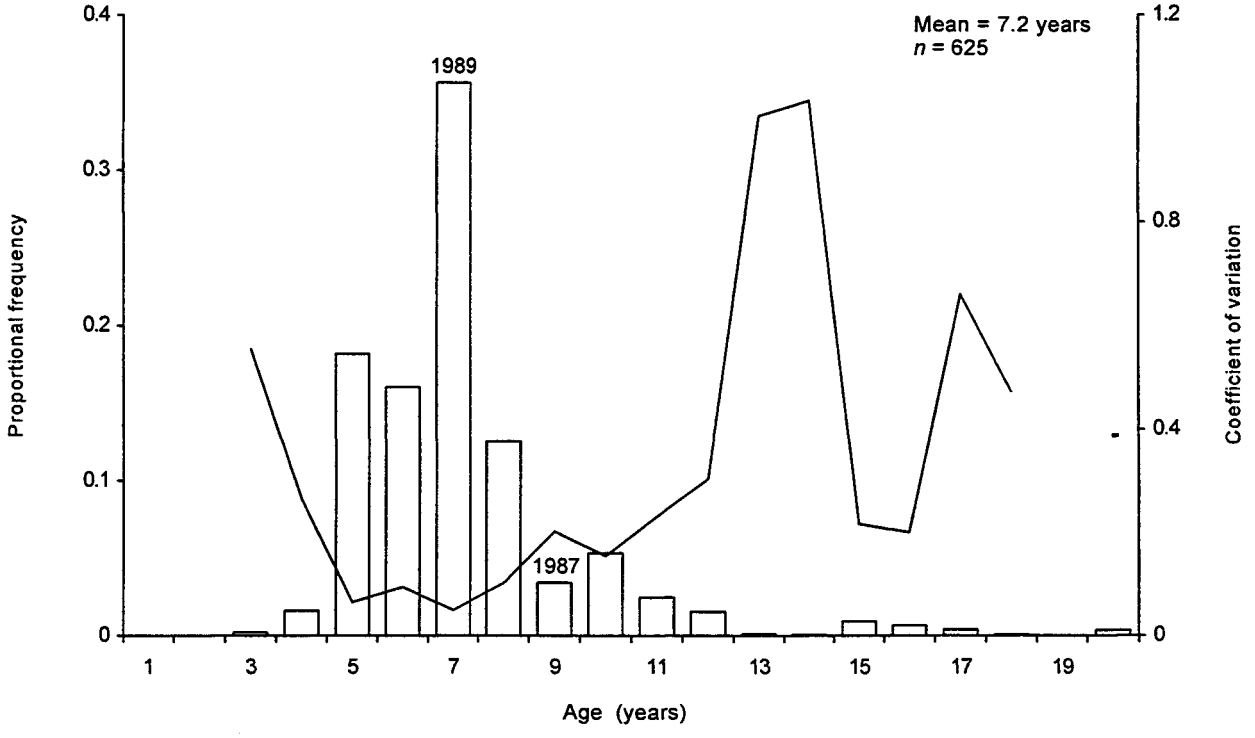


Figure 9: Proportion at age distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the Bay of Plenty longline fishery in 1995–96 (*n* denotes otolith sample size).

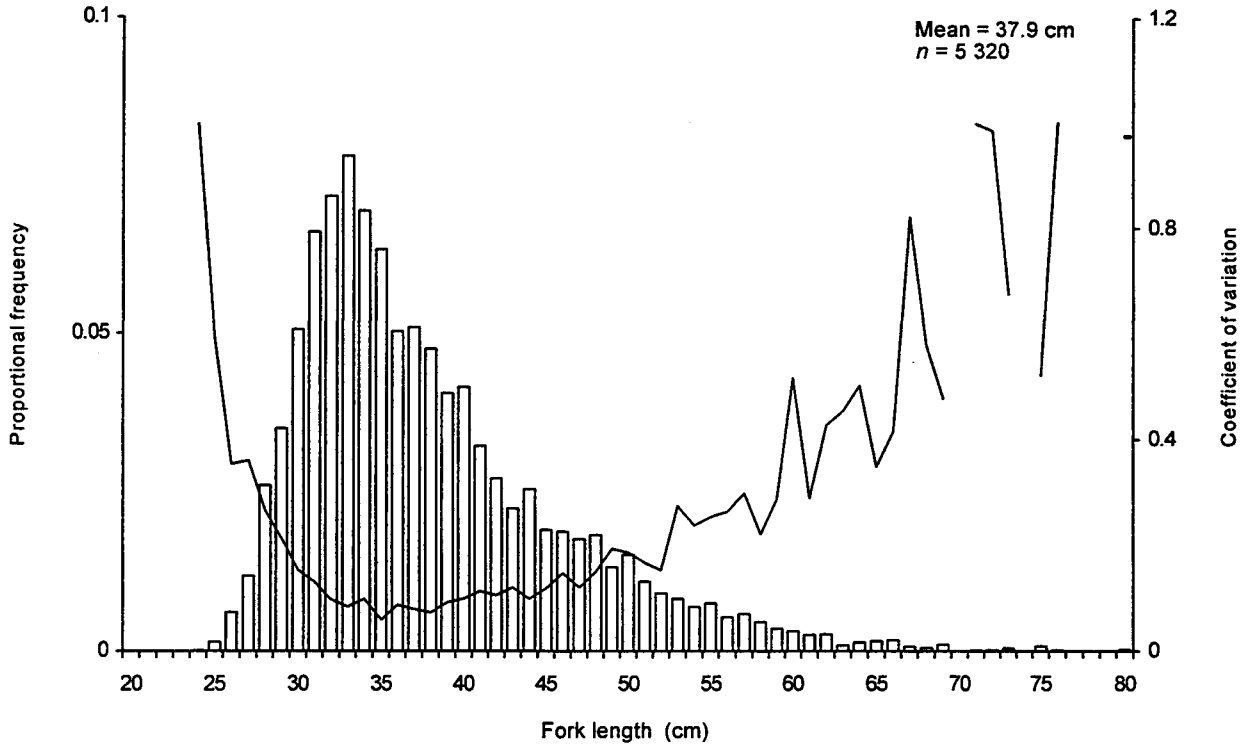


Figure 10: Proportion at length distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the east Northland fishery in 1995–96 (*n* denotes length sample size).

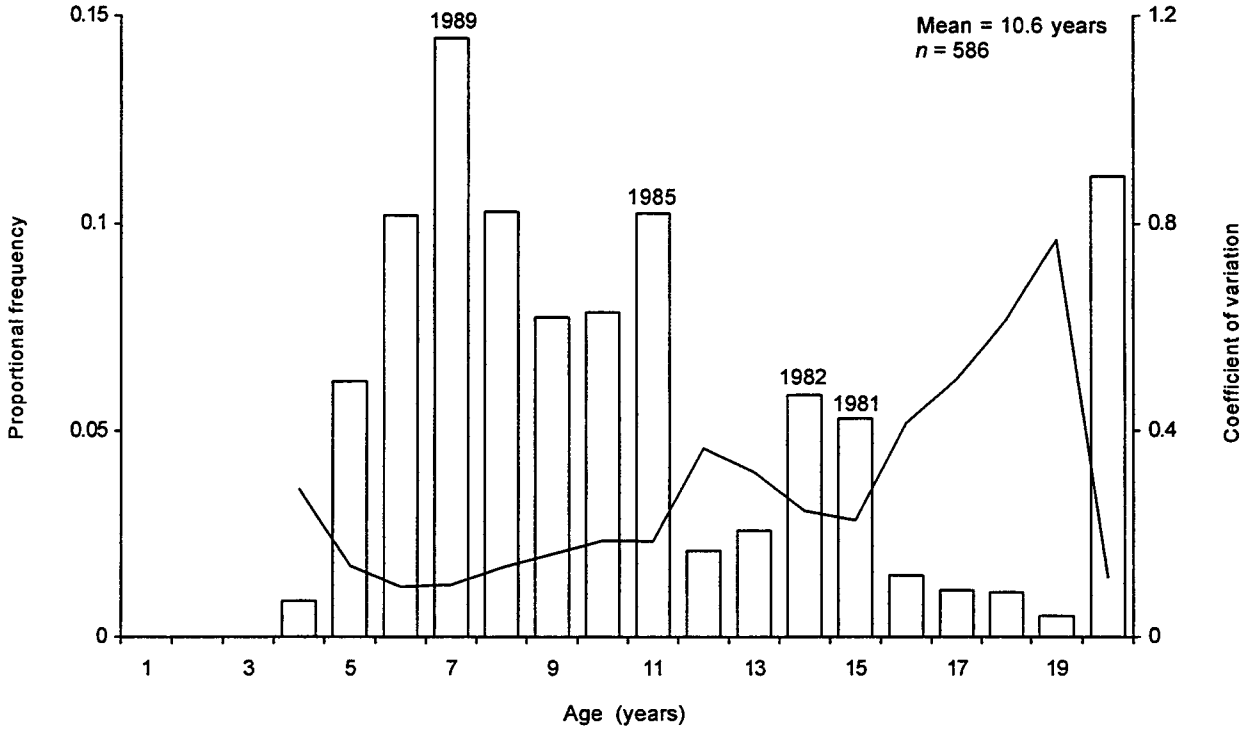


Figure 11: Proportion at age distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the east Northland longline fishery in 1995–96 (*n* denotes otolith sample size).

**Appendix 1: Estimated seasonal proportion at length and c.v.s for snapper fisheries in the AFMA in 1995–96.**

*P.i.* = proportion of fish in length class. *Nt* = total number of fish caught.
*c.v.* = coefficient of variation. *n* = total number of fish sampled.

**Estimates of the proportion at length of snapper from the west coast single trawl fishery in 1995–96.**

| | Single trawl | |
|---|---|---|
| Length | Spring | |
| (cm) | *P.i.* | *c.v.* |
| 20 | 0.0000 | 0.00 |
| 21 | 0.0000 | 0.00 |
| 22 | 0.0000 | 0.00 |
| 23 | 0.0005 | 0.83 |
| 24 | 0.0052 | 0.60 |
| 25 | 0.0210 | 0.28 |
| 26 | 0.0589 | 0.17 |
| 27 | 0.0810 | 0.10 |
| 28 | 0.0958 | 0.10 |
| 29 | 0.0688 | 0.06 |
| 30 | 0.0606 | 0.06 |
| 31 | 0.0564 | 0.12 |
| 32 | 0.0726 | 0.07 |
| 33 | 0.0749 | 0.09 |
| 34 | 0.0809 | 0.07 |
| 35 | 0.0648 | 0.10 |
| 36 | 0.0501 | 0.11 |
| 37 | 0.0327 | 0.08 |
| 38 | 0.0258 | 0.10 |
| 39 | 0.0197 | 0.15 |
| 40 | 0.0129 | 0.11 |
| 41 | 0.0144 | 0.09 |
| 42 | 0.0108 | 0.13 |
| 43 | 0.0107 | 0.13 |
| 44 | 0.0100 | 0.22 |
| 45 | 0.0098 | 0.23 |
| 46 | 0.0064 | 0.18 |
| 47 | 0.0068 | 0.14 |
| 48 | 0.0089 | 0.24 |
| 49 | 0.0060 | 0.33 |
| 50 | 0.0068 | 0.28 |
| 51 | 0.0049 | 0.25 |
| 52 | 0.0046 | 0.20 |
| 53 | 0.0035 | 0.23 |
| 54 | 0.0037 | 0.24 |
| 55 | 0.0011 | 0.46 |
| 56 | 0.0020 | 0.20 |
| 57 | 0.0018 | 0.32 |
| 58 | 0.0013 | 0.39 |
| 59 | 0.0006 | 0.59 |
| 60 | 0.0001 | 1.04 |
| 61 | 0.0005 | 0.56 |
| 62 | 0.0007 | 0.46 |
| 63 | 0.0003 | 0.99 |
| 64 | 0.0006 | 0.54 |
| 65 | 0.0002 | 0.99 |
| 66 | 0.0000 | 0.00 |
| 67 | 0.0002 | 0.99 |
| 68 | 0.0004 | 0.67 |
| 69 | 0.0000 | 0.00 |
| 70 | 0.0002 | 0.99 |
| 71 | 0.0002 | 0.99 |
| 72 | 0.0000 | 0.00 |
| 73 | 0.0000 | 0.00 |
| 74 | 0.0000 | 0.00 |
| 75 | 0.0000 | 0.00 |
| 76 | 0.0000 | 0.00 |
| 77 | 0.0000 | 0.00 |
| 78 | 0.0000 | 0.00 |
| 79 | 0.0000 | 0.00 |
| 80 | 0.0000 | 0.00 |
| *Nt* | 273 730 | |
| *n* | 5 806 | |

**Appendix 1 – continued:**
**Estimates of the proportion at length of snapper from the Hauraki Gulf longline and Danish seine fisheries in 1995–96.**

| | Longline | | | | | | Danish seine | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Length | Spring | | Summer | | Spr-sum | | Spring | | Summer | | Spr-sum | |
| (cm) | *P.i.* | *c.v.* | *P.i.* | *c.v.* | *P.i.* | *c.v.* | *P.i.* | *c.v.* | *P.i.* | *c.v.* | *P.i.* | *c.v.* |
| 20 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 21 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0001 | 0.95 | 0.0001 | 0.98 |
| 22 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0008 | 0.57 | 0.0004 | 0.63 |
| 23 | 0.0009 | 0.56 | 0.0000 | 0.00 | 0.0005 | 0.56 | 0.0012 | 1.10 | 0.0036 | 0.40 | 0.0024 | 0.44 |
| 24 | 0.0100 | 0.43 | 0.0034 | 0.36 | 0.0071 | 0.35 | 0.0062 | 0.70 | 0.0082 | 0.36 | 0.0072 | 0.36 |
| 25 | 0.0286 | 0.36 | 0.0142 | 0.30 | 0.0222 | 0.27 | 0.0109 | 0.48 | 0.0228 | 0.32 | 0.0171 | 0.30 |
| 26 | 0.0486 | 0.18 | 0.0306 | 0.17 | 0.0406 | 0.14 | 0.0295 | 0.38 | 0.0319 | 0.27 | 0.0307 | 0.22 |
| 27 | 0.0750 | 0.15 | 0.0467 | 0.15 | 0.0624 | 0.12 | 0.0374 | 0.25 | 0.0433 | 0.27 | 0.0405 | 0.19 |
| 28 | 0.0877 | 0.12 | 0.0592 | 0.14 | 0.0750 | 0.10 | 0.0582 | 0.16 | 0.0686 | 0.19 | 0.0636 | 0.14 |
| 29 | 0.0765 | 0.12 | 0.0668 | 0.12 | 0.0722 | 0.09 | 0.0728 | 0.08 | 0.0748 | 0.13 | 0.0738 | 0.08 |
| 30 | 0.0949 | 0.10 | 0.0748 | 0.09 | 0.0860 | 0.08 | 0.1167 | 0.06 | 0.0882 | 0.07 | 0.1020 | 0.07 |
| 31 | 0.0830 | 0.06 | 0.0740 | 0.08 | 0.0790 | 0.05 | 0.1284 | 0.11 | 0.0976 | 0.07 | 0.1125 | 0.09 |
| 32 | 0.0804 | 0.08 | 0.0812 | 0.06 | 0.0808 | 0.05 | 0.1305 | 0.16 | 0.0997 | 0.06 | 0.1146 | 0.11 |
| 33 | 0.0675 | 0.07 | 0.0699 | 0.07 | 0.0686 | 0.05 | 0.0921 | 0.11 | 0.0839 | 0.12 | 0.0879 | 0.08 |
| 34 | 0.0548 | 0.10 | 0.0630 | 0.08 | 0.0585 | 0.07 | 0.0783 | 0.08 | 0.0703 | 0.12 | 0.0742 | 0.07 |
| 35 | 0.0448 | 0.08 | 0.0577 | 0.08 | 0.0506 | 0.06 | 0.0533 | 0.10 | 0.0576 | 0.11 | 0.0555 | 0.07 |
| 36 | 0.0369 | 0.11 | 0.0482 | 0.08 | 0.0419 | 0.08 | 0.0452 | 0.07 | 0.0432 | 0.15 | 0.0442 | 0.09 |
| 37 | 0.0314 | 0.11 | 0.0408 | 0.08 | 0.0356 | 0.07 | 0.0271 | 0.09 | 0.0373 | 0.17 | 0.0324 | 0.12 |
| 38 | 0.0248 | 0.14 | 0.0334 | 0.10 | 0.0286 | 0.09 | 0.0234 | 0.08 | 0.0268 | 0.14 | 0.0252 | 0.09 |
| 39 | 0.0193 | 0.14 | 0.0262 | 0.11 | 0.0223 | 0.09 | 0.0164 | 0.11 | 0.0253 | 0.14 | 0.0210 | 0.11 |
| 40 | 0.0172 | 0.17 | 0.0253 | 0.12 | 0.0208 | 0.11 | 0.0158 | 0.10 | 0.0192 | 0.16 | 0.0176 | 0.10 |
| 41 | 0.0152 | 0.15 | 0.0226 | 0.11 | 0.0185 | 0.10 | 0.0074 | 0.25 | 0.0163 | 0.17 | 0.0120 | 0.20 |
| 42 | 0.0133 | 0.16 | 0.0190 | 0.12 | 0.0159 | 0.11 | 0.0052 | 0.55 | 0.0119 | 0.20 | 0.0087 | 0.28 |
| 43 | 0.0100 | 0.17 | 0.0181 | 0.13 | 0.0136 | 0.12 | 0.0050 | 0.37 | 0.0087 | 0.21 | 0.0069 | 0.23 |
| 44 | 0.0101 | 0.13 | 0.0145 | 0.12 | 0.0120 | 0.09 | 0.0082 | 0.12 | 0.0087 | 0.30 | 0.0085 | 0.17 |
| 45 | 0.0074 | 0.18 | 0.0125 | 0.14 | 0.0097 | 0.12 | 0.0046 | 0.43 | 0.0073 | 0.28 | 0.0060 | 0.27 |
| 46 | 0.0085 | 0.20 | 0.0118 | 0.17 | 0.0100 | 0.13 | 0.0038 | 0.40 | 0.0055 | 0.22 | 0.0047 | 0.23 |
| 47 | 0.0068 | 0.21 | 0.0091 | 0.16 | 0.0077 | 0.14 | 0.0054 | 0.42 | 0.0061 | 0.43 | 0.0057 | 0.30 |
| 48 | 0.0046 | 0.27 | 0.0099 | 0.19 | 0.0070 | 0.17 | 0.0022 | 0.60 | 0.0034 | 0.18 | 0.0028 | 0.28 |
| 49 | 0.0048 | 0.24 | 0.0063 | 0.20 | 0.0055 | 0.16 | 0.0020 | 0.38 | 0.0025 | 0.25 | 0.0023 | 0.22 |
| 50 | 0.0051 | 0.16 | 0.0069 | 0.19 | 0.0059 | 0.13 | 0.0021 | 0.30 | 0.0038 | 0.16 | 0.0030 | 0.19 |
| 51 | 0.0035 | 0.26 | 0.0065 | 0.29 | 0.0048 | 0.21 | 0.0019 | 0.62 | 0.0035 | 0.29 | 0.0027 | 0.33 |
| 52 | 0.0052 | 0.22 | 0.0065 | 0.19 | 0.0058 | 0.15 | 0.0010 | 0.66 | 0.0042 | 0.29 | 0.0027 | 0.36 |
| 53 | 0.0039 | 0.24 | 0.0060 | 0.18 | 0.0047 | 0.15 | 0.0019 | 0.69 | 0.0022 | 0.54 | 0.0021 | 0.42 |
| 54 | 0.0029 | 0.25 | 0.0054 | 0.23 | 0.0040 | 0.17 | 0.0010 | 0.36 | 0.0039 | 0.34 | 0.0025 | 0.37 |
| 55 | 0.0022 | 0.34 | 0.0032 | 0.30 | 0.0027 | 0.22 | 0.0005 | 0.37 | 0.0015 | 0.58 | 0.0010 | 0.48 |
| 56 | 0.0028 | 0.31 | 0.0042 | 0.29 | 0.0034 | 0.21 | 0.0013 | 0.48 | 0.0019 | 0.34 | 0.0016 | 0.29 |
| 57 | 0.0019 | 0.35 | 0.0028 | 0.29 | 0.0023 | 0.23 | 0.0004 | 0.56 | 0.0008 | 0.42 | 0.0006 | 0.36 |
| 58 | 0.0009 | 0.40 | 0.0033 | 0.26 | 0.0020 | 0.24 | 0.0007 | 0.37 | 0.0013 | 0.57 | 0.0010 | 0.40 |
| 59 | 0.0014 | 0.47 | 0.0021 | 0.41 | 0.0017 | 0.31 | 0.0004 | 0.86 | 0.0002 | 0.95 | 0.0003 | 0.59 |
| 60 | 0.0016 | 0.28 | 0.0033 | 0.32 | 0.0024 | 0.23 | 0.0003 | 1.07 | 0.0002 | 0.95 | 0.0003 | 0.69 |
| 61 | 0.0020 | 0.36 | 0.0032 | 0.33 | 0.0025 | 0.24 | 0.0002 | 1.13 | 0.0002 | 0.95 | 0.0002 | 0.71 |
| 62 | 0.0012 | 0.45 | 0.0022 | 0.32 | 0.0016 | 0.26 | 0.0002 | 1.13 | 0.0012 | 0.39 | 0.0007 | 0.45 |
| 63 | 0.0005 | 0.60 | 0.0012 | 0.35 | 0.0008 | 0.32 | 0.0002 | 1.13 | 0.0003 | 0.87 | 0.0003 | 0.69 |
| 64 | 0.0001 | 1.03 | 0.0011 | 0.39 | 0.0006 | 0.38 | 0.0003 | 1.07 | 0.0005 | 0.65 | 0.0004 | 0.57 |
| 65 | 0.0003 | 0.72 | 0.0009 | 0.42 | 0.0006 | 0.37 | 0.0002 | 1.13 | 0.0000 | 0.00 | 0.0001 | 0.99 |
| 66 | 0.0002 | 0.73 | 0.0007 | 0.49 | 0.0004 | 0.41 | 0.0002 | 1.12 | 0.0002 | 0.93 | 0.0002 | 0.71 |
| 67 | 0.0003 | 0.77 | 0.0003 | 0.72 | 0.0003 | 0.52 | 0.0000 | 0.00 | 0.0004 | 0.70 | 0.0002 | 0.76 |
| 68 | 0.0003 | 0.70 | 0.0001 | 0.99 | 0.0002 | 0.57 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 69 | 0.0000 | 0.00 | 0.0003 | 0.70 | 0.0001 | 0.72 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 70 | 0.0001 | 1.03 | 0.0000 | 0.00 | 0.0000 | 1.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 71 | 0.0002 | 0.99 | 0.0003 | 0.71 | 0.0002 | 0.58 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 72 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 73 | 0.0002 | 0.91 | 0.0000 | 0.00 | 0.0001 | 0.94 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 74 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 75 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 76 | 0.0000 | 0.00 | 0.0002 | 0.97 | 0.0001 | 0.99 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 77 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 78 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 79 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 80 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| *Nt* | 322 199 | | 260 188 | | 582 709 | | 56 465 | | 68 693 | | 125 459 | |
| *n* | 6 520 | | 6 229 | | 12 749 | | 3 150 | | 4 520 | | 7 670 | |

**Appendix 1 – continued:**
**Estimates of the proportion at length of snapper from the Bay of Plenty longline fishery in 1995–96.**

| | Longline | | | | | |
|---|---|---|---|---|---|---|
| Length | Spring | | Summer | | Spr-sum | |
| (cm) | *P.i.* | *c.v.* | *P.i.* | *c.v.* | *P.i.* | *c.v.* |
| 20 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 21 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 22 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 23 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 24 | 0.0000 | 0.00 | 0.0002 | 0.86 | 0.0001 | 0.89 |
| 25 | 0.0019 | 0.53 | 0.0041 | 0.31 | 0.0035 | 0.28 |
| 26 | 0.0120 | 0.51 | 0.0150 | 0.17 | 0.0142 | 0.17 |
| 27 | 0.0237 | 0.38 | 0.0538 | 0.16 | 0.0462 | 0.15 |
| 28 | 0.0420 | 0.22 | 0.0814 | 0.09 | 0.0714 | 0.09 |
| 29 | 0.0872 | 0.09 | 0.1078 | 0.07 | 0.1025 | 0.06 |
| 30 | 0.0980 | 0.09 | 0.1161 | 0.08 | 0.1115 | 0.07 |
| 31 | 0.1161 | 0.10 | 0.1031 | 0.07 | 0.1064 | 0.06 |
| 32 | 0.1121 | 0.06 | 0.1057 | 0.06 | 0.1073 | 0.04 |
| 33 | 0.0963 | 0.11 | 0.0823 | 0.08 | 0.0859 | 0.07 |
| 34 | 0.0938 | 0.11 | 0.0638 | 0.10 | 0.0714 | 0.08 |
| 35 | 0.0590 | 0.07 | 0.0510 | 0.05 | 0.0530 | 0.04 |
| 36 | 0.0465 | 0.09 | 0.0433 | 0.18 | 0.0441 | 0.14 |
| 37 | 0.0416 | 0.14 | 0.0343 | 0.16 | 0.0362 | 0.12 |
| 38 | 0.0288 | 0.10 | 0.0225 | 0.07 | 0.0241 | 0.06 |
| 39 | 0.0323 | 0.08 | 0.0213 | 0.09 | 0.0241 | 0.08 |
| 40 | 0.0192 | 0.15 | 0.0156 | 0.15 | 0.0165 | 0.12 |
| 41 | 0.0177 | 0.19 | 0.0094 | 0.25 | 0.0115 | 0.17 |
| 42 | 0.0159 | 0.15 | 0.0123 | 0.21 | 0.0132 | 0.16 |
| 43 | 0.0105 | 0.20 | 0.0088 | 0.15 | 0.0092 | 0.13 |
| 44 | 0.0062 | 0.33 | 0.0065 | 0.33 | 0.0064 | 0.26 |
| 45 | 0.0063 | 0.30 | 0.0047 | 0.20 | 0.0051 | 0.17 |
| 46 | 0.0060 | 0.32 | 0.0040 | 0.28 | 0.0045 | 0.22 |
| 47 | 0.0045 | 0.47 | 0.0042 | 0.25 | 0.0043 | 0.22 |
| 48 | 0.0035 | 0.55 | 0.0040 | 0.25 | 0.0038 | 0.23 |
| 49 | 0.0046 | 0.30 | 0.0033 | 0.41 | 0.0036 | 0.30 |
| 50 | 0.0030 | 0.29 | 0.0030 | 0.31 | 0.0030 | 0.24 |
| 51 | 0.0022 | 0.37 | 0.0032 | 0.28 | 0.0029 | 0.23 |
| 52 | 0.0024 | 0.30 | 0.0021 | 0.29 | 0.0022 | 0.23 |
| 53 | 0.0004 | 1.00 | 0.0027 | 0.31 | 0.0021 | 0.30 |
| 54 | 0.0012 | 0.67 | 0.0015 | 0.48 | 0.0014 | 0.40 |
| 55 | 0.0014 | 0.74 | 0.0011 | 0.40 | 0.0012 | 0.36 |
| 56 | 0.0000 | 0.00 | 0.0015 | 0.38 | 0.0011 | 0.38 |
| 57 | 0.0000 | 0.00 | 0.0009 | 0.43 | 0.0007 | 0.43 |
| 58 | 0.0000 | 0.00 | 0.0011 | 0.38 | 0.0008 | 0.37 |
| 59 | 0.0006 | 0.99 | 0.0005 | 0.74 | 0.0005 | 0.60 |
| 60 | 0.0010 | 0.63 | 0.0006 | 0.51 | 0.0007 | 0.40 |
| 61 | 0.0005 | 0.96 | 0.0014 | 0.37 | 0.0011 | 0.34 |
| 62 | 0.0004 | 1.02 | 0.0007 | 0.46 | 0.0007 | 0.41 |
| 63 | 0.0000 | 0.00 | 0.0003 | 0.70 | 0.0002 | 0.70 |
| 64 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 65 | 0.0000 | 0.00 | 0.0002 | 0.98 | 0.0001 | 0.98 |
| 66 | 0.0000 | 0.00 | 0.0001 | 1.00 | 0.0001 | 0.99 |
| 67 | 0.0000 | 0.00 | 0.0001 | 0.99 | 0.0001 | 0.99 |
| 68 | 0.0000 | 0.00 | 0.0001 | 0.99 | 0.0001 | 0.99 |
| 69 | 0.0000 | 0.00 | 0.0003 | 0.98 | 0.0003 | 0.98 |
| 70 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 71 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 72 | 0.0004 | 1.04 | 0.0002 | 0.98 | 0.0002 | 0.71 |
| 73 | 0.0000 | 0.00 | 0.0002 | 0.98 | 0.0001 | 0.98 |
| 74 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 75 | 0.0005 | 1.02 | 0.0000 | 0.00 | 0.0001 | 0.99 |
| 76 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 77 | 0.0005 | 1.02 | 0.0000 | 0.00 | 0.0001 | 0.99 |
| 78 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 79 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 80 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| *Nt* | 57 140 | | 43 251 | | 101 989 | |
| *n* | 2 038 | | 4 662 | | 6 700 | |

**Appendix 1 – continued:**
**Estimates of the proportion at length of snapper from the east Northland longline fishery in 1995–96.**

| | Longline | | | | | |
|---|---|---|---|---|---|---|
| Length | Spring | | Summer | | Spr-sum | |
| (cm) | *P.i.* | *c.v.* | *P.i.* | *c.v.* | *P.i.* | *c.v.* |
| 20 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 21 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 22 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 23 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 24 | 0.0002 | 1.00 | 0.0000 | 0.00 | 0.0001 | 1.00 |
| 25 | 0.0023 | 0.64 | 0.0003 | 0.99 | 0.0014 | 0.59 |
| 26 | 0.0077 | 0.41 | 0.0038 | 0.69 | 0.0060 | 0.35 |
| 27 | 0.0094 | 0.43 | 0.0151 | 0.56 | 0.0118 | 0.36 |
| 28 | 0.0237 | 0.27 | 0.0293 | 0.49 | 0.0261 | 0.27 |
| 29 | 0.0306 | 0.21 | 0.0409 | 0.38 | 0.0349 | 0.21 |
| 30 | 0.0440 | 0.17 | 0.0597 | 0.27 | 0.0506 | 0.15 |
| 31 | 0.0557 | 0.15 | 0.0802 | 0.22 | 0.0660 | 0.13 |
| 32 | 0.0762 | 0.11 | 0.0653 | 0.18 | 0.0716 | 0.10 |
| 33 | 0.0840 | 0.11 | 0.0697 | 0.13 | 0.0780 | 0.08 |
| 34 | 0.0763 | 0.14 | 0.0597 | 0.08 | 0.0693 | 0.10 |
| 35 | 0.0690 | 0.06 | 0.0554 | 0.11 | 0.0633 | 0.06 |
| 36 | 0.0577 | 0.10 | 0.0401 | 0.15 | 0.0503 | 0.09 |
| 37 | 0.0540 | 0.09 | 0.0467 | 0.16 | 0.0509 | 0.08 |
| 38 | 0.0488 | 0.09 | 0.0459 | 0.13 | 0.0476 | 0.07 |
| 39 | 0.0478 | 0.10 | 0.0305 | 0.15 | 0.0406 | 0.09 |
| 40 | 0.0422 | 0.11 | 0.0406 | 0.18 | 0.0416 | 0.10 |
| 41 | 0.0313 | 0.10 | 0.0337 | 0.23 | 0.0323 | 0.11 |
| 42 | 0.0282 | 0.14 | 0.0257 | 0.17 | 0.0272 | 0.11 |
| 43 | 0.0243 | 0.16 | 0.0199 | 0.16 | 0.0225 | 0.12 |
| 44 | 0.0268 | 0.12 | 0.0237 | 0.17 | 0.0255 | 0.10 |
| 45 | 0.0200 | 0.13 | 0.0177 | 0.23 | 0.0190 | 0.12 |
| 46 | 0.0181 | 0.14 | 0.0196 | 0.28 | 0.0187 | 0.15 |
| 47 | 0.0183 | 0.16 | 0.0166 | 0.18 | 0.0176 | 0.12 |
| 48 | 0.0165 | 0.15 | 0.0206 | 0.26 | 0.0182 | 0.15 |
| 49 | 0.0111 | 0.21 | 0.0161 | 0.30 | 0.0132 | 0.19 |
| 50 | 0.0134 | 0.20 | 0.0176 | 0.31 | 0.0152 | 0.19 |
| 51 | 0.0106 | 0.17 | 0.0114 | 0.32 | 0.0109 | 0.17 |
| 52 | 0.0101 | 0.21 | 0.0077 | 0.22 | 0.0091 | 0.15 |
| 53 | 0.0052 | 0.28 | 0.0124 | 0.36 | 0.0082 | 0.27 |
| 54 | 0.0061 | 0.25 | 0.0082 | 0.40 | 0.0070 | 0.24 |
| 55 | 0.0049 | 0.35 | 0.0111 | 0.31 | 0.0075 | 0.25 |
| 56 | 0.0040 | 0.28 | 0.0071 | 0.40 | 0.0053 | 0.26 |
| 57 | 0.0022 | 0.40 | 0.0110 | 0.30 | 0.0059 | 0.30 |
| 58 | 0.0039 | 0.33 | 0.0055 | 0.28 | 0.0046 | 0.22 |
| 59 | 0.0028 | 0.33 | 0.0047 | 0.44 | 0.0036 | 0.29 |
| 60 | 0.0022 | 0.58 | 0.0044 | 0.78 | 0.0032 | 0.52 |
| 61 | 0.0013 | 0.45 | 0.0042 | 0.33 | 0.0026 | 0.29 |
| 62 | 0.0024 | 0.68 | 0.0030 | 0.51 | 0.0026 | 0.43 |
| 63 | 0.0013 | 0.50 | 0.0003 | 1.02 | 0.0009 | 0.45 |
| 64 | 0.0013 | 0.51 | 0.0015 | 0.91 | 0.0014 | 0.50 |
| 65 | 0.0009 | 0.56 | 0.0025 | 0.43 | 0.0015 | 0.35 |
| 66 | 0.0010 | 0.55 | 0.0027 | 0.54 | 0.0017 | 0.42 |
| 67 | 0.0002 | 1.00 | 0.0015 | 0.96 | 0.0007 | 0.82 |
| 68 | 0.0002 | 1.00 | 0.0010 | 0.69 | 0.0005 | 0.58 |
| 69 | 0.0006 | 0.74 | 0.0015 | 0.60 | 0.0010 | 0.48 |
| 70 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 71 | 0.0002 | 1.00 | 0.0000 | 0.00 | 0.0001 | 1.00 |
| 72 | 0.0000 | 0.00 | 0.0004 | 0.99 | 0.0002 | 0.99 |
| 73 | 0.0005 | 0.93 | 0.0005 | 1.01 | 0.0005 | 0.67 |
| 74 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 75 | 0.0004 | 0.70 | 0.0013 | 0.68 | 0.0008 | 0.52 |
| 76 | 0.0003 | 1.01 | 0.0000 | 0.00 | 0.0002 | 1.00 |
| 77 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 78 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 79 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 80 | 0.0000 | 0.00 | 0.0007 | 0.96 | 0.0003 | 0.97 |
| *Nt* | 147 791 | | 137 092 | | 286 591 | |
| *n* | 3 157 | | 2 163 | | 5 320 | |

**Appendix 2: Estimated seasonal proportion at age and c.v.s for snapper fisheries in the AFMA in 1995–96.**

*P.j.* = proportion of fish in age class. *c.v.* = coefficient of variation.

**Estimates of proportion at age of snapper from the west coast single trawl fishery in 1995–96.**

Otolith sample size = 638

| Age (years) | Single trawl Spring *P.j.* | *c.v.* |
|---|---|---|
| 1 | 0.0000 | 0.00 |
| 2 | 0.0000 | 0.00 |
| 3 | 0.3164 | 0.03 |
| 4 | 0.1491 | 0.09 |
| 5 | 0.3468 | 0.04 |
| 6 | 0.0490 | 0.16 |
| 7 | 0.0455 | 0.17 |
| 8 | 0.0090 | 0.37 |
| 9 | 0.0233 | 0.24 |
| 10 | 0.0193 | 0.26 |
| 11 | 0.0203 | 0.21 |
| 12 | 0.0031 | 0.62 |
| 13 | 0.0000 | 0.00 |
| 14 | 0.0018 | 0.31 |
| 15 | 0.0028 | 0.74 |
| 16 | 0.0000 | 0.00 |
| 17 | 0.0000 | 0.00 |
| 18 | 0.0000 | 0.00 |
| 19 | 0.0000 | 0.00 |
| >19 | 0.0033 | 0.52 |

**Estimates of proportion at age of snapper from the Hauraki Gulf longline and Danish seine fisheries in 1995–96.**

Otolith sample size = 815

| Age | Longline Spring | | Summer | | Spr-sum | | Danish seine Spring | | Summer | | Spr-sum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (years) | *P.j.* | *c.v.* | *P.j.* | *c.v.* | *P.j.* | *c.v.* | *P.j.* | *c.v.* | *P.j.* | *c.v.* | *P.j.* | *c.v.* |
| 1 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 2 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 3 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 4 | 0.0015 | 0.91 | 0.0009 | 0.91 | 0.0012 | 0.91 | 0.0009 | 0.92 | 0.0010 | 0.91 | 0.0009 | 0.91 |
| 5 | 0.0635 | 0.13 | 0.0444 | 0.14 | 0.0550 | 0.13 | 0.0482 | 0.15 | 0.0526 | 0.14 | 0.0505 | 0.14 |
| 6 | 0.0985 | 0.11 | 0.0798 | 0.11 | 0.0902 | 0.11 | 0.0975 | 0.12 | 0.0941 | 0.11 | 0.0957 | 0.11 |
| 7 | 0.3024 | 0.05 | 0.2768 | 0.05 | 0.2911 | 0.05 | 0.3358 | 0.06 | 0.3122 | 0.05 | 0.3236 | 0.05 |
| 8 | 0.1479 | 0.08 | 0.1413 | 0.09 | 0.1450 | 0.08 | 0.1415 | 0.09 | 0.1456 | 0.09 | 0.1436 | 0.09 |
| 9 | 0.0849 | 0.12 | 0.0886 | 0.12 | 0.0866 | 0.12 | 0.0899 | 0.13 | 0.0882 | 0.12 | 0.0890 | 0.12 |
| 10 | 0.1010 | 0.11 | 0.1099 | 0.11 | 0.1049 | 0.10 | 0.1068 | 0.11 | 0.1059 | 0.11 | 0.1064 | 0.11 |
| 11 | 0.0611 | 0.14 | 0.0713 | 0.14 | 0.0656 | 0.14 | 0.0605 | 0.15 | 0.0627 | 0.14 | 0.0616 | 0.14 |
| 12 | 0.0455 | 0.16 | 0.0535 | 0.16 | 0.0491 | 0.16 | 0.0496 | 0.18 | 0.0488 | 0.16 | 0.0492 | 0.17 |
| 13 | 0.0054 | 0.44 | 0.0078 | 0.44 | 0.0064 | 0.44 | 0.0040 | 0.46 | 0.0061 | 0.45 | 0.0051 | 0.45 |
| 14 | 0.0019 | 0.70 | 0.0027 | 0.70 | 0.0023 | 0.70 | 0.0011 | 0.73 | 0.0017 | 0.70 | 0.0014 | 0.70 |
| 15 | 0.0533 | 0.14 | 0.0675 | 0.13 | 0.0596 | 0.13 | 0.0481 | 0.17 | 0.0535 | 0.15 | 0.0509 | 0.16 |
| 16 | 0.0049 | 0.49 | 0.0065 | 0.49 | 0.0056 | 0.49 | 0.0048 | 0.58 | 0.0057 | 0.50 | 0.0052 | 0.53 |
| 17 | 0.0020 | 0.71 | 0.0028 | 0.71 | 0.0023 | 0.71 | 0.0014 | 0.77 | 0.0017 | 0.76 | 0.0015 | 0.76 |
| 18 | 0.0043 | 0.46 | 0.0058 | 0.46 | 0.0050 | 0.46 | 0.0024 | 0.66 | 0.0037 | 0.50 | 0.0031 | 0.55 |
| 19 | 0.0019 | 0.73 | 0.0026 | 0.72 | 0.0023 | 0.72 | 0.0006 | 0.85 | 0.0009 | 0.77 | 0.0007 | 0.76 |
| >19 | 0.0205 | 0.19 | 0.0326 | 0.17 | 0.0259 | 0.17 | 0.0095 | 0.27 | 0.0163 | 0.21 | 0.0130 | 0.22 |

**Appendix 2 – continued:**

**Estimates of proportion at age of snapper from the Bay of Plenty longline fishery in 1995–96.**

Otolith sample size = 625

| Age (years) | Spring | | Summer | | Longline Spr-sum | |
|---|---|---|---|---|---|---|
| | *P.j.* | *c.v.* | *P.j.* | *c.v.* | *P.j.* | *c.v.* |
| 1 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 2 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 3 | 0.0018 | 0.58 | 0.0022 | 0.56 | 0.0021 | 0.56 |
| 4 | 0.0108 | 0.27 | 0.0179 | 0.27 | 0.0161 | 0.27 |
| 5 | 0.1319 | 0.08 | 0.1987 | 0.06 | 0.1817 | 0.07 |
| 6 | 0.1543 | 0.10 | 0.1626 | 0.09 | 0.1605 | 0.09 |
| 7 | 0.3814 | 0.05 | 0.3471 | 0.05 | 0.3559 | 0.05 |
| 8 | 0.1432 | 0.10 | 0.1193 | 0.10 | 0.1254 | 0.10 |
| 9 | 0.0398 | 0.20 | 0.0324 | 0.20 | 0.0343 | 0.20 |
| 10 | 0.0614 | 0.16 | 0.0509 | 0.16 | 0.0536 | 0.16 |
| 11 | 0.0291 | 0.23 | 0.0235 | 0.23 | 0.0249 | 0.23 |
| 12 | 0.0195 | 0.31 | 0.0143 | 0.31 | 0.0156 | 0.30 |
| 13 | 0.0011 | 1.01 | 0.0009 | 1.01 | 0.0010 | 1.00 |
| 14 | 0.0008 | 1.10 | 0.0007 | 1.05 | 0.0007 | 1.03 |
| 15 | 0.0086 | 0.32 | 0.0095 | 0.21 | 0.0093 | 0.22 |
| 16 | 0.0066 | 0.29 | 0.0067 | 0.22 | 0.0067 | 0.20 |
| 17 | 0.0047 | 0.72 | 0.0037 | 0.65 | 0.0039 | 0.66 |
| 18 | 0.0000 | 0.00 | 0.0009 | 0.49 | 0.0007 | 0.47 |
| 19 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| >19 | 0.0034 | 0.55 | 0.0036 | 0.38 | 0.0035 | 0.39 |

**Estimates of proportion at age of snapper from the east Northland longline fishery in 1995–96.**

Otolith sample size = 586

| Age (years) | Spring | | Summer | | Longline Spr-sum | |
|---|---|---|---|---|---|---|
| | *P.j.* | *c.v.* | *P.j.* | *c.v.* | *P.j.* | *c.v.* |
| 1 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 2 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 3 | 0.0000 | 0.00 | 0.0000 | 0.00 | 0.0000 | 0.00 |
| 4 | 0.0085 | 0.29 | 0.0093 | 0.30 | 0.0088 | 0.29 |
| 5 | 0.0600 | 0.15 | 0.0648 | 0.13 | 0.0620 | 0.14 |
| 6 | 0.0985 | 0.10 | 0.1068 | 0.09 | 0.1020 | 0.10 |
| 7 | 0.1463 | 0.11 | 0.1421 | 0.10 | 0.1445 | 0.10 |
| 8 | 0.1058 | 0.14 | 0.0990 | 0.13 | 0.1030 | 0.13 |
| 9 | 0.0812 | 0.16 | 0.0720 | 0.16 | 0.0773 | 0.16 |
| 10 | 0.0829 | 0.19 | 0.0728 | 0.19 | 0.0786 | 0.19 |
| 11 | 0.1076 | 0.18 | 0.0955 | 0.20 | 0.1025 | 0.19 |
| 12 | 0.0226 | 0.37 | 0.0188 | 0.37 | 0.0210 | 0.37 |
| 13 | 0.0268 | 0.32 | 0.0245 | 0.33 | 0.0258 | 0.32 |
| 14 | 0.0578 | 0.25 | 0.0599 | 0.25 | 0.0586 | 0.25 |
| 15 | 0.0563 | 0.23 | 0.0483 | 0.23 | 0.0529 | 0.23 |
| 16 | 0.0122 | 0.44 | 0.0188 | 0.44 | 0.0150 | 0.42 |
| 17 | 0.0111 | 0.51 | 0.0116 | 0.51 | 0.0113 | 0.50 |
| 18 | 0.0113 | 0.62 | 0.0104 | 0.62 | 0.0109 | 0.62 |
| 19 | 0.0049 | 0.82 | 0.0055 | 0.74 | 0.0051 | 0.77 |
| >19 | 0.0999 | 0.12 | 0.1273 | 0.12 | 0.1114 | 0.12 |

## Appendix 3: Age-length keys derived from otolith samples collected from snapper fisheries in the AFMA from 1995 to 1996.

### Estimates of proportion of length at age for snapper sampled from the west coast, October 1995 to November 1995. (Note: Aged to 01/01/96)

| Length | Age (years) | | | | | | | | | | | | | | | | | | | | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (cm) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | >19 | Aged |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 25 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 26 | 0 | 0 | 0.92 | 0.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| 27 | 0 | 0 | 0.96 | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 |
| 28 | 0 | 0 | 0.83 | 0.17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 |
| 29 | 0 | 0 | 0.68 | 0.27 | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 |
| 30 | 0 | 0 | 0.44 | 0.30 | 0.19 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| 31 | 0 | 0 | 0.08 | 0.42 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 |
| 32 | 0 | 0 | 0 | 0.19 | 0.77 | 0 | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| 33 | 0 | 0 | 0 | 0.25 | 0.66 | 0.02 | 0.04 | 0 | 0.02 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| 34 | 0 | 0 | 0 | 0.25 | 0.72 | 0 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 35 | 0 | 0 | 0 | 0.13 | 0.71 | 0.06 | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 |
| 36 | 0 | 0 | 0 | 0.03 | 0.78 | 0.14 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| 37 | 0 | 0 | 0 | 0.05 | 0.68 | 0.09 | 0.14 | 0 | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 38 | 0 | 0 | 0 | 0 | 0.53 | 0.26 | 0.16 | 0 | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| 39 | 0 | 0 | 0 | 0.08 | 0.42 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 40 | 0 | 0 | 0 | 0 | 0.71 | 0.29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 41 | 0 | 0 | 0 | 0 | 0.15 | 0.38 | 0.15 | 0.15 | 0.08 | 0.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 42 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0.60 | 0 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0.17 | 0.33 | 0.17 | 0.17 | 0 | 0 | 0 | 0 | 0.17 | 0 | 0 | 0 | 0 | 0 | 6 |
| 44 | 0 | 0 | 0 | 0 | 0 | 0.13 | 0.25 | 0.25 | 0.38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0.42 | 0 | 0.25 | 0.08 | 0.17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.08 | 12 |
| 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0.67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 47 | 0 | 0 | 0 | 0 | 0 | 0 | 0.14 | 0 | 0.14 | 0.14 | 0.29 | 0.14 | 0 | 0 | 0.14 | 0 | 0 | 0 | 0 | 0 | 7 |
| 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.40 | 0.20 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 | 0 | 0 | 0.25 | 0.25 | 0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.17 | 0.17 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.17 | 6 |
| 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.14 | 0 | 0.29 | 0.43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.14 | 7 |
| 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.50 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0.33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 3 |
| 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 61 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 68 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 74 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 76 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 77 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 78 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | | | | | | | | | | | | | | | | | | | | 638 |

**Appendix 3 – continued:**

**Estimates of proportion of length at age for snapper sampled from the Hauraki Gulf, October 1995 to January 1996. (Note: Aged to 01/01/96)**

| Length | Age (years) | | | | | | | | | | | | | | | | | | | | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (cm) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | >19 | Aged |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | 0 | 0 | 0.33 | 0.67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0.40 | 0.20 | 0.20 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 25 | 0 | 0 | 0 | 0 | 0.32 | 0.12 | 0.44 | 0.08 | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| 26 | 0 | 0 | 0 | 0.03 | 0.13 | 0.18 | 0.35 | 0.28 | 0.03 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 |
| 27 | 0 | 0 | 0 | 0 | 0.17 | 0.13 | 0.35 | 0.30 | 0 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 |
| 28 | 0 | 0 | 0 | 0 | 0.14 | 0.17 | 0.32 | 0.11 | 0.15 | 0.06 | 0.05 | 0 | 0 | 0 | 0.02 | 0 | 0 | 0 | 0 | 0 | 66 |
| 29 | 0 | 0 | 0 | 0 | 0.17 | 0.13 | 0.22 | 0.17 | 0.03 | 0.11 | 0.10 | 0.03 | 0 | 0 | 0.03 | 0 | 0 | 0 | 0 | 0 | 63 |
| 30 | 0 | 0 | 0 | 0 | 0.05 | 0.16 | 0.34 | 0.05 | 0.11 | 0.14 | 0.07 | 0.04 | 0 | 0 | 0.04 | 0 | 0 | 0 | 0 | 0 | 56 |
| 31 | 0 | 0 | 0 | 0 | 0.04 | 0.10 | 0.34 | 0.15 | 0.09 | 0.12 | 0.07 | 0.07 | 0 | 0 | 0.01 | 0 | 0 | 0 | 0 | 0 | 68 |
| 32 | 0 | 0 | 0 | 0 | 0.02 | 0.07 | 0.46 | 0.11 | 0.11 | 0.09 | 0.02 | 0.07 | 0 | 0 | 0.05 | 0.02 | 0 | 0 | 0 | 0 | 57 |
| 33 | 0 | 0 | 0 | 0 | 0 | 0.08 | 0.47 | 0.10 | 0.08 | 0.06 | 0.08 | 0.06 | 0 | 0 | 0.08 | 0 | 0 | 0 | 0 | 0 | 51 |
| 34 | 0 | 0 | 0 | 0 | 0 | 0.07 | 0.45 | 0.18 | 0.07 | 0.11 | 0.04 | 0.05 | 0 | 0 | 0.02 | 0 | 0 | 0 | 0 | 0.02 | 56 |
| 35 | 0 | 0 | 0 | 0 | 0 | 0.03 | 0.39 | 0.18 | 0.08 | 0.13 | 0.05 | 0.08 | 0 | 0 | 0.05 | 0 | 0 | 0 | 0 | 0 | 38 |
| 36 | 0 | 0 | 0 | 0 | 0 | 0.14 | 0.31 | 0.14 | 0.14 | 0.07 | 0.03 | 0.03 | 0 | 0 | 0.10 | 0 | 0 | 0.03 | 0 | 0 | 29 |
| 37 | 0 | 0 | 0 | 0 | 0 | 0.07 | 0.28 | 0.28 | 0.03 | 0.17 | 0.03 | 0.10 | 0 | 0 | 0.03 | 0 | 0 | 0 | 0 | 0 | 29 |
| 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0.15 | 0.15 | 0.15 | 0.23 | 0.19 | 0.04 | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0.04 | 26 |
| 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0.24 | 0.12 | 0.24 | 0 | 0 | 0.12 | 0 | 0.12 | 0.06 | 0 | 0 | 0 | 0 | 17 |
| 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0.18 | 0.06 | 0.12 | 0.24 | 0 | 0 | 0 | 0.24 | 0 | 0.06 | 0 | 0 | 0 | 17 |
| 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0.13 | 0.13 | 0.13 | 0.13 | 0 | 0 | 0.07 | 0.07 | 0 | 0 | 0 | 0 | 15 |
| 42 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.08 | 0.08 | 0.15 | 0.15 | 0.08 | 0.08 | 0.08 | 0.23 | 0 | 0 | 0 | 0 | 0.08 | 13 |
| 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.50 | 0.13 | 0.38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.07 | 0.21 | 0.29 | 0 | 0.14 | 0 | 0 | 0.21 | 0 | 0 | 0 | 0 | 0.07 | 14 |
| 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.14 | 0 | 0.29 | 0 | 0.14 | 0 | 0 | 0.14 | 0 | 0 | 0 | 0.29 | 7 |
| 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.17 | 0.33 | 0.33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.17 | 6 |
| 47 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.13 | 0.13 | 0.38 | 0 | 0 | 0 | 0.13 | 0.25 | 0 | 0 | 0 | 0 | 0 | 8 |
| 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0.33 | 0.33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0 | 0 | 0.20 | 0 | 0.20 | 0 | 0.20 | 0.20 | 5 |
| 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0 | 0 | 0 | 0.20 | 0 | 0 | 0.40 | 0 | 0 | 0.20 | 0 | 0 | 5 |
| 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 | 0 | 0.25 | 0 | 0 | 0.50 | 0 | 0 | 0 | 0 | 0 | 4 |
| 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.14 | 0 | 0 | 0.43 | 0 | 0 | 0.29 | 0 | 0.14 | 7 |
| 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.67 | 0 | 0 | 0 | 0 | 0.33 | 3 |
| 54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0 | 0 | 0.67 | 3 |
| 55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 | 0 | 0 | 0.25 | 0 | 0.50 | 4 |
| 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.50 | 0.50 | 2 |
| 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 1 |
| 61 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 2 |
| 63 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 2 |
| 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 68 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 74 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 76 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 77 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 78 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | | | | | | | | | | | | | | | | | | | | 815 |

**Appendix 3 – continued:**

**Estimates of proportion of length at age for snapper sampled from the Bay of Plenty, February 1996.**

**(Note: Aged to 01/01/96)**

| Length | Age (years) | | | | | | | | | | | | | | | | | | | | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (cm) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | >19 | Aged |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | 0 | 0.38 | 0.62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 26 | 0 | 0 | 0.15 | 0.35 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| 27 | 0 | 0 | 0 | 0.10 | 0.83 | 0.03 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| 28 | 0 | 0 | 0 | 0.04 | 0.64 | 0.18 | 0.11 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| 29 | 0 | 0 | 0 | 0 | 0.55 | 0.27 | 0.15 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 62 |
| 30 | 0 | 0 | 0 | 0.02 | 0.20 | 0.34 | 0.41 | 0.02 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 |
| 31 | 0 | 0 | 0 | 0 | 0.09 | 0.30 | 0.55 | 0.04 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| 32 | 0 | 0 | 0 | 0 | 0 | 0.14 | 0.68 | 0.14 | 0 | 0.02 | 0 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 |
| 33 | 0 | 0 | 0 | 0 | 0 | 0.19 | 0.71 | 0.07 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| 34 | 0 | 0 | 0 | 0 | 0 | 0.10 | 0.66 | 0.22 | 0 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 |
| 35 | 0 | 0 | 0 | 0 | 0 | 0.10 | 0.41 | 0.21 | 0.15 | 0.08 | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 |
| 36 | 0 | 0 | 0 | 0 | 0 | 0.09 | 0.13 | 0.48 | 0.04 | 0.22 | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 37 | 0 | 0 | 0 | 0 | 0 | 0 | 0.24 | 0.43 | 0.10 | 0.14 | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0.17 | 0.30 | 0.17 | 0.30 | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0.08 | 0.50 | 0.08 | 0.17 | 0.08 | 0.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0.24 | 0.18 | 0.29 | 0.12 | 0 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0.08 | 0.17 | 0.17 | 0.17 | 0.25 | 0.17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 42 | 0 | 0 | 0 | 0 | 0 | 0 | 0.08 | 0.15 | 0.08 | 0.31 | 0.08 | 0.23 | 0 | 0 | 0.08 | 0 | 0 | 0 | 0 | 0 | 13 |
| 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0.20 | 0.40 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0 | 0.40 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0 | 0.40 | 0.40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.50 | 0 | 0 | 0 | 0 | 0.50 | 0 | 0 | 0 | 2 |
| 47 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 1 |
| 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 | 0 | 0.25 | 0 | 0 | 0 | 0.25 | 0.25 | 0 | 0 | 0 | 4 |
| 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.33 | 0 | 0 | 0 | 0 | 0.33 | 3 |
| 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 1 |
| 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.50 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0.33 | 0 | 0.33 | 0 | 0 | 0 | 3 |
| 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 2 |
| 54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 1 |
| 55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 1 |
| 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 1 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 1 |
| 61 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 68 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 74 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 76 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 77 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 78 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | | | | | | | | | | | | | | | | | | | | 625 |

**Appendix 3 – continued:**

**Estimates of proportion of length at age for snapper sampled from east Northland, October 1995 to February 1996. (Note: Aged to 01/01/96)**

| Length | Age (years) | | | | | | | | | | | | | | | | | | | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (cm) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | >19 | Aged |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | 0 | 0 | 0.17 | 0.33 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 26 | 0 | 0 | 0 | 0.27 | 0.32 | 0.09 | 0.18 | 0.14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 27 | 0 | 0 | 0 | 0.17 | 0.35 | 0.22 | 0.09 | 0.09 | 0.09 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 28 | 0 | 0 | 0 | 0.02 | 0.38 | 0.30 | 0.11 | 0.15 | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 |
| 29 | 0 | 0 | 0 | 0.02 | 0.17 | 0.35 | 0.27 | 0.08 | 0.06 | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| 30 | 0 | 0 | 0 | 0.05 | 0.12 | 0.28 | 0.26 | 0.12 | 0.05 | 0.07 | 0.03 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| 31 | 0 | 0 | 0 | 0 | 0.15 | 0.28 | 0.30 | 0.13 | 0.10 | 0.01 | 0.01 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 71 |
| 32 | 0 | 0 | 0 | 0.02 | 0 | 0.20 | 0.31 | 0.22 | 0.10 | 0.04 | 0.08 | 0 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 |
| 33 | 0 | 0 | 0 | 0 | 0.17 | 0.26 | 0.24 | 0.14 | 0.07 | 0.05 | 0 | 0.02 | 0.02 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| 34 | 0 | 0 | 0 | 0 | 0.03 | 0.16 | 0.25 | 0.19 | 0.13 | 0.13 | 0.09 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 35 | 0 | 0 | 0 | 0 | 0.04 | 0 | 0.11 | 0.22 | 0.22 | 0.07 | 0.19 | 0.04 | 0.04 | 0 | 0 | 0 | 0.04 | 0 | 0 | 0.04 | 27 |
| 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0.08 | 0.08 | 0.23 | 0.23 | 0.31 | 0 | 0 | 0.04 | 0.04 | 0 | 0 | 0 | 0 | 0 | 26 |
| 37 | 0 | 0 | 0 | 0 | 0.07 | 0 | 0.07 | 0.07 | 0.07 | 0.07 | 0.21 | 0.07 | 0.29 | 0 | 0 | 0 | 0 | 0 | 0.07 | 0 | 14 |
| 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0.27 | 0.09 | 0 | 0.27 | 0.18 | 0.09 | 0 | 0 | 0.09 | 0 | 0 | 0 | 0 | 0 | 11 |
| 39 | 0 | 0 | 0 | 0 | 0.06 | 0 | 0.13 | 0 | 0.06 | 0.06 | 0.13 | 0.13 | 0 | 0.13 | 0.31 | 0 | 0 | 0 | 0 | 0 | 16 |
| 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0.07 | 0.14 | 0.07 | 0.07 | 0.14 | 0 | 0.07 | 0.07 | 0.21 | 0 | 0.07 | 0.07 | 0 | 0 | 14 |
| 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0.67 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 42 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0.20 | 0.20 | 0 | 0 | 0 | 0.20 | 0 | 0 | 0.20 | 0 | 0 | 5 |
| 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0 | 0.20 | 0.20 | 0 | 0 | 0 | 0.20 | 0 | 0 | 0 | 0 | 0.20 | 5 |
| 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0.10 | 0 | 0.10 | 0.10 | 0 | 0 | 0 | 0.10 | 0 | 0.20 | 0 | 0.10 | 0 | 0.30 | 10 |
| 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.67 | 0.17 | 0.17 | 0 | 0 | 0 | 6 |
| 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0 | 0 | 0.20 | 0 | 0 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0.40 | 5 |
| 47 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 | 0 | 0 | 0 | 0.25 | 0 | 0 | 0 | 0 | 0 | 0.50 | 4 |
| 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 6 |
| 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0 | 0 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0.60 | 5 |
| 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.50 | 0 | 0 | 0 | 0 | 0 | 0.50 | 4 |
| 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.67 | 3 |
| 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0 | 0.67 | 3 |
| 54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.67 | 3 |
| 56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.50 | 0 | 0.50 | 0 | 0 | 0 | 2 |
| 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.50 | 0 | 0 | 0 | 0.50 | 2 |
| 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 2 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.50 | 0.50 | 2 |
| 61 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 2 |
| 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 66 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 68 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 0 | 0 | 0 | 0 | 1 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 74 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1 |
| 76 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 77 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 78 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | | | | | | | | | | | | | | | | | | | | 586 |