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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 east and west coast stocks, SNA 1 and SNA 8. Because of heterogeneity in snapper biology and fishing patterns, SNA 1 is often further subdivided into three substocks: East Northland, Hauraki Gulf, and Bay of Plenty. The time series of length and age information has been summarised in previous reports for the periods 1988–94, 1994–95, 1995–96, and 1996–97 (Davies & Walsh 1995, Walsh *et al.* 1995, 1997, 1998). This report presents the results of market sampling between October 1997 and February 1998, thus continuing the time series. Funding for this project, SNA9702(A), was provided by the Ministry of Fisheries.

Objective

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

> To determine the commercial length frequency and age structure of the 4 snapper substocks that comprise SNA 1 and 8 for use in stock assessment models, by market sampling.

The programme may also support other snapper stock assessment programmes that require length and age composition information, e.g., daily egg production method and tagging programmes for estimating stock biomass. However, no support function was required during the sampling programme in 1997–98.

Methods

Landings from the snapper fishery were stratified hierarchically by stock or substock, fishing method, and quarterly season, e.g., Bay of Plenty – longline – spring. The stock and substocks correspond to the four areas: west coast, Bay of Plenty, Hauraki Gulf, and East Northland (Figure 1). Fishing methods sampled were longline (BLL) for the east coast substocks and single trawl (BT) for the west coast stock. 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 1997–98 are given in Table 1, illustrating the dominant methods in respective stock and substock strata during the period of sampling. The Ministry of Fisheries was unable to supply the number of landings in each method-season fishery for the 1997–98 fishing year. Therefore, the estimated total number of landings in each method–season fishery given here was determined using the mean landing weight from the 1996–97 fishing year and the total landed weight from the 1997–98 fishing year (Tables 2–5). Some of these estimates appear to be low and should be treated with caution. Samples were collected in spring and summer when most of the snapper stock becomes vulnerable to fishing.

A two-stage sampling procedure was used to obtain length frequencies (West 1978). The random selection of landings and a random sample of bins within landings represent the first and second stages respectively. The procedure for obtaining a random sample for length frequency was modified to account for the grading of fish according to length and quality by employing a stratified random sampling of bins within a 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). Length frequency samples were collected from the west coast single trawl and Bay of Plenty longline fisheries.

Two methods were employed for the collection of otoliths from landings in particular stock and substock areas. The first approach was a random collection of otoliths from pair trawl and single trawl landings from the west coast and from Danish seine, longline, research trawl, and set net landings in the Bay of Plenty to produce age-length keys as described by Davies & Walsh (1995). The sample allocation for each length class interval was made according to the west coast single trawl and Bay of Plenty longline proportion at length distributions as estimated for the previous year. To allow for annual variability in the abundance of fish in the 25–26 cm size range, a fixed sample size of about 20 otoliths was obtained per interval for the Bay of Plenty collection.

Age-length keys derived from the age data collected in each stock and substock area are assumed to be representative of the seasonal strata of the sample. The main assumption that must be satisfied for an otolith sample to be used for deriving an age-length key is that the sample was taken randomly from within each length class (Southward 1976).

The calculation of stratum proportions and variances at length and age from the length frequency samples and age-length keys followed that of Davies & Walsh (1995). Bootstrap mean and variance estimates were not determined for proportion at length and age estimates because the difference between bootstrap and analytical estimates has been found to be negligible (Davies *et al.* unpublished results). The calculation of mean weight-at-age and variances from the length frequency samples and age-length keys followed that of Quinn II *et al.* (1983). Proportions at age and mean weight-at-age with analytical estimates of coefficient of variation (*c.v.*) were calculated for the range of age classes recruited to each stratum, with the maximum age being an aggregate of all age classes over 19 years.

The second approach for collecting otoliths was called the random age frequency sampling method (Davies *et al.* unpublished results) and was used for the Hauraki Gulf and East Northland longline fisheries. The age frequency samples were collected by taking random otolith samples from the catch. A systematic selection interval was used in sampling. This involved a random sample of bins from each landing with the systematic selection of every n^{th} fish counted in a continuous sequence from those bins. The optimum selection interval, n, for the random age frequency sample was determined from simulations using data from historical length and age samples that achieved a desired level of precision in catch-at-age estimates. This range took account of the expected mean number of fish in a bin and the total number of bins in landings. The sample sizes typically ranged from 15 fish being collected from landings of 10 bins, to 45 fish being collected from landings of above 100 bins. A total sample size of between 900 and 1000 otoliths was targeted for collection from each fishery, which provides the desired precision in estimates of catch-at-age.

Proportion at age and variance (analytical and bootstrap) estimates for the East Northland and Hauraki Gulf longline fisheries were calculated from random age frequency samples collected from each landing. Essentially, a mean proportion at age for all landings in the sample (weighted by the estimated number of fish in each landing) based on the sample age frequencies, was determined. Bootstrap mean estimates are not presented as the difference between analytical and bootstrap means in proportion at age estimates have been found to be negligible (Davies *et al.* unpublished results). Proportions at length and variance estimates were also calculated from the random age frequency samples, as were mean weight-at-age estimates with bootstrap *c.v.* s.

Random age frequency data were collected specifically to derive catch-at-age estimates. However, only small differences in proportion at age estimates are derived from the age-length key and random

age frequency approaches (Walsh *et al.* 1998). Given that the random age frequency otolith sample was collected in a strictly random manner, it can be assumed that individual fish sampled for age were random observations from within each length interval. Consequently, proportional allocation age-length keys were derived from the random age frequency otolith samples for the East Northland and Hauraki Gulf substocks. However, fish in the larger length classes, especially from the random age frequency otolith collections, were infrequently sampled and are therefore poorly described.

A standardised procedure for reading otoliths was followed (Davies & Walsh 1995). Age was defined as rounded whole years from a nominal birth date of 1 January as described by Davies & Walsh (1995), e.g., the 1989 year class was recorded as 9 years old whether sampled in December 1997 or February 1998.

Snapper length and age data were stored on the Ministry of Fisheries *market* and *age* databases respectively, held by NIWA.

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 from autumn 1997 to summer 1997–98 are provided in Tables 2–5 to illustrate seasonal patterns in the fisheries. The SNA 8 snapper fishery was mainly concentrated over spring and summer and the SNA 1 fishery was more evenly spread over the entire year.

Length and age distributions

For the west coast single trawl and Bay of Plenty longline fisheries, catch-at-age compositions were derived from the combined spring and summer length distributions to compare stock and method strata and identify year class strengths. 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 long is not considerable between spring and summer, this assumption is probably valid for broad comparisons. This assumption has been accepted for other species with growth rates comparable to those of snapper (Westrheim & Ricker 1978).

Sample length and age distributions for the 1997–98 season are presented as histograms for the west coast single trawl and Bay of Plenty longline fisheries (Figures 2–5). Age distributions derived from random age frequency approaches are given for the Hauraki Gulf and East Northland longline fisheries with analytical and bootstrap variance estimates (Figures 6 and 7). The estimated proportions at length, age, and mean weight-at-age for the stock-method-season strata are shown in Appendices 1, 2, and 3 respectively. The age-length keys for the stock and substocks are presented in Appendix 4.

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 (Appendix 1). Because mean weight is specific to each 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.

West coast snapper (SNA 8)

The length distribution of the single trawl catch was characterised by two modes which peaked at 28 and 34 cm, and had a broad tail extending to over 60 cm (Figure 2). The smaller first mode between 26 and 30 cm consists mainly of 3 year old fish (*see* Appendix 4). The mean length of snapper sampled from the fishery was 38.4 cm, and the mean weighted *c.v.* of the proportions was 0.10.

Relative year class strengths were discernible from the age compositions, with the 1993 and 1991 year classes (5 and 7 year olds, respectively) appearing strong and the 1992, 1990, and 1988 year classes (6, 8, and 10 year olds) particularly weak. The mean age of snapper from the west coast single trawl fishery was 6.2 years (Figure 3). The age distribution had a mean weighted *c.v.* of 0.08.

East coast snapper (SNA 1)

Bay of Plenty

The length distribution of the Bay of Plenty longline fishery was characterised by a strong mode between 29 and 36 cm with a tail extending to over 60 cm and mean weighted *c.v.* of 0.08 (Figure 4). The mean length of snapper sampled from the fishery was 34.6 cm.

The longline age distribution consisted mainly of fish less than 15 years old with a mean age of 8.5 years and a mean weighted *c.v.* of 0.12 (Figure 5). Most evident were the strong 1991 and 1989 year classes (7 and 9 year olds, respectively) and weak 1987 year class (11 year olds). The 1993 and 1992 year classes (5 and 6 year olds, respectively), although incompletely recruited, also appear weak. The 1991 year class has now fully recruited to the fishery (*see* Appendix 4).

Hauraki Gulf

The Hauraki Gulf longline age distribution was dominated by the strong 1991 and 1989 year classes (7 and 9 year olds respectively; Figure 6). Neither of these year classes have fully recruited to the fishery as they still contain a proportion of 25 cm fish (*see* Appendix 4). The 1993 and 1992 year classes (5 and 6 year olds, respectively), although incompletely recruited, appear weak. The mean age of snapper in the Hauraki Gulf longline fishery was 9.9 years. The analytical and bootstrap mean weighted *c.v.* s for the random age frequency approach were 0.14 and 0.18 respectively.

East Northland

The East Northland longline age distribution was dominated by the strong 1991 and 1989 year classes (7 and 9 year olds, respectively; Figure 7). The 1993 and 1992 year classes (5 and 6 year olds, respectively), although incompletely recruited, appear weak. The mean age of snapper in the East Northland longline fishery was 9.6 years. The analytical and bootstrap mean weighted *c.v.* s for the random age frequency approach were 0.18 and 0.23 respectively.

Discussion

The relative year class strengths inferred from the length and age distributions sampled from the SNA 1 and SNA 8 fisheries in the 1997–98 season are generally consistent with trends observed in previous years (McKenzie *et al.* 1992, Davies & Walsh 1995, Walsh *et al.* 1995, 1997, 1998). In 1997–98, however, it was not possible to sample from some sectors of the fishing industry, or from particular areas within the Hauraki Gulf substock due to seasonal closures. Therefore, estimates of proportion at age may not be as representative of entire fisheries as those from previous years in the East Northland and Hauraki Gulf longline fisheries.

The west coast single trawl age distribution was dominated by the strong 1993 and 1991 year classes (5 and 7 year olds, respectively), accounting for almost 50% of snapper in single trawl landings from the west coast in 1997–98. Inferred year class strengths of the older age classes (8–14 years) appear to have declined in their respective dominance as a result of these relatively strong year classes. The 1985 and 1986 year classes which were dominant in the early 1990s now account for about 6% of the 1997–98 single trawl catch. The mean length and age of snapper in the 1997–98 west coast single trawl fishery have increased from last year. This is likely to be a direct result of growth by fish from the dominant 1991 and 1993 year classes (Davies 1997).

The Bay of Plenty length and age distributions in 1997–98 were almost identical to those obtained in 1996–97 allowing for one year's growth. As a result, mean length and age have increased. The 1989 and 1991 year classes accounted for almost 50% of the snapper caught by longline in the Bay of Plenty in 1997–98.

As in 1996–97, the strong 1989 year class continued to account for almost 25% of the Hauraki Gulf longline catch in 1997–98 (Figure 6). The 1993 and 1992 year classes (5 and 6 year olds, respectively), although not yet fully recruited, appear to be of low strength. The once very strong 1981 year class (17 year olds) is less evident than in previous years. Relative year class strengths inferred from the Hauraki Gulf 1997–98 longline age distribution, and those of previous years (Davies & Walsh 1995, Walsh *et al.* 1995, 1997, 1998), are generally consistent with those predicted from the temperature-recruitment relationship and trawl surveys of 1 year old snapper (Francis *et al.* 1995, 1997). However, the predicted relative strengths of certain year classes are not reflected in either the 1996–97 or the 1997–98 Hauraki Gulf longline age distributions. The temperature-recruitment relationship predicts that the 1990 and 1989 year classes are of similar strength and the 1991 year class is below average. In the 1997–98 Hauraki Gulf longline age distribution, the 1989 and 1991 year classes are of similar strength and the 1990 year class is of low strength. Although none of these year classes are fully recruited, further recruitment is likely to confirm this disagreement.

The distribution at age of the East Northland longline fishery in 1997–98 was less typical of the distributions seen in past years. The usually broad age distributions (Davies & Walsh 1995, Walsh *et al.* 1995, 1997, 1998) have been replaced by one dominated by the strong 1991 and 1989 year classes, 7 and 9 year olds respectively. These two year classes accounted for over 40% of the catch in the East Northland substock in 1997–98. The mean age of snapper and the number of fish greater than 19 years of age in East Northland longline catches has reduced from that of the previous year. The once dominant 1982 year class, common to East Northland longline catches in past years, here is estimated to be of average strength.

Since 1989–90, broad similarities in relative year class strengths and recruitment patterns have been evident between the SNA 1 substocks, particularly in extremely strong and weak year classes (Davies & Walsh 1995, Walsh *et al.* 1995, 1997, 1998). The strong 1989 and 1991 year classes are clearly evident in all three substocks of SNA 1, as are the weak 1987, 1990, and 1992 year classes. The

previously strong 1981 year class is still evident in catch-at-age distributions, although not to the same degree as in past years. The similar characteristics displayed in year class strength in all the SNA 1 substocks in 1997–98 are likely to have resulted from a number of contributing factors. As seen in previous years, most of the Bay of Plenty length and age samples were collected from the western side of the Bay, that is, the side nearest the Hauraki Gulf. Similarities in proportion at age estimates may be drawn because of the close proximity of the fishing grounds for these two substocks and the level of migration that is thought to occur (Annala & Sullivan 1996). Strong similarities are also noticeable in the age distributions of the East Northland and Hauraki Gulf substocks. In the spring and summer of 1997–98, the East Northland substock had a substantial reduction in fishing effort from that seen in 1996–97, especially in the northern part of its range (Ministry of Fisheries unpublished data). Many of the longline fleet have left the industry over past seasons as a result of quota reductions or for financial reasons, especially in the more remote areas like the east coast of the far north. Therefore, more samples were collected from the southern part of the East Northland substock, an area adjacent to the Hauraki Gulf, compared with previous years. Many longline fishers who normally target areas such as the Firth of Thames and inner Hauraki Gulf early in the schooling season were also forced to concentrate effort elsewhere, such as the Bream Bay area of East Northland where water temperature and fishing success were higher (authors' discussion with fishers). This anomaly may be partially attributable to El Niño weather effects experienced over the 1997–98 fishing year, serving to concentrate fishing effort in the central areas of SNA 1. Consequently, the proportion at age estimates derived for all three SNA 1 substocks in 1997–98 are more similar than in previous years.

Apart from the strong 1991 year class, few similarities in relative year class strengths have been apparent between the SNA 1 and SNA 8 stocks since 1989–90.

Conclusions

1. The length and age distributions sampled from the SNA 1 and SNA 8 fisheries in the 1997–98 season were generally consistent with trends observed in previous years.

2. Strong 1991 and 1993 year classes were evident in the SNA 8 stock and strong 1989 and 1991 year classes were evident in the SNA 1 stock.

3. There were broad similarities in the recruitment patterns of the SNA 1 substocks. Few similarities in recruitment patterns exist between the SNA 1 and SNA 8 stocks.

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Table 1 : **Percentage of snapper catch by fishing method* for the stock and substocks in SNA 1 and SNA 8 for the 1997–98 fishing year†**

	BPT	BT	BLL	DS	Other
West coast	17	72	3	0	8
Bay of Plenty	2	30	28	36	4
Hauraki Gulf	0	24	50	22	4
East Northland	1	6	85	1	7

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

† 1997–98 represents 01/10/97 to 28/02/98 only.

Table 2 : **Summary of the catch (total number and weight of landings) and samples (number of landings and weight sampled, and number of fish measured) in method–season strata for the west coast snapper fisheries from autumn 1997 to summer 1997–98***

		Number of landings			No. of fish	Weight of landings (t)		
Method	Season	Total	Sampled	% of total	measured	Total	Sampled	% of total
BPT	Autumn	6	0	0	0	25	0	0
	Winter	2	0	0	0	4	0	0
	Spring	7	0	0	0	114	0	0
	Summer	5	0	0	0	47	0	0
BT	Autumn	100	0	0	0	154	0	0
	Winter	81	0	0	0	101	0	0
	Spring	83	11	13.3	6 180	371	120	32.3
	Summer	91	7	7.7	4 927	296	64	21.6

* BPT, pair trawl; BT, single trawl.

Table 3 : **Summary of the catch (total number and weight of landings) and samples (number of landings and weight sampled, and number of fish measured) in method–season strata for the Bay of Plenty snapper fisheries from autumn 1997 to summer 1997–98***

		Number of landings			No. of fish	Weight of landings (t)		
Method	Season	Total	Sampled	% of total	measured	Total	Sampled	% of total
BLL	Autumn	306	0	0	0	89	0	0
	Winter	354	0	0	0	120	0	0
	Spring	185	22	11.9	4 176	62	8	12.9
	Summer	157	22	14.0	3 195	40	4	10.0
BT	Autumn	24	0	0	0	120	0	0
	Winter	7	0	0	0	23	0	0
	Spring	6	0	0	0	33	0	0
	Summer	29	0	0	0	77	0	0
DS	Autumn	57	0	0	0	53	0	0
	Winter	48	0	0	0	56	0	0
	Spring	41	0	0	0	68	0	0
	Summer	47	0	0	0	61	0	0

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

Table 4 : **Summary of the catch (total number and weight of landings) and samples (number of landings and weight sampled, and number of fish measured) in method–season strata for the Hauraki Gulf snapper fisheries from autumn 1997 to summer 1997–98***

Method	Season	Number of landings			No. of fish measured	Weight of landings (t)		
		Total	Sampled	% of total		Total	Sampled	% of total
BLL	Autumn	762	0	0	0	197	0	0
	Winter	539	0	0	0	110	0	0
	Spring	675	26	3.8	584	237	11	4.6
	Summer	903	14	1.5	384	287	9	3.1
BT	Autumn	8	0	0	0	82	0	0
	Winter	1	0	0	0	1	0	0
	Spring	4	0	0	0	81	0	0
	Summer	9	0	0	0	171	0	0
DS	Autumn	113	0	0	0	106	0	0
	Winter	70	0	0	0	25	0	0
	Spring	127	0	0	0	86	0	0
	Summer	126	0	0	0	149	0	0

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

Table 5 : **Summary of the catch (total number and weight of landings) and samples (number of landings and weight sampled, and number of fish measured) in method–season strata for the East Northland snapper fishery from autumn 1997 to summer 1997–98***

Method	Season	Number of landings			No. of fish measured	Weight of landings (t)		
		Total	Sampled	% of total		Total	Sampled	% of total
BLL	Autumn	627	0	0	0	161	0	0
	Winter	794	0	0	0	195	0	0
	Spring	727	28	3.8	386	250	17	6.8
	Summer	517	13	2.5	566	179	3	1.7

* BLL, longline.

Table 6 : **Details of snapper otolith samples collected in 1997–98 from the stock and substocks in SNA 1 and SNA 8***

Area	Fishing method †	Sampling period	Sample method ††	Length range (cm)	No. aged
WCNI	BPT, BT	Spring, summer	SR	22–80	1 095
BPLE	BLL, DS, RT, SN	Spring, summer	SR	23–80	687
HAGU	BLL	Spring, summer	R	24–68	968
ENLD	BLL	Spring, summer	R	26–72	952

* WCNI, west coast North Island; BPLE, Bay of Plenty; HAGU, Hauraki Gulf; ENLD, East Northland.

† BPT, pair trawl; BT, single trawl; BLL, longline; DS, Danish seine; RT, research trawl; SN, set net.

†† SR, stratified random sample; R, random sample.

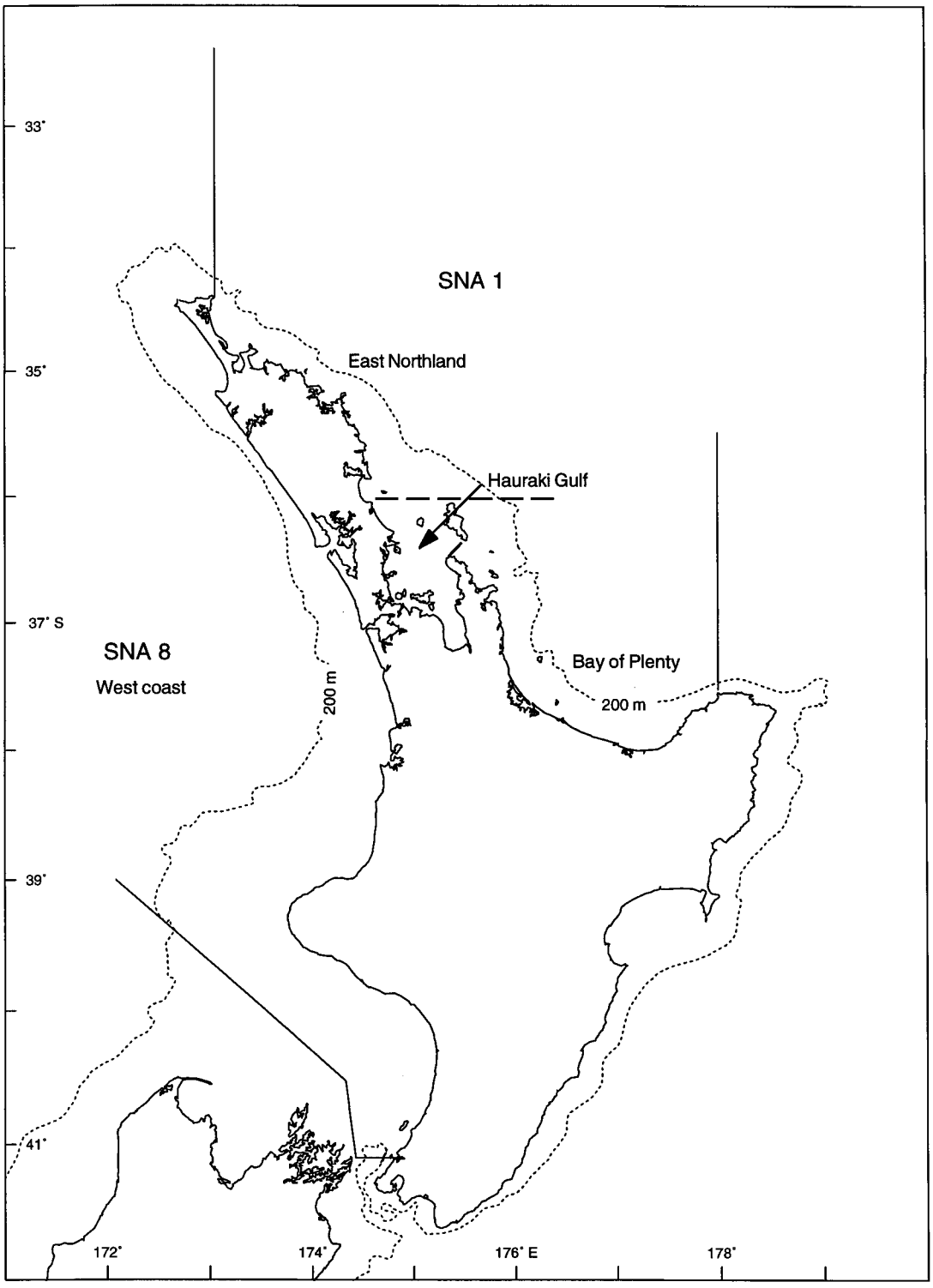

Figure 1: **The quota management areas for the east and west coast snapper stocks (SNA 1 and SNA 8 respectively) and the range of the three SNA 1 substocks; East Northland, Hauraki Gulf, and Bay of Plenty.**

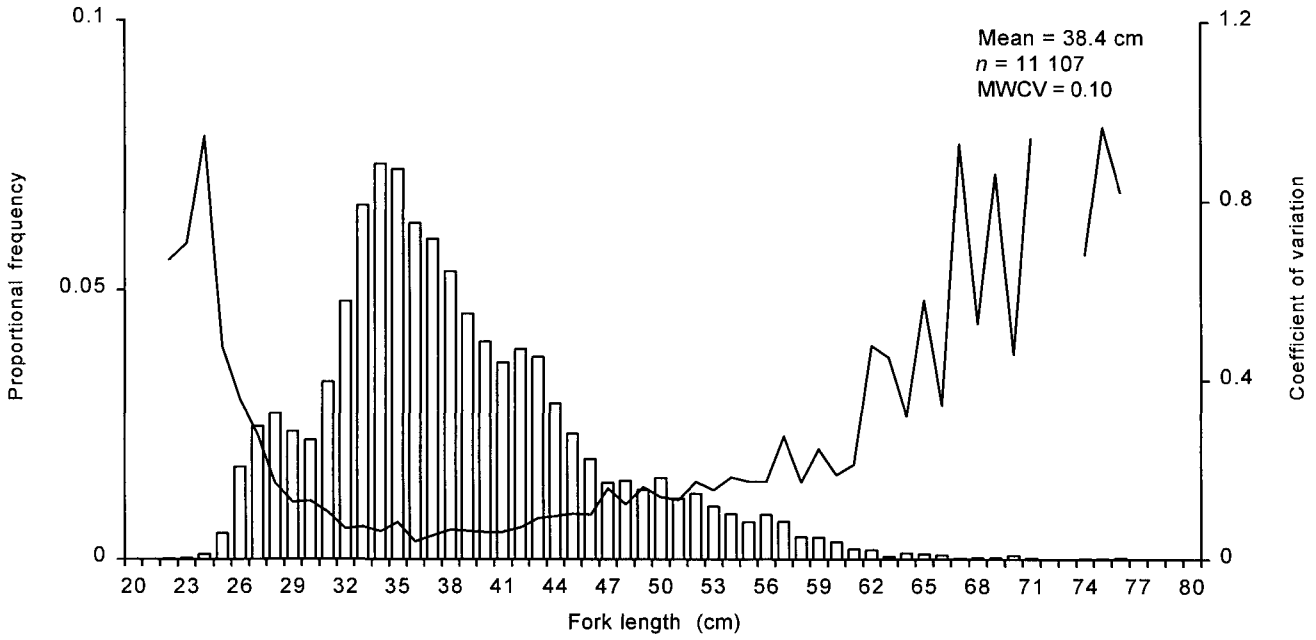

Figure 2: **Proportion at length distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the west coast single trawl fishery in 1997–98 (*n* denotes length sample size, MWCV denotes mean weighted *c.v.*).**

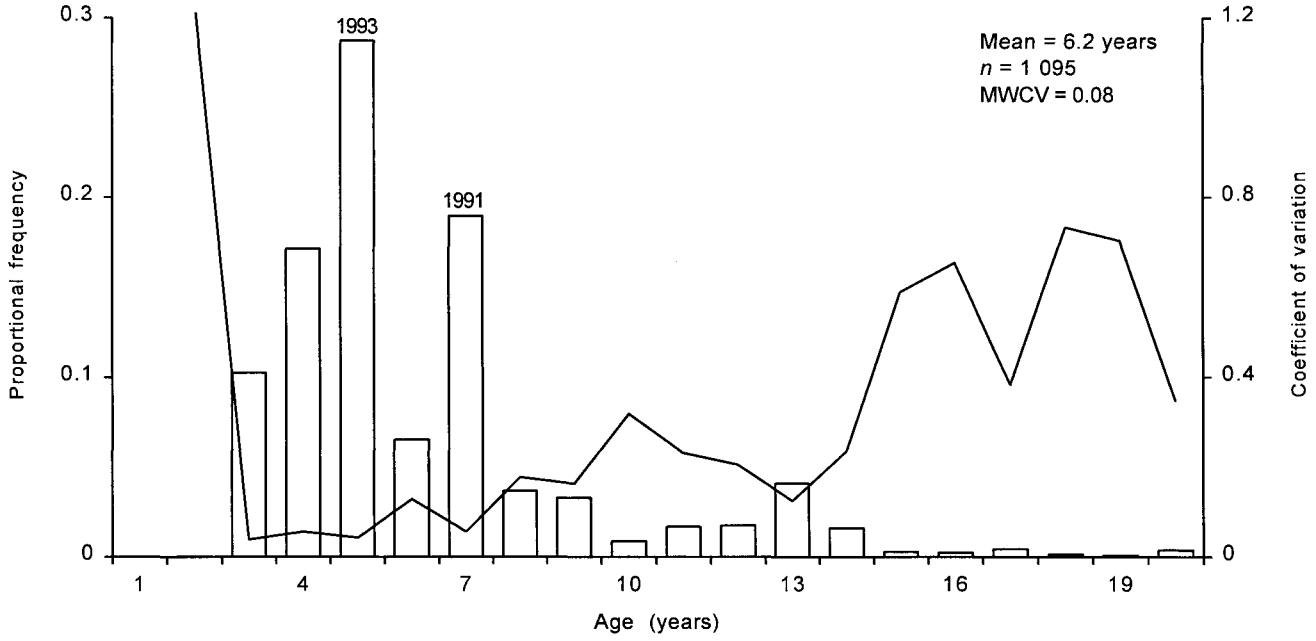

Figure 3: **Proportion at age distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the west coast single trawl fishery in 1997–98 using the age-length key approach (*n* denotes otolith sample size, MWCV denotes mean weighted *c.v.*).**

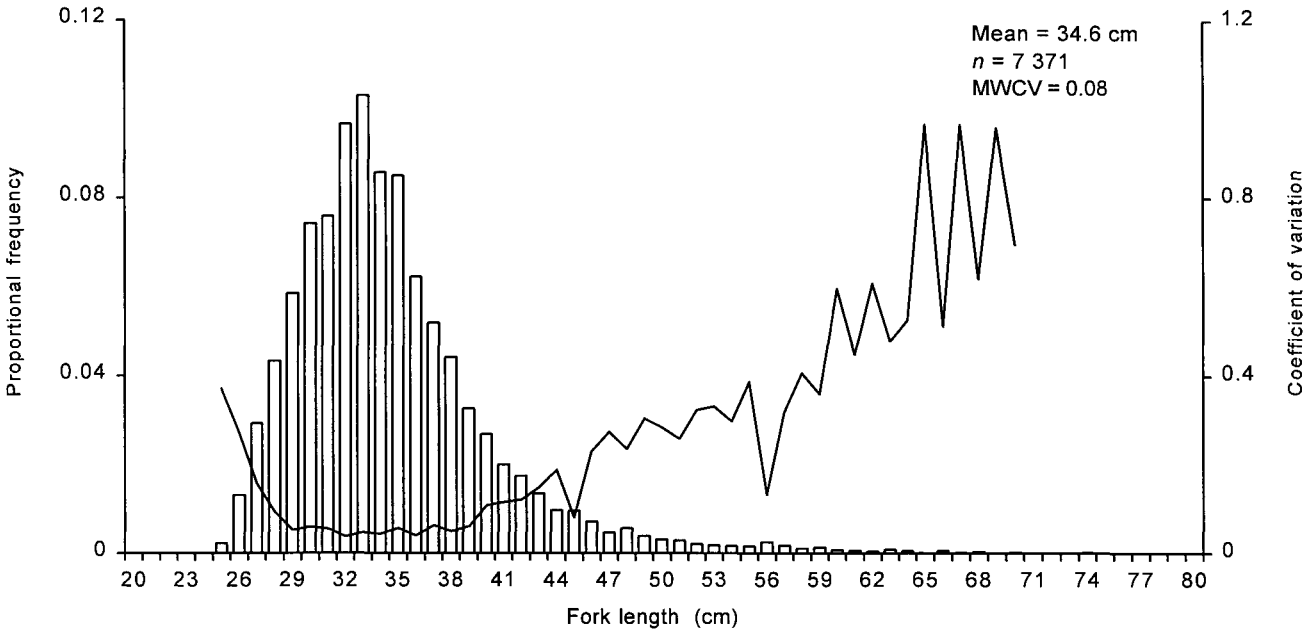

Figure 4: **Proportion at length distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the Bay of Plenty longline fishery in 1997–98 (*n* denotes length sample size, MWCV denotes mean weighted *c.v.*).**

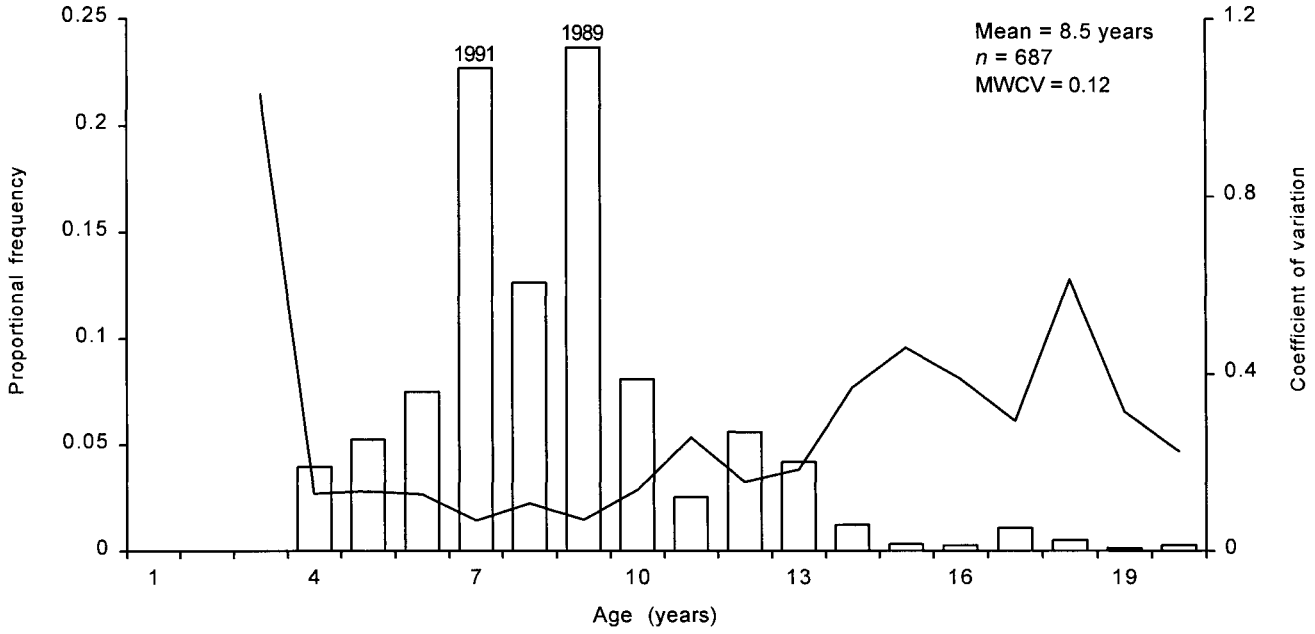

Figure 5: **Proportion at age distribution (histogram) and *c.v.*s (solid line) determined from snapper landings sampled from the Bay of Plenty longline fishery in 1997–98 using the age-length key approach (*n* denotes otolith sample size, MWCV denotes mean weighted *c.v.*).**

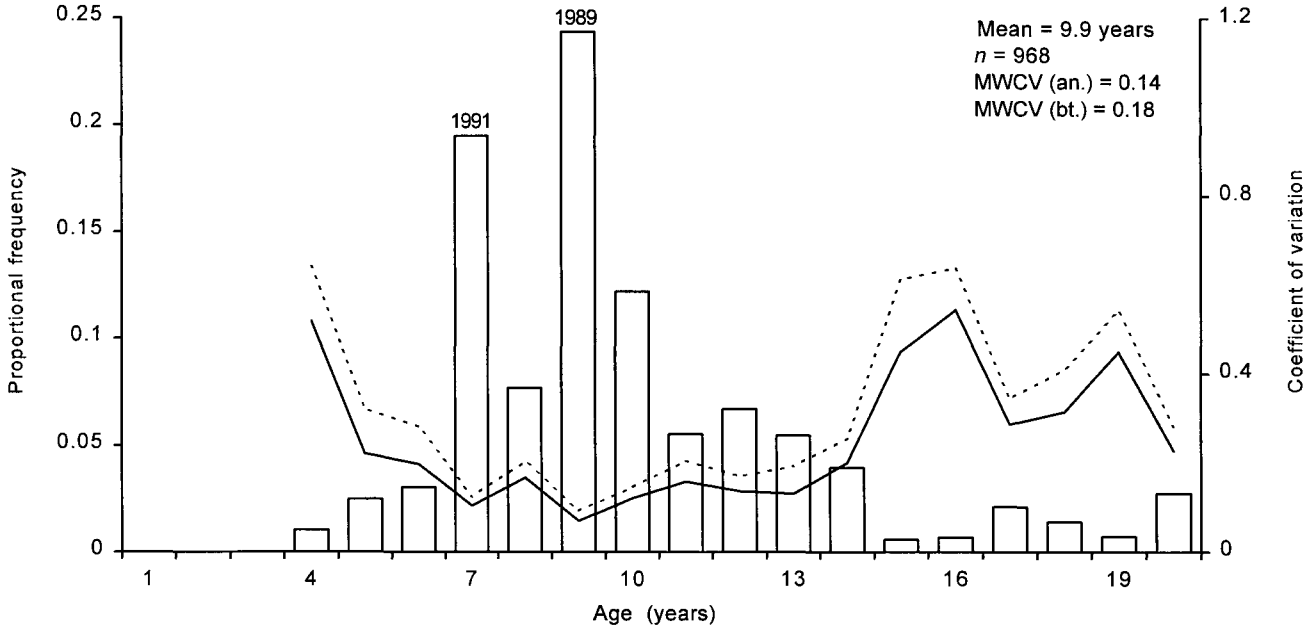

Figure 6: **Proportion at age distribution (histogram) and *c.v.*s (solid and dashed lines represent analytical and bootstrap estimates respectively) determined from snapper landings sampled from the Hauraki Gulf longline fishery in 1997–98 using the random age frequency approach (*n* denotes otolith sample size, MWCV denotes mean weighted *c.v.*).**

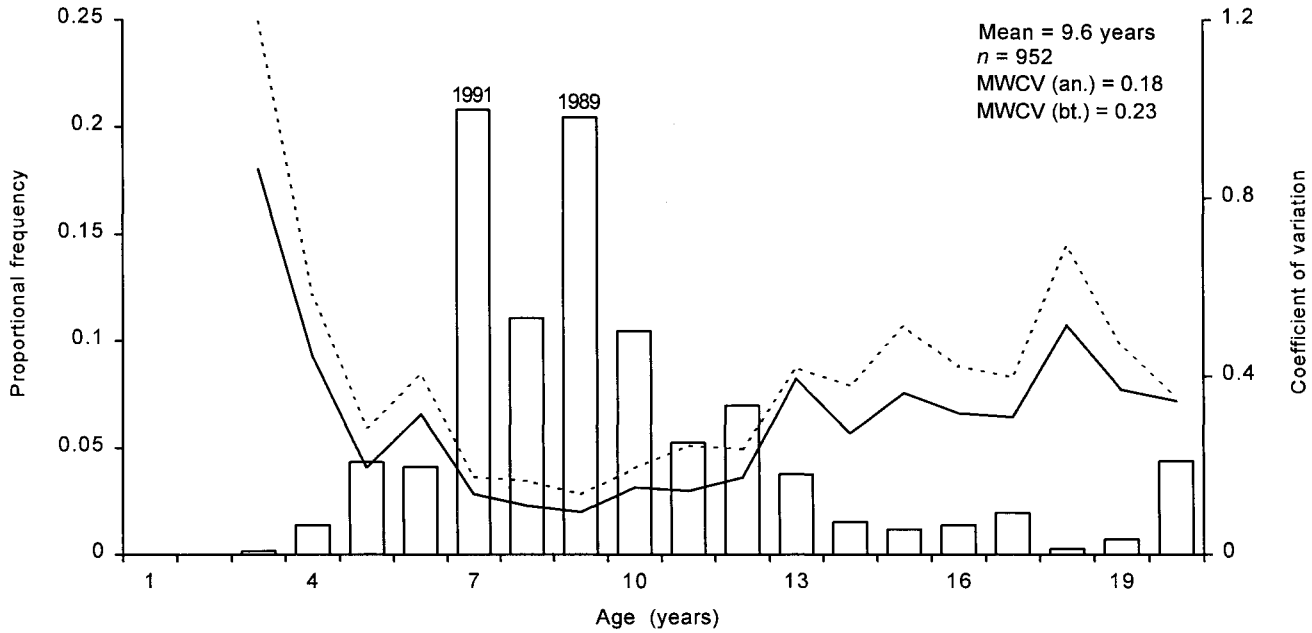

Figure 7: **Proportion at age distribution (histogram) and *c.v.*s (solid and dashed lines represent analytical and bootstrap estimates respectively) determined from snapper landings sampled from the East Northland longline fishery in 1997–98 using the random age frequency approach (*n* denotes otolith sample size, MWCV denotes mean weighted *c.v.*).**

Appendix 1 : **Estimated seasonal proportion at length and *c.v.* s for snapper fisheries in SNA 1 and SNA 8 in 1997–98**

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 1997–98

	Single trawl					
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	0.0004	0.64	0.0002	0.67
23	0.0001	0.96	0.0005	0.93	0.0002	0.71
24	0.0000	0.00	0.0025	0.93	0.0009	0.94
25	0.0025	0.38	0.0088	0.66	0.0048	0.47
26	0.0081	0.33	0.0330	0.42	0.0172	0.36
27	0.0152	0.27	0.0411	0.37	0.0247	0.28
28	0.0246	0.16	0.0315	0.34	0.0271	0.17
29	0.0219	0.16	0.0269	0.20	0.0237	0.13
30	0.0197	0.17	0.0262	0.19	0.0221	0.13
31	0.0313	0.16	0.0357	0.10	0.0329	0.11
32	0.0421	0.07	0.0582	0.07	0.0480	0.07
33	0.0667	0.11	0.0642	0.08	0.0658	0.07
34	0.0708	0.09	0.0780	0.07	0.0735	0.06
35	0.0780	0.11	0.0628	0.11	0.0725	0.08
36	0.0648	0.04	0.0585	0.09	0.0625	0.04
37	0.0618	0.07	0.0555	0.08	0.0595	0.05
38	0.0572	0.09	0.0471	0.06	0.0535	0.07
39	0.0490	0.07	0.0398	0.12	0.0456	0.06
40	0.0416	0.07	0.0383	0.11	0.0404	0.06
41	0.0376	0.07	0.0346	0.11	0.0365	0.06
42	0.0408	0.08	0.0359	0.14	0.0390	0.07
43	0.0412	0.10	0.0311	0.13	0.0375	0.09
44	0.0314	0.10	0.0246	0.19	0.0289	0.10
45	0.0251	0.12	0.0200	0.15	0.0233	0.10
46	0.0197	0.11	0.0167	0.21	0.0186	0.10
47	0.0151	0.21	0.0128	0.20	0.0143	0.16
48	0.0160	0.15	0.0122	0.16	0.0146	0.12
49	0.0143	0.21	0.0106	0.20	0.0129	0.16
50	0.0166	0.18	0.0126	0.18	0.0151	0.14
51	0.0127	0.16	0.0089	0.15	0.0113	0.13
52	0.0140	0.20	0.0090	0.24	0.0122	0.17
53	0.0112	0.18	0.0075	0.21	0.0098	0.15
54	0.0076	0.22	0.0097	0.34	0.0084	0.18
55	0.0053	0.11	0.0098	0.32	0.0069	0.17
56	0.0081	0.25	0.0085	0.23	0.0083	0.17
57	0.0081	0.33	0.0052	0.44	0.0071	0.27
58	0.0038	0.24	0.0047	0.26	0.0042	0.17
59	0.0033	0.31	0.0052	0.41	0.0040	0.25
60	0.0033	0.24	0.0031	0.31	0.0032	0.19
61	0.0023	0.24	0.0013	0.34	0.0019	0.21
62	0.0017	0.73	0.0017	0.31	0.0017	0.48
63	0.0003	0.92	0.0008	0.47	0.0005	0.45
64	0.0008	0.59	0.0016	0.32	0.0011	0.32
65	0.0013	0.60	0.0003	1.00	0.0009	0.58
66	0.0005	0.66	0.0013	0.34	0.0008	0.34
67	0.0003	0.91	0.0000	0.00	0.0002	0.93
68	0.0001	0.86	0.0005	0.63	0.0003	0.53
69	0.0005	0.82	0.0000	0.00	0.0003	0.86
70	0.0009	0.51	0.0003	0.95	0.0007	0.46
71	0.0003	0.93	0.0000	0.00	0.0002	0.94
72	0.0000	0.00	0.0000	0.00	0.0000	0.00
73	0.0000	0.00	0.0000	0.00	0.0000	0.00
74	0.0001	0.97	0.0002	1.00	0.0001	0.68
75	0.0000	0.00	0.0002	1.00	0.0001	0.97
76	0.0003	0.80	0.0000	0.00	0.0002	0.82
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	0.0000	0.00	0.0000	0.00
Nt	274 874		238 492		509 138	
n	6 180		4 927		11 107	

Appendix 1 – **continued:**

Estimates of the proportion at length of snapper from the Bay of Plenty longline fishery in 1997–98

	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	0.0000	0.00	0.0000	0.00
25	0.0024	0.49	0.0019	0.39	0.0022	0.37
26	0.0145	0.34	0.0097	0.27	0.0130	0.27
27	0.0304	0.20	0.0266	0.21	0.0292	0.16
28	0.0467	0.12	0.0356	0.17	0.0433	0.09
29	0.0623	0.05	0.0498	0.07	0.0584	0.05
30	0.0770	0.08	0.0680	0.08	0.0742	0.06
31	0.0766	0.07	0.0742	0.08	0.0758	0.05
32	0.0998	0.04	0.0893	0.07	0.0965	0.04
33	0.1094	0.05	0.0888	0.06	0.1030	0.05
34	0.0892	0.05	0.0778	0.07	0.0857	0.04
35	0.0911	0.05	0.0716	0.07	0.0850	0.06
36	0.0636	0.05	0.0591	0.06	0.0622	0.04
37	0.0525	0.09	0.0503	0.08	0.0519	0.06
38	0.0424	0.06	0.0480	0.09	0.0441	0.05
39	0.0315	0.08	0.0351	0.09	0.0326	0.06
40	0.0226	0.14	0.0361	0.12	0.0268	0.11
41	0.0172	0.13	0.0259	0.14	0.0199	0.11
42	0.0142	0.14	0.0242	0.12	0.0173	0.12
43	0.0087	0.15	0.0237	0.09	0.0134	0.15
44	0.0063	0.21	0.0172	0.16	0.0097	0.19
45	0.0090	0.09	0.0107	0.17	0.0095	0.08
46	0.0056	0.36	0.0106	0.15	0.0072	0.23
47	0.0030	0.38	0.0084	0.25	0.0047	0.27
48	0.0040	0.36	0.0093	0.14	0.0057	0.24
49	0.0034	0.46	0.0049	0.21	0.0039	0.30
50	0.0019	0.43	0.0059	0.22	0.0031	0.28
51	0.0025	0.37	0.0038	0.27	0.0029	0.26
52	0.0012	0.49	0.0041	0.36	0.0021	0.32
53	0.0008	0.57	0.0041	0.27	0.0018	0.33
54	0.0015	0.43	0.0021	0.29	0.0017	0.30
55	0.0013	0.63	0.0024	0.33	0.0016	0.39
56	0.0024	0.17	0.0028	0.23	0.0025	0.13
57	0.0006	0.59	0.0042	0.21	0.0017	0.32
58	0.0008	0.74	0.0017	0.43	0.0011	0.41
59	0.0012	0.48	0.0017	0.51	0.0014	0.36
60	0.0008	0.74	0.0005	0.68	0.0007	0.60
61	0.0002	0.95	0.0013	0.44	0.0006	0.45
62	0.0003	0.75	0.0006	0.95	0.0004	0.61
63	0.0004	0.76	0.0017	0.54	0.0008	0.48
64	0.0000	0.00	0.0017	0.44	0.0005	0.53
65	0.0000	0.00	0.0003	0.95	0.0001	0.97
66	0.0002	0.99	0.0013	0.53	0.0006	0.51
67	0.0000	0.00	0.0006	0.95	0.0002	0.97
68	0.0001	1.00	0.0009	0.70	0.0004	0.62
69	0.0000	0.00	0.0003	0.92	0.0001	0.96
70	0.0000	0.00	0.0006	0.66	0.0002	0.70
71	0.0000	0.00	0.0000	0.00	0.0000	0.00
72	0.0000	0.00	0.0003	0.95	0.0001	0.97
73	0.0000	0.00	0.0000	0.00	0.0000	0.00
74	0.0001	1.01	0.0003	0.93	0.0002	0.70
75	0.0000	0.00	0.0000	0.00	0.0000	0.00
76	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
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	0.0001	1.01	0.0000	0.00	0.0001	0.97
Nt	68 984		38 046		107 819	
n	4 176		3 195		7 371	

Appendix 1 – **continued:**

Estimates of the proportion at length of snapper from the Hauraki Gulf longline fishery in 1997–98

	Longline	
Length	Spr-sum	
(cm)	*P.i.*	*c.v.*
20	0.0000	0.00
21	0.0000	0.00
22	0.0000	0.00
23	0.0000	0.00
24	0.0086	0.55
25	0.0155	0.38
26	0.0267	0.30
27	0.0271	0.29
28	0.0365	0.20
29	0.0562	0.20
30	0.0620	0.13
31	0.0444	0.24
32	0.0735	0.15
33	0.0613	0.14
34	0.0581	0.13
35	0.0715	0.10
36	0.0681	0.19
37	0.0421	0.20
38	0.0480	0.16
39	0.0390	0.22
40	0.0215	0.25
41	0.0290	0.16
42	0.0209	0.21
43	0.0260	0.19
44	0.0191	0.26
45	0.0236	0.20
46	0.0208	0.22
47	0.0155	0.27
48	0.0167	0.29
49	0.0087	0.33
50	0.0078	0.42
51	0.0097	0.32
52	0.0057	0.44
53	0.0057	0.42
54	0.0071	0.37
55	0.0036	0.49
56	0.0012	0.72
57	0.0013	0.65
58	0.0049	0.41
59	0.0047	0.64
60	0.0040	0.53
61	0.0000	0.00
62	0.0007	0.75
63	0.0000	0.00
64	0.0027	0.61
65	0.0000	0.00
66	0.0000	0.00
67	0.0000	0.00
68	0.0006	1.02
69	0.0000	0.00
70	0.0000	0.00
71	0.0000	0.00
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	466 506	
n	968	

Appendix 1 – **continued:**

Estimates of the proportion at length of snapper from the East Northland longline fishery in 1997–98

	Longline	
Length	Spr-sum	
(cm)	*P.i.*	*c.v.*
20	0.0000	0.00
21	0.0000	0.00
22	0.0000	0.00
23	0.0000	0.00
24	0.0000	0.00
25	0.0000	0.00
26	0.0044	0.64
27	0.0033	0.80
28	0.0270	0.29
29	0.0661	0.16
30	0.0868	0.26
31	0.0897	0.14
32	0.1112	0.15
33	0.0895	0.26
34	0.0836	0.18
35	0.0562	0.11
36	0.0583	0.21
37	0.0405	0.26
38	0.0366	0.15
39	0.0341	0.30
40	0.0154	0.25
41	0.0193	0.28
42	0.0291	0.21
43	0.0200	0.29
44	0.0176	0.37
45	0.0212	0.28
46	0.0092	0.36
47	0.0119	0.37
48	0.0122	0.35
49	0.0078	0.38
50	0.0079	0.51
51	0.0099	0.28
52	0.0068	0.46
53	0.0036	0.52
54	0.0012	0.67
55	0.0071	0.45
56	0.0020	0.59
57	0.0023	0.67
58	0.0010	0.78
59	0.0018	0.71
60	0.0023	0.67
61	0.0000	0.00
62	0.0005	1.05
63	0.0006	0.81
64	0.0000	0.00
65	0.0005	1.05
66	0.0005	1.04
67	0.0005	1.04
68	0.0000	0.00
69	0.0000	0.00
70	0.0000	0.00
71	0.0000	0.00
72	0.0003	1.05
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	405 536	
n	952	

Appendix 2 : **Estimated seasonal proportion at age and *c.v.* s for snapper fisheries in SNA 1 and SNA 8 in 1997–98**
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 1997–98
Otolith sample size = 1 095

					Age-length key Single trawl	
Age	Spring		Summer		Spr-sum	
(years)	*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	0.0002	1.21	0.0001	1.25
3	0.0760	0.05	0.1490	0.04	0.1026	0.04
4	0.1666	0.06	0.1799	0.05	0.1715	0.05
5	0.2943	0.04	0.2751	0.04	0.2873	0.04
6	0.0682	0.13	0.0593	0.13	0.0650	0.13
7	0.2008	0.06	0.1703	0.06	0.1897	0.06
8	0.0389	0.18	0.0324	0.18	0.0365	0.18
9	0.0356	0.16	0.0280	0.16	0.0328	0.16
10	0.0090	0.31	0.0078	0.34	0.0085	0.32
11	0.0176	0.23	0.0149	0.24	0.0166	0.23
12	0.0182	0.21	0.0155	0.21	0.0172	0.20
13	0.0423	0.13	0.0379	0.13	0.0407	0.12
14	0.0161	0.24	0.0149	0.25	0.0156	0.23
15	0.0032	0.59	0.0022	0.59	0.0028	0.59
16	0.0023	0.63	0.0025	0.75	0.0024	0.66
17	0.0045	0.37	0.0042	0.45	0.0044	0.38
18	0.0013	0.77	0.0016	0.74	0.0014	0.73
19	0.0009	0.60	0.0008	1.06	0.0009	0.70
>19	0.0039	0.36	0.0034	0.38	0.0037	0.35

Estimates of proportion at age of snapper from the Bay of Plenty longline fishery in 1997–98
Otolith sample size = 687

					Age-length key Longline	
Age	Spring		Summer		Spr-sum	
(years)	*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	0.0001	1.05	0.0001	1.08	0.0001	1.03
4	0.0420	0.13	0.0337	0.14	0.0394	0.13
5	0.0555	0.13	0.0459	0.14	0.0525	0.13
6	0.0780	0.13	0.0679	0.13	0.0749	0.13
7	0.2369	0.07	0.2047	0.07	0.2269	0.07
8	0.1302	0.11	0.1172	0.11	0.1261	0.11
9	0.2420	0.07	0.2246	0.07	0.2366	0.07
10	0.0782	0.14	0.0862	0.14	0.0807	0.14
11	0.0227	0.26	0.0310	0.26	0.0253	0.26
12	0.0495	0.16	0.0703	0.16	0.0560	0.16
13	0.0339	0.19	0.0591	0.18	0.0418	0.18
14	0.0113	0.38	0.0145	0.37	0.0123	0.37
15	0.0017	0.59	0.0065	0.42	0.0032	0.46
16	0.0013	0.66	0.0053	0.31	0.0026	0.39
17	0.0092	0.32	0.0145	0.29	0.0108	0.29
18	0.0041	0.62	0.0073	0.64	0.0051	0.61
19	0.0012	0.45	0.0017	0.43	0.0014	0.32
>19	0.0015	0.39	0.0052	0.24	0.0027	0.22

Appendix 2 – **continued:**

Estimates of proportion at age with coefficients of variation (analytical & bootstrap estimates, *c.v. (an.)* & *c.v. (bt.)* respectively), for snapper from the Hauraki Gulf longline fishery in 1997–98

Otolith sample size = 968

Age (years)	Random age frequency		Longline Spr-sum
	P.j.	*c.v. (an)*	*c.v. (bt)*
1	0.0000	0.00	0.00
2	0.0000	0.00	0.00
3	0.0000	0.00	0.00
4	0.0103	0.52	0.64
5	0.0248	0.22	0.32
6	0.0302	0.20	0.28
7	0.1947	0.10	0.12
8	0.0766	0.17	0.20
9	0.2434	0.07	0.09
10	0.1219	0.12	0.15
11	0.0553	0.16	0.21
12	0.0669	0.14	0.17
13	0.0547	0.13	0.19
14	0.0393	0.20	0.26
15	0.0057	0.45	0.61
16	0.0067	0.54	0.64
17	0.0209	0.29	0.34
18	0.0140	0.31	0.41
19	0.0071	0.45	0.54
>19	0.0275	0.23	0.28

Estimates of proportion at age with coefficients of variation (analytical & bootstrap estimates, *c.v. (an.)* & *c.v. (bt.)* respectively), for snapper from the East Northland longline fishery in 1997–98

Otolith sample size = 952

Age (years)	Random age frequency		Longline Spr-sum
	P.j.	*c.v. (an)*	*c.v. (bt)*
1	0.0000	0.00	0.00
2	0.0000	0.00	0.00
3	0.0015	0.87	1.20
4	0.0137	0.44	0.58
5	0.0432	0.20	0.29
6	0.0410	0.32	0.40
7	0.2080	0.14	0.17
8	0.1107	0.11	0.17
9	0.2045	0.10	0.14
10	0.1046	0.15	0.19
11	0.0524	0.14	0.25
12	0.0697	0.17	0.24
13	0.0376	0.40	0.42
14	0.0151	0.27	0.38
15	0.0116	0.36	0.51
16	0.0136	0.32	0.42
17	0.0194	0.31	0.40
18	0.0026	0.52	0.69
19	0.0072	0.37	0.47
>19	0.0436	0.35	0.36

Appendix 3 : **Estimated mean weight at age (kg) and *c.v.* s for snapper fisheries in SNA 1 and SNA 8 in 1997–98**

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

Estimates of mean weight at age (kg) of snapper from the west coast single trawl fishery in 1997–98

Otolith sample size = 1 095

Age	Spring		Summer		Spr-sum		
(years)	Mean	*c.v.*	Mean	*c.v.*	Mean	*c.v.*	*n*
1	–	–	–	–	–	–	–
2	–	–	0.25	0.01	0.25	0.01	1
3	0.50	0.01	0.47	0.01	0.48	0.01	190
4	0.78	0.01	0.77	0.01	0.78	0.01	214
5	0.98	0.01	0.97	0.01	0.98	0.01	269
6	1.20	0.03	1.19	0.03	1.19	0.03	54
7	1.53	0.01	1.52	0.01	1.52	0.01	152
8	1.77	0.03	1.75	0.03	1.76	0.03	31
9	2.16	0.04	2.15	0.04	2.16	0.04	37
10	2.31	0.13	2.33	0.16	2.32	0.14	11
11	2.46	0.05	2.51	0.06	2.47	0.05	19
12	2.69	0.04	2.80	0.05	2.72	0.04	23
13	2.92	0.03	2.99	0.03	2.94	0.03	50
14	3.20	0.05	3.28	0.05	3.23	0.05	17
15	3.08	0.09	3.04	0.09	3.07	0.09	3
16	4.09	0.10	3.79	0.06	3.98	0.08	3
17	4.18	0.03	4.27	0.06	4.21	0.04	4
18	4.41	0.06	4.55	0.07	4.47	0.07	2
19	5.56	0.07	4.95	0.02	5.35	0.06	3
>19	4.83	0.14	4.73	0.12	4.80	0.13	12

Estimates of mean weight at age (kg) of snapper from the Bay of Plenty longline fishery in 1997–98

Otolith sample size = 687

Age	Spring		Summer		Spr-sum		
(years)	Mean	*c.v.*	Mean	*c.v.*	Mean	*c.v.*	*n*
1	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	0.36	0.01	0.36	0.01	0.36	0.01	1
4	0.47	0.02	0.48	0.03	0.47	0.02	60
5	0.54	0.03	0.55	0.03	0.54	0.03	54
6	0.63	0.03	0.64	0.03	0.63	0.03	60
7	0.70	0.02	0.70	0.02	0.70	0.02	154
8	0.81	0.02	0.84	0.04	0.82	0.03	75
9	0.93	0.02	0.95	0.02	0.93	0.02	130
10	1.11	0.04	1.20	0.05	1.14	0.04	47
11	1.27	0.07	1.38	0.07	1.31	0.07	16
12	1.35	0.04	1.48	0.05	1.41	0.05	35
13	1.60	0.05	1.71	0.04	1.65	0.05	27
14	1.44	0.16	1.66	0.15	1.52	0.16	8
15	2.31	0.15	2.48	0.12	2.41	0.13	2
16	3.31	0.05	3.48	0.03	3.42	0.04	2
17	2.81	0.10	2.97	0.10	2.88	0.10	7
18	1.39	0.10	1.47	0.09	1.43	0.10	3
19	3.94	0.01	3.94	0.01	3.94	0.01	1
>19	4.67	0.11	4.65	0.02	4.66	0.04	5

Appendix 3 – **continued:**

Estimates of mean weight at age (kg) of snapper from the Hauraki Gulf longline fishery in 1997–98

Otolith sample size = 968

Age (years)	Spr-sum Mean	*c.v.*	*n*
1	–	–	–
2	–	–	–
3	–	–	–
4	0.41	0.20	8
5	0.58	0.09	24
6	0.62	0.07	30
7	0.69	0.06	170
8	0.77	0.06	65
9	0.89	0.04	220
10	1.18	0.06	119
11	1.32	0.12	54
12	1.42	0.09	77
13	1.51	0.10	63
14	2.08	0.18	40
15	1.93	0.21	6
16	1.49	0.36	7
17	2.00	0.11	28
18	2.32	0.10	12
19	2.32	0.18	9
>19	3.04	0.11	36

Estimates of mean weight at age (kg) of snapper from the East Northland longline fishery in 1997–98

Otolith sample size = 952

Age (years)	Spr-sum Mean	*c.v.*	*n*
1	–	–	–
2	–	–	–
3	0.41	0.61	2
4	0.54	0.08	15
5	0.60	0.07	48
6	0.61	0.06	30
7	0.70	0.03	135
8	0.84	0.07	105
9	0.86	0.04	165
10	1.00	0.06	95
11	1.19	0.13	51
12	1.45	0.09	70
13	1.43	0.10	44
14	1.92	0.12	21
15	2.26	0.18	12
16	2.57	0.19	21
17	1.71	0.09	31
18	1.61	0.22	7
19	2.29	0.10	14
>19	2.77	0.08	86

Appendix 4 : **Age-length keys derived from otolith samples collected from snapper fisheries in SNA 1 and SNA 8 in 1997–98**

Estimates of proportion of length at age for snapper sampled from the west coast, spring and summer 1997–98 (Note: Aged to 01/01/98)

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	0.50	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
23	0	0	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
24	0	0	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
25	0	0	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
26	0	0	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
27	0	0	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
28	0	0	0.96	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
29	0	0	0.72	0.28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
30	0	0	0.32	0.49	0.17	0	0	0.02	0	0	0	0	0	0	0	0	0	0	0	0	47
31	0	0	0.08	0.75	0.14	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
32	0	0	0.02	0.63	0.34	0	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	64
33	0	0	0.02	0.56	0.38	0.03	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	64
34	0	0	0	0.35	0.57	0.05	0.01	0	0	0.01	0	0	0	0	0	0	0	0	0	0	79
35	0	0	0	0.29	0.65	0.05	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	63
36	0	0	0	0.15	0.69	0.08	0.08	0	0	0	0	0	0	0	0	0	0	0	0	0	52
37	0	0	0	0.02	0.77	0.17	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0	47
38	0	0	0	0.05	0.49	0.24	0.22	0	0	0	0	0	0	0	0	0	0	0	0	0	41
39	0	0	0	0.03	0.47	0.21	0.21	0	0.08	0	0	0	0	0	0	0	0	0	0	0	38
40	0	0	0	0	0.18	0.05	0.66	0.08	0	0.03	0	0	0	0	0	0	0	0	0	0	38
41	0	0	0	0	0.09	0.13	0.69	0.06	0	0	0.03	0	0	0	0	0	0	0	0	0	32
42	0	0	0	0	0	0.09	0.77	0.14	0	0	0	0	0	0	0	0	0	0	0	0	22
43	0	0	0	0	0.04	0.12	0.72	0.08	0.04	0	0	0	0	0	0	0	0	0	0	0	25
44	0	0	0	0	0	0.04	0.68	0.16	0.08	0	0	0	0.04	0	0	0	0	0	0	0	25
45	0	0	0	0	0	0	0.46	0.31	0.08	0	0.08	0	0.08	0	0	0	0	0	0	0	13
46	0	0	0	0	0	0.06	0.38	0.25	0.19	0.06	0	0	0.06	0	0	0	0	0	0	0	16
47	0	0	0	0	0	0	0.44	0.17	0.17	0	0.06	0.11	0	0.06	0	0	0	0	0	0	18
48	0	0	0	0	0	0	0.12	0.12	0.29	0	0.29	0.06	0.06	0	0	0	0	0	0	0.06	17
49	0	0	0	0	0	0	0.22	0.06	0.44	0.11	0	0.11	0	0.06	0	0	0	0	0	0	18
50	0	0	0	0	0	0	0	0	0.17	0	0.11	0.33	0.17	0.17	0.06	0	0	0	0	0	18
51	0	0	0	0	0	0	0	0.09	0.18	0.23	0.05	0.14	0.32	0	0	0	0	0	0	0	22
52	0	0	0	0	0	0	0	0	0	0	0.13	0.20	0.53	0.13	0	0	0	0	0	0	15
53	0	0	0	0	0	0	0	0	0.08	0	0.17	0	0.67	0	0.08	0	0	0	0	0	12
54	0	0	0	0	0	0	0	0	0.13	0	0.13	0.20	0.4	0.07	0	0.07	0	0	0	0	15
55	0	0	0	0	0	0	0	0	0	0	0.14	0	0.71	0.14	0	0	0	0	0	0	7
56	0	0	0	0	0	0	0	0	0	0	0.13	0.13	0.38	0.38	0	0	0	0	0	0	8
57	0	0	0	0	0	0	0	0	0.17	0	0	0	0.33	0.33	0.17	0	0	0	0	0	6
58	0	0	0	0	0	0	0	0	0	0.33	0	0.33	0	0	0	0	0.33	0	0	0	3
59	0	0	0	0	0	0	0	0	0	0	0	0	0.33	0.33	0	0.33	0	0	0	0	3
60	0	0	0	0	0	0	0	0	0	0	0	0	0.25	0.25	0	0	0.25	0.25	0	0	4
61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	0	0	1
62	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50	0	0	0	0	0	0.50	2
63	0	0	0	0	0	0	0	0	0	0	0	0.50	0.50	0	0	0	0	0	0	0	2
64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50	0.50	0	2
65	0	0	0	0	0	0	0	0	0	0	0	0	0.50	0	0	0.50	0	0	0	0	2
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	2
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	2
68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	0	0	1
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	1
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	1.00	1
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	1
73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	1
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	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	1.00	1
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
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	1
Total																					1 095

Appendix 4 – **continued:**

Estimates of proportion of length at age for snapper sampled from the Bay of Plenty, spring and summer 1997–98 (Note: Aged to 01/01/98)

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	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
24	0	0	0	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
25	0	0	0.05	0.65	0.15	0.15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
26	0	0	0	0.64	0.27	0.05	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	22
27	0	0	0	0.45	0.21	0.15	0.18	0	0	0	0	0	0	0	0	0	0	0	0	0	33
28	0	0	0	0.18	0.36	0.16	0.28	0.02	0	0	0	0	0	0	0	0	0	0	0	0	50
29	0	0	0	0.06	0.15	0.21	0.48	0.08	0.02	0	0	0	0	0	0	0	0	0	0	0	52
30	0	0	0	0.05	0.07	0.17	0.47	0.15	0.08	0	0	0	0	0	0	0	0	0	0	0	59
31	0	0	0	0.02	0.12	0.20	0.33	0.18	0.12	0	0.04	0	0	0	0	0	0	0	0	0	51
32	0	0	0	0	0.02	0.14	0.42	0.14	0.22	0.04	0	0.02	0	0	0	0	0	0	0	0	50
33	0	0	0	0	0.02	0.02	0.33	0.29	0.33	0	0	0	0	0.02	0	0	0	0	0	0	52
34	0	0	0	0	0	0.04	0.20	0.20	0.39	0.14	0	0.04	0	0	0	0	0	0	0	0	51
35	0	0	0	0	0	0.02	0.16	0.18	0.39	0.20	0.02	0	0	0.02	0	0	0	0	0	0	44
36	0	0	0	0	0	0.03	0.16	0.10	0.58	0.10	0	0	0.03	0	0	0	0	0	0	0	31
37	0	0	0	0	0	0	0.07	0.11	0.46	0.14	0.04	0.11	0.07	0	0	0	0	0	0	0	28
38	0	0	0	0	0	0	0.05	0.09	0.41	0.18	0.09	0.14	0	0	0	0	0	0.05	0	0	22
39	0	0	0	0	0	0	0	0	0.26	0.16	0.11	0.32	0.11	0.05	0	0	0	0	0	0	19
40	0	0	0	0	0	0	0	0.11	0.28	0.28	0.00	0.11	0.17	0.06	0	0	0	0	0	0	18
41	0	0	0	0	0	0	0	0	0.09	0.09	0.09	0.45	0.18	0	0	0	0.09	0	0	0	11
42	0	0	0	0	0	0	0	0.05	0.05	0.20	0.15	0.30	0.15	0.05	0	0	0	0.05	0	0	20
43	0	0	0	0	0	0	0	0	0	0.17	0.17	0.17	0.33	0	0	0	0	0.17	0	0	6
44	0	0	0	0	0	0	0	0	0	0.29	0.14	0	0.43	0	0.14	0	0	0	0	0	7
45	0	0	0	0	0	0	0	0	0.20	0.20	0.20	0	0.20	0.20	0	0	0	0	0	0	5
46	0	0	0	0	0	0	0	0	0	0	0	0.40	0.60	0	0	0	0	0	0	0	5
47	0	0	0	0	0	0	0	0.25	0	0	0.25	0.25	0.25	0	0	0	0	0	0	0	4
48	0	0	0	0	0	0	0	0	0	0	0	0.67	0.33	0	0	0	0	0	0	0	3
49	0	0	0	0	0	0	0	0	0	0	0	0	0.50	0	0	0	0.50	0	0	0	2
50	0	0	0	0	0	0	0	0	0	0	0	0.50	0	0.50	0	0	0	0	0	0	2
51	0	0	0	0	0	0	0	0	0	0.50	0	0	0	0	0	0	0.50	0	0	0	2
52	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	0	0	0	0	0	0	2
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	0	0	0	0	1
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50	0	0.50	0	0	0	0	2
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	0	0	1
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	0	0	1
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	0	0	0	1
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	0	0	1
59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	0	1
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	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	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	1
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	1.00	0	0	0	1
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	1.00	1
Total																					687

Appendix 4 – **continued:**

Estimates of proportion of length at age for snapper sampled from the Hauraki Gulf, spring and summer 1997–98 (Note: Aged to 01/01/98)

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	0.17	0.17	0.17	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	6
25	0	0	0	0	0	0.18	0.45	0.27	0.09	0	0	0	0	0	0	0	0	0	0	0	11
26	0	0	0	0.14	0.05	0.09	0.64	0	0.09	0	0	0	0	0	0	0	0	0	0	0	22
27	0	0	0	0.04	0.17	0.13	0.35	0.13	0.17	0	0	0	0	0	0	0	0	0	0	0	23
28	0	0	0	0.03	0.10	0.07	0.38	0.10	0.28	0.03	0	0	0	0	0	0	0	0	0	0	29
29	0	0	0	0.02	0.07	0.07	0.48	0.14	0.20	0.02	0	0	0	0	0	0	0	0	0	0	44
30	0	0	0	0	0.05	0.08	0.40	0.08	0.18	0.05	0.05	0.05	0.03	0.02	0	0	0	0	0	0	60
31	0	0	0	0.02	0.10	0.02	0.24	0.10	0.35	0.08	0.02	0.04	0	0.02	0	0	0	0	0	0	49
32	0	0	0	0	0.05	0.05	0.34	0.06	0.22	0.13	0.03	0.03	0.06	0.03	0	0	0	0	0	0	64
33	0	0	0	0	0	0.09	0.21	0.14	0.29	0.18	0.05	0.02	0	0.02	0	0	0	0	0	0	56
34	0	0	0	0	0	0	0.19	0.06	0.42	0.17	0.06	0.02	0.04	0.04	0	0	0	0	0	0	48
35	0	0	0	0	0	0.01	0.12	0.12	0.38	0.12	0.04	0.09	0.03	0.03	0	0.03	0.04	0	0	0	69
36	0	0	0	0	0	0.02	0.08	0.10	0.42	0.20	0.03	0.08	0.02	0.02	0	0	0.02	0	0	0	59
37	0	0	0	0	0.02	0.02	0.12	0.07	0.30	0.16	0.14	0.05	0.07	0.02	0	0.02	0	0	0	0	43
38	0	0	0	0	0	0	0.10	0.06	0.33	0.15	0.13	0.17	0.02	0.02	0	0	0	0	0.02	0	48
39	0	0	0	0	0	0	0.06	0.06	0.33	0.22	0.08	0.08	0.14	0.03	0	0	0	0	0	0	36
40	0	0	0	0	0	0	0.12	0.04	0.20	0.16	0.12	0.16	0.04	0.12	0	0	0.04	0	0	0	25
41	0	0	0	0	0	0	0.03	0.03	0.21	0.18	0.12	0.12	0.12	0.06	0.03	0.03	0.03	0	0	0.03	33
42	0	0	0	0	0	0	0	0.04	0.07	0.33	0.22	0.15	0.15	0	0	0	0.04	0	0	0	27
43	0	0	0	0	0	0	0	0	0.06	0.32	0.03	0.19	0.23	0.06	0.03	0	0.06	0	0	0	31
44	0	0	0	0	0	0	0	0	0.09	0.09	0.05	0.18	0.18	0.23	0	0.05	0.05	0.05	0.05	0	22
45	0	0	0	0	0	0	0	0	0.14	0.09	0	0.32	0.14	0	0.05	0	0.14	0.05	0	0.09	22
46	0	0	0	0	0	0	0	0	0.10	0.19	0.05	0.10	0.19	0.14	0.05	0	0	0.10	0.05	0.05	21
47	0	0	0	0	0	0	0	0	0.14	0.21	0.14	0.07	0.21	0	0	0	0	0	0	0.21	14
48	0	0	0	0	0	0	0	0	0.05	0.05	0.05	0.14	0.09	0.09	0.09	0	0.27	0.05	0.05	0.09	22
49	0	0	0	0	0	0	0	0	0	0	0	0.30	0.20	0.30	0	0	0	0.10	0	0.10	10
50	0	0	0	0	0	0	0	0	0	0.11	0	0.33	0.11	0.11	0	0.11	0	0	0.11	0.11	9
51	0	0	0	0	0	0	0	0	0	0	0.18	0.18	0.27	0.09	0	0	0	0	0.09	0.18	11
52	0	0	0	0	0	0	0	0	0	0	0	0	0.40	0.20	0	0.20	0	0	0	0.20	5
53	0	0	0	0	0	0	0	0	0	0	0.17	0	0.33	0	0	0	0.17	0.33	0	0	6
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0.10	0	0	0.40	0.30	0	0.20	10
55	0	0	0	0	0	0	0	0	0	0	0	0.20	0	0	0	0	0	0	0.20	0.60	5
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50	0.50	2
57	0	0	0	0	0	0	0	0	0	0	0	0	0.33	0.33	0	0	0	0	0	0.33	3
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0.14	0	0	0.43	0.14	0.14	0.14	7
59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	5
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0.20	0	0	0.20	0	0	0.60	5
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	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	3
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	1.00	1
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																					968

Appendix 4 – **continued:**

Estimates of proportion of length at age for snapper sampled from East Northland, spring and summer 1997–98 (Note: Aged to 01/01/98)

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0.13	0.25	0.38	0.13	0.13	0	0	0	0	0	0	0	0	0	0	0	0	0	8
27	0	0	0.20	0.40	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
28	0	0	0	0.07	0.26	0.19	0.30	0.07	0.11	0	0	0	0	0	0	0	0	0	0	0	27
29	0	0	0	0.07	0.22	0.07	0.35	0.15	0.13	0	0	0	0	0	0	0	0	0	0	0	54
30	0	0	0	0.01	0.12	0.13	0.35	0.17	0.17	0.01	0.01	0.01	0	0	0	0	0	0	0	0	69
31	0	0	0	0.02	0.12	0.08	0.32	0.18	0.18	0.07	0.02	0	0.02	0	0	0	0	0	0	0	60
32	0	0	0	0.03	0.06	0.05	0.20	0.15	0.32	0.11	0.03	0.04	0.01	0	0	0	0	0	0	0	79
33	0	0	0	0.01	0.03	0	0.29	0.19	0.28	0.09	0.03	0.04	0.03	0	0	0	0	0	0	0	68
34	0	0	0	0	0	0.02	0.17	0.13	0.38	0.17	0.08	0	0.03	0.02	0	0	0	0	0	0	60
35	0	0	0	0	0.02	0.02	0.14	0.17	0.35	0.06	0.08	0.10	0.02	0	0	0	0.03	0.02	0	0	63
36	0	0	0	0	0.02	0	0.07	0.18	0.16	0.25	0.09	0.11	0.05	0.04	0	0	0.02	0	0	0	55
37	0	0	0	0	0	0	0.06	0.08	0.18	0.12	0.14	0.22	0.10	0.06	0	0	0	0	0	0.06	51
38	0	0	0	0	0	0	0.03	0.13	0.18	0.13	0.13	0.10	0.15	0.03	0.05	0.03	0.03	0	0	0.05	40
39	0	0	0	0	0	0	0.03	0	0.16	0.25	0.13	0.19	0.03	0.06	0.03	0	0	0.03	0	0.09	32
40	0	0	0	0	0	0	0	0.17	0.09	0.22	0.13	0.09	0.09	0	0	0.04	0.09	0	0	0.09	23
41	0	0	0	0	0	0	0	0	0.14	0.18	0.09	0.14	0.09	0.05	0	0.05	0.14	0	0.05	0.09	22
42	0	0	0	0	0	0	0	0.04	0.08	0.04	0.04	0.12	0.23	0	0.04	0.04	0.19	0.04	0	0.15	26
43	0	0	0	0	0	0	0	0.06	0.06	0.19	0.03	0.13	0	0.03	0.03	0.06	0.06	0.03	0.10	0.19	31
44	0	0	0	0	0	0	0	0.05	0.05	0.20	0.05	0.10	0.05	0	0.10	0.10	0.10	0	0.05	0.15	20
45	0	0	0	0	0	0	0	0.05	0.14	0.18	0.09	0.09	0.18	0	0.05	0.14	0	0.05	0	0.05	22
46	0	0	0	0	0	0	0	0	0	0.16	0.05	0.05	0.05	0.05	0	0	0.16	0.05	0.11	0.32	19
47	0	0	0	0	0	0	0	0	0	0	0	0.14	0	0.21	0.07	0.07	0	0	0.14	0.36	14
48	0	0	0	0	0	0	0	0	0	0	0	0.11	0.11	0.11	0.05	0.11	0.21	0	0	0.32	19
49	0	0	0	0	0	0	0	0	0	0	0	0.15	0.08	0	0.08	0	0.15	0	0.08	0.46	13
50	0	0	0	0	0	0	0	0	0	0.10	0.10	0.10	0.10	0.10	0	0	0	0	0	0.50	10
51	0	0	0	0	0	0	0	0	0	0	0.08	0.25	0.17	0	0	0.08	0	0	0.08	0.33	12
52	0	0	0	0	0	0	0	0	0	0	0	0.13	0	0.13	0.13	0.13	0.13	0.13	0	0.25	8
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0.29	0	0	0.14	0	0	0.57	7
54	0	0	0	0	0	0	0	0	0	0	0.33	0	0	0	0	0.33	0	0	0.33	0	3
55	0	0	0	0	0	0	0	0	0	0	0	0.29	0	0	0	0.29	0	0	0.14	0.29	7
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.25	0	0	0.75	4
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.25	0	0	0.75	4
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	2
59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.40	0	0	0	0.60	5
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	3
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	1.00	1
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.50	0.50	2
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	1.00	1
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	1
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	1
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	1.00	1
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																					952