GUARDIANS OF PAUATAHANUI INLET
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NIWA

Taihoro Nukurangi

Cockles in Pauatahanui Inlet: results of the 2001 sampling programme.

NIWA Client Report: NEL02401/2
June 2002

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Executive Summary

Community volunteers undertook an Inlet-wide survey of the cockle populations in Pauatahanui Inlet during November 2001. This represents the fifth survey of the same sites since 1976.

This series of cockle surveys is possibly the longest running and most comprehensive undertaken by community volunteers in New Zealand.

The results show that cockles throughout the Inlet are distributed in similar patterns as found previously, with the greatest densities along the southern shores. Fewer cockles were recorded along the northern shore, consistent with previous surveys. Increasing densities of cockles occurred down the shore, as expected.

The mean size of cockles increased down the shore at all localities. Juveniles were recorded in similar but slightly lower numbers than in 1998, but still considerably more than in surveys prior to 1998.

The total estimated population of cockles in the Inlet, based on the 2001 survey, was around 210 million, slightly down from the 257 million estimated in 1998, but up from 180 million in 1995, although both differences are non-significant.

In general, the cockle population appears to have stabilised over the past two surveys, which provides an excellent base upon which future changes can be measured.

1. INTRODUCTION

The Guardians of Pauatahanui Inlet is a community group of residents concerned about the ecological health of the Inlet. As part of that concern, they have completed several surveys of the cockle (*Austrovenus stutchburyi*) population throughout the Inlet, in collaboration with NIWA.

The first systematic sampling of the cockles in the Inlet was undertaken in 1976 by the then New Zealand Oceanographic Institute, DSIR, as part of the wider Pauatahanui Environmental Programme (Healy 1980). These results were published by Richardson *et al* (1979). A second survey, using most of the same sites as the 1976 survey, was undertaken in 1992, this time with the assistance of community volunteers, and overseen by NIWA (Grange 1993). That survey showed a significant decrease in the numbers of cockles in the Inlet since 1976, and indicated fewer recruits (juveniles ≤10 mm shell length) in the population. The most pronounced decreases were around the south-eastern shores of the Inlet. A third survey, undertaken in November 1995, resampled the same sites using the same methodology as the 1992 survey, and aimed to further document any changes in the population. Those results showed that the population decline had continued (Grange *et al* 1996). A fourth survey, in November 1998, repeated the previous surveys (Grange & Crocker, 1999). This report presents the results of the fifth survey, completed during November 2001, using the same methodology and sites as previous surveys.

The total estimated population of cockles in Pauatahanui Inlet declined from 438-608 million individuals in 1976, to 187-257 million in 1992, and then to 146-214 million in 1995 (Grange *et al* 1996). The population was estimated to have increased slightly to 215-299 million in 1998 (Grange & Crocker 1999). The 1995 and 1998 surveys recorded a greater overall abundance of juveniles compared with the 1992 survey and Grange *et al* (1996) suggested that this could indicate that the population decline may reverse in subsequent years.

2. METHODS

As in 1998, community volunteers were each provided with a series of sheets that explained the sample sites, method of measurement and placing of quadrats. They were also provided with recording sheets (see Grange & Crocker 1999 for examples). Three randomly placed, replicate quadrats of 0.1 m^2 were sampled from each of 4 tidal heights along each transect, as in previous surveys. The entire sample was sieved to remove small individuals and each cockle collected was measured to the nearest 1 mm and

returned to the substrate. Sieve mesh sizes varied with volunteer, but most were reported to be 4-5 mm (Neil Bellingham, *pers. comm.*).

Densities for each site were calculated from the mean numbers recorded in each quadrat from all transects within a locality. Mean densities at each tidal height were also calculated and comparisons made with the 1976, 1992, 1995, and 1998 surveys.

Shell length measurements from each of the 3 replicate quadrats at each site were combined to produce an estimate of population size structure and allowed histograms to be produced to compare sites and tidal heights. The numbers of recruits (defined as individuals ≤10 mm, based on Larcombe, 1971 and Richardson *et al*, 1979) were also analysed to compare with previous surveys.

An additional transect on the west side of Moorhouse Point was included this year because of reported high densities of cockles in this area. The results of this transect are included in this report as Transect 3A, Seaview Rd.

3. RESULTS

3.1. Cockle Densities

The densities of cockles recorded in each quadrat ranged from zero, to a maximum of 114 per $0.1m^2$ (at upper mid tide, Mana) and 118 per $0.1m^2$ (at lower mid tide, Pauatahanui). The mean numbers of cockles recorded at each site are shown in Figure 1. The maximum mean density at any one site (mean of the 3 quadrats) was also recorded at LMT, Browns Bay (151 per $0.1m^2$). The highest mean densities were recorded at Motukaraka and Mana transects. However, at each of these localities, densities varied considerably among transects. Localities that supported low mean densities of cockles occurred at Cambourne, Duck Creek, and Motukaraka West. These are the same general trends as recorded in previous surveys.

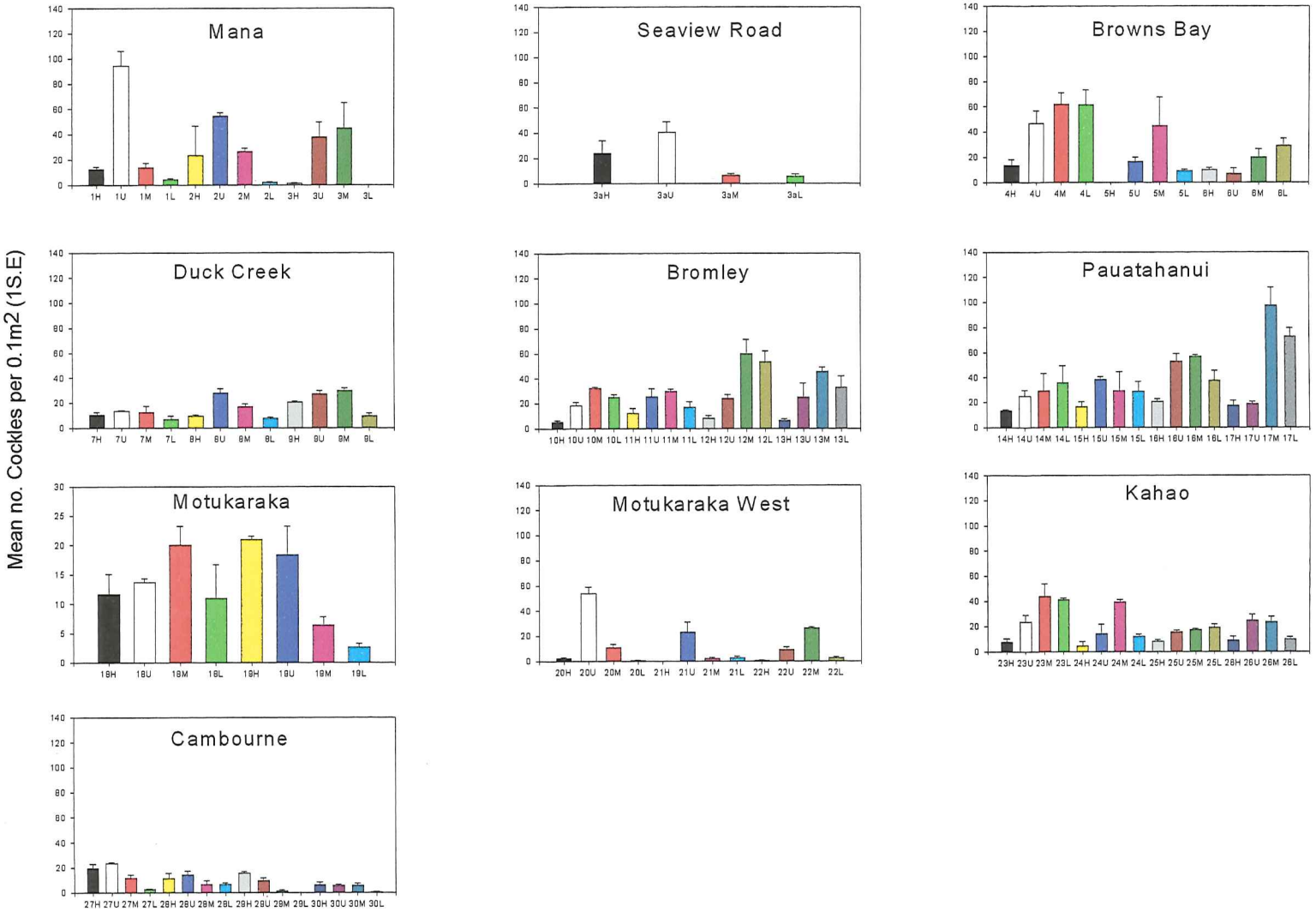


Figure 1. Mean densities of cockles recorded from each transect at each locality, 2001. H = High Tide; U = Upper Mid-tide; L = Lower Mid-tide; L = Low Tide.

The total numbers of cockles collected at each transect show a similar trend to the mean numbers per quadrat (Fig. 2). Browns Bay, Pauatahanui and Bromley transects had the greatest total numbers of cockles, as did Mana, but there was greater variability among transects at Browns Bay, with transects 5 and 6 supporting significantly fewer cockles that the other two transects. Cambourne transects supported the lowest total population.

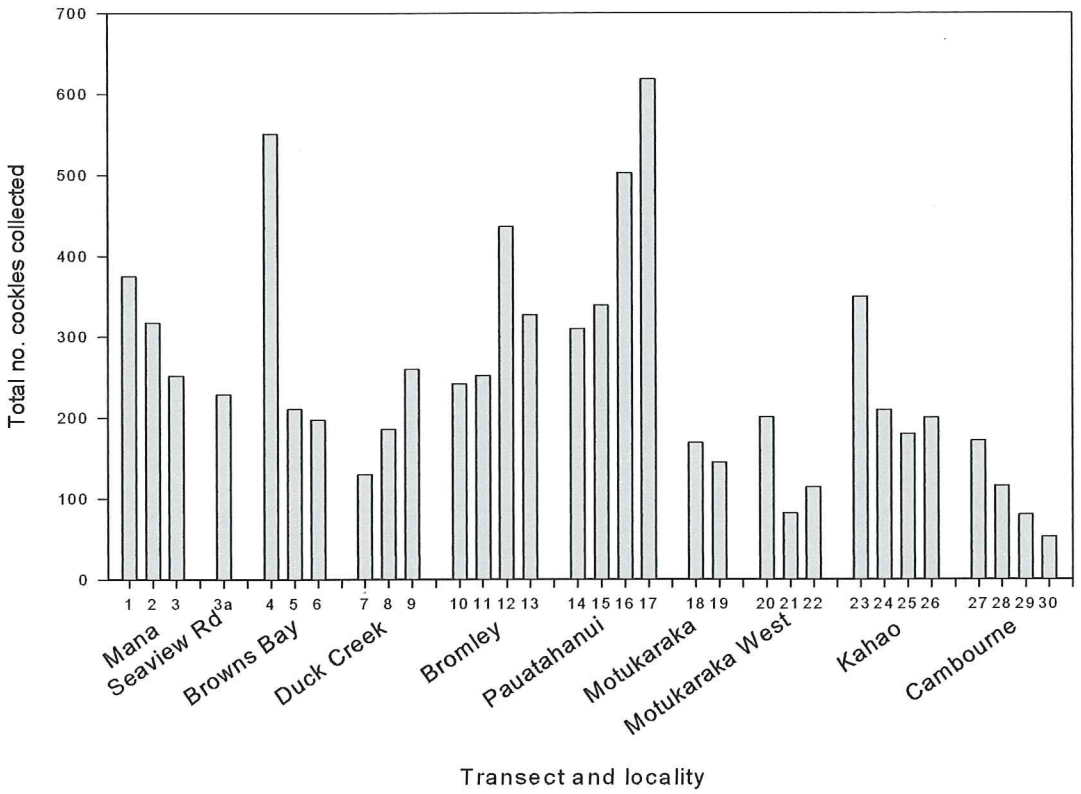


Figure 2. Total numbers of cockles collected down each transect at each locality, November 2001.

Generally, there were no obvious trends of increased numbers of cockles down the shore, with 5 of the sites having the greatest densities at high tide and 3 having the greatest densities at either lower mid or low tide quadrats (Fig. 2). When all results are combined, however, the maximum densities of cockles occurred at upper and lower mid-tidal sites (approximately 27 & 28 per 0.1.m^2 respectively) (Fig. 3). High tidal sites supported a mean of only 11 cockles per 0.1 m^2. This was not unexpected, and reflects similar trends to previous surveys, although maximum densities were recorded at lower mid tidal sites in 1998 and low tidal sites in 1995.

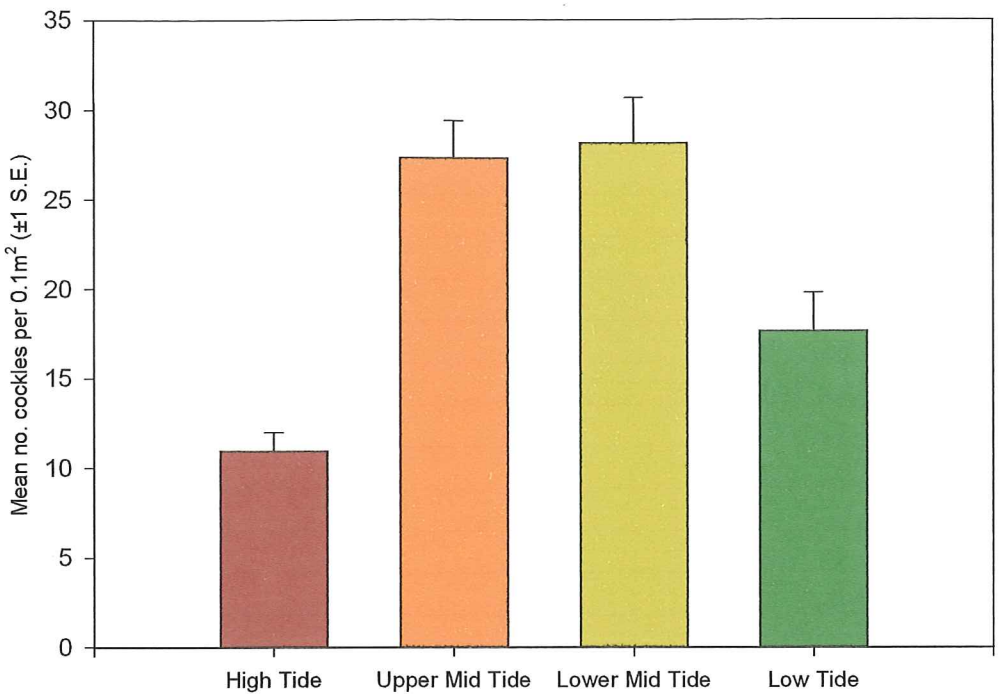


Figure 3. Distribution of cockles at each tidal height, all localities combined, November 2001.

An estimate of the total cockle population in the Inlet has been calculated from the mean densities of cockles in each quadrat (Table 1), as in previous surveys, assuming a total intertidal area of 1 km^2 (Healy 1980).

Table 1. Densities of cockles in Pauatahanui Inlet and total population estimate, 1975-1998.

	1976	1992	1995	1998	2001
Max number per quadrat	208	168	191	273	118
Total counted	15,633	7,976	6,484	9,264	7,807
Mean number per quadrat	52.3	22.2	18	25.7	21
99% CL on mean	43.8-60.8	18.7-25.7	14.6-21.4	21.5-29.9	18.2-23.8
Total population estimate (millions)	438-608	187-257	146-214	215-299	182-238

The maximum number of cockles recorded per quadrat (118) was the lowest recorded in any survey. However, the total numbers of cockles counted during the survey were greater than in 1995 and 1998, and very close to those recorded in 1992 (Table 1).

Figure 4 shows the trend in estimated total population since 1976. Although it appears as though the 2001 results have continued the downward trend, these figures are not

significantly different since 1992, so it is not possible to state that the population has continued to decrease since 1992.

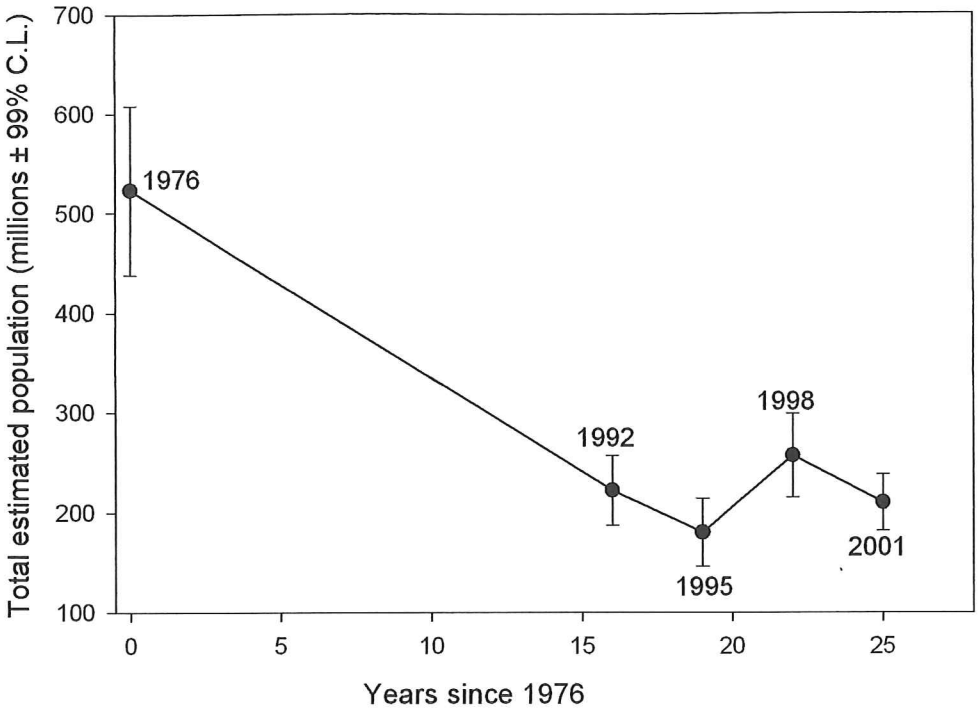


Figure 4. Trend in total cockle population within Pauatahanui Inlet, 1975-2001.

Previous surveys indicated that there had been pronounced decreases in cockle densities along the eastern and south-eastern shores between 1976 and 1998. In particular, transects at Motukaraka, Kahao and Cambourne showed consistent decreases over time (Grange *et al* 1996; Fig. 4). Figure 5 shows the mean numbers of cockles per transect over time. Overall, 20 of the 30 transects (67%) show a decrease in numbers since the previous sampling period in 1998, but only 8 (27%) had fewer numbers than in 1995. All transects at Pauatahanui and Bromley supported fewer cockles than in 1998. No transects have shown a continual increase in numbers over time.

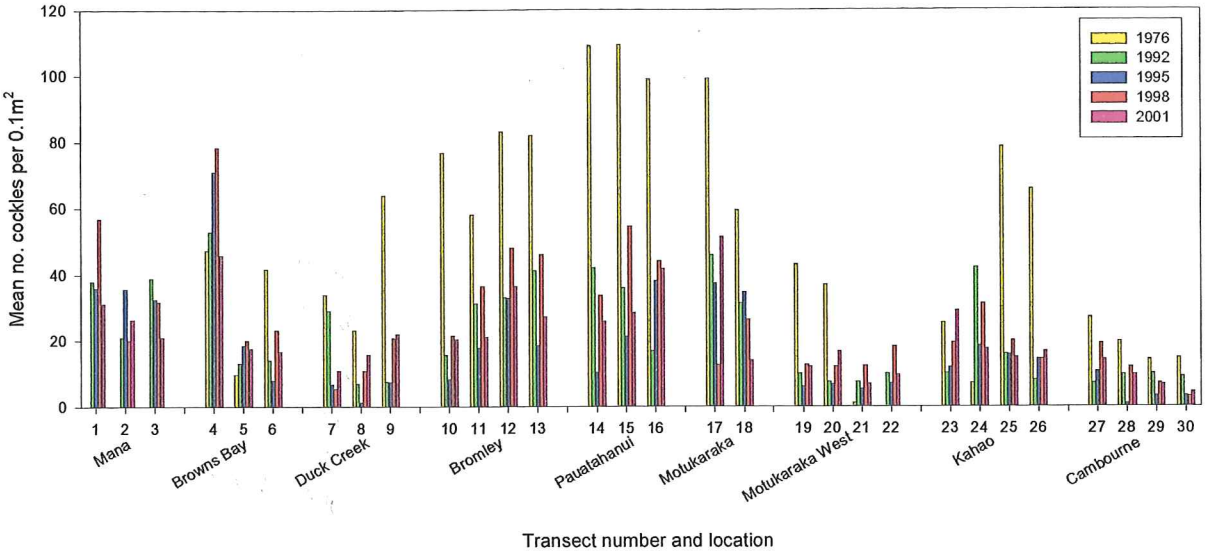


Figure 5. Mean number of cockles recorded at each site over the five surveys, 1975-2001.

3.2. Cockle Size Frequencies

Histograms of the size frequencies of cockles at all sites are presented in Appendix 1.

3.2.1. High Tide

Most high tidal localities showed a unimodal size frequency distribution as in previous years, with modes between 15-20 or 20-25 mm. At two localities, Duck Creek and Bromley, there appears to be a second mode with adult cockles greater than 35 mm. Although the numbers at Bromley are too small to be significant, the larger cockles at Duck Creek appear to be real, especially since they are similar to results from 1998. Juvenile cockles, < 10 mm shell length, were recorded at all high tidal sites.

3.2.2. Upper-mid Tide

At the upper mid-tidal sites, far more cockles were recorded at Mana than at other locations note y-axis on histograms, Appendix 1). Modes varied among localities, with most cockles being between 15-20 mm in length at Bromley, Pauatahanui, and Kahao, 20-25 mm at Browns Bay, Motukaraka, and Motukaraka West, 25-30 mm at Mana, Duck Creek, and Cambourne, and 30-35 mm at the new site, Seaview Rd. Juveniles occurred at all localities, except Seaview Road, and very small individuals, less than 5 mm shell length, occurred at 6 of the 9 localities, as in 1998. Large cockles, greater

than 35 mm shell length, occurred at only Duck Creek, Motukaraka West, Kahao and Cambourne.

3.2.3. Lower-mid Tide

At the lower mid-tidal sites, juveniles were also recorded at all localities, except Seaview Road and Cambourne, and a few very large individuals (> 40 mm) were recorded at Seaview Road and Motukaraka West. Very large individuals were recorded only at Bromley in previous surveys. Modes in the size frequencies were between 20 and 30 mm at all localities, except Seaview Road, where most cockles were over 30 mm in size.

3.2.4. Low Tide

Several low tidal sites showed a bimodal size frequency distribution, with numbers of smaller cockles and larger ones and few in between at some sites, e.g. Mana, Seaview Road, Duck Creek, Pauatahanui, Motukaraka and Cambourne, suggesting a recruitment cohort. In 1998 there was a similar suggestion of a recruitment cohort at Mana and Motukaraka. At some localities, the growth of those recruits can be followed, e.g. at Mana in 1998 the cohort was 5-10 mm, whereas in 2001 it is 10-15 mm, at Motukaraka West there was a clear cohort at 5-15 mm, but in 2001 it appears to be 15-20 mm. The largest frequencies occurred in size range of 25-30 mm. All sites, except Pauatahanui and Motukaraka West, had reasonable numbers of large (> 35 mm) cockles.

The mean sizes of all cockles recorded at each locality and tidal height are presented in Table 2. Within each locality, there was a clear trend of increasing sizes down the shore, with the largest individuals occurring at the low tidal level at all sites. Conversely, the mean sizes were smallest at high tide or upper mid-tide sites. The sites with the largest mean sizes were low tidal sites at Seaview Road and Mana. Overall, the values in Table 2 appear slightly larger than those given in Table 2 of Grange & Crocker (1999).

Table 2. Mean sizes (mm) of cockles for each shore height at each locality, November 2001.

	High tide	Upper mid-tide	Lower mid-tide	Low tide
Mana	24.0	24.1	28.2	34.0
Seaview Road	23.1	30.9	30.2	36.5
Browns Bay	18.1	19.6	22.6	25.8
Duck Creek	21.2	23.4	26.5	28.6
Bromley	17.1	17.7	21.6	27.9
Pauatahanui	18.3	16.1	18.9	24.2
Motukaraka	19.7	20.5	23.1	25.6
Motukaraka West	26.6	19.0	23.5	28.2
Kahao	20.1	18.3	21.0	22.6
Cambourne	22.6	26.5	28.0	30.9

The mean sizes of cockles measured at each locality and tidal height are also presented in graphic form in Figure 6. Within each tidal height there are no clear trends. Most localities supported cockles of very similar sizes, except Mana, Seaview Road and Cambourne. These localities supported cockles that were consistently larger than average, whereas cockles at Pauatahanui and Kahao were below average in size at all tidal heights. Mean sizes increased down the shore.

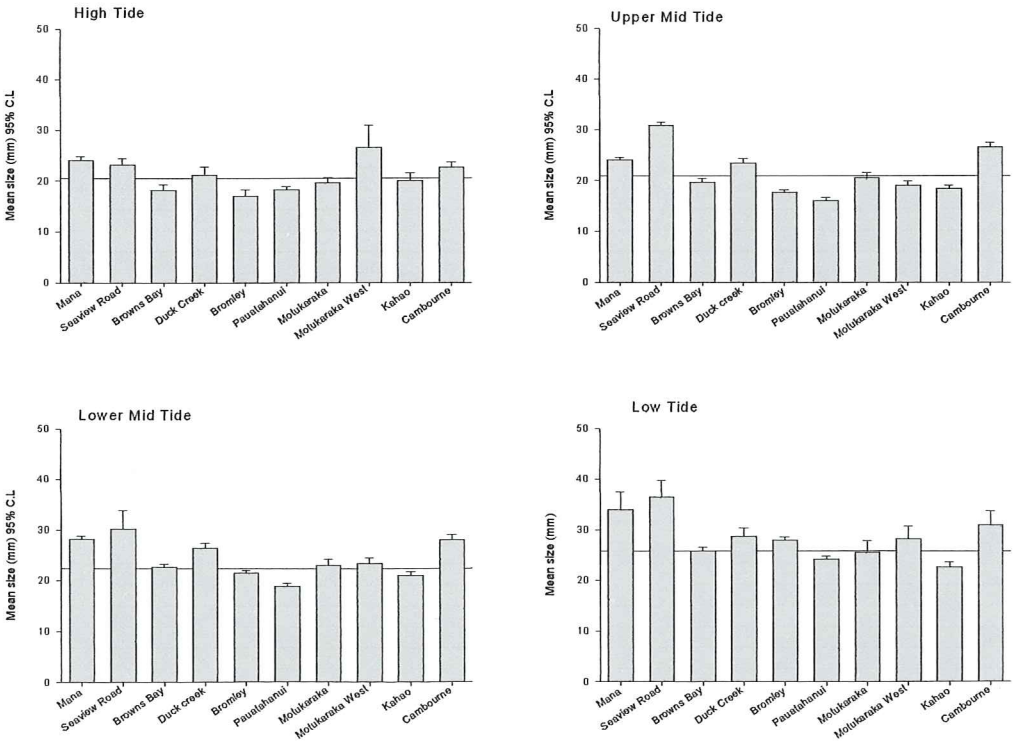


Figure 6. Mean sizes (mm ± 95% Confidence Limits) of cockles at each locality and tidal height, November 2001. Horizontal lines represent the mean values for that tidal height.

Figure 7 presents the numbers of adult cockles (> 10 mm shell length) that were recorded at each locality in 2001, compared to the 1998, 1995 and 1992 surveys. The 2001 results agree closely with those from previous surveys, with similar numbers at all sites. Slight increases may be apparent at Duck Creek and Pauatahanui, and the decrease that occurred at Motukaraka in 1998 has continued.

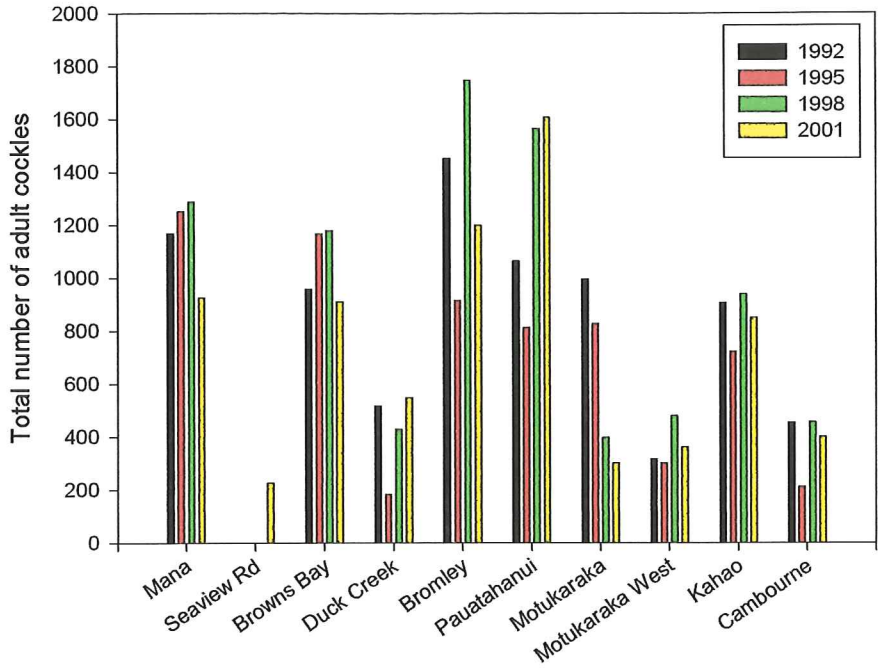


Figure 7. Total number of adult cockles (> 10 mm) collected at each site, 1992-1998.

Figure 8 presents the numbers of juveniles recorded at all localities from 1992-1998. In the 1998 survey, large numbers of juveniles were recorded at every locality, which represented a considerable change from previous surveys where juveniles were scarce. Particularly large increases occurred at Browns Bay, Bromley, Pauatahanui, Motukaraka, and Kahao. The 2001 results show similar, but slightly lower, recruitment at most sites compared to 1998. However, quite large decreases were apparent at Browns Bay and Motukaraka. In 2001, slightly more juveniles were recorded at Motukaraka West and Kahao.

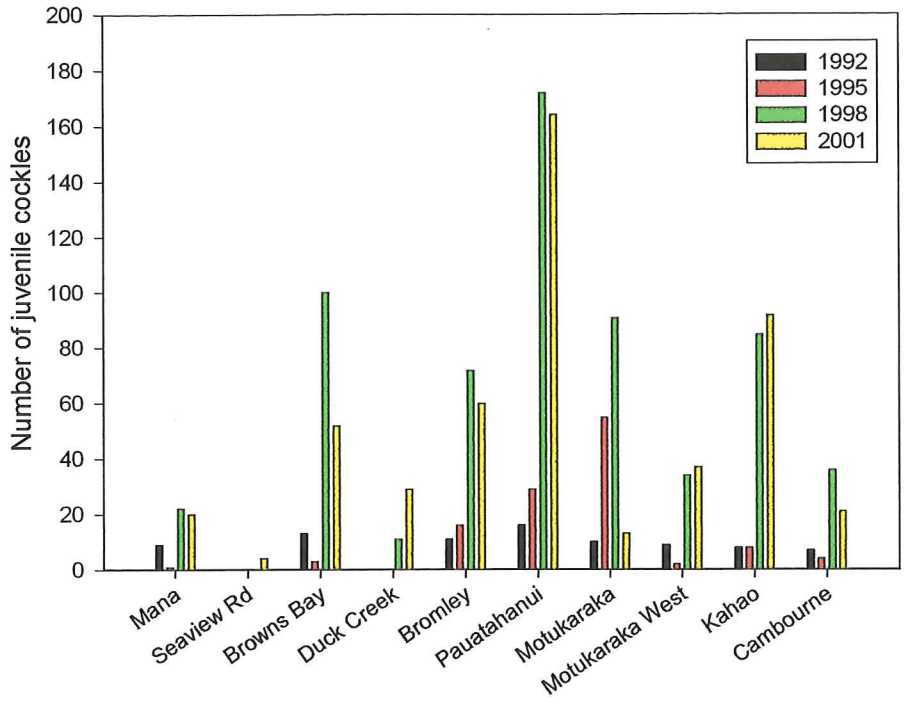


Figure 8. Numbers of juvenile cockles (< 10 mm shell length) recorded at all localities, 1992-2001.

In the 1998 survey, the abundance of juveniles increased. This increase, coupled with a lack of associated increase in adults at most sites meant that the proportion of juveniles in the total population within Pauatahanui Inlet rose from around 1% in 1992, to almost 7% in 1998 (Grange & Crocker, 1999). While still considerably higher than pre-1998 surveys, the percentage of juveniles in 2001 had decreased slightly to 6.3% (Fig. 9)

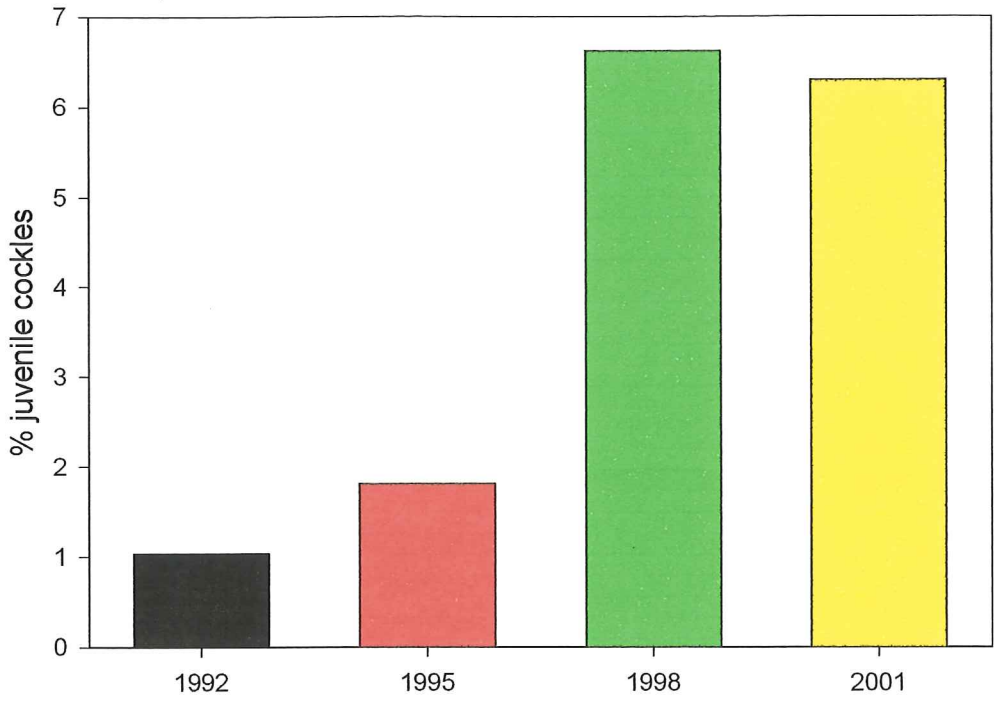


Figure 9. Juveniles as a percentage of total cockle population, 1992-2001.

4. DISCUSSION

Overall, the results from the 2001 survey are very similar to previous results, in particular those from 1998. The patterns of distribution both down the shore and geographically are very similar to previous surveys. The areas of greatest densities were Browns Bay, Pauatahanui, and Bromley, and the lowest densities were at Cambourne. Although there appears to be a slight decrease in the total population in the Inlet shown by the 2001 results, there has been no significant difference in total population since 1992. Densities increased towards low tide at most localities and mean sizes of cockles also increased towards low tide. The mean sizes of the cockles throughout the Inlet showed a slight increase to the 1998 survey, which perhaps indicates the successful growth of the recruitment identified in that year's samples. This is further indicated by the histograms that show, at several localities, an increase in the juvenile cohort.

There has been further recruitment since 1998 and the population now appears much more stable both in terms on numbers and sizes, except at Motukaraka and Cambourne where the population continues to decline.

5. REFERENCES

Grange, K.R. 1980: Intertidal biology. Pp 108-114, *in* Healy, W.B. (ed) 1980: Pauatahanui Inlet – an environmental study. *DSIR Information Series 141*. 198 pp.

Grange, K.R. 1993: Distribution, abundance, and population structure of cockles (*Austrovenus stutchburyi*) in Pauatahanui Inlet. *NIWA contract report 1993/1, prepared for Guardians of the Inlet, Pauatahanui*. 8 p + figs.

Grange, K.R.; Cole, R.G.; Parker, N.R. 1996: Distribution, abundance, and population size structure of cockles (*Austrovenus stutchburyi*) in Pauatahanui Inlet. *NIWA contract report NEL60416, prepared for Guardians of the Inlet, Pauatahanui*. 18 pp.

Grange, K.R.; Crocker, T. 1999: Cockles in Pauatahanui Inlet: results of the 1998 sampling programme. *NIWA contract report NEL90401/3, prepared for Guardians of the Inlet, Pauatahanui*. 20 pp + appends.

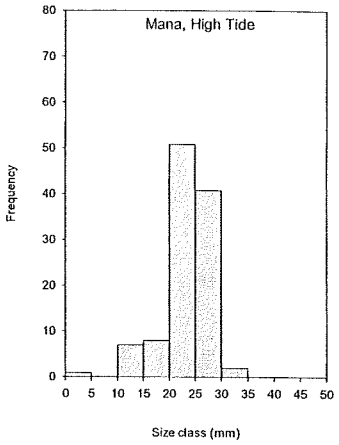
Healy, W.B. (ed) 1980: Pauatahanui Inlet – an environmental study. *DSIR Information Series 141*. 198 pp.

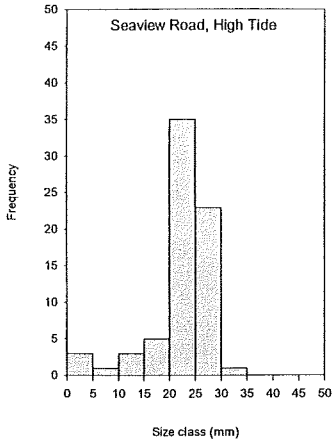
Larcombe, M.F. 1971: The ecology, population dynamics, and energetics of some soft-shore molluscs. PhD Thesis, University of Auckland, Department of Zoology.

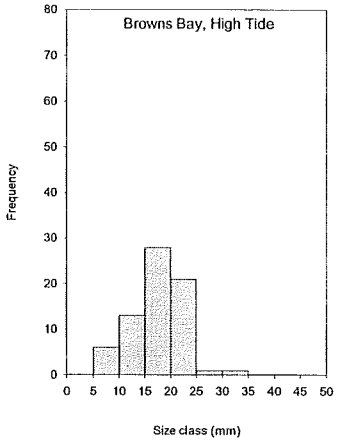
Richardson, J.R.; Aldridge, A.E.; Main, W.deL. 1979: Distribution of the New Zealand cockle, *Chione stutchburyi*, at Pauatahanui Inlet. *NZOI Oceanographic Field Report 14*. 10 pp.

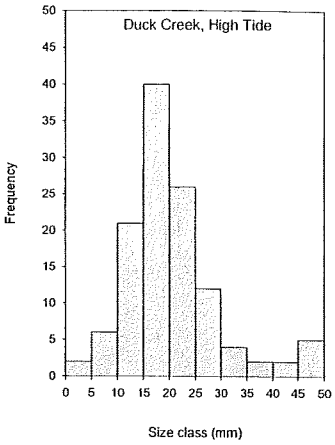
APPENDIX 1. SIZE-FREQUENCY HISTOGRAMS FROM EACH SAMPLING SITE AND TIDAL HEIGHT, 2001.

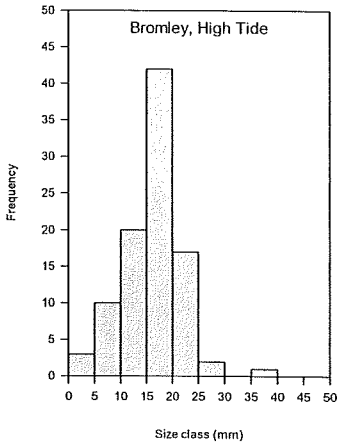
High Tide

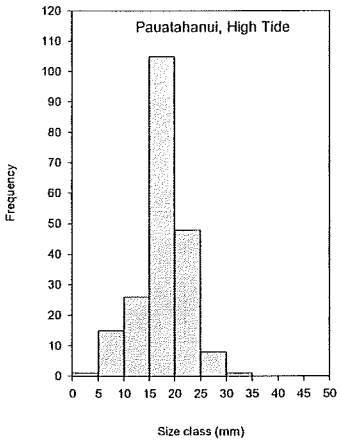

Mana, High Tide
Frequency
Size class (mm)

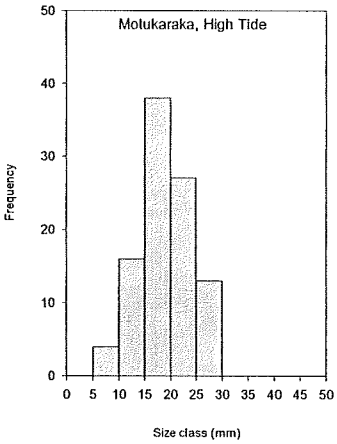

Seaview Road, High Tide
Frequency
Size class (mm)

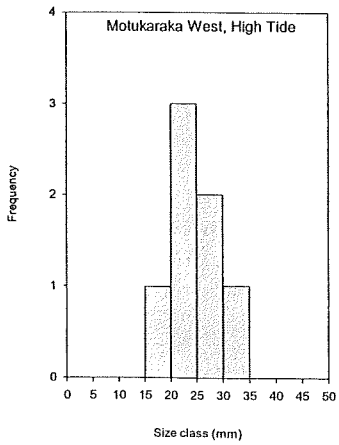

Browns Bay, High Tide
Frequency
Size class (mm)

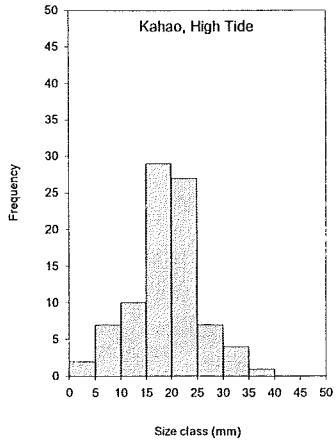

Duck Creek, High Tide
Frequency
Size class (mm)

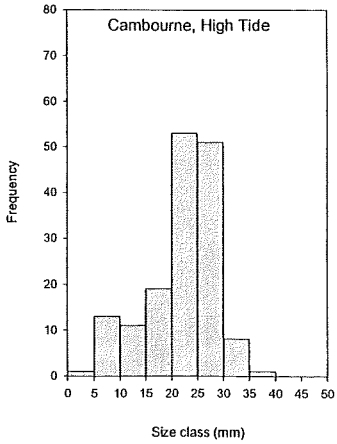

Bromley, High Tide
Frequency
Size class (mm)


Pauatahanui, High Tide
Frequency
Size class (mm)

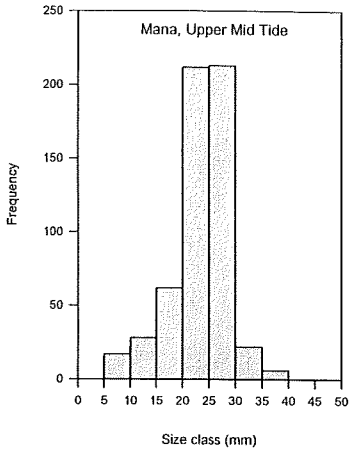

Motukaraka, High Tide
Frequency
Size class (mm)

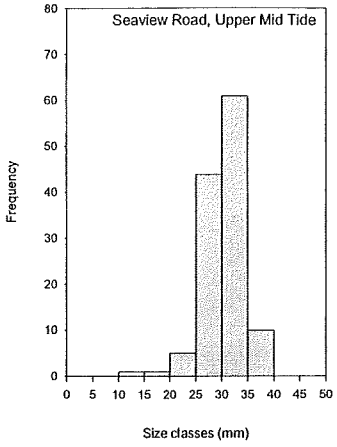

Motukaraka West, High Tide
Frequency
Size class (mm)

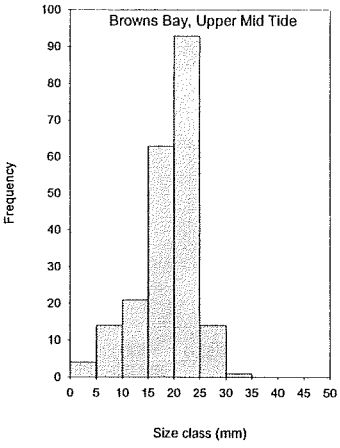

Kahao, High Tide
Frequency
Size class (mm)

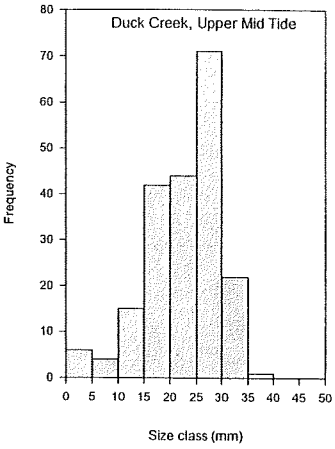

Cambourne, High Tide
Frequency
Size class (mm)

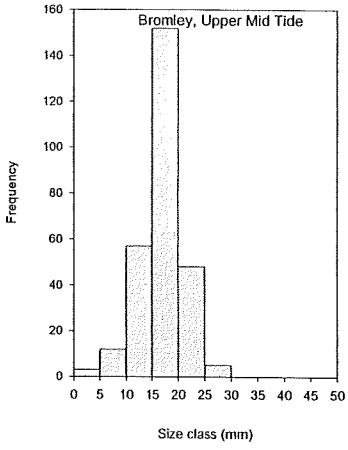
Upper Mid Tide

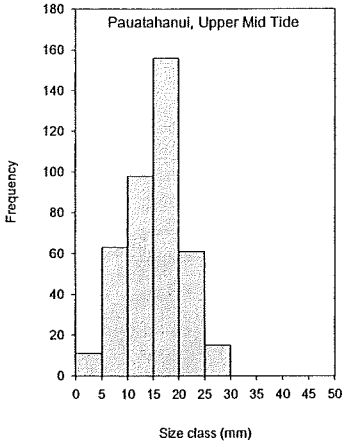


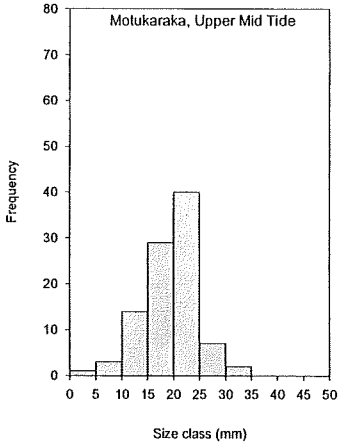


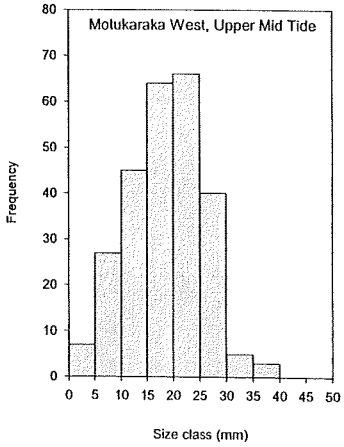


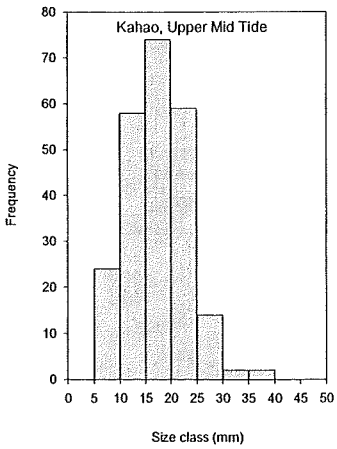


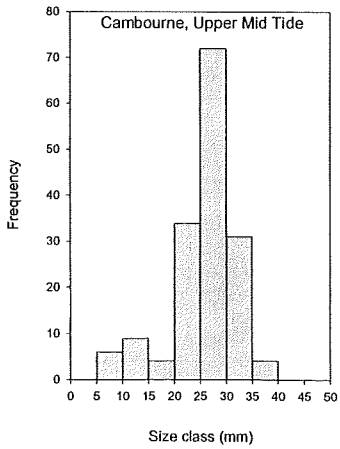




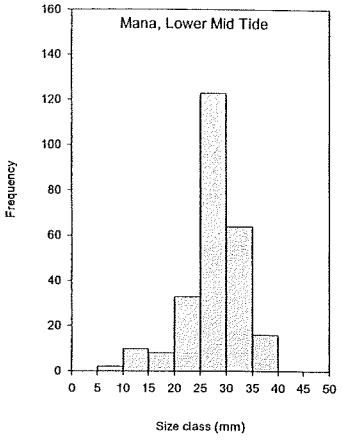


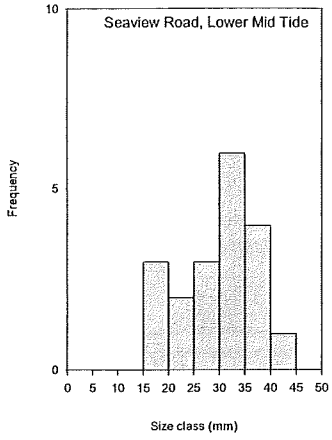


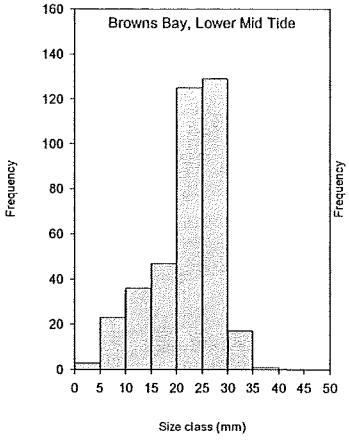


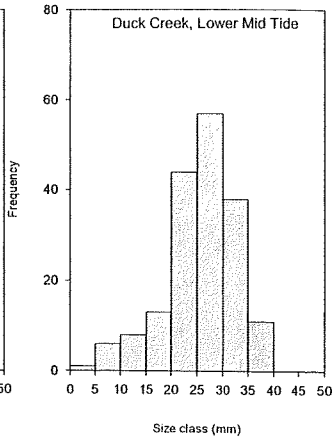


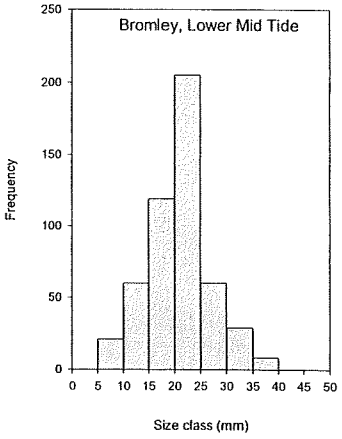
Lower Mid Tide

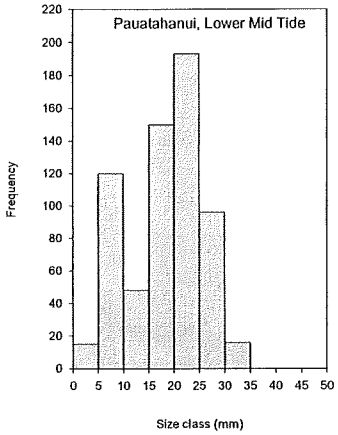


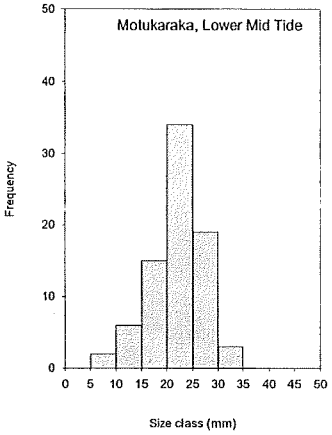


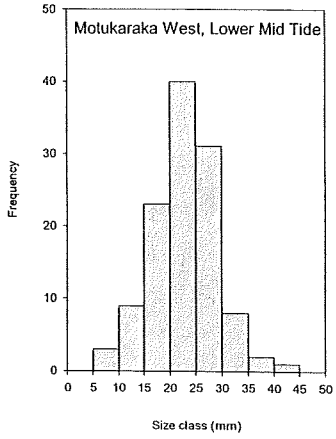


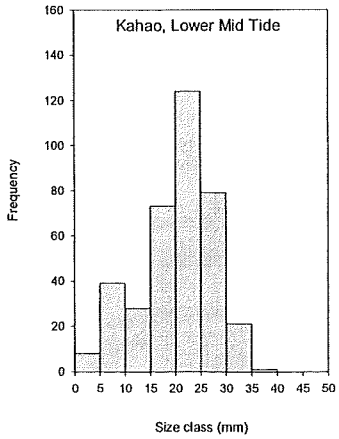


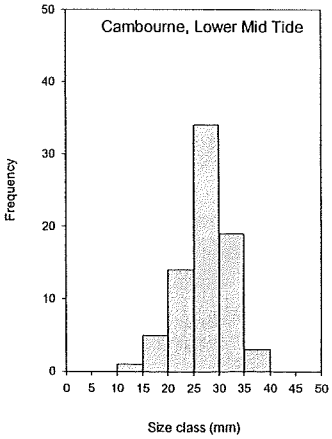




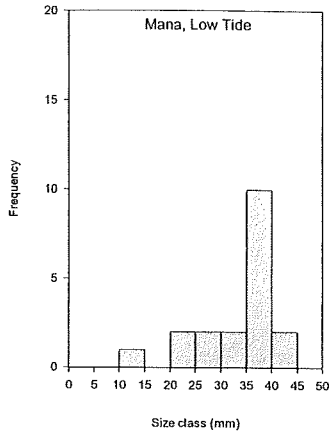


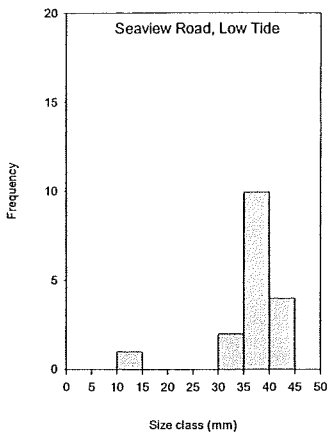


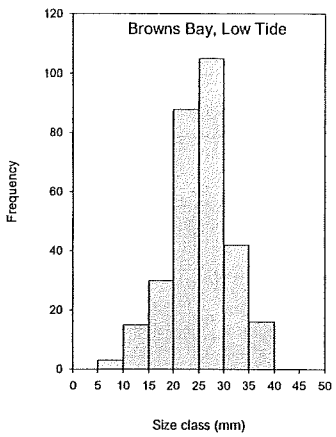


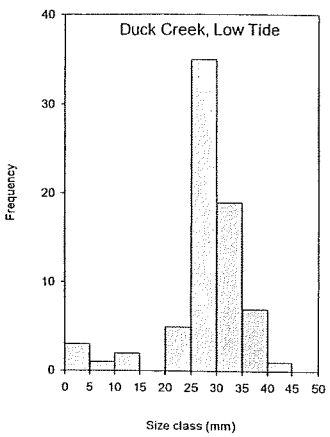


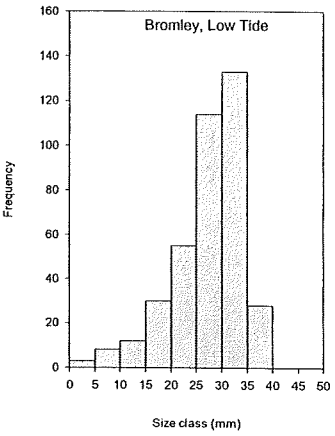
Low Tide

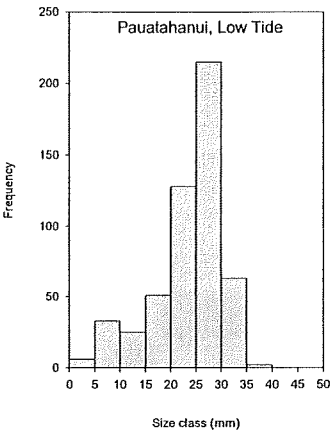

Mana, Low Tide
Frequency
Size class (mm)

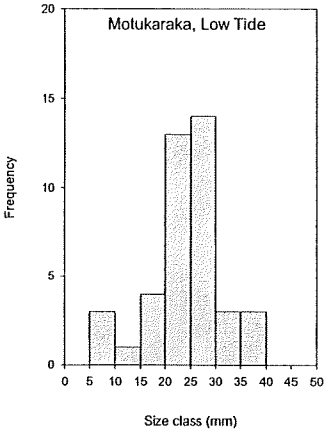

Seaview Road, Low Tide
Frequency
Size class (mm)

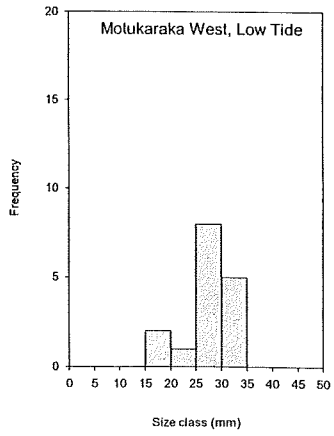

Browns Bay, Low Tide
Frequency
Size class (mm)

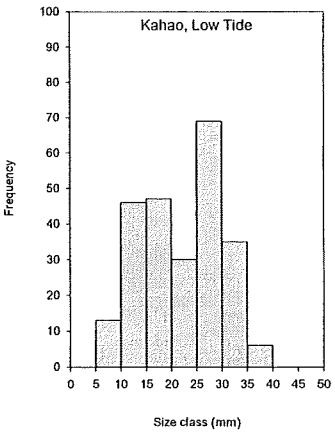

Duck Creek, Low Tide
Frequency
Size class (mm)

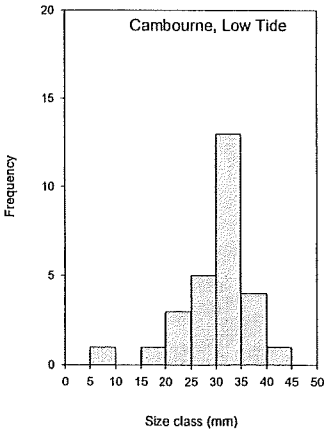

Bromley, Low Tide
Frequency
Size class (mm)


Pauatahanui, Low Tide
Frequency
Size class (mm)


Motukaraka, Low Tide
Frequency
Size class (mm)


Motukaraka West, Low Tide
Frequency
Size class (mm)


Kahao, Low Tide
Frequency
Size class (mm)


Cambourne, Low Tide
Frequency
Size class (mm)

APPENDIX 2. RAW DATA

1HA	1HB	1HC	1UMA	1UMB	1UMC	1LMA	1LMB	1LMC	1LA	1LB	1LC	2HA	2HB	2HC	2UMA	2UMB	2UMC
12	18	13	7	8	7	17	13	6	21	15	23	3			7	10	12
15	18	15	7	9	8	24	13	7	35	30	37	14			15	13	14
18	20	21	10	9	10	24	16	22	36	38	37	14			18	15	14
18	23	23	12	9	12	26	24	25	37		40	20			20	16	15
21	23	24	12	10	12	26	26	27			41	20			20	18	16
22	23	24	12	11	12	27	27	28			42	22			21	18	16
23	23	25	13	13	13	28	28	31				22			22	19	18
23	24	25	15	13	14	29	29	32				22			22	20	19
23	24	25	16	13	14	29	32	34				23			22	20	19
24	25		17	15	14	30	35	37				23			22	20	19
24	26		18	15	17	30	40					23			22	20	20
29	27		18	18	18	31						23			22	20	20
	27		18	18	18	31						23			22	21	20
	27		21	19	18	31						23			22	21	20
	28		21	20	18	32						23			23	21	21
	28		21	20	18	32						23			23	22	21
			22	21	18	33						23			23	22	21
			22	21	18	34						24			23	22	21
			23	21	19	35						24			23	22	21
			23	21	19	35						24			24	22	22
			24	22	19	37						24			24	22	22
			24	22	20							24			24	22	22
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12	16	9	73	96	114	21	11	10	4	3	6	70	0	0	49	55	59
											375						

2LMA	2LMB	2LMC	2LA	2LB	2LC	3HA	3HB	3HC	3UMA	3UMB	3UMC	3LMA	3LMB	3LMC	3LA	3LB	3LC
12	11	16	34	28	38	19		13	7	10	17	21	15	13			
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					318												252	

3aHA	3aHB	3aHC	3aUMA	3aUMB	3aUMC	3aLMA	3aLMB	3aLMC	3aLA	3aLB	3aLC	
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4	23	11	22	25	24	30	17	21	38	39	34	
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				37								
				38								
				39								
44	16	11	34	57	31	5	5	9	5	3	9	**229**

4HA	4HB	4HC	4UMA	4UMB	4UMC	4LMA	4LMB	4LMC	4LA	4LB	4LC	5HA	5HB	5HC	5UMA	5UMB	5UMC
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12	16	13	5	10	11	6	5	7	16	12	12				14	20	10
13	19	14	5	13	11	7	6	7	17	13	15				14	20	13
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15	21	15	6	14	12	8	8	8	18	14	19				17	22	16
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16		18	8	15	15	10	12	10	19	14	20				19	24	17
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17		20	9	16	17	10	14	14	21	15	20				19	25	18
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17		22	10	18	18	11	15	15	22	15	22				22	31	20
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19			13	20	19	12	16	16	23	18	23				25		23
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20			16	21	20	13	19	20	24	19	24						23
21			17	21	20	14	20	20	24	20	24						24
22			18	21	20	14	20	20	24	20	24						25
22			18	21	20	14	20	21	25	20	24						25
23			18	22	21	15	20	21	25	20	24						25
			18	22	21	15	20	22	25	21	24						27
			19	22	21	15	20	22	25	21	24						
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			22			22	26	24	28	24	28						
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			22			23	27	25		25	29						
			23			23	28	25		25	30						
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22	5	13	67	35	38	55	51	80	49	85	51	0	0	0	15	11	23
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5LMA	5LMB	5LMC	5LA	5LB	5LC	6HA	6HB	6HC	6UMA	6UMB	6UMC	6LMA	6LMB	6LMC	6LA	6LB	6LC	
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6	22	22	31	31	20	11	20	12		19	19	19	23	18	25	24	26	
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9	25	22	34	35	27	20	22	17		21	22	27	24	21	25	26	28	
11	25	22	34	36	31	21	24	19		24	24	29	24	23	26	27	29	
12	25	23	36	37	32	22	27	20			25	29	24	23	26	28	29	
12	26	26		37	32	23		21			25		25	24	28	28	30	
15	26	27		39		24		21			26		26	24	28	29	30	
17	26	27		39		31		22			26		26	25	28	30	30	
18	28	28		39				22			26		27	25	28	30	30	
19	28	28		40				23			26		28	25	28	30	30	
20	28	29						24			27		28	25	29	31	31	
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20	29	30									29		28	26	29	31	32	
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21	29	31											29	27	29	31	34	
22	29												29	28	30	33	34	
22	30												29	28	30	34	34	
22	30												29	28	30	35	35	
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23	30												29	29	30		36	
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24	31												30	31	31		38	
24	31												32	31	31		38	
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90	28	17	7	12	8	10	7	13	0	6	15	7	26	27	40	20	27	960
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7HA	7HB	7HC	7UMA	7UMB	7UMC	7LMA	7LMB	7LMC	7LA	7LB	7LC	8HA	8HB	8HC	8UMA	8UMB	8UMC
20	10	17	19	16	16	10	12	10	23	13	26	10	16	5	11	7	9
20	15	18	20	17	19	24	22	13	24	25	27	15	17	7	16	11	13
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24	20	22	20	21	19	27	24	20	29	26	29	16	18	19	19	15	15
26	20	23	21	22	20	30	24	22	32	27		19	22	20	21	17	18
36	23	25	21	22	20	33	25	22		28		25	22	20	25	19	20
	25	25	22	22	22		27	22		28		25	24	27	26	20	20
	25	25	23	25	22		28	22		28		26	25	32	26	20	21
	25	26	23	25	23		29	23		28		28	25		26	20	22
	26	26	23	26	23		30	24		29			26		26	21	25
	26	29	25	26	24			25		32			26		27	21	25
	26	38	27	28	28			25		32					27	23	25
	34			29	28			25							27	25	27
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								26							28	26	29
								26							29	26	29
								29							30	27	29
								30							30	27	30
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																31	
																34	
6	13	12	12	14	14	6	10	22	5	12	4	9	11	8	26	35	23
											130						

8LMA	8LMB	8LMC	8LA	8LB	8LC	9HA	9HB	9HC	9UMA	9UMB	9UMC	9LMA	9LMB	9LMC	9LA	9LB	9LC	
20	18	22	26	5	27	7	5	10	5	5	4	6	4	15	5	5	15	
22	18	24	27	26	28	8	12	12	5	6	4	11	6	18	10	21	29	
24	20	25	28	27	29	12	14	12	7	14	5	13	8	20	28	24	32	
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28	25	28		32		15	16	16	15	18	25	26	20	24	40	34		
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30	27	30		34		16	18	17	15	19	27	27	23	25		35		
30	29	30				18	18	17	16	19	27	27	23	25		37		
31	35	30				19	18	18	17	19	28	29	25	25		39		
32	35	30				19	18	18	20	20	28	29	26	25		40		
33		32				20	20	19	22	20	29	29	26	25		40		
33		34				23	21	20	22	20	29	29	26	25				
35		34				32	22	20	22	22	30	29	27	26				
36		35				48	22	21	22	22	30	29	27	26				
37		35				49	23	22	22	23	30	31	28	26				
37							24	43	22	26	30	31	28	27				
39							31	45	24	27	31	31	30	28				
							48	47	25	27	31	31	32	29				
								48	27	28	32	31	32	30				
									28	28		31	34	30				
									28	30		32	35	32				
									28	30		32	38	33				
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									31	30		34	38	34				
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														38				
														38				
														40				
20	13	18	7	10	6	18	21	22	31	28	22	28	27	34	8	14	7	576
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10HA	10HB	10HC	10UMA	10UMB	10UMC	10LMA	10LMB	10LMC	10LA	10LB	10LC	11HA	11HB	11HC	11UMA	11UMB	11UMC
10	11	12	6	4	11	12	7	11	5	8	5	5	6	5	9	5	5
12	18	17	15	6	14	13	10	12	14	11	6	10	15	5	12	6	6
20	40	19	16	14	15	14	10	14	16	21	14	14	17	6	12	8	11
22		21	16	15	17	15	13	17	16	23	14	15	20	8	13	10	15
23		22	16	17	17	18	14	17	20	24	22	18	21	10	13	11	15
25		22	16	17	18	18	14	18	22	26	24	19	21	10	14	16	15
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			18	18	21	20	19	21	25	26	25	20		15	15	17	16
			19	18	22	20	20	26	27	26	26	20		15	15	18	16
			22	19	24	22	21	26	28	27	26	20		15	15	18	16
			22	20	24	23	23	26	28	27	26			16	15	18	18
			23	20	25	23	23	27	30	27	26			16	15	18	19
			25	20	25	25	24	28	31	27	26			17	15	19	20
			25	21	25	25	25	28	31	27	27			17	16	20	20
			26	22	26	25	25	28	32	28	30			18	16	20	20
			28	22		28	26	29	34	28	30			18	16	20	21
			29	23		28	27	29	34	29	31			18	16	20	21
				23		29	27	30	34	30	32			19	17	21	22
				23		29	27	31	35	30	34			20	17	22	23
				24		30	29	31	36	31	35			22	17		
				25		31	30	31	39	31	36				17		
				25		31	30	32		33	37				18		
				26		31	30	32		33	38				18		
						31	30	32		34	39				18		
						31	30	32		35					18		
						32	31	32		35					18		
						32	31	33		35					18		
						34	32	35		36					18		
						34	32	36		40					18		
						37	32	36							19		
						37	33	37							19		
						40	34								20		
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6	3	7	17	23	15	32	34	31	21	29	24	10	6	20	38	19	19
											242						

11LMA	11LMB	11LMC	11LA	11LB	11LC	12HA	12HB	12HC	12UMA	12UMB	12UMC	12LMA	12LMB	12LMC	12LA	12LB	12LC
11	11	10	8	15	1	15	7	8	7	11	6	6	7	10	8	10	18
12	12	12	11	16	10	15	15	8	10	14	10	7	8	14	10	18	19
13	13	15	11	20	26	17	18	12	12	15	11	9	8	15	16	18	20
16	15	15	14	20	28	17	19	14	14	15	13	12	10	15	19	18	20
16	18	15	17	22	28	18	20		15	15	13	12	13	15	19	20	21
17	20	16	18	22	29	20	20		15	15	15	12	14	16	19	20	21
17	20	17	20	25	30	20	20		15	16	16	13	15	16	11	20	21
19	20	17	20	26	30		22		15	16	17	14	15	17	11	20	21
19	20	18	21	26	30		24		15	17	17	14	15	17	22	20	22
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20	20	20	25	30	35		25		17	18	18	15	15	20	22	24	22
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20	21	20	26	30			27		17	19	19	16	15	20	22	25	23
21	21	20	26	31					17	20	20	16	16	20	23	26	23
21	21	21	27	35					18	20	20	17	16	20	23	26	24
21	21	21	28						18	20	20	17	16	20	23	26	25
21	22	21	28						19	20	20	17	17	21	23	28	25
22	22	22	28						19	20	20	17	17	21	23	28	25
23	22	22	28						19	20	23	17	17	22	24	28	25
24	23	22	28						20	20		17	18	22	24	30	25
24	23	22	29						20	21		18	18	22	24	30	26
24	23	22	31						20	21		18	18	22	25	30	27
24	23	23	32						20	23		19	19	22	25	30	27
25	24	25	32						20	25		19	19	22	26	30	27
25	24	25	34						20			19	19	22	26	30	28
25	25	26							20			19	20	23	26	31	28
25	25								22			20	20	23	27	31	29
25	25								23			20	20	24	27	31	29
25	25								24			20	20	24	28	33	29
26	26											20	20	24	29	34	30
28	26											20	20	25	29	34	30
30												20	20	25	29	35	30
												20	20	25	30	36	30
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32	31	26	25	15	11	7	13	4	29	24	19	74	68	38	64	36	60
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13HA	13HB	13HC	13UMA	13UMB	13UMC	13LMA	13LMB	13LMC	13LA	13LB	13LC	
11	11	12	18	9	13	10	8	8	7	13	16	
12	16	13	19	13	13	13	8	10	13	18	18	
16	18	18		13	14	14	9	13	18	22	27	
18	19	20		14	14	14	9	15	25	24	27	
18	20	20		15	14	14	10	15	26	26	29	
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21				15	14	17	12	15	27	29	30	
21				16	14	17	13	17	28	29	32	
22				16	15	18	13	18	29	29	32	
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				18	18	21	20	22	33	31		
				18	18	22	20	22	33	31		
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							31					
9	5	5	2	37	35	41	52	43	37	46	15	1257
											327	

14HA	14HB	14HC	14UMA	14UMB	14UMC	14LMA	14LMB	14LMC	14LA	14LB	14LC	15HA	15HB	15HC	15UMA	15UMB	15UMC
16	18	16	8	5	4	14	13	12	11	19	14	8	6	14	4	7	4
18	19	17	13	6	6	17	14	14	15	20	15	12	8	15	5	10	5
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22	21	22	17	15	9	22	16	22	21	29	19	20	16	17	10	14	10
22	22	22	18	15	11	22	17	22	24	29	19	20	17	17	11	15	11
23	22	22	19	16	12	23	17	23	25	30	22	21	18	18	11	15	11
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26	27	25	22	17	17	29	23	25	26		23		19	24	14	16	15
27			23	19	17	29	24	28	26		24		19	28	15	17	15
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			26	23	17		24	34	26		24		20		16	18	16
			26	26	18		24		27		24		21		16	18	17
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			27		18		25		27		25		22		17	18	19
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			28		18		26		28		25		23		18	19	19
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					21		27		30		27				20	20	20
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15LMA	15LMB	15LMC	15LA	15LB	15LC	16HA	16HB	16HC	16UMA	16UMB	16UMC	16LMA	16LMB	16LMC	16LA	16LB	16LC
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17HA	17HB	17HC	17UMA	17UMB	17UMC	17LMA	17LMB	17LMC	17LA	17LB	17LC	
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18HA	18HB	18HC	18UMA	18UMB	18UMC	18LMA	18LMB	18LMC	18LA	18LB	18LC	19HA	19HB	19HC	19UMA	19UMB	19UMC	19LMA	19LMB	19LMC	19LA	19LB	19LC
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314

20HA	20HB	20HC	20UMA	20UMB	20UMC	20LMA	20LMB	20LMC	20LA	20LB	20LC	21HA	21HB	21HC	21UMA	21UMB	21UMC
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30	25		12	6	7	21	20	19							5	8	10
35	27		12	6	7	22	21	19							5	15	12
			14	7	8	23	24	20							5	20	15
			14	7	10	25	25	21							5	20	17
			15	8	10	25	28	21							6	20	17
			15	8	11	26		22							7	25	20
			17	8	12	28		23							11	25	20
			18	9	12	29		24							12	25	21
			18	9	12	29		25							12	28	22
			19	9	13	30		29							12	30	22
			19	9	13	32		34							13	30	23
			19	10	13	34		37							13		28
			19	10	14	36									14		28
			20	11	15										15		29
			20	11	16										16		29
			20	12	16										19		29
			21	12	16										19		31
			21	12	17										19		
			22	12	17										19		
			22	13	18										20		
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			22	13	18										20		
			23	14	18										20		
			23	15	18										20		
			24	16	18										21		
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			27	21	20										26		
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											201						

21LMA	21LMB	21LMC	21LA	21LB	21LC	22HA	22HB	22HC	22UMA	22UMB	22UMC	22LMA	22LMB	22LMC	22LA	22LB	22LC	
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23HA	23HB	23HC	23UMA	23UMB	23UMC	23LMA	23LMB	23LMC	23LA	23LB	23LC	24HA	24HB	24HC	24UMA	24UMB	24UMC
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	16	24	13	10	9	6	6	10	10	12	11		20		15	30	28
	17	28	14	10	11	6	6	12	11	12	11		22		15	33	38
	18	30	14	10	11	6	6	16	11	12	11		25		19		39
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24LMA	24LMB	24LMC	24LA	24LB	24LC	25HA	25HB	25HC	25UMA	25UMB	25UMC	25LMA	25LMB	25LMC	25LA	25LB	25LC
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22	20	24		40						22	23	25	26	25	25	28	24
23	22	24								23	23	25	28	26	27		24
25	23	25								24	25		28	26	28		25
25	24	25												27	28		25
25	24	26												28			29
25	24	26															30
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26	26	27															32
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	33																
	36																
38	43	38	12	15	9	6	11	7	13	17	17	16	17	19	18	15	24
					210												180

26HA	26HB	26HC	26UMA	26UMB	26UMC	26LMA	26LMB	26LMC	26LA	26LB	26LC	
4	12	24	7	7	15	10	12	4	14	23	14	
6	13	25	8	11	15	11	12	5	23	25	20	
6	18	27	9	12	15	18	17	8	25	28	23	
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20	21		12	15	17	20	18	17	30	29	29	
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20	21		16	18	18	22	19	20	35	30	30	
21	23		16	19	20	23	19	20		33	31	
23	23		19	19	20	24	20	21		34	32	
24	24		19	19	20	24	20	21			34	
25	24		20	19	20	25	20	21			36	
25	27		22	20	22	26	20	21			36	
			23	20	22	26	20	21			37	
			23	20	22	26	21	22				
			24	20	22	27	21	24				
			24	20	23		24	25				
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12	12	3	20	34	20	15	28	27	7	9	13	939
											200	