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Central Waitemata Harbour Ecological Monitoring: 2000 - 2008

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1 Executive Summary

This report details the results of a State of the Environment monitoring programme for the Central Waitemata Harbour conducted between October 2000 and February 2008. The focus of the programme is to monitor the ecological status and trends of change in macrobenthic communities in the Central Waitemata. Five intertidal soft-sediment sites were monitored, representing distinct habitats in terms of physical and biological composition. The design of the programme matches those carried out in Mahurangi and Manukau Harbours. The monitoring focuses on 20 taxa which are expected to respond differently to changes in site characteristics such as sediment composition, contamination and other forms of disturbances. This method has proved useful in monitoring Manukau and Mahurangi and has been further validated in work carried out by NIWA and the University of Auckland on ways of defining healthy communities (Anderson et al. 2003).

This report addresses several questions relevant to State of the Environment monitoring:

- Have the sedimentary conditions at each site changed?
- Have any of the sites undergone changes in monitored taxa or in overall community structure?
- If changes have occurred in the ecology, do they reflect changes in habitat conditions e.g., sedimentation, or can they be attributed to other factors such as long-term natural cycles or chemical contamination
- Are changes confined to one site or one area of the harbour or do they reflect a harbour-wide change?

All sites have shown minimal change in sediment composition over the time series. Much larger changes have been observed in community composition, suggesting that grain-size is not a predominantly controlling factor. Patches of seagrass have expanded in coverage at Te Tokaroa Reef (Reef) and a new stream has appeared close to Hobsonville (HBV), but is not currently jeopardizing the site.

A general trend observed across the Central Waitemata was a decrease in the abundance of the deposit feeding bivalve *Nucula hartvigiana*. Species that increased in abundance were the Capitellid polychaete *Heteromastus filiformis* at Shoal Bay (ShB), Whau River (Whau) and Reef, the gastropod *Zeacumantus lutulentus* at HBV, ShB and Whau, the Maldanid tube-worm *Macroclymenella stewartensis* at Henderson Creek (HC), ShB and Whau and the anemone *Anthopleura aureoradiata* at HBV and HC. Also at every site annual and greater than annual patterns in abundance for most species were evident. Recent changes in *Glycera*, *Prionospio* and *Aricidea* were observed but it is yet unknown whether this is due to transient peaks in recruitment, longer lived changes in trend or changes in abundances that form part of a longer term cycle.

The current areas in which the five monitoring sites are located provide expansive coverage across the Central Waitemata. The sites cover distinct sections of the

harbour and have distinct communities. Whau, HC and Hobsonville are all situated near the outflow of tidal creeks; areas that could be susceptible to change in the future. Both Reef and ShB are situated in locations that are hydrodynamically discrete from each other and the remaining monitoring sites. All monitored sites complement ongoing ARC funded research in other disciplines and may prove useful in future multi-disciplinary studies.

However, consideration should be given to moving the SHB site 50m further up the shore as its lower elevation has made it difficult to sample when exposed by the low tide. Sampling whilst underwater is not ideal as it may affect the variability of the data for highly dispersive fauna such as the amphipods, cumaceans, and isopods. Relocating the site would require a faunal survey of the new site area to ensure similarity with the lower shore.

2 Introduction

In October 2000, a State of the Environment monitoring programme for the Central Waitemata Harbour was developed for the Auckland Regional Council (ARC). The programme was designed to be scientifically credible, practical, and affordable and to meet the requirements of the Resource Management Act (1991). The focus of the programme was to monitor the ecological status and trends of change in macrobenthic communities in the Central Waitemata.

Hewitt (2000) suggested that the Central Waitemata would be best represented by 6 intertidal sites; 5 from soft-sediment habitats and 1 rocky habitat. In 2000, NIWA was commissioned to monitor the soft sediments and the University of Auckland was commissioned to monitor the rocky site (Meola Reef). The soft-sediment sites were selected for monitoring in consultation with the ARC, and were chosen to integrate over as many aquatic inputs as possible, while being distanced from any industry-specific source of contaminants. A site was placed in each of five sub-regions of the Central Waitemata Harbour, based on hydrodynamics and drainage areas with significant intertidal habitats (Figure 4; Hewitt, 2000). Details on site selection are given in the first report (Nicholls et al. 2002).

The monitoring focuses on a selection of 20 species (see Nicholls et al. 2002) that could be expected to respond to changes in their surroundings in a variety of ways. This method has proved useful in monitoring the Manukau and Mahurangi Harbours and has been further validated in work carried out by NIWA and the University of Auckland on ways of defining healthy communities (Anderson et al. 2003).

This report presents the results from monitoring soft-sediment sites between October 2000 and February 2008 and details the present status of the benthic communities of the Central Waitemata Harbour. In particular the following questions are addressed:

- Have there been any changes in the characteristics of the sites or nearby areas?
- Have there been any changes of concern to the monitored benthic communities of Central Waitemata?

This latter point will be answered by looking at two sub-questions:

- Are species exhibiting temporal variations that appear predictable?
- Are species abundances exhibiting similar patterns at all sites?

The report also discusses potential anthropogenic impacts in the Central Waitemata including the stormwater contamination gradient and the impacts of sedimentation on mangrove expansion.

Figure 1:
Map of the Waitemata Harbour showing the five permanent soft-sediment monitoring sites at Hobsonville (HBV), Henderson Creek (HC), Whau River (Whau), Te Tokaroa Reef (Reef) and Shoal Bay (ShB).

3 Methods

Five soft-sediment sites are sampled representing five different sub-regions of the Central Waitemata: Upper-Waitemata-Hobsonville (HBV), Henderson Creek (HC), Whau River (Whau), Meola Creek, Motions Creek and Te Tokaroa Reef area (Reef) and Shoal Bay (ShB) (see Figure 1). The sites are located at mid-tide level and each cover an area of 9000 m^2, apart from HBV which covers 10,800 m^2.

Sites are located in areas that are representative of the general character of the surrounding intertidal environment and are as close to channels as practical (to aid access). Sites are marked by wooden stakes and located by GPS (Table 1).

Table 1:

Dimensions and GPS co-ordinates for the monitored sites in the Central Waitemata. Hobsonville (HBV), Henderson Creek (HC), Whau River (Whau), Te Tokaroa Reef (Reef), Shoal Bay (ShB).

Site	Dimensions (m)		GPS coordinates in NZMG	
	X	Y	North	East
HBV	180	60	6487791	2660090
HC	100	90	6486226	2658567
Whau	100	90	6482500	2659244
Reef	180	50	6482597	2663505
ShB	180	50	6485554	2667087

Methods and techniques used for sampling and sample processing are consistent with those used at the established sentinel locations of Mahurangi and Manukau Harbours, and have been detailed in a previous report (Nicholls et al. 2002). Sampling is conducted every two months, and began in October 2000. The methods used are briefly described below.

3.1 Macrofauna

On each sampling occasion, 12 core samples (each 13 cm diameter, 15 cm deep) are collected from each site. To provide an adequate spread of cores over the site, each site is 'divided' into 12 equal sections and one core sample is taken from a random location within each section. To reduce the influence of previous sampling activity and spatial autocorrelation, samples are not placed within a 5 m radius of each other or of any samples collected in the previous 12 months. Core samples are sieved through a 500 µm mesh and the residues stained with rose bengal and preserved in 70 % isopropyl alcohol. Samples are then sorted and stored in 50 % isopropyl alcohol. The 20 selected species (see Table 2) are counted and stored in 50 % isopropyl alcohol.

Other macrofauna are not discarded, rather they are kept and processed under other funding when available.

Table 2:

List of the 20 taxa recommended for ongoing monitoring in the Waitemata Harbour long-term monitoring programme. As many genera and species change names with taxonomic reviews, names in brackets indicate alternatives.

Order	Taxa
Bivalvia	*Arthritica bifurca*
	Austrovenus (*Chione*) *stutchburyi*
	Macomona (*Tellina*) *liliana*
	Nucula hartvigiana
	Paphies australis
Cnidaria	*Anthopleura aureoradiata*
Cumacea	*Colurostylis lemurum*
Gastropoda	*Diloma subrostrata*
	Haminoea zelandiae
	Notoacmea helmsi
	Zeacumantus lutulentus
Isopoda	*Exosphaeroma chilensis*
Polychaeta	*Aonides trifida* (*oxycephala*)
	Prionospio (*Aquilaspio*) *aucklandica*
	Aricidea sp.
	Boccardia syrtis
	Euchone sp.
	Glycera spp.
	Heteromastus filiformis
	Macroclymenella stewartensis

3.2 Bivalve size-class analysis

After identification, individual *Paphies australis*, *Austrovenus stutchburyi* and *Macomona liliana* are measured and placed into size classes (<1 mm, 1 – 5 mm, 5 – 10 mm, then 10 mm increments). Unlike the Manukau and Mahurangi monitoring

programmes, *Nucula hartvigiana* is not measured as the high densities found at some sites would make this uneconomical. Instead, only those bivalve species which grow to be relatively large and for which we know that juveniles are more sensitive to stress than adults are measured.

3.3 Site characteristics

During each site visit, attention is paid to the appearance of the site and the surrounding sandflat. In particular, surface sediment characteristics and the presence of birds, gastropods and plants are noted.

3.4 Sediment characteristics

Sediment characteristics (grain size, organic content and chlorophyll *a*) are assessed at each site on each sampling occasion. At six random locations within the site, two small sediment cores (2 cm deep, 2 cm diameter) are collected, one to determine grain-size and organic content and the other for chlorophyll *a* analysis. The six cores are pooled, and kept frozen in the dark prior to being analysed as described below.

Grain size: The samples are homogenised and a subsample of approximately 5 g of sediment taken, and digested in ~ 9% hydrogen peroxide until frothing ceases. The sediment sample is then wet sieved through 2000 μm, 500 μm, 250 μm and 63 μm mesh sieves. Pipette analysis is used to separate the <63 μm fraction into >3.9 μm and ≤3.9 μm. All fractions are then dried at 60°C until a constant weight is achieved (fractions are weighed at ~ 40 h and then again at 48 h). The results of the analysis are presented as percentage weight of gravel/shell hash (>2000 μm), coarse sand (500 – 2000 μm), medium sand (250 – 500 μm), fine sand (63 – 250 μm), silt (3.9 – 63 μm) and clay (≤3.9 μm). Mud content is calculated as the sum of the silt and clay content.

Chlorophyll *a*: Within one month of sampling, the full sample is freeze dried, weighed, then homogenised and a subsample (~0.5 g) taken for analysis. Chlorophyll *a* is extracted by boiling the sediment in 90% ethanol, and the extract processed using a spectrophotometer. An acidification step is used to separate degradation products from chlorophyll *a*.

Organic content: Approximately 5 g of sediment is placed in a dry, pre-weighed tray. The sample is then dried at 60°C until a constant weight is achieved (the sample is weighed after ~ 40 h and then again after 48 h). The sample is then ashed for 5.5 h at 400°C (Mook and Hoskin 1982) and then reweighed.

3.5 Statistical analyses

When the State of the Environment monitoring programme was developed for the ARC, the methods to be used in analysing the data were also detailed (Hewitt, 2000). This report recommended that, every 2 years, a graphical analysis of patterns in selected taxa abundances over time at each site should be conducted to identify seasonal patterns, multiyear patterns and trends.

Analyses included:

- Changes in dominant taxa over time were investigated to determine whether observed changes in individual monitored taxa led to community changes.
- Multivariate ordination of ecological data collected in October of each year was used to determine whether community composition at the sites was changing over the monitored period. Ordination of raw data was conducted through non-metric multidimensional scaling based on Bray-Curtis similarities.

Note that all analyses conducted are performed on the sum of the 12 cores collected at a site.

3.5.1 Trend analysis

To formally identify any suggested trends in both biotic and abiotic variables, trend analysis was conducted on:

- All monitored species
- Sediment properties to investigate if changes in the sediment environment occurred and if so, whether these alterations reflected changes in species abundances.
- Bivalve size classes to see if there were size specific changes occurring and if so, where changes in a size class would underpin changes occurring in the species abundance.

In each trend analysis autocorrelation was investigated using *chi*-square probabilities. Where autocorrelation was indicated, increasing or decreasing trends were investigated by adjusting parameters and significance levels (AUTOREG procedure, SAS). Otherwise ordinary least squares regression was carried out. Analyses were carried out on both raw and log transformed data: the latter being the only way that non-linear trends were included.

Trends discussed in the report are those which were statistically significant at $p = 0.05$. Changes we feel that may be important in future which are not significant are discussed as "possible" or "recent"

4 Present status of the benthic communities of Central Waitemata

This programme was designed to monitor the ecological status and trends of change in macrobenthic communities in the Central Waitemata. An important process in detecting trends is determining temporal variability, as knowledge of cyclic patterns of recruitment aids in detection of long-term trends (Hewitt et al. 1994). Thus, in this report we ask the following questions:

- Have there been any changes in site characteristics?
- At each site, are species exhibiting temporal variations that appear predictable, i.e., trends, seasonal patterns or multiyear cycles?
- Are species' abundances exhibiting similar patterns at each site?
- Have any changes in species over time led to changes in communities, with sites becoming more or less similar to each other?

4.1 Have there been any changes in site characteristics?

4.1.1 Hobsonville (HBV)

Site HBV is located on the sandflats near the Hobsonville Air Base, close to the deep channel entering the Upper Waitemata Harbour. The sandflat at HBV exhibits many of the characteristics of areas subject to high flow (coarse sediment, ripples in the sediment surface) (Plate 1, Section 6). Large fragments of old logs are often found buried and there is a thick shell layer approximately 15 cm below the sediment surface. While the site itself has changed little since monitoring began, a channel on the seaward/eastern side has increased in muddiness in recent years and has also increased in size (<1 m wide and approx. 0.3m deep in 2000, now it is 2-3 m wide and approx. 0.5 m deep) in the last year. A second smaller channel (<1 m, approx 0.3 m deep) has also branched from this and leads towards one edge of the monitored site but does not yet enter it.

Sediment at HBV is predominantly medium and fine sand, with a small amount of coarse sand (Table 3). The proportion of mud and fine sand was highest during the first 18 months sampling (Figure 2). However since October 2002, no changes have been evident in the sediment characteristics. Chlorophyll *a* content of the sediment has ranged between 8.0 and 19.7 µg/g sediment and the organic content has been both low and variable (mean 1%, range 5.9).

Table 3:

Summary of sediment characteristics at Hobsonville (HBV), Henderson Creek (HC), Whau River (Whau), Te Tokaroa Reef (Reef), Shoal Bay (ShB), from October 2000 to October 2007. Chl*a* = chlorophyll *a* in μg.g^{-1}, coarse sand (500 – 2000 μm), medium sand (250 – 500 μm), fine sand (62.5 – 500 μm), mud (< 62.5 μm). Full results are given in Appendix 1.

Site	Date	%mud	% fine sand	%medium	%coarse	%organics	chla
HBV	Oct-00	8.13	74.16	12.20	4.01	0.95	10.26
	Oct-01	5.32	73.67	14.90	4.02	0.81	16.50
	Oct-02	1.99	54.79	31.31	8.15	3.73	13.98
	Oct-03	1.55	50.07	39.00	7.84	0.78	7.97
	Oct-04	2.95	52.05	25.78	5.87	1.75	10.78
	Oct-05	2.12	54.51	36.31	6.86	1.53	17.55
	Oct-06	1.80	52.08	36.62	7.92	1.39	15.81
	Oct-07	2.13	55.62	33.52	7.67	1.13	12.15
	mean	3.25	58.37	28.71	6.54	1.51	13.13
HC	Oct-00	4.00	55.08	23.92	9.36	1.61	9.53
	Oct-01	2.30	58.56	30.63	7.43	1.46	21.67
	Oct-02	6.39	75.07	13.30	3.24	2.04	22.49
	Oct-03	6.26	77.57	12.42	2.70	1.90	20.34
	Oct-04	7.39	71.92	17.67	3.03	2.85	19.92
	Oct-05	9.47	77.16	10.86	2.01	2.24	18.41
	Oct-06	8.81	73.85	11.48	2.52	2.51	25.22
	Oct-07	4.16	70.60	18.99	4.89	1.77	23.60
	mean	6.10	69.98	17.41	4.40	2.05	20.15
WHAU	Oct-00	2.77	93.64	1.79	0.80	0.76	5.23
	Oct-01	2.75	92.42	2.78	0.47	0.86	10.72
	Oct-02	3.30	91.71	3.79	0.56	0.75	7.79
	Oct-03	2.92	93.55	2.24	0.66	0.92	6.87
	Oct-04	2.06	93.08	1.07	0.39	1.17	11.22
	Oct-05	3.15	92.89	1.40	0.90	1.01	12.41
	Oct-06	2.75	93.43	1.55	1.50	0.84	16.74
	Oct-07	1.83	92.89	1.23	0.83	0.85	12.39
	mean	2.69	92.95	1.98	0.76	0.90	10.42
REEF	Oct-00	4.09	91.80	3.77	0.28	0.90	7.28
	Oct-01	3.43	89.44	5.21	0.26	0.74	10.54
	Oct-02	5.08	92.25	1.67	0.11	1.04	10.46
	Oct-03	6.74	90.29	2.59	0.27	1.08	6.42
	Oct-04	6.47	91.82	1.67	0.04	1.20	5.36
	Oct-05	7.61	90.31	1.90	0.11	1.64	18.45
	Oct-06	8.05	88.68	3.05	0.22	1.73	7.80
	Oct-07	9.55	87.57	2.52	0.30	1.41	11.92
	mean	6.38	90.27	2.80	0.20	1.22	9.78
SHB	Oct-00	3.46	78.71	14.11	2.46	0.63	5.23
	Oct-01	13.01	63.30	22.43	0.70	0.48	10.72
	Oct-02	3.06	80.84	11.70	3.33	0.81	7.79
	Oct-03	3.25	79.66	12.31	2.13	0.70	6.87
	Oct-04	1.67	72.67	24.18	0.77	0.87	8.37
	Oct-05	4.83	84.69	8.11	0.87	1.01	14.32
	Oct-06	6.98	74.17	10.81	1.84	0.88	9.40
	Oct-07	4.33	80.22	8.47	2.61	1.23	6.88
	mean	5.07	76.78	14.02	1.84	0.83	8.70

4.1.2 Henderson Creek (HC)

Site HC is located adjacent to Henderson Creek on a large intertidal flat, which is fringed by mangroves on the upper edge. The sediment surface is generally free from features such as ripples and is covered with a layer of cockle shell-hash (Plate 2, p42). HC sediments are predominantly medium and fine sand (Table 3). The proportion of fine sand increased at this site rapidly over the first two years of monitoring (Table 3, Appendix 1) but since October 2002 has stabilised. In the last year there has been an indication of a slight decrease in the amount of fine sand, however this may be a result of minor inter-annual variation. The increasing content of mud noted at this site in the previous report (Halliday and Hewitt, 2006) has evened off, with mud content now variable and lower than 2005 values (Figure 2). Chlorophyll *a* content is generally high, ranging from 9.5 –38 µg/g sediment, with a cyclic pattern of lowest chlorophyll *a* content in either August or October. The organic content of the sediment has been both low and variable.

4.1.3 Whau River (Whau)

The Whau site is located on the north-western side of the Whau River (Plate 3, p43). The flats here are large, sandy and they generally show signs of wind-wave activity (small ripples on the sediment surface). There has been little change to this site or the nearby channel; with most sediment size fractions consistent over time. The medium sand fraction was more variable prior to February 04 (Figure 2), but since then has showed virtually no change (range 0.32%). The sediment from Whau is predominantly fine sand (Table 3), with average chlorophyll *a* content (generally <10 µg/g sediment) and very low organic content (generally < 1 %).

4.1.4 Te Tokaroa Reef (Reef)

The intertidal flat on the eastern side of Te Tokoroa Reef is a muddy sandflat with a small channel dissecting it (Plate 4, p44). Of all the study areas, this has the longest uninterrupted fetch and consequently it may be affected by both waves and currents. The site itself is situated next to scattered patches of rock, well away from the channel. The sediment surface is frequently covered with a diatomaceous film and a high numbers of gastropods. At this site *Ulva* has been observed on intertidal areas towards the channel on occasions. Since December 2004 patches of seagrass (*Zostera capricorni*) have established at the site (Plate 4) with the number and size of these patches slowly increasing over time (10% seagrass coverage at westward end of the site ranging to closer to 50% seagrass coverage eastward). Associated with the seagrass is an increase in muddy sediment within 2-3 m of the edge of the patches. Based on previous observations of the Manukau ecological monitoring programme, seagrass growth in the Auckland region occurs in long-term cycles of expansion followed by contraction. The sediment at the Reef site is dominated by fine sand (76 – 95%), and exhibits the lowest proportion of coarse sand (< 1%) of all the monitored sites (Table 3). The chlorophyll *a* and organic content of the sediment are both moderate to low.

4.1.5 Shoal Bay (ShB)

The intertidal flat selected for monitoring in Shoal Bay is adjacent to the Auckland Harbour Bridge and near a large rock platform (Plate 5, p46). The sediment at this site is coarse with a dense shell hash and consequently it has the highest gravel content of all monitored sites (Appendix 10.1). The sediment surface also displays ripples which is a characteristic of an exposed site. A buried pipeline running perpendicular to the shore intersects the site. Human debris (plastics, glassware and rubber) is commonly observed on this sandflat. The sediment at ShB is mainly fine sand, although a considerable proportion of medium sand is found (mean 14%, Table 3). ShB sediments have the lowest mean organic content (0.23 – 1.94%) of all the monitored sites, and the chlorophyll *a* content is also frequently low.

4.1.6 Summary of site characteristics

Table 4:

Analysis of temporal variability in sediment characteristics at five sites from October 2000 to February 2008; Hobsonville (HBV), Henderson Creek (HC), Whau River (Whau), Te Tokaroa Reef (Reef) and Shoal Bay (ShB): Average annual variability (Standard Deviation) of sediment % by weight, coarse sand (500 – 2000 μm), medium sand (250 – 500 μm), fine sand (62.5 – 250 μm), mud (< 62.5 μm) and Chla = chlorophyll *a*. Note: gravel faction (>2000 μm) not included.

site	%mud	%fine sand	%medium sand	%coarse sand	%organics	chl*a* $\mu g.g^{-1}$
HBV	1.62	8.87	9.19	2.33	0.98	3.01
HC	2.39	9.97	9.18	2.09	0.77	5.79
Whau	1.05	2.33	2.11	0.24	0.41	2.86
Reef	3.20	3.11	1.39	0.15	0.98	3.22
ShB	2.55	8.16	8.70	1.55	0.32	2.46

Values for organic content and chlorophyll *a* remain comparable to the other sentinel sites in the Manukau and Mahurangi Harbours (Hewitt and Hailes 2007, Cummings 2007) and to previous years of study in the Waitemata (Halliday and Hewitt 2006). As commented on in previous reports, mean chlorophyll *a* varies among sites, with highest values at HC and lowest at ShB (Table 3). Organic content was low at all sites (i.e., <3%) and, similar to chlorophyll *a*, was lowest at ShB (Table 3).

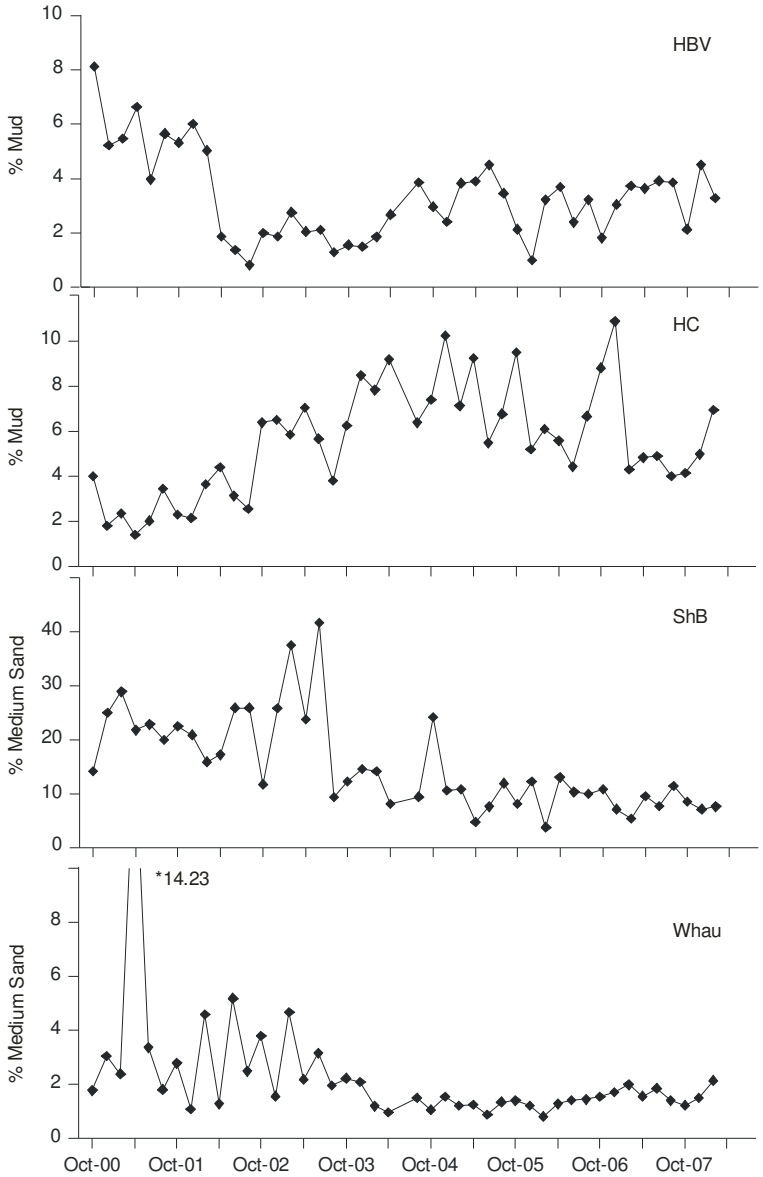
The five sites can still be divided into two groups on the basis of within-year variability in sediment characteristics: Whau, Reef and ShB have lower variability than HBV and HC (Table 4). Since 2006 both HBV and HC have further increased in variability; with all standard deviations greater in 2008 than in 2006 with the exception of HBV organics (Table 4, Halliday and Hewitt 2006). Consistent seasonal fluctuations are still present in chlorophyll *a* at HBV and HC but lacking at other sites. Organic content also exhibits multiyear cycles.

After three years of monitoring, sites HBV and HC showed signs of progressive change in grain size, with the percentage of mud decreasing at the HBV and increasing

at the HC (Figure 2). This change has not persisted with both these trends discontinuing, however HC has become increasing variable. ShB has shown a decreasing trend in percentage medium sand at the site across the majority of the time series. The Whau site has undergone a small change through a decrease in variability of the percentage of medium sand (Table 2). Occasionally high percentage mud values were recorded for a site, for example ShB October 2001 (see Table 3) or Reef April 2007 (Appendix 1), but these are likely to be caused by local storm events.

Figure 2:

Temporal changes in site sediment characteristics. Percentage mud content decrease at HBV after 1-7 years. Increase in percentage mud content at HC from 1-5 years followed by high variability from 6-7 years. Decrease in percentage medium sand at ShB and a reduction in variability at Whau after February 2004.



4.2 At each site, are species exhibiting temporal variations that appear predictable?

This section describes patterns observed in species abundances at a site. Three types of patterns are described: trends, seasonal patterns that are similar in timing from year to year; and multiyear patterns. The latter are usually variations in the magnitude of seasonal recruitment, although the description also covers species that have multiyear recruitment patterns.

4.2.1 Hobsonville (HBV)

The Hobsonville site continues to be dominated by *Nucula hartvigiana*. There has been no change in dominance for October since monitoring began (Table 5); with the polychaete *Aonides trifida* and venerid bivalve *Austrovenus stutchburyi* consistently second and third most abundant respectively. Recently however, *Aonides* has succeeded *Nucula* in dominance on two occasions (February and December 2007). Analysis of trends show that *Aonides* is increasing and there is an indication *Nucula* has been decreasing since October 2003 (Figure 3). A change in dominance may occur if these abundance trajectories continue. The remaining monitored fauna were usually low in abundance, although the limpet *Notoacmea helmsi* and *Paphies australis* were among the dominant taxa for a number of sampling dates.

Table 5:

The three most abundant monitored taxa found over time at HBV.

Date	1st	2nd	3rd
Oct-00	*Nucula*	*Aonides*	*Austrovenus*
Oct-01	*Nucula*	*Aonides*	*Austrovenus*
Oct-02	*Nucula*	*Aonides*	*Austrovenus*
Oct-03	*Nucula*	*Aonides*	*Austrovenus*
Oct-04	*Nucula*	*Aonides*	*Austrovenus*
Oct-05	*Nucula*	*Aonides*	*Notoacmea*
Oct-06	*Nucula*	*Aonides*	*Austrovenus*
Oct-07	*Nucula*	*Aonides*	*Austrovenus*

Austrovenus stutchburyi at the HBV site were mainly of intermediate size (5-20 mm); with adult individuals being rare. The intermediate cockles had a trend of decreasing abundance whilst juveniles (<5 mm) had a significant increase (Figure 4). Overall abundance of cockles at this site was quite high and similar to Whau. This site still remains the only monitoring location to consistently support *Paphies australis* which are of juvenile and intermediate sizes (Figure 4 & 5). Whilst the total numbers of *Paphies* has not changed, the number of juveniles has exhibited a decreasing trend and been low since February 2006 suggesting a lack of supply, or poor success in recruitment. Consequently this species will decline in abundance if recruitment does not recover. *Macomona liliana* at HBV was dominated by adult individuals in similar densities to the Whau and Reef sites (Appendix 1). There has been a trend of decreasing abundance of large adult *Macomona* at HBV, although there has been a simultaneous increase in juveniles.

Figure 3:

Trends in abundance of the two dominant species *Nucula hartvigiana decreasing* and *Aonides trifida* increasing at the HBV site.

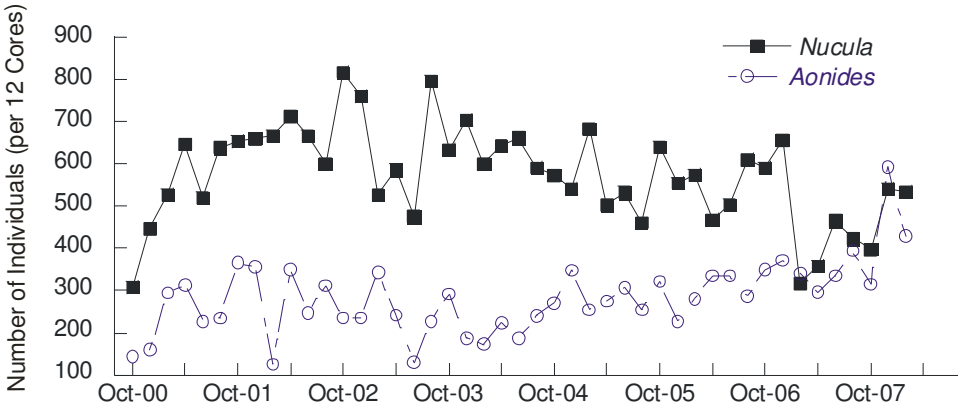


Figure 4:

The abundance of different size classes of *Austrovenus stutchburyi, Macomona liliana* and *Paphies australis* found over time at site HBV.

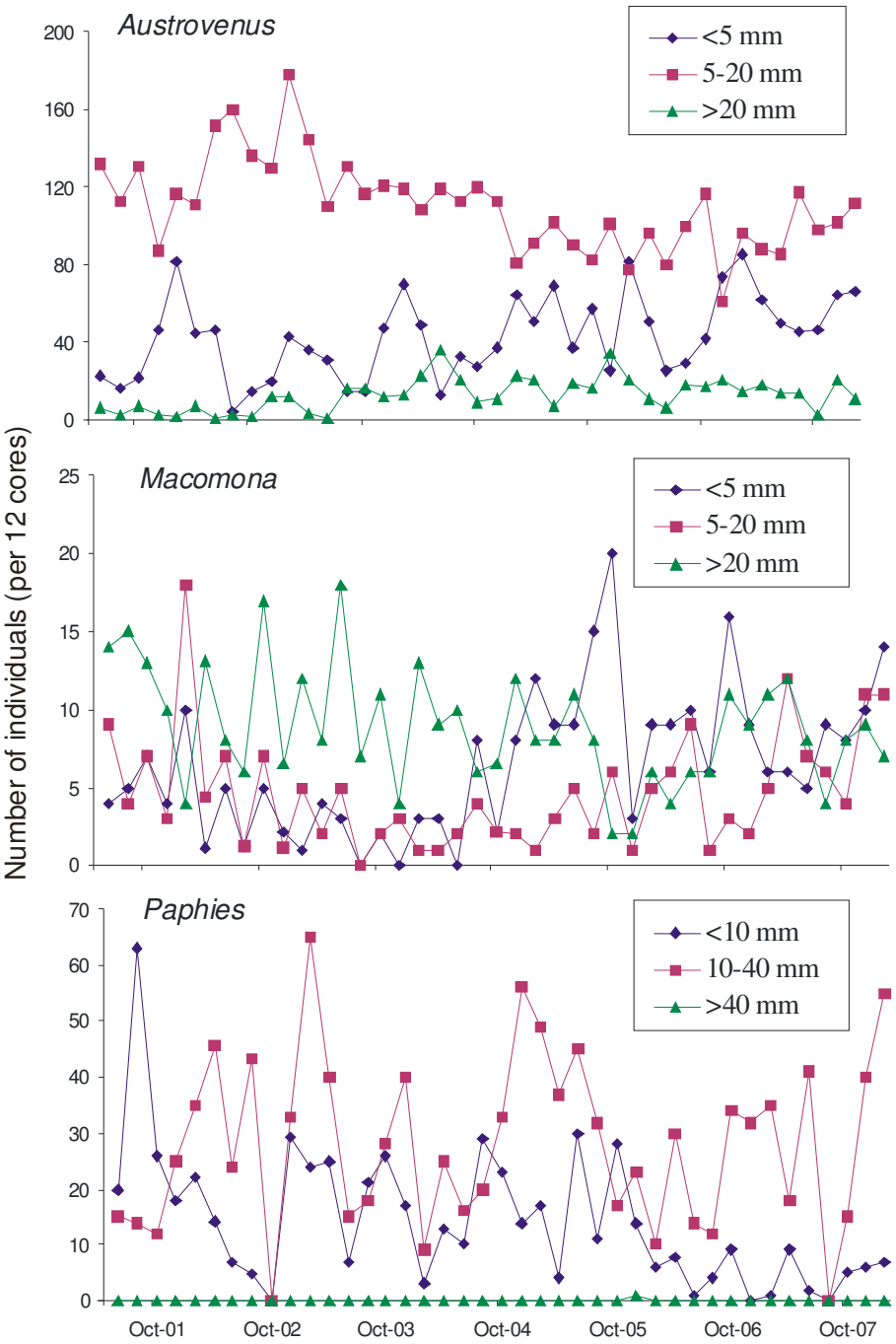


Figure 5:

Size class distributions of cockles *(Austrovenus stutchburyi)* and wedge shells (*Macomona liliana*) measured as maximum shell width, at each site in June 2007. Population structures during recruitment periods are generally dominated by juveniles. To give a more general representation of population structure, this graph is based on June, typically a month when juvenile recruitment is low or absent.

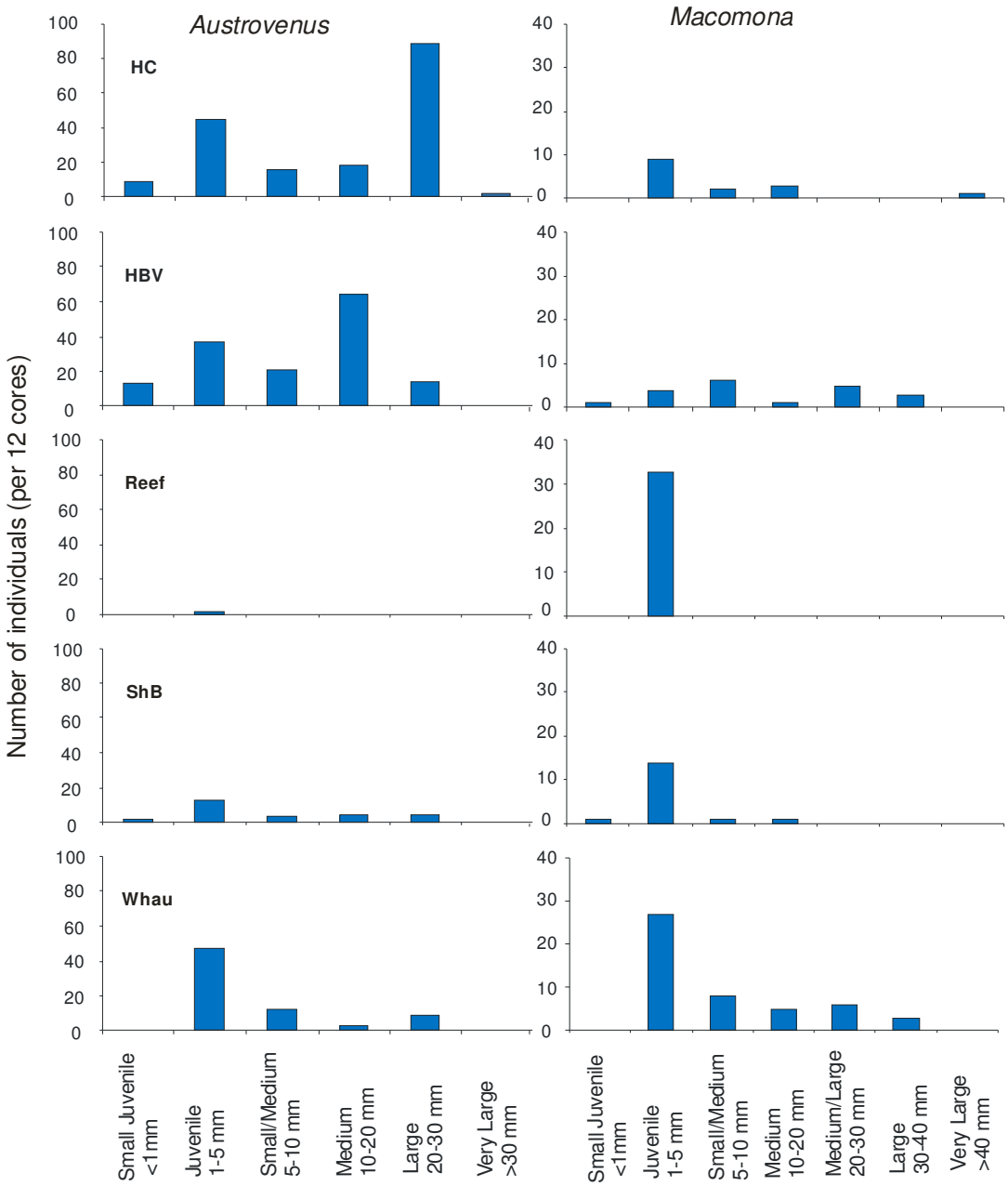
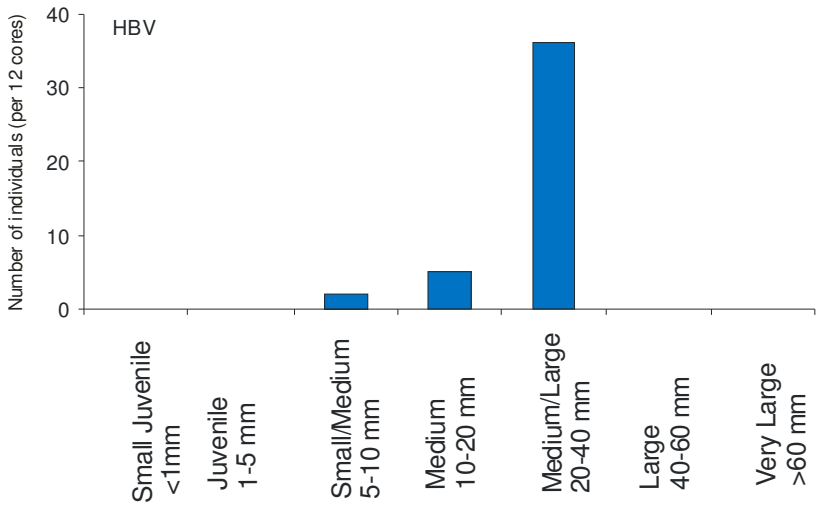


Figure 5: (cont.):

Size class distributions of pipis (*Paphies australis*) at Hobsonville measured as maximum shell width, at each site in June 2007.



A number of changes have occurred in species abundances since the 2006 report. In Halliday and Hewitt (2006), the cnidarian *Anthopleura aureoradiata* showed an increasing trend in abundance. This species has continued to increase in number, although the rate has diminished, most likely benefiting from the shell hash and the *Austrovenus stutchburyi* population at this site as attachment substrates. *Zeacumantus lutulentus* is still showing an increased trend following the sharp rise in abundances from August 04. *Zeacumantus* has also shown an increase in variance, with large changes in abundance from month to month in the last 3 years. *Prionospio aucklandica* abundances have exhibited a strong significant trend of decreasing abundance since April 01 (Halliday and Hewitt 2006, Figure 6). However, on the last two sampling occasions, abundances have substantially increased; a pattern which can also be seen for *Gycera* spp., *Haminoea zelandiae* and *Macroclymenella stewartensis*. It is too early to determine whether these changes will be maintained or are only part of a longer-term cycle. For *Prionospio*, a species which has previously had low month to month variation, the recent increase in abundance in the last two sampling events is of significant interest.

Cyclic patterns in abundances occur at HBV with several species showing seasonal patterns (Table 6). Peak abundances during the summer occurred for *Austrovenus stutchburyi* (February), *Exosphaeroma chilensis* (February-April) and *Macroclymenella stewartensis* (December). Peak abundances for other species occurred at different times of the year: *Boccardia syrtis* (June-August), *Aricidea* sp. (October) and *Colurostylis lemurum* (April and August). *Notoacmea helmsi* and *Colurostylis* also exhibited greater than annual cycles while *Paphies* and *Macomona* both showed non-cyclic patterns in abundance.

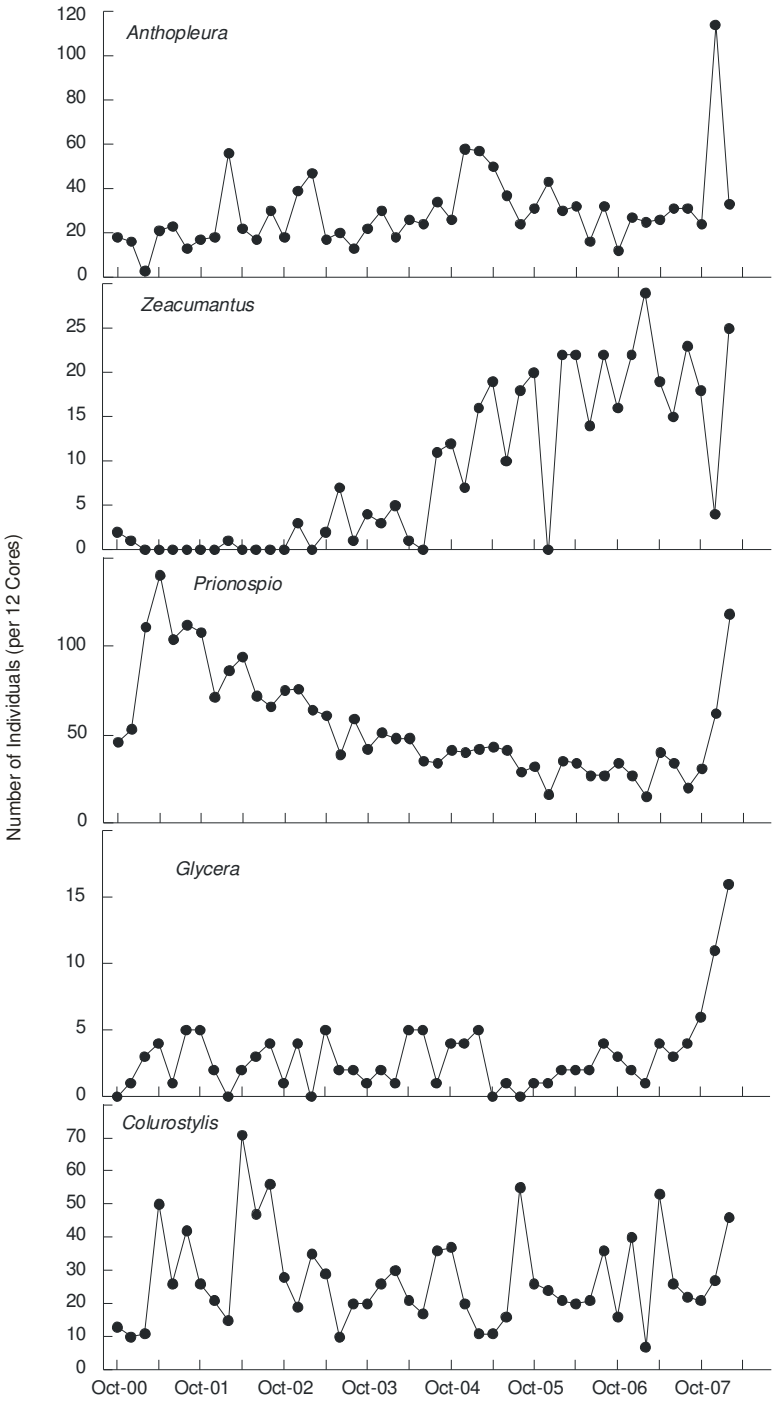
Table 6:

Summary of temporal patterns in abundance of selected taxa observed at each site between October 2000 to February 2008. Hobsonville (HBV), Henderson Creek (HC), Whau River (Whau), Te Tokaroa Reef (Reef) and Shoal Bay (ShB). *recent sampling indicated trend may be changing. **trend most apparent over the whole monitoring series but may not indicate current trend of species abundances. *** *Boccardia* has a cycle of 5-10 months at Whau.

Site	Seasonal cycles	Greater than annual patterns	Suggested trends	Trend direction
HBV	*Macroclymenella*	*Notoacmea*	*Anthopleura*	Increase
	Exosphaeroma	*Colurostylis*	*Zeacumantus*	Increase
	Austrovenus		*Aonides*	Increase
	Aricidea		*Prionospio*	Decrease*
	Boccardia			
	Colurostylis			
HC	*Anthopleura*,	*Austrovenus*	*Aricidea*	Increase*
	Exosphaeroma	*Notoacmea*	*Nucula*	Decrease
	Macroclymenella	*Nucula*	*Austrovenus*	Decrease
	Aricidea	*Diloma*	*Macroclymenella*	Increase
	Notoacmea			
Whau	*Colurostylis*		*Anthopleura*	Decrease**
	Austrovenus		*Aricidea*	Decrease**
	*Boccardia****		*Notoacmea*	Decrease**
			Prionospio	Decrease**
			Heteromastus	Increase
			Macroclymenella	Increase
			Colurostylis	Increase
			Nucula	Decrease
			Euchone	Increase
Reef	*Haminoea*	*Haminoea*	*Nucula*	Decrease
	Arthritica	*Austrovenus*	*Heteromastus*	Increase
	Austrovenus	*Euchone*	*Zeacumantus*	Increase
	Euchone	*Macroclymenella*		
		Aricidea		
ShB	*Notoacmea*	*Aricidea*,	*Nucula*	Decrease
	Nucula	*Anthopleura*	*Heteromastus*	Increase
	Colurostylis	*Euchone*	*Macroclymenella*	Increase
	Glycera	*Austrovenus*	*Boccardia*	Increase
	Austrovenus		*Prionospio*	Increase
	Aonides		*Zeacumantus*	Decrease

Figure 6:

Abundances of *Anthopleura aureoradiata* and *Zeacumantus lutulentus* at HBV exhibit an increasing trend while *Prionospio aucklandica* is exhibits a decreasing trend in abundance. *Colurostylis lemurum* is an example of a species with a seasonal cycle in abundance (peaks in April and August). Both *Prionospio* and the *Glycera* spp. have shown a large increase in abundance in December 07 and February 08.



4.2.2 Henderson Creek (HC)

Nucula hartvigiana was consistently the most dominant species over the monitoring period (Table 7), attaining high densities (typically >1000 for the sum of 12 cores). *Austrovenus stutchburyi* was also highly abundant with large numbers of intermediate (5 – 20 mm) and adult (>20 mm) individuals (Figure 7). Other common species included *Notoacmea helmsi*, and occasionally *Anthopleura aureoradiata*; probably supported by the large surface area of bivalve shells. *Aricidea* sp. was also one of the more common species with *Prionospio aucklandica* and *Zeacumantus lutulentus* intermittently abundant. *Paphies australis* was rare at the HC site with only a few individuals collected over the whole monitoring period. *Macomona liliana* was also in low abundance at the HC site (lower than all other of the monitoring sites) with the majority in the juvenile size-class (< 5 mm). The juvenile size-class exhibited an increasing trend with several large abundance peaks occurring since October 2004 (Figure 8).

Table 7:

The three most abundant monitored taxa found over time at HC.

Date	1st	2nd	3rd
Oct-00	*Nucula*	*Austrovenus*	*Notoacmea*
Oct-01	*Nucula*	*Austrovenus*	*Aricidea*
Oct-02	*Nucula*	*Austrovenus*	*Aricidea*
Oct-03	*Nucula*	*Austrovenus*	*Notoacmea*
Oct-04	*Nucula*	*Austrovenus*	*Notoacmea*
Oct-05	*Nucula*	*Austrovenus*	*Aricidea*
Oct-06	*Nucula*	*Aricidea*	*Austrovenus*
Oct-07	*Nucula*	*Aricidea*	*Austrovenus*

A number of trends in abundance previously commented on (Halliday and Hewitt 2006) have now stopped. Changes in the abundance of *Zeacumantus* and *Prionospio* have proved to be part of a multi-year cycle of abundance. *Zeacumantus* has shown a sharp drop in abundance since October 2006 (Figure 8), and *Prionospio* has increased in abundance since December 2006. In other cases, however, abundances have stabilized at a different level. *Boccardia* has shown consistently steady and low abundance since June 2004. *Anthopleura* may also have stabilised at a new (in this case higher) level of abundance (Figure 8).

Macroclymenella stewartensis has shown an increased abundance at HC. Both the abundant bivalve species *Nucula* and *Austrovenus* have shown a decrease in their populations at HC since February 2003. Although these species have declined, they remain abundant in relation to the numbers of other species. The decline in *Austrovenus* was driven by a decreasing trend in the abundance of intermediate sized individuals, which have showed a general decrease since the time series began (Figure 7).

Seasonal cycles were seen for *Anthopleura*, *Exosphaeroma chilensis* and *Macroclymenella* which all had peaks in abundance during the summer (December-February). *Aricidea* and *Notoacmea helmsi* also showed seasonal variations with peak abundances around October. Greater than annual patterns were seen in *Austrovenus*, *Notoacmea*, *Nucula* and *Diloma subrostrata*. Patterns for *Austrovenus, Notoacmea* and *Nucula* reflect differential recruitment success. Peaks in *Diloma* abundance did not occur each season, instead occurring every 10 to 15 months.

Figure 7:
The abundance of different size classes of *Austrovenus stutchburyi* and *Macomona liliana* found over time at HC.

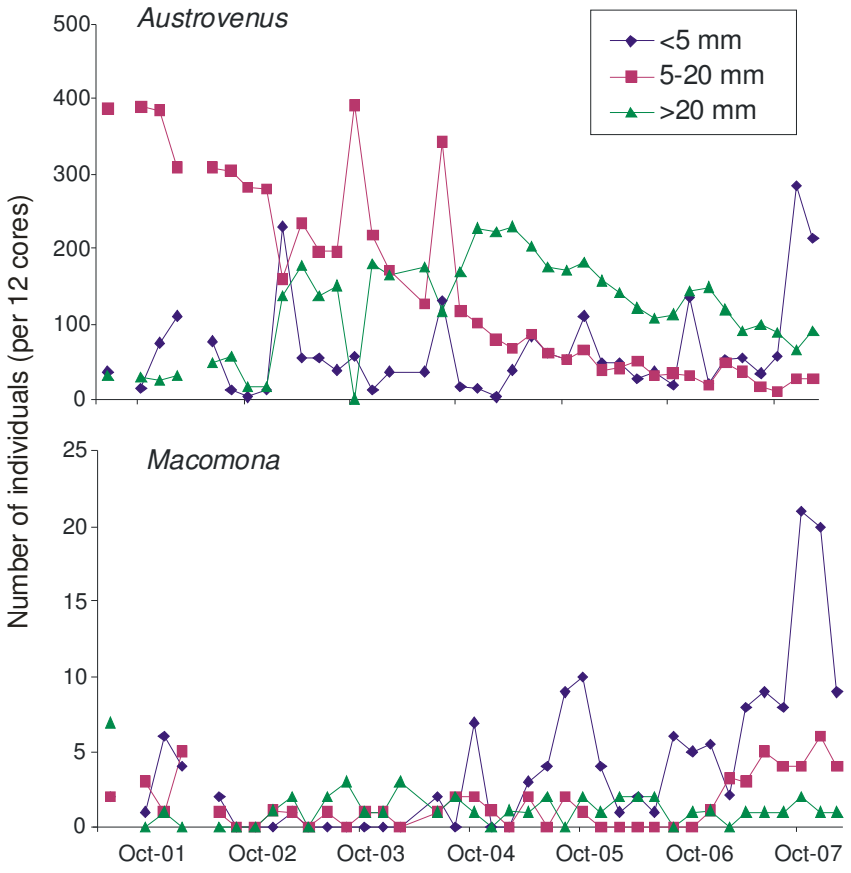
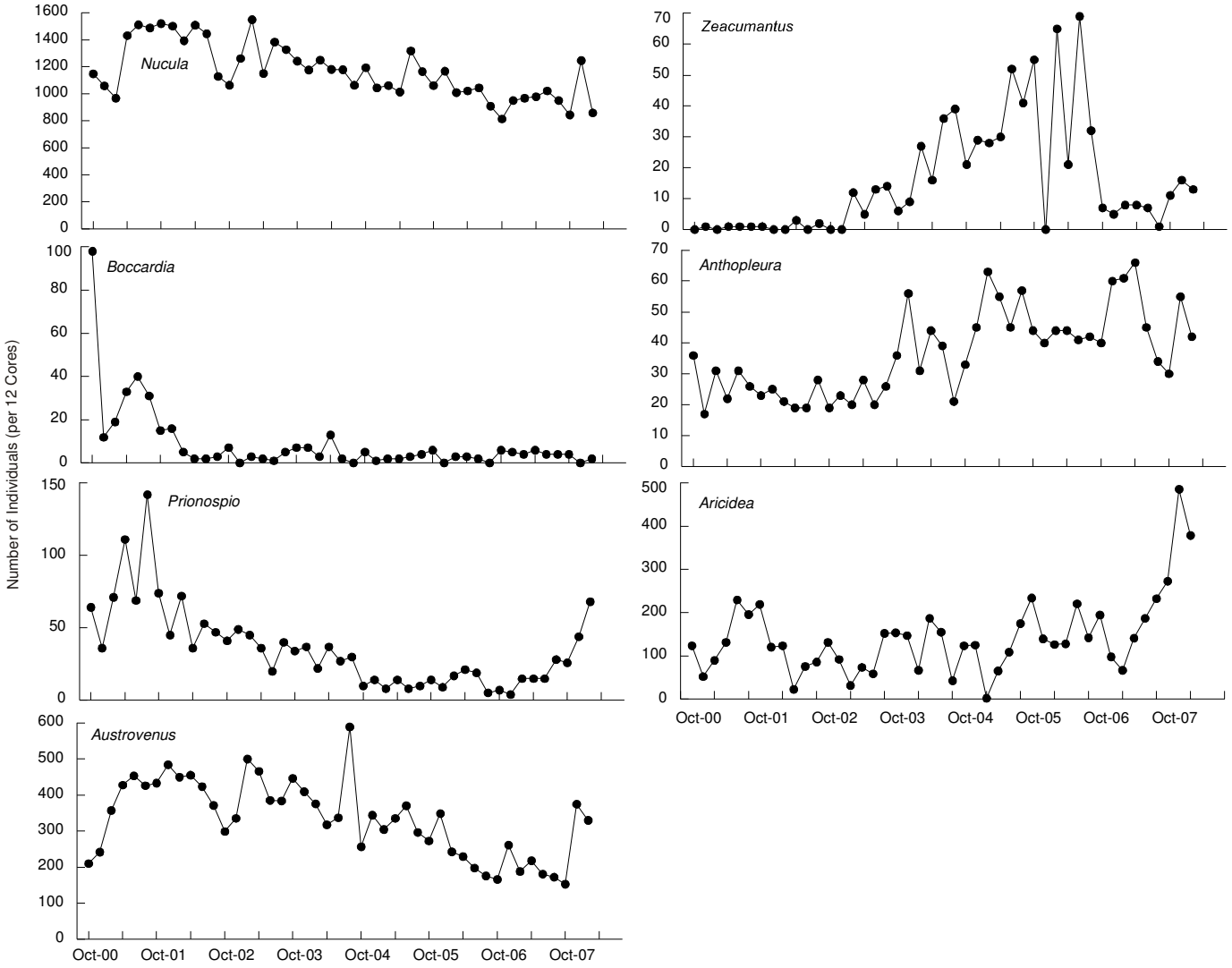


Figure 8:

Abundance of *Anthopleura aureoradiata* at HC exhibiting and increasing trend, while there was a decreasing trend in abundance for *Nucula hartvigiana* and *Austrovenus stutchburyi*. Trends in abundance of *Zeacumantus lutulentus* and *Prionospio aucklandica* have changed in recent months. *Aricidea* sp. showed a recent increase in abundance. *Boccardia syrtis* showed a stable abundance following a peak in June 2001. Note difference scales for each species.



4.2.3 Whau River (Whau)

Nucula hartvigiana was again the most dominant species at the Whau site, with abundances similar in magnitude to HBV, although lower than HC (Table 8). *Aricidea* sp. and *Austrovenus stutchburyi* have also been consistently in the top few dominant species. Occasional dominants at this site include the Maldanid polychaete *Macroclymenella stewartensis* and *Notoacmea helmsi* and *Macomona liliana*; although not in the October data. *Macomona* was more abundant at Whau than at any other site. Individuals were present in each size class (Figure 9) although population structure was dominated by juveniles.

Table 8:

The three most abundant monitored taxa found over time at Whau.

Date	1st	2nd	3rd
Oct-00	*Nucula*	*Aricidea*	*Austrovenus*
Oct-01	*Nucula*	*Aricidea*	*Austrovenus*
Oct-02	*Nucula*	*Aricidea*	*Austrovenus*
Oct-03	*Nucula*	*Austrovenus*	*Aricidea*
Oct-04	*Aricidea*	*Nucula*	*Macroclymenella*
Oct-05	*Nucula*	*Aricidea*	*Macroclymenella*
Oct-06	*Nucula*	*Aricidea*	*Macroclymenella*
Oct-07	*Nucula*	*Aricidea*	*Austrovenus*

Trends of decreasing abundance have been reported for *Anthopleura aureoradiata*, *Aricidea*, *Nucula*, *Notoacmea* and *Prionospio aucklandica* (Figure 10). All species had higher abundances in 2000 when monitoring began than they do at the current time. However, abundances of most of these species have been relatively unchanged since February 2003 with *Nucula* unchanged since February 2004. February 2003 was also the time at which an increasing trend in *Zeacumantus lutulentus* abundances began. *Macroclymenella*, *Colurostylis lemurum* and *Heteromastus filiformis* have all exhibited increasing abundance trends at Whau over time despite high bimonthly variability. *Euchone* sp. was rare at Whau until October 2005, but has since showed consistently higher abundances. Seasonal patterns can be seen for *Colurostylis* which has a peak abundance in June and *Austrovenus* which peaks between December and February. *Boccardia syrtis* also shows peaks in recruitment but this does not happen on a seasonal basis; instead occurring between five and ten months apart.

Figure 9:
The abundance of different size classes of *Austrovenus stutchburyi* and *Macomona liliana* found over time at Whau.

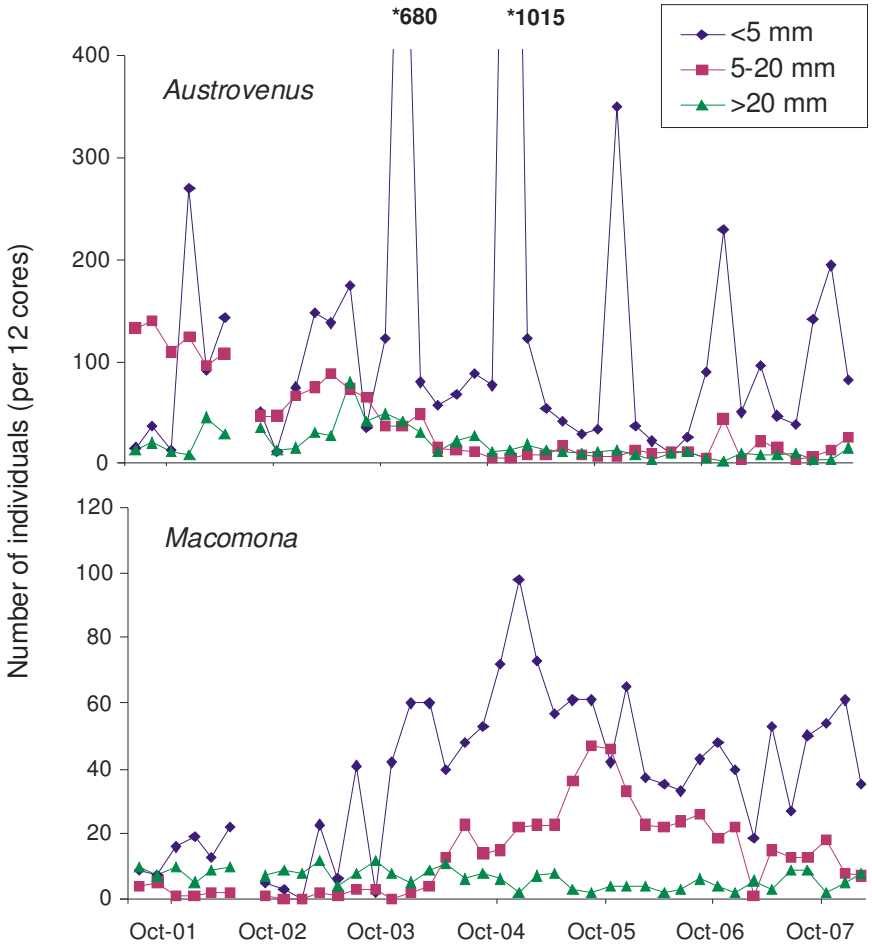
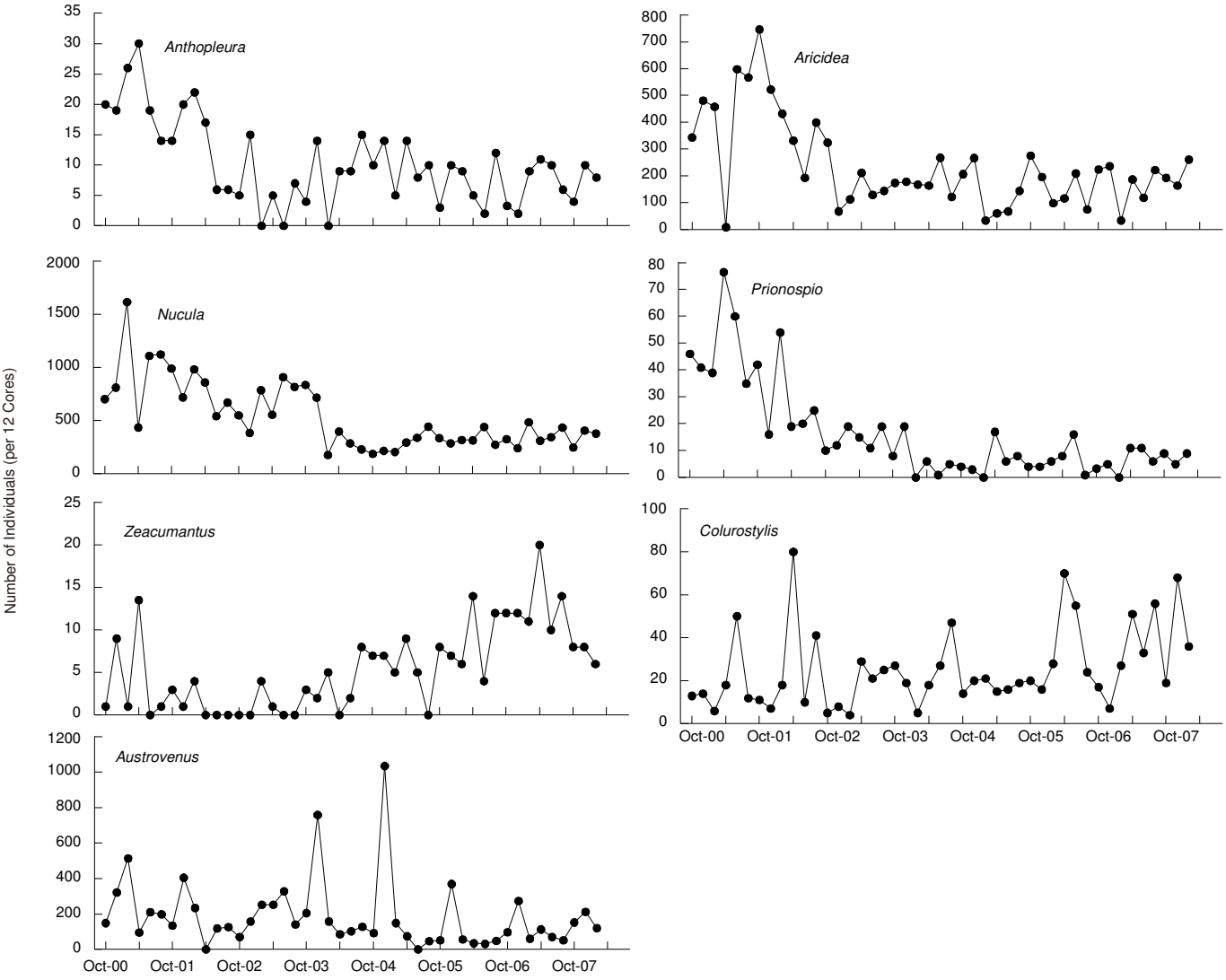


Figure 10:

Decreasing trends in abundance for *Anthopleura aureoradiata, Aricidea* sp.*, Nucula hartvigiana* and *Prionospio aucklandica* early in the time series, but have changed little since October 2003 at Whau. *Zeacumantus lutulentus* exhibits increasing abundances. *Colurostylis lemurum* and *Austrovenus stutchburyi* exhibit seasonal patterns in abundance.



4.2.4 Te Tokaroa Reef (Reef)

The Reef site supports a diverse range of different taxa, although these usually occur in low abundance. Of the monitored species *Anthopleura aureoradiata*, *Aonides trifida, Diloma subrostrata*, *Exosphaeroma chilensis*, *Notoacmea helmsi* and *Paphies australis* are all rarely found and a lack of surface deposit feeders is notable at this site.

Species dominance at this site primarily reflects the trends in two species. At the beginning of the monitoring period similar to many other sites, *Nucula hartvigiana* was the dominant species (Table 9). However, this species declined in abundance in the early years, and has only occurred in low abundances since October 04 (Figure 11). Coupled with the decline in *Nucula* has been an increase trend in the Capitelid polychaete, *Heteromastus filiformis* (Figure 11), since February 2003.. As a result *Heteromastus* has been the dominant species for the last three years; although with variable abundances. Other dominant species at this site include the Sabellid polychaete *Euchone* sp., which dominated from October 2003-04 and *Aricidea* sp., *Austrovenus stutchburyi* and *Macomona liliana*. *Zeacumantus lutulentus* is also considered common and has shown an increasing trend in abundance. *Austrovenus* abundances at Reef are the lowest of all the Central Waitemata monitoring sites. The size class is predominantly juveniles with adults absent (Figure 12) and intermediate individuals rare across the whole time series. The size of the recruitment peaks for *Austrovenus* has fluctuated over the monitoring period with lower levels of recruitment in 2001-2002 and 2006-2007 but with higher recruitment occurring from 2003-2005 (Figure 12). *Macomona* densities are average in relation to other sampling sites and all size classes are found (Figure 12).

Seasonal cycles in abundance were seen in *Austrovenus* (Figure 11), the bubble shell *Haminoea zelandiae* (Figure 12), and *Arthritica bifurca*; which all peaked during the summer, usually between December and February. *Euchone* also demonstrated a seasonal pattern with peak abundance between June and August (Figure 11). Greater than seasonal cycles were also seen for *Austrovenus, Haminoea* and *Euchone* which differed in recruitment success from year to year. Both *Macroclymenella* and *Aricidea* exhibited greater than annual patterns in recruitment. The remaining monitored species at Reef were only found in low numbers.

Table 9:

The three most abundant monitored taxa found over time at Reef.

Date	1st	2nd	3rd
Oct-00	*Nucula*	*Euchone*	*Aricidea*
Oct-01	*Nucula*	*Euchone*	*Aricidea*
Oct-02	*Nucula*	*Euchone*	*Aricidea*
Oct-03	*Euchone*	*Austrovenus*	*Nucula*
Oct-04	*Euchone*	*Heteromastus*	*Aricidea*
Oct-05	*Heteromastus*	*Euchone*	*Boccardia*
Oct-06	*Heteromastus*	*Euchone*	*Aricidea*
Oct-07	*Heteromastus*	*Euchone*	*Aricidea*

Figure 11:
A decreasing trend in *Nucula hartvigiana* and an increasing trend in *Heteromastus filiformis* abundance over time at Reef. Both seasonal and greater than seasonal patterns (multi-year cycles) are evident for *Haminoea zelandica*, *Euchone* sp. and *Austrovenus stutchburyi*.

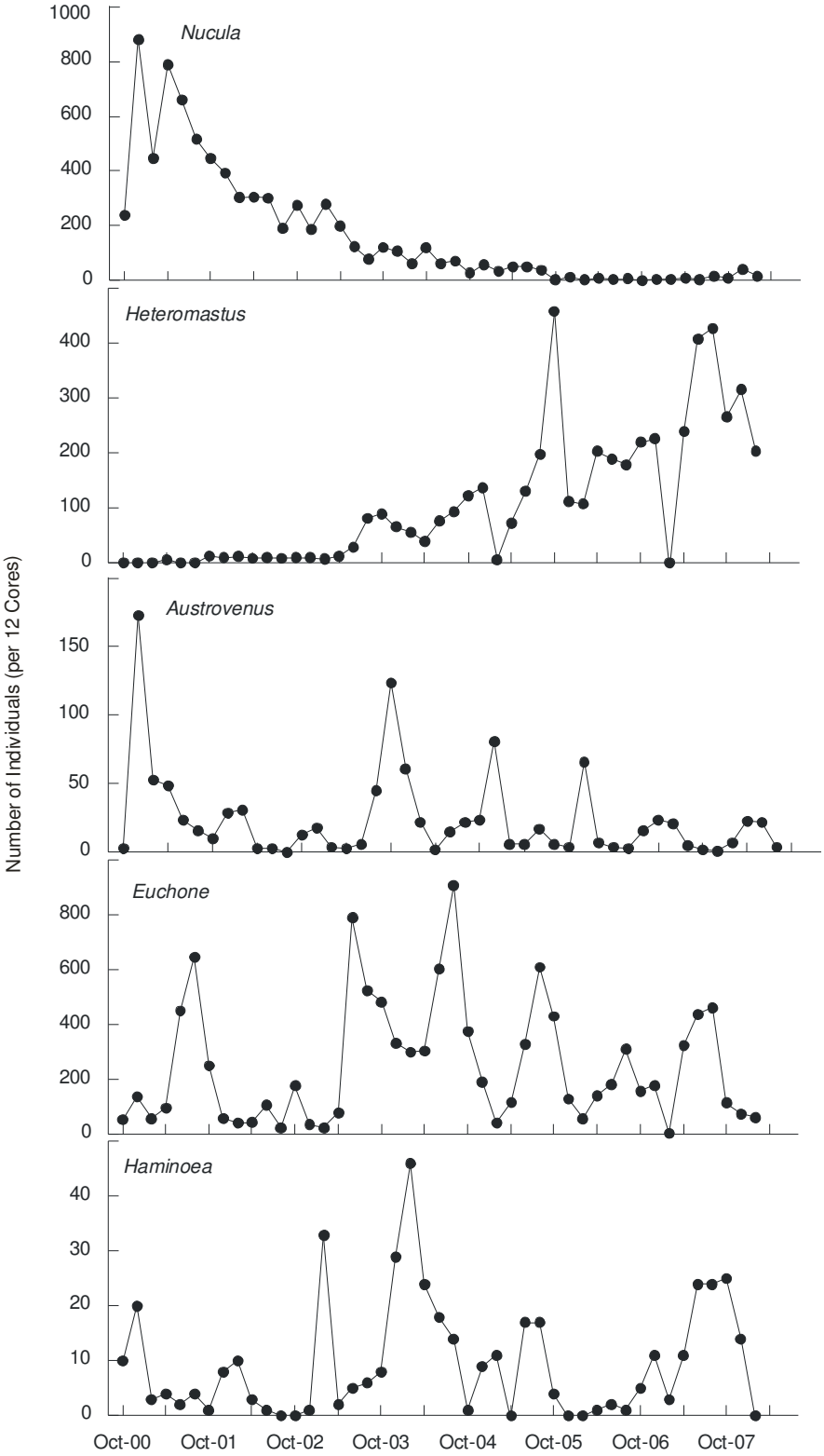
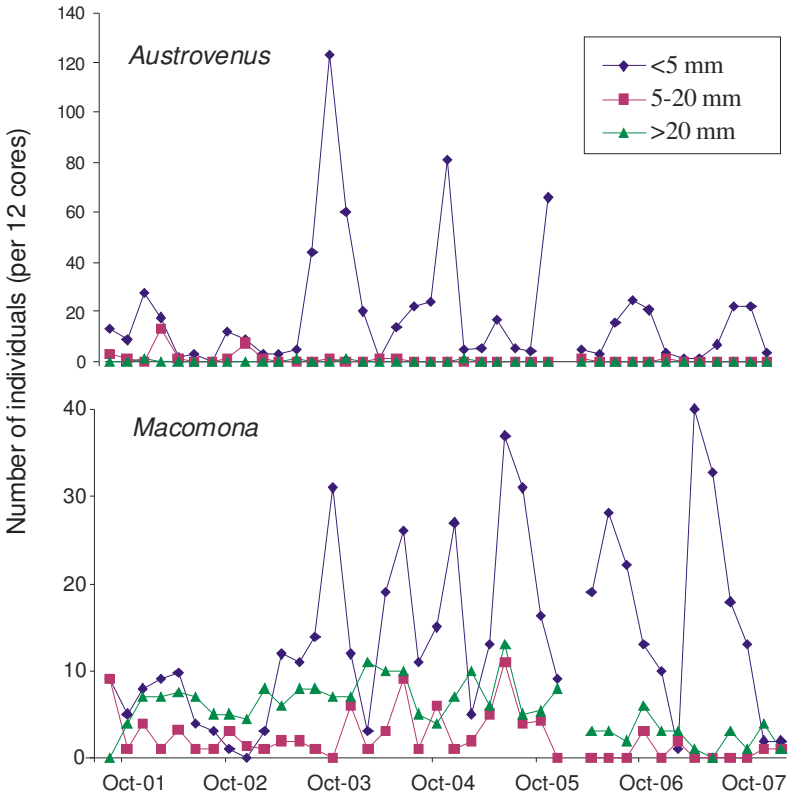


Figure 12:
The abundance of different size classes of *Austrovenus stutchburyi* and *Macomona liliana* found over time at Reef.



4.2.5 Shoal Bay (ShB)

Like many of the monitoring sites faunal abundance at ShB is dominated by *Nucula hartvigiana* (Table 10). Also comparable to other sites however, has been the decline in this species over the last few years of sampling and the rise in *Heteromastus filiformis* (Figure 13). *Notoacmea helmsi* has been dominant in the last 3 years on two occasions and has been an abundant species throughout the whole monitoring period. Other common species at this site include *Aonides trifida*, *Aricidea* sp., *Austrovenus stutchburyi*, *Boccardia syrtis*, *Colurostylis lemurum*, *Euchone* sp., *Heteromastus filiformis* and *Prionospio aucklandica*. The density of *Austrovenus* at ShB is relatively low, suggesting that the high abundance of *Notoacmea* may benefit from the dense shell hash found at this site as substrate (Plate 5). *Macomona* abundance at this site is typical for the Central Waitemata although larger individuals are scarce (Figure 14). Adult *Macomona* have shown a decreasing trend in abundance at ShB and have been rare since February 2006.

Table 10:

The three most abundant monitored taxa found over time at ShB.

Date	1st	2nd	3rd
Oct-00	*Nucula*	*Notoacmea*	*Boccardia*
Oct-01	*Nucula*	*Notoacmea*	*Aricidea*
Oct-02	*Nucula*	*Notoacmea*	*Aricidea*
Oct-03	*Nucula*	*Notoacmea*	*Aricidea*
Oct-04	*Nucula*	*Notoacmea*	*Euchone*
Oct-05	*Notoacmea*	*Boccardia*	*Euchone*
Oct-06	*Nucula*	*Notoacmea*	*Boccardia*
Oct-07	*Notoacmea*	*Boccardia*	*Euchone*

Notoacmea, *Nucula*, *Colurostylis*, *Glycera* spp., *Austrovenus* and *Aonides* all showed seasonal patterns in abundances at ShB (Figure 13). The timing of peak abundance was specific to the individual taxa and could occur throughout the year e.g., *Notoacmea peaked in* winter while *Glycera* peaked in summer. Greater than annual cycles were seen in *Aricidea*, *Anthopleura*, *Euchone* and *Austrovenus* primarily reflecting variation in recruitment success from year to year or less frequent recruitment. Trends in species abundances include an increase in both *Heteromastus* and *Macroclymenella stewartensis*. There was also a small upward trend in the abundance of *Prionospio* and *Boccardia* although abundances of both species are highly variable. *Zeacumantus lutulentus* showed a similar pattern in abundance to *Euchone* at the Whau site, being absent at this site until June 2004 but occurring in consistently low numbers thereafter.

Figure 13:

Changes in abundance of *Nucula hartvigiana* and *Heteromastus filiformis* over time at ShB. *Notoacmea helmsi* and *Glycera* spp. both exhibit seasonal cycles in abundance at this site.

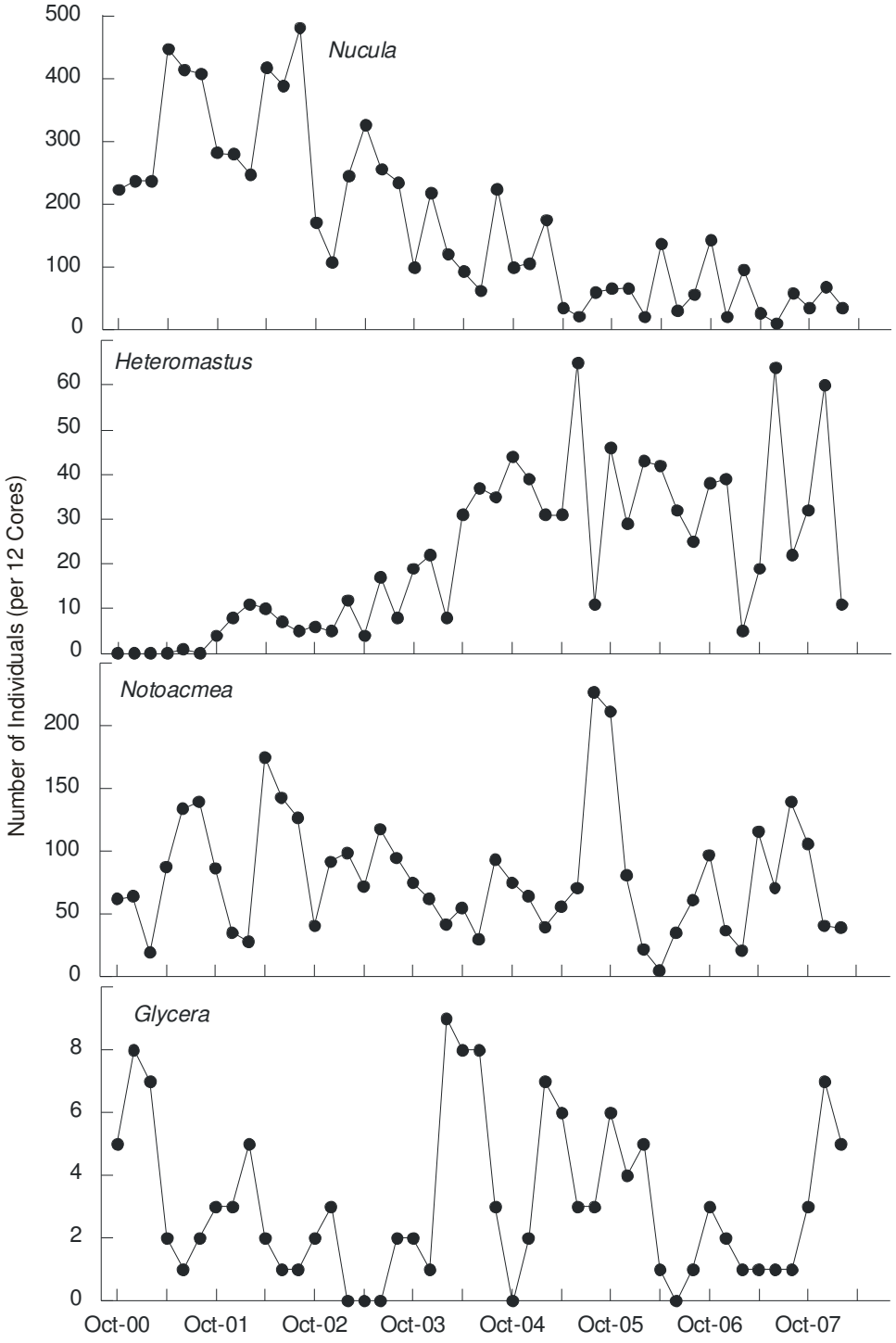
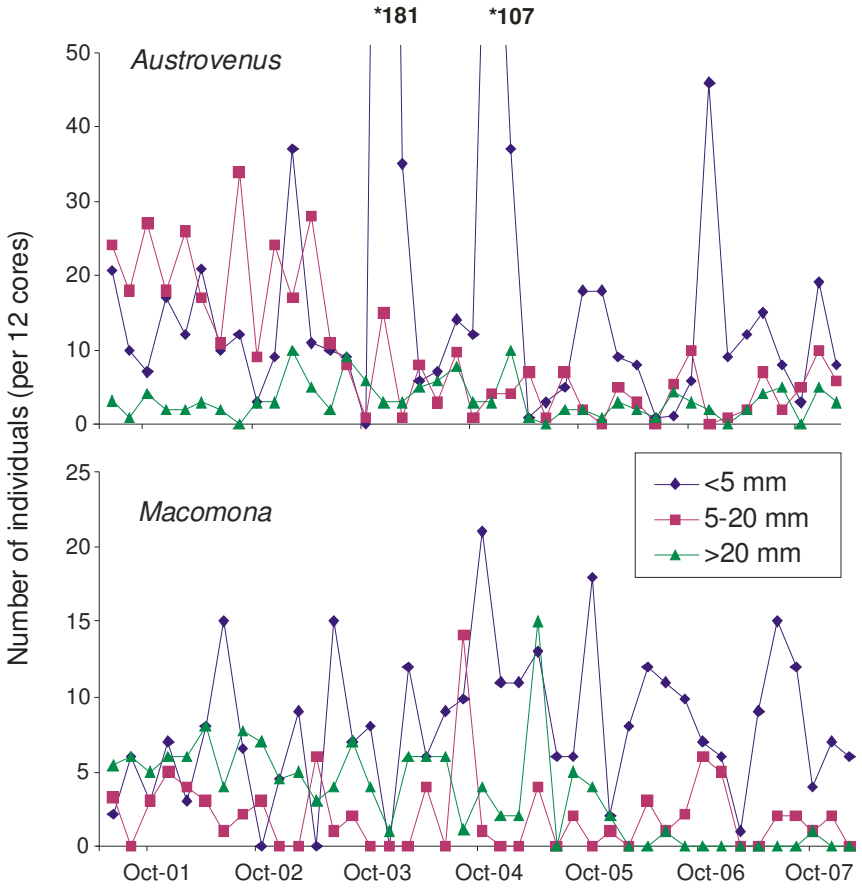


Figure 14:

The abundance of different size classes of *Austrovenus stutchburyi* and *Macomona liliana* found over time at ShB.



4.3 Are species abundances exhibiting similar patterns at all sites?

There were consistent trends in the abundance of several species across sites. *Nucula hartvigiana* decreased at the majority of sites in the Waitemata, although the magnitude varied. High losses occurred at Reef, Whau and ShB with moderate losses recorded at HC. At HBV *Nucula* abundance increased between 2000 and 2002, but has since shown a steady decrease (Figure 5). *Heteromastus filiformis* increased in abundance at ShB, Whau and Reef, while *Zeacumantus lutulentus* increased at HBV, ShB and Whau. *Macroclymenella stewartensis* increased in abundance at HC, ShB and Whau and *Anthopleura aureoradiata* at HBV and HC. There have also been very recent and consistently sharp rises in the abundance of *Prionospio aucklandica* (HBV, HC, Reef), *Glycera* spp. (HBV), and *Aricidea* sp. (HC). Future monitoring will determine the permanence of these recent changes.

4.4 Have any changes in species over time led to changes in communities, or sites becoming more or less similar to each other?

4.4.1 Changes in site characteristics

At the beginning of the monitoring period sites could be grouped by their sediment composition: Whau and Reef were predominantly fine sand (90%), HBV and ShB fine sand (75%) with a greater percentage coarse fraction and HC with the lowest fine fraction and highest mud content. The greatest changes in sediment composition occurred over the first 18 months of the time series as documented in earlier reports (Hewitt et al. 2004, Halliday and Hewitt 2006). The recent trend analysis confirmed this (e.g., Figure 2), with most sites showing relatively stable conditions for several years now. A notable significant trend was the decrease in percentage medium sand at ShB (Figure 2.), which had high and variable values prior to June 2003, but has had much lower values since. However, this decrease did not change the dominant sediment type at this site, which remains predominantly (~80%) fine sand. Other trends in grain size were small in magnitude such as the rise in coarse sediment at HBV (4%) or Whau (0.3%). HBV, Reef and Whau all showed significant but small increases in the clay fraction.

The small variation in sediment characteristics over the last three years suggest that the changes occurring in community structure (section 4.4.2 below, Figure 15a) were not solely or largely driven by the measured sediment properties; grain-sizes, organics or chlorophyll *a* content. Correlations between the abundance of *Nucula hartvigiana*, the species showing greatest decline, and sediment grain sizes over time did not indicate strong relationships. R^2 values were consistently low (highest R^2 of all sediment size fractions for each site: 0.13 HBV mud, 0.16 HC mud, 0.17 Reef mud, 0.12 Whau Mud and ShB 0.46 medium sand). The highest correlation consistently occurred for the mud fraction but this is unlikely to be the cause of decline in *Nucula* as this species is mud tolerant, and fine fractions (clay-mud) have been increasing.

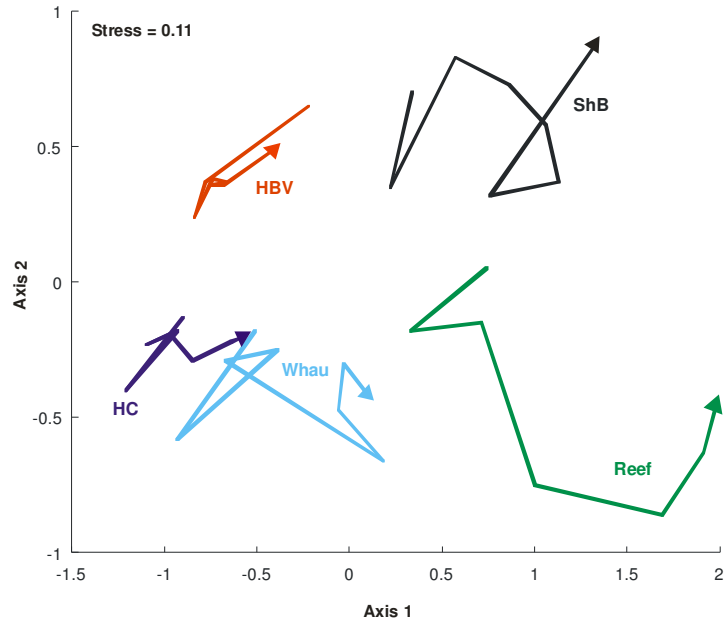
4.4.2 Changes in communities

In October 2000 at the beginning of the time series all five locations had distinct communities, with HC and Whau the most similar (Nicholls et al. 2002). Current multivariate ordination indicates that the community structures at each site are still distinct from one another, although a number of changes have occurred. The largest changes in community composition have occurred at the Reef and ShB sites, with moderate change at Whau (Figure 15a). These sites have been, or are, dominated by *Nucula hartvigiana* and the large decline in abundance of this species is dominating the response observed in the ordination based on raw data. HBV and HC have shown the smallest degree of community change as *Nucula* decline has been less severe at these sites. The small changes that have occurred at HC show the community to now be similar to the structure of Whau in October 2000. However, Whau has changed over the seven year monitoring period; hence Whau and HC maintain a degree of dissimilarity. The multivariate ordination based on 4^{th} root transformed data show reduced change at Reef and ShB (Figure 15b), as this transformation decrease the importance of abundance, and consequently the impact of the decline in *Nucula*. However, there are still some small changes at all sites except ShB (Figure 15b).

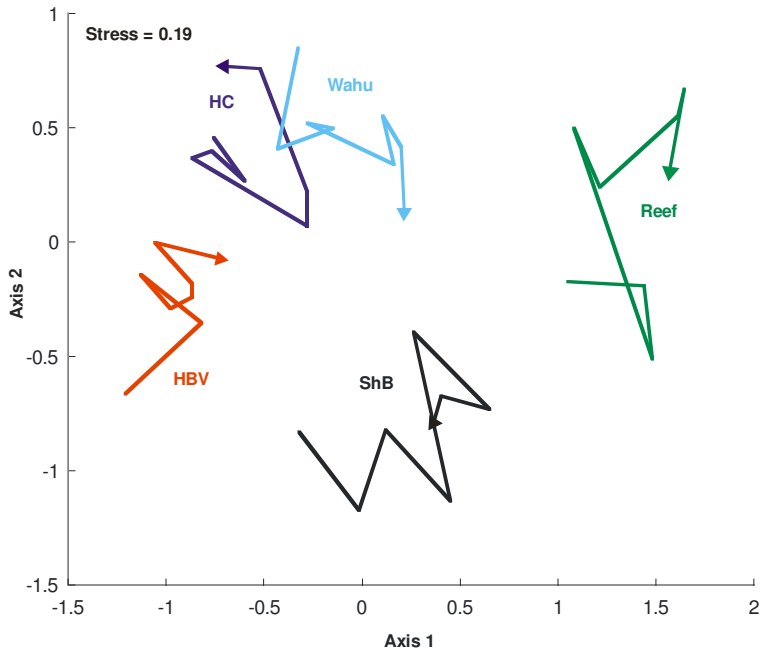
Trends in abundance of monitored species were evident at every surveyed site. The number of species showing changes over time however, was not a good indication of the degree of alteration in community structure: The HBV site had a high numbers of species exhibiting trends in abundance, but community variability was low (Figure 15a). For HBV, the species that showed trends were present at low densities and consequently did not have a large impact on community structure. Conversely, Reef showed fewer trends but the changes in *Nucula* and *Heteromastus filiformis*, both dominant species (Table 9), result in changes to community structure (Figure 15a).

Figure 15:
MDS ordination using Bray-Curtis similarity of the five sites (HBV, HC, Reef, Whau and ShB). Using (a) raw abundances and (b) 4th root transformation, of the monitored species from October data 2000-2007.

(a)



(b)



4.5 Potential for anthropogenic impacts in the Central Waitemata

Human activities in and around the Auckland area have the potential to impact upon the mud and sand flats within the Central Waitemata Harbour.

4.6 Sedimentation and mangrove expansion

Urban development around the greater Auckland area has caused acceleration in the amount of sediment deposited in the estuaries and tidal creeks of the Waitemata Harbour. The average sedimentation rate over the past 50 years at intertidal sites in the Central Waitemata Harbour is estimated to be 3.2 mm/year, with a range of 0.7-6.8 mm/year (Swales et al. 2007). High rates of sedimentation have increased the total area of tidal flats which have the potential to be colonised by mangroves and other vegetation (Swales et al. 2004). The issues of mangrove expansion is currently being investigated by NIWA for the ARC (Potential for mangrove-habitat expansion in Auckland's east-coast estuaries, A. Swales) using aerial photography and a numerical modelling approach incorporating key physical processes that influence mangrove distribution. The mangrove habitats in the Central Waitemata are not currently of concern with regards to expansion. Areas of mangroves on the western side of the harbour, near the Whau and HC sites, have been stable and have shown minimal extension in the last 40 years. Sedimentation in Central Waitemata has been highest in the Shoal Bay area; which is receiving a higher proportion of sediment emerging from Henderson Creek than other areas (M. Green *pers. com*). However, mangrove habitat in Shoal Bay is predominantly to the north east side and away from the ShB site situated to the south west.

4.7 Water quality

The ARC has extensively monitored the water quality of the greater Auckland area through the Saline State of the Environment monitoring programmes. Long term data sets (16-18 years) have allowed spatial and temporal patterns in water quality to be monitored. Four of the ARC saline monitoring stations fall within the Central Waitemata Harbour (Hobsonville, Chelsea, Henderson Creek and Whau creek) and these stations have all been found to have a reasonable water quality. Sites have been scored using a Water Quality Index (WQ) which rates them from poor, fair, good and very good, and is calculated using the annual median concentrations of nitrate, ammonium, total and soluble reactive phosphate, total suspended solids and the faecal coliforms (faecal indicator bacteria; MPN 100 ml-1). All four of the central Waitemata sites scored 'good' on the water WQ index.

5 Conclusions and recommendations

The general trends in species abundances occurring in the Central Waitemata are: (1) *Nucula hartvigiana* decreasing at all sites with the greatest loss occurring at Reef, ShB and Whau, (2) *Heteromastus filiformis* increasing in abundance at ShB, Whau and Reef, (3) *Zeacumantus lutulentus* increasing at HBV, ShB and Whau, (4) *Macroclymenella stewartensis* increasing in abundance at HC, ShB and Whau and (5) *Anthopleura aureoradiata* increasing in abundance at HBV and HC.

The change in species abundances does not appear to have been driven by changes in sediment grain-size alone, which only showed minimal deviation over the monitoring period. The exception to this was the decrease in percentage medium sand at the Shoal Bay (ShB) site which was substantial, but this did not change the predominant sediment type and was not reflected in community changes. In addition, based on the sensitivities of species exhibiting trends, changes in abundances were unlikely to be caused by contamination (Hewitt and Halliday 2006). In a system shown to have numerous anthropogenic pressures, the rising trend in *Heteromastus filiformis* could be an indication of a change in, or an increase, in the level of disturbance. It is well established that capitellids can thrive in disturbed environments (Pearson and Rosenberg 1978, Tsutsumi 1990) and other species of *Heteromastus* have been shown to have high recolonization potential (Netto and Lana 1994). A change may have occurred that gave *Heteromastus* a competitive ability allowing population expansion. Organic enrichment is not evident in the sediment data suggesting a different type of disturbance. The trends in species abundances could relate to alteration in recruitment. Capitellids are known to have good dispersal ability in their planktonic larvae (Tsutsumi 1990) and they may be benefiting from recruitment limitation of other species. The close proximity and similarity in community composition of the Whau and HC sites was previously suggested to indicate that recruitment and dispersal dynamics are important in this system (Hewitt and Halliday 2006).

Future monitoring will determine whether the recent changes in *Glycera* spp., *Prionospio aucklandica* and *Aricidea* sp. at HBV and HC (Figures 6 and 8) are transient peaks in recruitment or longer lived. These observed changes could also form part of a longer term cycle in these species abundance. The monitoring of macrofauna in the Manukau Harbour has shown cycles of nine years in species abundance. The monitoring series in the Central Waitemata Harbour has only been in duration for seven and a half years, so there is still the possibility that longer term cycles may become evident. Also analysis from the Manukau (Hewitt and Hailes (2007) shows many species are affected by ENSO and other climatic events and it is likely that many of the changes observed in the Central Waitemata are also related to such events.

The current areas in which the five monitoring sites are located provide expansive coverage across the Central Waitemata Harbour. The sites cover distinct sections of the Harbour and have distinct communities (Figure 15a/b) and for this reason it is recommended that none of them should be dropped from the monitoring programme. The Whau, HC and Hobsonville sites are all situated near the outflow of tidal creeks; areas that could be susceptible to change in the future. This is particularly valuable at Hobsonville, as the modeling of contaminant-sediment movements was less

successful in this area. Both the Reef and ShB sites are situated in locations that are hydrodynamically discrete from each other and the remaining monitoring sites. All monitored sites complement ongoing ARC funded research in other disciplines (M. Green *pers. com*) and may prove useful in future multi-discipline studies.

It is recommended that field sampling for the monitoring survey is conducted only on low tides of 0.7 m or lower, as both Reef and ShB cannot be sampled completely uncovered above this level. Both these sites have been sampled whilst partially or completely covered by water in the last year. Sampling for macrofauna while covered may jeopardize the quality and increase the variability in the macrofauna data, as highly dispersive fauna e.g., amphipods, cumaceans, and isopods may be absent or poorly sampled. This includes the monitored species *Exosphaeroma chilensis* and *Colurostylis lemurum*. Additionally, the patches of seagrass at the Reef site make it imperative that the exact location of each macrofaunal core is known i.e., knowing whether or not a sample has been taken inside or outside of a seagrass patch. Consideration should however be given to moving the SHB site 50m further up the shore, because this site has been consistently sampled underwater. Relocating the site would require a faunal survey of the new site area to ensure similarity with the lower shore.

6 Plates

Plate 1:

The Hobsonville area (top) with a close-up of sediment from within the HBV site (bottom). Pictures taken in February 2007.

Plate 2:

The sandflat near Henderson Creek (top) with a close-up of sediment from within the HC site (bottom). Pictures taken in August 2007.

Plate 3:

The sandflat near the Whau River (top) with a close-up of sediment from within the Whau site (bottom). Pictures taken in February 2007.

Plate 4:

The sandflat near Te Tokaroa Reef (top) with close-up of sediment (bottom). Site pictures taken in February 2008. Seagrass patch (next page) taken in February 07.

Plate 5:

A sandflat within Shoal Bay (top) with a close-up of sediment from site ShB (bottom). Pictures taken in February 2007.

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9 Appendices

9.1 Appendix 1: Sediment characteristics October 2000 – February 2008

Sediment characteristics including particle size as gravimetric %, % organics calculated from loss on ignition, and chlorophyll *a* (chla). June 2004 samples were lost prior to analysis.

site	*date*	*%clay*	*%silt*	*%mud*	*%fine sand*	*% medium*	*%coarse sand*	*%gravel*	*%organics*	*chla ug/g*
HBV	Oct-00	0.48	7.65	8.13	74.16	12.20	4.01	1.50	0.95	10.26
	Dec-00	0.05	5.17	5.22	78.45	10.74	2.33	3.26	1.05	13.36
	Feb-01	1.08	4.41	5.49	75.11	14.43	2.88	2.09	1.16	13.62
	Apr-01	1.80	4.84	6.64	66.93	18.26	4.97	3.20	1.29	17.77
	Jun-01	1.38	2.59	3.97	67.83	18.27	5.19	4.75	1.18	18.79
	Aug-01	1.20	4.46	5.66	77.59	12.67	2.66	1.43	1.15	17.51
	Oct-01	1.49	3.83	5.32	73.67	14.90	4.02	2.09	0.81	16.50
	Dec-01	1.60	4.42	6.02	71.49	15.98	2.73	3.78	0.80	12.38
	Feb-02	1.80	3.24	5.03	71.49	13.79	4.96	4.72	1.67	11.21
	Apr-02	0.85	1.02	1.88	46.32	45.28	5.92	0.60	1.14	17.18
	Jun-02	0.69	0.69	1.38	48.61	42.09	5.58	2.34	1.17	18.09
	Aug-02	0.32	0.49	0.81	46.19	40.48	9.45	3.07	2.43	15.80
	Oct-02	0.50	1.49	1.99	54.79	31.31	8.15	3.75	3.73	13.98
	Dec-02	1.60	0.27	1.86	58.28	32.23	4.65	2.97	1.25	12.58
	Feb-03	1.70	1.06	2.76	53.54	31.54	8.33	3.82	1.12	12.20
	Apr-03	0.00	2.05	2.05	55.95	33.42	7.65	0.92	1.39	17.75
	Jun-03	1.05	1.05	2.10	56.44	24.44	13.32	3.69	1.17	10.76
	Aug-03	0.00	1.29	1.29	60.15	31.61	6.09	0.86	0.78	11.24
	Oct-03	0.78	0.78	1.55	50.07	39.00	7.84	1.53	0.78	7.97
	Dec-03	0.00	1.50	1.50	47.68	43.56	7.09	0.17	0.83	14.11
	Feb-04	0.00	1.85	1.85	59.54	31.24	5.70	1.67	1.11	12.83
	Apr-04	0.00	2.67	2.67	49.60	32.00	5.75	9.98	3.38	11.23
	Jun-04									7.98
	Aug-04	2.32	1.55	3.87	56.69	33.33	6.10	0.00	0.52	18.04
	Oct-04	1.97	0.98	2.95	52.05	25.78	5.87	13.36	1.75	10.78
	Dec-04	2.40	0.00	2.40	48.99	39.52	8.70	0.38	2.19	15.36
	Feb-05	2.55	1.28	3.83	56.71	32.41	6.53	0.52	6.40	10.39
	Apr-05	1.30	2.59	3.89	49.48	33.58	7.08	5.97	1.07	12.66
	Jun-05	2.25	2.25	4.50	54.52	33.01	7.30	0.67	1.29	16.24
	Aug-05	2.46	0.99	3.45	56.32	34.15	5.67	0.41	1.12	15.32
	Oct-05	1.65	0.47	2.12	54.51	36.31	6.86	0.20	1.53	17.55
	Dec-05	0.98	0.00	0.98	44.21	42.33	10.71	1.76	1.75	10.68
	Feb-06	1.61	1.61	3.22	63.63	36.18	6.78	0.18	1.87	11.00
	Apr-06	1.67	2.01	3.68	57.92	30.86	6.47	1.07	0.78	10.99
	Jun-06	0.96	1.43	2.39	57.51	32.08	6.94	1.09	1.48	9.51
	Aug-06	2.85	0.36	3.21	56.96	32.09	5.10	2.64	1.46	19.72
	Oct-06	1.20	0.60	1.80	52.08	36.62	7.92	1.58	1.39	15.81
	Dec-06	2.29	0.76	3.05	58.52	32.22	4.77	1.44	1.21	11.70
	Feb-07	1.66	2.07	3.72	55.41	34.87	4.95	1.04	2.22	14.55
	Apr-07	3.23	0.40	3.63	50.80	36.13	7.76	1.68	1.43	13.87
	Jun-07	2.06	1.85	3.91	65.45	24.73	4.25	1.66	1.40	16.27
	Aug-07	0.00	3.87	3.87	58.35	23.11	12.43	2.25	1.92	16.39
	Oct-07	1.86	0.27	2.13	55.62	33.52	7.67	1.07	1.13	12.15
	Dec-07	1.50	3.00	4.51	58.93	25.96	8.82	1.79	1.89	12.50
	Feb-08	2.46	0.82	3.28	56.54	32.59	7.19	0.40	1.54	13.64

HC	Oct-00	0.43	3.57	4.00	55.08	23.92	9.36	7.64	1.61	9.53
	Dec-00	0.50	1.31	1.81	48.81	40.02	7.77	1.59	1.89	19.89
	Feb-01	0.45	1.92	2.37	50.99	37.74	8.05	0.85	1.75	17.99
	Apr-01	0.17	1.26	1.43	55.75	26.83	5.08	10.90	2.66	26.12
	Jun-01	0.57	1.47	2.04	58.03	31.22	7.96	0.74	2.65	29.61
	Aug-01	0.49	2.97	3.46	67.19	22.95	5.19	1.20	1.50	18.89
	Oct-01	0.53	1.76	2.30	58.56	30.63	7.43	1.08	1.46	21.67
	Dec-01	0.37	1.80	2.17	47.88	35.95	7.65	6.34	1.10	23.60
	Feb-02	0.13	3.53	3.66	52.76	25.84	11.42	6.33	2.55	16.58
	Apr-02	0.00	4.40	4.40	75.51	13.56	5.00	1.53	2.11	29.57
	Jun-02	3.15	0.00	3.15	74.86	15.05	3.82	3.12	2.08	26.77
	Aug-02	0.48	2.09	2.57	66.94	23.80	4.61	2.09	2.32	22.11
	Oct-02	3.73	2.66	6.39	75.07	13.30	3.24	2.00	2.04	22.49
	Dec-02	3.25	3.25	6.49	64.35	12.43	2.39	14.33	1.80	26.04
	Feb-03	2.51	3.35	5.86	72.52	13.85	4.06	3.70	1.77	29.99
	Apr-03	4.23	2.82	7.05	69.26	15.36	3.74	4.58	0.85	23.38
	Jun-03	3.78	1.89	5.67	35.11	52.55	3.16	3.50	1.19	31.70
	Aug-03	2.85	0.95	3.81	75.80	15.16	4.10	1.13	1.47	27.98
	Oct-03	0.83	5.42	6.26	77.57	12.42	2.70	1.05	1.90	20.34
	Dec-03	4.62	3.85	8.47	74.10	13.75	2.24	1.44	1.81	16.53
	Feb-04	3.13	4.70	7.83	74.91	12.75	3.05	1.46	1.92	23.81
	Apr-04	3.67	5.50	9.17	74.96	12.51	1.97	1.39	0.89	27.98
	Jun-04									18.80
	Aug-04	5.11	1.28	6.38	73.89	12.39	5.31	2.02	0.34	24.09
	Oct-04	4.62	2.77	7.39	71.92	17.67	3.03	0.00	2.85	19.92
	Dec-04	8.98	1.28	10.26	72.81	12.12	3.44	1.38	3.62	38.62
	Feb-05	2.67	4.46	7.13	75.56	12.19	2.51	2.60	4.74	37.79
	Apr-05	3.96	5.28	9.23	74.70	12.55	2.84	0.67	3.00	31.27
	Jun-05	3.93	1.57	5.50	77.36	13.39	3.25	0.50	2.37	25.63
	Aug-05	5.65	1.13	6.78	72.12	13.48	5.20	2.42	2.21	32.94
	Oct-05	5.21	4.26	9.47	77.16	10.86	2.01	0.49	2.24	18.41
	Dec-05	4.46	0.74	5.20	77.40	11.77	3.55	2.07	3.34	27.47
	Feb-06	0.47	5.64	6.11	76.45	14.29	2.44	0.72	2.18	16.28
	Apr-06	3.72	1.86	5.58	74.30	13.14	4.83	2.16	1.35	21.76
	Jun-06	1.98	2.47	4.45	77.34	13.99	3.63	0.59	2.36	23.40
	Aug-06	4.07	2.59	6.66	77.15	12.27	2.95	0.97	2.72	14.55
	Oct-06	6.29	2.52	8.81	73.85	11.48	2.52	3.34	2.51	25.22
	Dec-06	7.84	3.02	10.86	66.22	17.04	4.28	1.61	2.27	28.22
	Feb-07	1.01	3.30	4.31	77.09	12.63	3.65	2.32	1.41	28.20
	Apr-07	4.84	0.00	4.84	70.34	21.99	2.83	0.00	2.13	24.76
	Jun-07	2.58	2.32	4.90	72.27	14.71	4.75	3.37	2.27	27.50
	Aug-07	1.71	2.28	4.00	72.83	17.16	3.97	2.04	2.45	20.86
	Oct-07	1.89	2.27	4.16	70.60	18.99	4.89	1.36	1.77	23.60
	Dec-07	3.73	1.24	4.98	73.02	16.42	4.35	1.24	2.68	22.23
	Feb-08	3.74	3.20	6.94	72.28	14.68	3.87	2.23	2.28	22.93
REEF	Oct-00	0.59	3.50	4.09	91.80	3.77	0.28	0.06	0.90	7.28
	Dec-00	1.12	3.25	4.37	93.12	1.79	0.29	0.43	0.92	11.12
	Feb-01	1.17	4.22	5.39	90.81	2.78	0.18	0.85	1.09	10.51
	Apr-01	0.24	3.02	3.26	92.07	3.24	0.23	1.20	1.13	12.74
	Jun-01	1.04	3.87	4.91	91.43	2.78	0.19	0.68	1.26	15.02
	Aug-01	0.91	5.28	6.19	87.22	5.02	0.14	1.43	1.16	10.94
	Oct-01	0.67	2.76	3.43	89.44	5.21	0.26	1.67	0.74	10.54
	Dec-01	1.39	1.81	3.20	93.76	2.87	0.11	0.06	1.35	6.29
	Feb-02	0.32	2.58	2.90	87.20	8.37	0.92	0.62	1.02	19.31
	Apr-02	2.13	1.83	3.96	92.37	3.25	0.17	0.25	1.52	17.64
	Jun-02	1.98	3.30	5.27	91.51	3.11	0.10	0.00	1.14	12.65
	Aug-02	3.11	4.36	7.47	89.26	3.00	0.23	0.04	1.62	15.64
	Oct-02	3.63	1.45	5.08	92.25	1.67	0.11	0.89	1.04	10.46
	Dec-02	1.85	2.16	4.01	93.73	1.27	0.24	0.75	2.01	10.03
	Feb-03	1.91	1.91	3.82	93.32	2.56	0.19	0.12	1.13	7.24
	Apr-03	1.86	1.60	3.46	91.96	3.72	0.36	0.50	1.00	9.60
	Jun-03	0.94	4.72	5.67	87.22	7.11	0.00	0.00	2.00	11.92
	Aug-03	7.65	0.00	7.65	89.41	2.59	0.27	0.07	0.99	8.47
	Oct-03	2.70	4.04	6.74	90.29	2.59	0.27	0.12	1.08	6.42
	Dec-03	0.79	8.65	9.44	88.41	2.08	0.07	0.00	1.09	6.52

	Feb-04	1.55	6.19	7.74	89.12	2.97	0.11	0.06	1.24	6.74
	Apr-04	2.12	3.18	5.30	90.98	3.36	0.19	0.16	7.22	7.37
	Jun-04									8.69
	Aug-04	6.12	1.53	7.65	86.56	2.84	0.55	2.40	0.50	9.90
	Oct-04	4.85	1.62	6.47	91.82	1.67	0.04	0.00	1.20	5.36
	Dec-04	2.59	0.43	3.02	94.55	2.26	0.06	0.12	2.16	10.99
	Feb-05	3.67	0.00	3.67	94.85	1.15	0.29	0.04	1.78	7.91
	Apr-05	3.56	4.57	8.13	89.85	1.90	0.00	0.13	1.68	7.83
	Jun-05	4.04	2.69	6.74	87.26	3.93	0.27	1.81	1.28	6.76
	Aug-05	4.45	5.56	10.01	87.09	2.53	0.28	0.10	1.48	10.39
	Oct-05	2.65	4.97	7.61	90.31	1.90	0.11	0.07	1.64	18.45
	Dec-05	3.60	6.40	10.00	87.81	2.03	0.11	0.06	1.93	6.40
	Feb-06	3.00	3.85	6.85	91.58	1.32	0.23	0.02	1.43	7.93
	Apr-06	1.82	4.54	6.35	90.92	2.59	0.12	0.02	0.76	8.83
	Jun-06	2.70	1.35	4.04	93.16	2.24	0.19	0.36	1.86	10.43
	Aug-06	3.92	5.49	9.42	87.42	2.85	0.20	0.11	1.51	7.80
	Oct-06	3.83	4.22	8.05	88.68	3.05	0.22	0.00	1.73	7.80
	Dec-06	4.79	2.66	7.45	90.52	1.94	0.09	0.00	0.65	11.92
	Feb-07	3.63	6.22	9.85	88.31	1.74	0.09	0.00	1.78	12.49
	Apr-07	10.66	11.19	21.85	76.06	1.97	0.12	0.00	1.47	9.63
	Jun-07	3.21	4.01	7.22	89.86	2.60	0.13	0.19	1.47	8.94
	Aug-07	3.19	6.38	9.57	88.26	1.98	0.12	0.07	1.87	10.54
	Oct-07	4.46	5.09	9.55	87.57	2.52	0.30	0.06	1.41	11.92
	Dec-07	4.10	1.54	5.64	91.56	2.50	0.18	0.13	2.60	9.97
	Feb-08	4.24	3.63	7.87	90.18	1.76	0.18	0.01	1.65	10.78
SHB	Oct-00	0.13	3.33	3.46	78.71	14.11	2.46	1.26	0.63	5.23
	Dec-00	0.42	1.74	2.16	68.32	24.91	1.96	2.65	0.64	8.78
	Feb-01	0.46	1.27	1.73	67.55	28.84	0.87	1.01	0.27	4.87
	Apr-01	0.09	1.59	1.68	74.45	21.83	0.64	1.41	0.91	7.04
	Jun-01	0.37	1.17	1.54	72.98	22.83	1.31	1.35	0.49	10.29
	Aug-01	0.77	2.24	3.00	71.78	20.01	1.57	3.64	0.54	7.03
	Oct-01	12.36	0.65	13.01	63.30	22.43	0.70	0.56	0.48	10.72
	Dec-01	0.96	0.67	1.63	62.87	20.93	0.55	14.01	1.05	11.10
	Feb-02	0.68	2.91	3.59	78.72	15.86	1.08	0.76	0.76	10.53
	Apr-02	0.19	1.31	1.49	77.08	17.17	1.90	2.36	0.62	10.03
	Jun-02	0.50	1.66	2.15	67.64	25.86	2.01	2.34	0.73	8.19
	Aug-02	2.34	0.00	2.34	67.51	25.94	2.72	1.50	0.69	10.67
	Oct-02	2.80	0.25	3.06	80.84	11.70	3.33	1.07	0.81	7.79
	Dec-02	0.47	0.10	0.58	60.27	25.83	8.71	4.61	0.84	8.48
	Feb-03	0.18	0.55	0.74	53.62	37.54	5.03	3.07	0.23	6.45
	Apr-03	0.00	1.56	1.56	69.27	23.72	2.63	2.82	0.51	6.63
	Jun-03	0.00	1.89	1.89	48.92	41.65	1.68	5.86	0.70	8.38
	Aug-03	1.36	0.82	2.18	76.41	9.37	1.37	10.68	0.59	6.37
	Oct-03	0.36	2.89	3.25	79.66	12.31	2.13	2.65	0.70	6.87
	Dec-03	0.00	2.44	2.44	75.61	14.59	1.76	5.59	0.57	5.62
	Feb-04	0.00	3.33	3.33	69.35	14.13	3.97	9.21	0.91	5.05
	Apr-04	0.00	7.35	7.35	83.55	8.02	0.41	0.66	0.42	2.77
	Jun-04									13.56
	Aug-04	3.18	3.18	6.37	73.68	9.39	4.58	5.98	0.54	8.08
	Oct-04	0.83	0.83	1.67	72.67	24.18	0.77	0.71	0.87	8.37
	Dec-04	1.98	0.00	1.98	77.59	10.56	2.69	7.19	1.36	6.53
	Feb-05	0.00	3.20	3.20	85.28	10.82	0.59	0.12	1.94	7.99
	Apr-05	3.08	2.55	5.63	87.08	4.75	0.66	1.88	1.23	6.75
	Jun-05	2.69	1.35	4.04	75.08	7.57	2.87	10.44	0.96	5.04
	Aug-05	2.65	0.44	3.09	74.20	11.95	4.48	6.28	0.78	6.81
	Oct-05	2.23	2.60	4.83	84.69	8.11	0.87	1.50	1.01	14.32
	Dec-05	1.02	0.00	1.02	85.13	12.27	0.80	0.78	0.68	6.64
	Feb-06	5.85	0.49	6.33	86.11	3.79	0.53	3.23	0.71	4.23
	Apr-06	0.86	2.59	3.45	73.95	13.06	3.12	6.42	0.54	6.53
	Jun-06	0.96	1.50	2.46	78.57	10.29	3.51	5.17	1.48	8.36
	Aug-06	2.60	3.38	5.99	76.75	9.94	1.33	5.99	0.87	7.68
	Oct-06	3.84	3.14	6.98	74.17	10.81	1.84	6.19	0.88	9.40
	Dec-06	2.16	0.72	2.88	77.40	7.04	2.19	10.49	0.76	4.36
	Feb-07	3.56	6.24	9.80	78.43	5.36	1.57	4.84	0.70	7.11
	Apr-07	3.29	1.92	5.22	82.41	9.51	1.54	1.33	0.91	6.76
	Jun-07	3.39	5.57	8.96	71.75	7.67	3.39	8.23	1.15	2.75

	Aug-07	0.50	3.00	3.50	83.17	11.42	1.28	0.62	0.91	10.66
	Oct-07	2.70	1.62	4.33	80.22	8.47	2.61	4.37	1.23	6.88
	Dec-07	1.49	2.09	3.58	72.77	7.07	1.97	14.62	1.11	6.54
	Feb-08	1.31	1.58	2.89	72.32	7.57	1.88	15.34	1.02	5.62
WHAU	Oct-00	0.02	2.75	2.77	93.64	1.79	0.80	1.00	0.76	5.23
	Dec-00	0.26	1.96	2.22	92.38	3.04	0.82	1.53	0.77	8.78
	Feb-01	0.70	2.11	2.81	91.90	2.40	0.69	2.19	0.86	4.87
	Apr-01	0.02	3.17	3.19	82.15	14.23	0.26	0.16	1.42	7.04
	Jun-01	0.57	1.67	2.24	88.91	3.37	0.64	4.84	1.02	10.29
	Aug-01	0.85	1.84	2.69	94.48	1.81	0.65	0.36	0.90	7.03
	Oct-01	0.85	1.90	2.75	92.42	2.78	0.47	1.59	0.86	10.72
	Dec-01	0.53	1.38	1.91	91.65	1.10	0.34	5.00	2.86	11.10
	Feb-02	0.41	2.00	2.41	90.94	4.59	0.81	1.24	1.03	10.53
	Apr-02	1.06	1.06	2.12	95.48	1.29	0.43	0.68	0.93	10.03
	Jun-02	0.00	1.81	1.81	91.37	5.18	0.75	0.89	1.09	8.19
	Aug-02	0.00	1.81	1.81	92.44	2.49	0.54	2.72	1.07	10.67
	Oct-02	0.99	2.31	3.30	91.71	3.79	0.56	0.64	0.75	7.79
	Dec-02	1.70	0.57	2.26	94.94	1.57	0.49	0.73	0.58	8.48
	Feb-03	2.50	1.59	4.10	88.20	4.67	0.91	2.12	0.76	6.45
	Apr-03	0.80	2.41	3.21	92.25	2.19	0.52	1.83	0.80	6.63
	Jun-03	1.76	1.76	3.52	92.20	3.16	0.65	0.47	0.85	8.38
	Aug-03	1.91	0.00	1.91	95.10	1.98	0.59	0.42	0.80	6.37
	Oct-03	1.46	1.46	2.92	93.55	2.24	0.66	0.64	0.92	6.87
	Dec-03	0.80	4.01	4.81	91.87	2.09	0.35	0.89	0.87	5.62
	Feb-04	0.86	4.30	5.16	92.29	1.20	0.50	0.85	0.84	5.05
	Apr-04	0.00	5.10	5.10	93.48	0.97	0.45	0.00	0.58	8.72
	Jun-04									10.02
	Aug-04	2.00	1.33	3.33	94.22	1.51	0.88	0.05	0.16	13.28
	Oct-04	1.47	0.59	2.06	93.08	1.07	0.39	3.40	1.17	11.22
	Dec-04	1.33	2.65	3.98	93.68	1.55	0.80	0.00	2.03	11.79
	Feb-05	0.00	1.62	1.62	93.95	1.22	0.73	2.48	1.58	10.13
	Apr-05	1.94	3.23	5.16	88.73	1.26	0.60	4.24	1.28	7.36
	Jun-05	3.52	0.59	4.10	93.07	0.89	0.58	1.35	1.02	9.77
	Aug-05	2.74	2.19	4.93	91.40	1.37	0.71	1.59	0.63	12.94
	Oct-05	1.05	2.10	3.15	92.89	1.40	0.90	1.67	1.01	12.41
	Dec-05	1.54	0.00	1.54	96.07	1.22	0.42	0.75	1.19	7.19
	Feb-06	1.10	0.74	1.84	95.69	0.83	0.54	1.09	0.84	10.60
	Apr-06	1.96	1.96	3.92	92.11	1.29	0.76	1.93	0.48	11.44
	Jun-06	2.39	0.95	3.34	92.73	1.43	0.65	1.85	1.28	12.37
	Aug-06	1.46	2.29	3.75	93.08	1.45	0.68	1.04	1.25	14.44
	Oct-06	1.00	1.75	2.75	93.43	1.55	1.50	0.77	0.84	16.74
	Dec-06	2.32	0.58	2.90	93.74	1.72	0.96	0.68	0.98	13.87
	Feb-07	2.83	0.00	2.83	93.19	2.00	0.57	1.40	1.12	13.29
	Apr-07	2.09	1.77	3.86	91.61	1.56	0.80	2.17	0.85	11.47
	Jun-07	1.78	1.60	3.38	92.71	1.86	1.00	1.04	1.16	11.93
	Aug-07	0.27	1.09	1.37	94.93	1.41	0.56	1.74	0.99	14.67
	Oct-07	0.78	1.05	1.83	92.89	1.23	0.83	3.22	0.85	12.39
	Dec-07	2.03	0.00	2.03	91.51	1.53	0.86	4.06	1.02	12.73
	Feb-08	1.63	0.65	2.29	90.91	2.15	1.26	3.39	1.14	10.20

9.2 Appendix 2: Benthic Invertebrate data collected between October 2000 and February 2008.

Total, median, mean number of individuals found in 12 cores. Range= 90th percentile – 5th percentile.

Species: ***Anthopleura aureoradiata***

Site	Series	Total	Median	Range	Mean
HBV	1	18	1	5	1.5
HBV	2	16	1	4	1.3
HBV	3	0	0	0	0.0
HBV	4	21	2	4	1.8
HBV	5	23	1.5	3	1.9
HBV	6	13	1	3	1.1
HBV	7	17	1	3	1.4
HBV	8	18	1	4	1.5
HBV	9	56	3	11	4.7
HBV	10	22	1	4	1.8
HBV	11	17	1	3	1.4
HBV	12	30	3	4	2.5
HBV	13	18	1	3	1.5
HBV	14	39	3	4	3.3
HBV	15	47	3	7	3.9
HBV	16	17	1.5	3	1.4
HBV	17	20	1	5	1.7
HBV	18	13	1	3	1.1
HBV	19	22	1.5	4	1.8
HBV	20	30	3	2	2.5
HBV	21	18	1	4	1.5
HBV	22	26	2	5	2.2
HBV	23	24	1.5	5	2.0
HBV	24	34	2	5	2.8
HBV	25	26	2	3	2.2
HBV	26	58	5	8	4.8
HBV	27	57	3.5	10	4.8
HBV	28	50	4	7	4.2
HBV	29	37	3	4	3.1
HBV	30	24	1.5	3	2.0
HBV	31	31	2	7	2.6
HBV	32	43	3	8	3.6
HBV	33	30	2.5	5	2.5
HBV	34	32	2.5	5	2.7
HBV	35	16	1	3	1.3
HBV	36	32	2	3	2.7
HBV	37	12	1	2	1.0
HBV	38	27	1.5	5	2.3
HBV	39	25	1	2	2.1
HBV	40	26	1.5	6	2.2
HBV	41	31	2	3	2.6
HBV	42	31	2	4	2.6
HBV	43	24	1	3	2.0
HBV	44	114	8.5	10	9.5
HBV	45	33	2.5	5	2.8
HC	1	36	3	3	3.0
HC	2	17	1	3	1.4
HC	3	31	2	5	2.6
HC	4	22	1.5	4	1.8
HC	5	31	2.5	5	2.6
HC	6	26	2	4	2.2
HC	7	23	2	3	1.9
HC	8	25	1.5	3	2.1
HC	9	21	1	5	1.8
HC	10	19	1	3	1.6
HC	11	19	1.5	3	1.6
HC	12	28	2	4	2.4
HC	13	19	1.5	4	1.6
HC	14	23	1.5	2	1.9
HC	15	20	1	4	1.7
HC	16	28	2.5	4	2.3
HC	17	20	1.5	3	1.7
HC	18	26	2	3	2.2
HC	19	36	3	4	3.0
HC	20	56	4.5	7	4.7
HC	21	31	2	6	2.6
HC	22	44	3.5	6	3.7
HC	23	39	2	8	3.3
HC	24	21	1	5	1.8
HC	25	33	2.5	4	2.8
HC	26	45	3	7	3.7
HC	27	63	5	6	5.3
HC	28	55	4	7	4.6
HC	29	45	3	4	3.8
HC	30	57	4	6	4.8
HC	31	44	3	8	3.7
HC	32	40	2.5	7	3.3
HC	33	44	4	5	3.7
HC	34	44	3.5	5	3.7
HC	35	41	3	5	3.4
HC	36	42	2.5	6	3.5
HC	37	40	3.5	5	3.3
HC	38	60	6	10	5.0
HC	39	61	5	8	5.1
HC	40	66	5.5	6	5.5
HC	41	45	3	5	3.8
HC	42	34	2	4	2.8
HC	43	30	2	5	2.5
HC	44	55	5	6	4.6
HC	45	42	2	7	3.5
Reef	1	0	0	0	0.0
Reef	2	1	0	0	0.1
Reef	3	0	0	0	0.0
Reef	4	1	0	0	0.1
Reef	5	0	0	0	0.0
Reef	6	1	0	0	0.1
Reef	7	0	0	0	0.0
Reef	8	2	0	1	0.2
Reef	9	2	0	1	0.2
Reef	10	0	0	0	0.0
Reef	11	1	0	0	0.1
Reef	12	0	0	0	0.0
Reef	13	0	0	0	0.0
Reef	14	0	0	0	0.0
Reef	15	0	0	0	0.0
Reef	16	0	0	0	0.0
Reef	17	2	0	0	0.2
Reef	18	0	0	0	0.0
Reef	19	1	0	0	0.1

Site	Series	Total	Median	Range	Mean
Reef	20	0	0	0	0.0
Reef	21	0	0	0	0.0
Reef	22	0	0	0	0.0
Reef	23	0	0	0	0.0
Reef	24	0	0	0	0.0
Reef	25	0	0	0	0.0
Reef	26	0	0	0	0.0
Reef	27	0	0	0	0.0
Reef	28	0	0	0	0.0
Reef	29	0	0	0	0.0
Reef	30	2	0	0	0.2
Reef	31	0	0	0	0.0
Reef	32	0	0	0	0.0
Reef	33	0	0	0	0.0
Reef	34	1	0	0	0.1
Reef	35	0	0	0	0.0
Reef	36	2	0	1	0.2
Reef	37	1	0	0	0.1
Reef	38	0	0	0	0.0
Reef	39	1	0	0	0.1
Reef	40	1	0	0	0.1
Reef	41	2	0	1	0.2
Reef	42	0	0	0	0.0
Reef	43	0	0	0	0.0
Reef	44	3	0	1	0.3
Reef	45	0	0	0	0.0
ShB	1	9	0	2	0.8
ShB	2	10	0	2	0.8
ShB	3	9	0	2	0.8
ShB	4	15	1	3	1.3
ShB	5	7	0	2	0.5
ShB	6	5	0	1	0.4
ShB	7	10	1	2	0.8
ShB	8	8	0	2	0.7
ShB	9	5	0	1	0.4
ShB	10	6	0	2	0.5
ShB	11	7	0.5	1	0.6
ShB	12	4	0	1	0.4
ShB	13	5	0	1	0.4
ShB	14	9	0	2	0.8
ShB	15	14	0.5	2	1.2
ShB	16	11	0	3	0.9
ShB	17	12	0.5	3	1.0
ShB	18	15	1	3	1.3
ShB	19	11	0	3	0.9
ShB	20	13	0.5	3	1.1
ShB	21	9	0	3	0.8
ShB	22	14	1	3	1.2
ShB	23	4	0	1	0.3
ShB	24	5	0	1	0.5
ShB	25	4	0	1	0.3
ShB	26	4	0	1	0.3
ShB	27	6	0	2	0.5
ShB	28	8	0	2	0.7
ShB	29	9	0	3	0.8

Site	Series	Total	Median	Range	Mean
ShB	30	13	0.5	3	1.1
ShB	31	14	0	4	1.2
ShB	32	3	0	1	0.3
ShB	33	13	1	3	1.1
ShB	34	2	0	1	0.2
ShB	35	5	0	1	0.4
ShB	36	2	0	1	0.2
ShB	37	2	0	1	0.2
ShB	38	8	0	1	0.7
ShB	39	4	0	1	0.3
ShB	40	22	1	4	1.8
ShB	41	6	0	1	0.5
ShB	42	5	0	2	0.4
ShB	43	7	0	2	0.6
ShB	44	12	0	2	1.0
ShB	45	12	0.5	3	1.0
Whau	1	20	0	5	1.7
Whau	2	19	1	3	1.6
Whau	3	26	1	4	2.2
Whau	4	30	2	4	2.5
Whau	5	19	2	4	1.6
Whau	6	14	1	3	1.2
Whau	7	14	1	2	1.2
Whau	8	20	1.5	3	1.7
Whau	9	22	2	4	1.8
Whau	10	17	1	4	1.4
Whau	11	6	0	1	0.5
Whau	12	6	0	1	0.5
Whau	13	5	0	1	0.4
Whau	14	15	1	3	1.3
Whau	15	0	0	0	0.0
Whau	16	5	0	1	0.4
Whau	17	0	0	0	0.0
Whau	18	7	0	2	0.6
Whau	19	4	0	1	0.3
Whau	20	14	1	3	1.2
Whau	21	0	0	0	0.0
Whau	22	9	1	2	0.8
Whau	23	9	0	2	0.8
Whau	24	15	1.5	3	1.3
Whau	25	10	0.5	3	0.8
Whau	26	14	0.5	3	1.2
Whau	27	5	0	1	0.4
Whau	28	14	1	2	1.2
Whau	29	8	0.5	2	0.7
Whau	30	10	1	2	0.8
Whau	31	3	0	1	0.3
Whau	32	10	1	2	0.8
Whau	33	9	1	2	0.8
Whau	34	5	0	1	0.4
Whau	35	2	0	1	0.2
Whau	36	12	0.5	2	1.0
Whau	37	3	0	1	0.3
Whau	38	2	0	1	0.2
Whau	39	9	0	2	0.8

Site	Series	Total	Median	Range	Mean
Whau	40	11	0.5	2	0.9
Whau	41	10	1	2	0.8
Whau	42	6	0	1	0.5
Whau	43	4	0	1	0.3
Whau	44	10	0.5	2	0.8
Whau	45	8	0	2	0.7

Species: *Aonides trifida*

Site	Series	Total	Median	Range	Mean
HBV	1	145	10	18	12.1
HBV	2	160	12.5	20	13.3
HBV	3	294	22.5	26	24.5
HBV	4	313	24	13	26.1
HBV	5	227	19.5	28	18.9
HBV	6	235	16	24	19.6
HBV	7	366	31	17	30.5
HBV	8	356	29	27	29.7
HBV	9	126	9.5	13	10.5
HBV	10	351	31	43	29.3
HBV	11	248	19	16	20.7
HBV	12	312	27	33	26.0
HBV	13	236	20.5	16	19.7
HBV	14	236	17	10	19.6
HBV	15	343	26.5	30	28.6
HBV	16	242	21	17	20.2
HBV	17	130	11.5	11	10.8
HBV	18	228	17.5	21	19.0
HBV	19	292	24.5	24	24.3
HBV	20	188	16.5	16	15.7
HBV	21	173	14.5	16	14.4
HBV	22	223	16.5	14	18.6
HBV	23	188	15.5	19	15.7
HBV	24	241	19	23	20.1
HBV	25	271	22	23	22.5
HBV	26	348	24.5	25	29.0
HBV	27	254	22.5	24	21.2
HBV	28	275	21.5	32	22.9
HBV	29	307	25	15	25.6
HBV	30	255	22	14	21.3
HBV	31	323	22	36	26.9
HBV	32	228	21.5	25	19.0
HBV	33	280	19.5	29	23.3
HBV	34	335	29	16	27.9
HBV	35	335	27	32	27.9
HBV	36	288	24.5	28	24.0
HBV	37	350	20.5	42	29.2
HBV	38	372	31	15	31.0
HBV	39	340	27	30	28.3
HBV	40	295	24.5	16	24.6
HBV	41	335	28	22	27.9
HBV	42	394	33	21	32.8
HBV	43	316	23.5	39	26.3
HBV	44	593	46	41	49.4
HBV	45	429	39.5	30	35.8
HC	1	2	0	1	0.2
HC	2	2	0	1	0.2
HC	3	4	0	1	0.3
HC	4	0	0	0	0.0
HC	5	2	0	1	0.2
HC	6	11	0	3	0.9
HC	7	0	0	0	0.0
HC	8	3	0	1	0.3
HC	9	0	0	0	0.0
HC	10	10	0	2	0.8
HC	11	1	0	0	0.1
HC	12	3	0	1	0.3
HC	13	0	0	0	0.0
HC	14	2	0	1	0.2
HC	15	0	0	0	0.0
HC	16	1	0	0	0.1
HC	17	0	0	0	0.0
HC	18	5	0	2	0.4
HC	19	0	0	0	0.0
HC	20	1	0	0	0.1
HC	21	1	0	0	0.1
HC	22	1	0	0	0.1
HC	23	0	0	0	0.0
HC	24	3	0	1	0.3
HC	25	1	0	0	0.1
HC	26	5	0	1	0.5
HC	27	2	0	1	0.2
HC	28	0	0	0	0.0
HC	29	1	0	0	0.1
HC	30	0	0	0	0.0
HC	31	0	0	0	0.0
HC	32	3	0	1	0.3
HC	33	0	0	0	0.0
HC	34	5	0	2	0.4
HC	35	0	0	0	0.0
HC	36	1	0	0	0.1
HC	37	3	0	1	0.3
HC	38	0	0	0	0.0
HC	39	0	0	0	0.0
HC	40	6	0	1	0.5
HC	41	1	0	0	0.1
HC	42	4	0	1	0.3
HC	43	1	0	0	0.1
HC	44	3	0	1	0.3
HC	45	2	0	0	0.2
Reef	1	1	0	0	0.1
Reef	2	3	0	1	0.3
Reef	3	2	0	1	0.2
Reef	4	1	0	0	0.1
Reef	5	0	0	0	0.0
Reef	6	0	0	0	0.0
Reef	7	1	0	0	0.1
Reef	8	2	0	1	0.2
Reef	9	0	0	0	0.0
Reef	10	0	0	0	0.0
Reef	11	0	0	0	0.0
Reef	12	1	0	0	0.1
Reef	13	0	0	0	0.0
Reef	14	0	0	0	0.0
Reef	15	0	0	0	0.0
Reef	16	0	0	0	0.0
Reef	17	2	0	1	0.2
Reef	18	4	0	1	0.3
Reef	19	1	0	0	0.1

Site	Series	Total	Median	Range	Mean
Reef	20	0	0	0	0.0
Reef	21	0	0	0	0.0
Reef	22	1	0	0	0.1
Reef	23	0	0	0	0.0
Reef	24	8	0	2	0.7
Reef	25	1	0	0	0.1
Reef	26	1	0	0	0.1
Reef	27	2	0	1	0.2
Reef	28	5	0	2	0.4
Reef	29	3	0	1	0.3
Reef	30	1	0	0	0.1
Reef	31	0	0	0	0.0
Reef	32	1	0	0	0.1
Reef	33	1	0	0	0.1
Reef	34	0	0	0	0.0
Reef	35	0	0	0	0.0
Reef	36	3	0	0	0.3
Reef	37	0	0	0	0.0
Reef	38	4	0	1	0.3
Reef	39	0	0	0	0.0
Reef	40	0	0	0	0.0
Reef	41	2	0	1	0.2
Reef	42	0	0	0	0.0
Reef	43	0	0	0	0.0
Reef	44	3	0	1	0.3
Reef	45	2	0	0	0.2
ShB	1	6	0	1	0.5
ShB	2	6	0	1	0.5
ShB	3	7	0	2	0.6
ShB	4	27	0	12	2.3
ShB	5	24	0	2	2.0
ShB	6	21	0	4	1.8
ShB	7	0	0	0	0.0
ShB	8	5	0	2	0.4
ShB	9	1	0	0	0.1
ShB	10	28	0	2	2.3
ShB	11	2	0	0	0.2
ShB	12	26	0	6	2.2
ShB	13	2	0	1	0.2
ShB	14	59	1	11	4.9
ShB	15	56	0	22	4.7
ShB	16	11	0	3	0.9
ShB	17	6	0	2	0.5
ShB	18	1	0	0	0.1
ShB	19	9	0.5	2	0.8
ShB	20	24	0	1	2.0
ShB	21	15	0	2	1.3
ShB	22	4	0	1	0.4
ShB	23	9	0	1	0.8
ShB	24	20	1	3	1.6
ShB	25	9	0	3	0.8
ShB	26	13	0	6	1.1
ShB	27	14	0	0	1.2
ShB	28	12	1	2	1.0
ShB	29	11	0	2	0.9

Site	Series	Total	Median	Range	Mean
ShB	30	8	0	2	0.7
ShB	31	22	0	3	1.8
ShB	32	6	0	1	0.5
ShB	33	12	0	2	1.0
ShB	34	3	0	1	0.3
ShB	35	3	0	1	0.3
ShB	36	47	1	13	3.9
ShB	37	36	0	10	3.0
ShB	38	4	0	1	0.3
ShB	39	2	0	1	0.2
ShB	40	2	0	1	0.2
ShB	41	40	0.5	14	3.3
ShB	42	4	0	0	0.3
ShB	43	14	0	5	1.2
ShB	44	36	0	5	3.0
ShB	45	9	0	3	0.8
Whau	1	2	0	1	0.2
Whau	2	1	0	0	0.1
Whau	3	1	0	0	0.1
Whau	4	71	6	8	5.9
Whau	5	7	0	1	0.6
Whau	6	1	0	0	0.1
Whau	7	0	0	0	0.0
Whau	8	2	0	1	0.2
Whau	9	2	0	0	0.2
Whau	10	6	0	2	0.5
Whau	11	1	0	0	0.1
Whau	12	0	0	0	0.0
Whau	13	7	1	1	0.6
Whau	14	2	0	1	0.2
Whau	15	3	0	1	0.3
Whau	16	2	0	1	0.2
Whau	17	0	0	0	0.0
Whau	18	6	0	2	0.5
Whau	19	0	0	0	0.0
Whau	20	0	0	0	0.0
Whau	21	13	0.5	2	1.1
Whau	22	9	0	3	0.8
Whau	23	6	0	1	0.5
Whau	24	13	1	2	1.1
Whau	25	11	0.5	2	0.9
Whau	26	19	1	6	1.6
Whau	27	20	0.5	5	1.7
Whau	28	17	0	5	1.4
Whau	29	5	0	1	0.4
Whau	30	21	0	5	1.8
Whau	31	21	1	4	1.8
Whau	32	6	0	2	0.5
Whau	33	4	0	1	0.3
Whau	34	0	0	0	0.0
Whau	35	3	0	1	0.3
Whau	36	10	0	3	0.8
Whau	37	21	0	5	1.7
Whau	38	14	1	2	1.2
Whau	39	0	0	0	0.0

Site	Series	Total	Median	Range	Mean
Whau	40	10	0	3	0.8
Whau	41	3	0	1	0.3
Whau	42	4	0	1	0.3
Whau	43	1	0	0	0.1
Whau	44	6	0	1	0.5
Whau	45	13	0.5	4	1.1

Species: *Aricidea* sp.

Site	Series	Total	Median	Range	Mean
HBV	1	13	1	3	1.1
HBV	2	1	0	0	0.1
HBV	3	0	0	0	0.0
HBV	4	6	0	1	0.5
HBV	5	3	0	1	0.3
HBV	6	15	0	2	1.3
HBV	7	17	1	3	1.4
HBV	8	10	0	3	0.8
HBV	9	3	0	1	0.3
HBV	10	2	0	1	0.2
HBV	11	8	1	1	0.7
HBV	12	2.4	0	1	0.2
HBV	13	9	0	3	0.8
HBV	14	1	0	0	0.1
HBV	15	1	0	0	0.1
HBV	16	1	0	0	0.1
HBV	17	2	0	0	0.2
HBV	18	7	0	3	0.6
HBV	19	10	0.5	2	0.8
HBV	20	4	0	1	0.3
HBV	21	1	0	0	0.1
HBV	22	1	0	0	0.1
HBV	23	7	0	1	0.6
HBV	24	19	0	6	1.6
HBV	25	14	0	4	1.2
HBV	26	17	1	4	1.4
HBV	27	5	0	1	0.4
HBV	28	2	0	0	0.2
HBV	29	3	0	1	0.3
HBV	30	7	0	3	0.6
HBV	31	17	1	3	1.4
HBV	32	17	1	3	1.4
HBV	33	2	0	1	0.2
HBV	34	10	0.5	3	0.8
HBV	35	9	0	2	0.8
HBV	36	6	0	1	0.5
HBV	37	23	2	4	1.9
HBV	38	13	1	3	1.1
HBV	39	5	0	1	0.4
HBV	40	18	0	5	1.5
HBV	41	18	1	4	1.5
HBV	42	31	2	6	2.6
HBV	43	19	1	4	1.6
HBV	44	21	1.5	3	1.8
HBV	45	17	1	2	1.4
HC	1	124	5.5	21	10.3
HC	2	52	2	11	4.3
HC	3	90	3.5	15	7.5
HC	4	132	7.5	16	11.0
HC	5	230	14	43	19.2
HC	6	196	17	24	16.3
HC	7	219	12	33	18.3
HC	8	121	7	20	10.1
HC	9	124	8	17	10.3
HC	10	23	1	4	1.9
HC	11	76	4	15	6.3
HC	12	86	5	11	7.2
HC	13	132	4	22	11.0
HC	14	92	8	8	7.7
HC	15	32	1	7	2.7
HC	16	74	5	9	6.2
HC	17	59	2.5	9	4.9
HC	18	152	10	20	12.7
HC	19	154	7	24	12.8
HC	20	147	10	17	12.3
HC	21	67	3.5	7	5.6
HC	22	187	14	18	15.6
HC	23	155	8.5	25	12.9
HC	24	43	3	8	3.6
HC	25	124	9	16	10.3
HC	26	125	11	17	10.5
HC	27	2	0	1	0.2
HC	28	66	4	12	5.5
HC	29	109	10	15	9.1
HC	30	175	14.5	18	14.6
HC	31	234	14.5	20	19.5
HC	32	140	12	19	11.7
HC	33	127	9.5	16	10.6
HC	34	128	10.5	14	10.7
HC	35	221	18	28	18.4
HC	36	142	11.5	18	11.8
HC	37	195	15	16	16.3
HC	38	98	7	18	8.2
HC	39	67	5	9	5.5
HC	40	141	12.5	18	11.8
HC	41	187	13.5	23	15.6
HC	42	233	17	25	19.4
HC	43	273	25	17	22.8
HC	44	485	39	21	40.4
HC	45	379	30.5	37	31.6
Reef	1	33	2.5	6	2.8
Reef	2	59	4	9	4.9
Reef	3	22	2	2	1.8
Reef	4	63	3	10	5.3
Reef	5	51	3	8	4.3
Reef	6	99	8	13	8.3
Reef	7	51	4.5	6	4.3
Reef	8	45	3.5	7	3.8
Reef	9	36	2	5	3.0
Reef	10	10	1	2	0.8
Reef	11	15	1	2	1.3
Reef	12	11	1	0	0.9
Reef	13	42	4	7	3.5
Reef	14	8	0.5	1	0.6
Reef	15	17	1.5	3	1.4
Reef	16	35	2.5	7	2.9
Reef	17	63	4	9	5.3
Reef	18	56	4	9	4.7
Reef	19	75	5.5	8	6.3

Site	Series	Total	Median	Range	Mean
Reef	20	67	3.5	9	5.6
Reef	21	59	3	13	4.9
Reef	22	41	2.5	8	3.4
Reef	23	59	3.5	10	4.9
Reef	24	42	2.5	6	3.5
Reef	25	89	5.5	7	7.4
Reef	26	76	5	9	6.3
Reef	27	33	1.5	6	2.8
Reef	28	65	4	8	5.4
Reef	29	77	7	10	6.4
Reef	30	89	7	11	7.4
Reef	31	124	11	12	10.4
Reef	32	49	3	10	4.1
Reef	33	65	4.5	10	5.4
Reef	34	68	5	11	5.7
Reef	35	74	6	11	6.2
Reef	36	98	7.5	15	8.2
Reef	37	71	6.5	8	5.9
Reef	38	110	8	15	9.2
Reef	39	5	0	1	0.4
Reef	40	60	6	8	5.0
Reef	41	68	4	9	5.6
Reef	42	49	2.5	9	4.1
Reef	43	58	4.5	9	4.8
Reef	44	69	5	10	5.8
Reef	45	32	2	4	2.7
ShB	1	19	0.5	5	1.6
ShB	2	21	1	5	1.8
ShB	3	24	0	7	2.0
ShB	4	38	3.5	7	3.2
ShB	5	19	0	5	1.5
ShB	6	50	2.5	8	4.2
ShB	7	44	3.5	5	3.7
ShB	8	26	1.5	5	2.2
ShB	9	26	1	5	2.2
ShB	10	38	3	6	3.2
ShB	11	27	2.5	4	2.3
ShB	12	17	1	3	1.5
ShB	13	24	1.5	4	2.0
ShB	14	3	0	1	0.3
ShB	15	14	0	4	1.2
ShB	16	17	1	2	1.4
ShB	17	47	3	9	3.9
ShB	18	20	1	4	1.7
ShB	19	42	1	7	3.5
ShB	20	59	1	14	4.9
ShB	21	46	2	6	3.8
ShB	22	31	1	4	2.5
ShB	23	23	1.5	5	1.9
ShB	24	27	2	5	2.3
ShB	25	9	1	1	0.8
ShB	26	33	2	5	2.8
ShB	27	11	0.5	2	0.9
ShB	28	12	1	2	1.0
ShB	29	41	2.5	6	3.4

Site	Series	Total	Median	Range	Mean
ShB	30	32	2.5	6	2.7
ShB	31	56	3.5	6	4.7
ShB	32	21	1	4	1.8
ShB	33	22	1	2	1.8
ShB	34	63	3.5	13	5.3
ShB	35	32	1	7	2.7
ShB	36	17	1	3	1.5
ShB	37	60	5	9	5.0
ShB	38	76	3.5	16	6.3
ShB	39	4	0	1	0.3
ShB	40	54	2	9	4.5
ShB	41	65	3.5	11	5.4
ShB	42	28	0.5	4	2.3
ShB	43	30	2.5	5	2.5
ShB	44	30	2.5	4	2.5
ShB	45	56	2	10	4.7
Whau	1	344	25.5	58	28.7
Whau	2	482	36	56	40.2
Whau	3	458	36.5	40	38.2
Whau	4	9	0.5	2	0.8
Whau	5	598	52	78	49.8
Whau	6	567	47	40	47.3
Whau	7	746	57	99	62.2
Whau	8	523	37	54	43.6
Whau	9	432	30	56	36.0
Whau	10	332	16.5	54	27.7
Whau	11	193	11.5	25	16.1
Whau	12	399	18	84	33.3
Whau	13	325	22	40	27.1
Whau	14	68	4.5	10	5.7
Whau	15	113	5.5	28	9.4
Whau	16	212	10.5	41	17.7
Whau	17	130	7.5	21	10.8
Whau	18	145	10	24	12.1
Whau	19	175	8	31	14.6
Whau	20	179	8.5	28	14.9
Whau	21	168	8.5	35	14.0
Whau	22	165	11.5	18	13.8
Whau	23	269	22.5	37	22.4
Whau	24	123	10	21	10.3
Whau	25	207	16	22	17.3
Whau	26	267	16.5	45	22.3
Whau	27	34	2.5	5	2.8
Whau	28	62	5.5	10	5.2
Whau	29	69	4.5	13	5.8
Whau	30	145	9	16	12.1
Whau	31	276	17.5	42	23.0
Whau	32	197	15.5	26	16.4
Whau	33	99	8	16	8.3
Whau	34	117	8	20	9.8
Whau	35	210	14.5	38	17.5
Whau	36	75	6.5	5	6.3
Whau	37	225	15	37	18.7
Whau	38	237	11.5	49	19.8
Whau	39	35	2	6	2.9

Site	Series	Total	Median	Range	Mean
Whau	40	187	9.5	38	15.6
Whau	41	119	7	23	9.9
Whau	42	223	18.5	31	18.6
Whau	43	193	10.5	26	16.1
Whau	44	165	15.5	24	13.8
Whau	45	261	21.5	29	21.8

Species: ***Arthritica bifurca***

Site	Series	Total	Median	Range	Mean
HBV	1	0	0	0	0.0
HBV	2	1	0	0	0.1
HBV	3	1	0	0	0.1
HBV	4	2	0	1	0.2
HBV	5	3	0	1	0.3
HBV	6	1	0	0	0.1
HBV	7	0	0	0	0.0
HBV	8	3	0	1	0.3
HBV	9	4	0	1	0.3
HBV	10	4	0	1	0.4
HBV	11	6	0	1	0.5
HBV	12	1.2	0	0	0.1
HBV	13	7	0	0	0.6
HBV	14	0	0	0	0.0
HBV	15	0	0	0	0.0
HBV	16	0	0	0	0.0
HBV	17	3	0	1	0.3
HBV	18	2	0	1	0.2
HBV	19	0	0	0	0.0
HBV	20	3	0	1	0.3
HBV	21	1	0	0	0.1
HBV	22	7	0	2	0.6
HBV	23	0	0	0	0.0
HBV	24	9	0.5	2	0.8
HBV	25	10	0	1	0.8
HBV	26	10	0	3	0.8
HBV	27	5	0	1	0.4
HBV	28	1	0	0	0.1
HBV	29	0	0	0	0.0
HBV	30	1	0	0	0.1
HBV	31	0	0	0	0.0
HBV	32	2	0	0	0.2
HBV	33	6	0	1	0.5
HBV	34	0	0	0	0.0
HBV	35	4	0	1	0.3
HBV	36	6	0	1	0.5
HBV	37	10	0	2	0.8
HBV	38	9	0	2	0.8
HBV	39	6	0	1	0.5
HBV	40	2	0	1	0.2
HBV	41	5	0	1	0.4
HBV	42	2	0	1	0.2
HBV	43	2	0	1	0.2
HBV	44	5	0	1	0.4
HBV	45	1	0	0	0.1
HC	1	10	0	2	0.8
HC	2	0	0	0	0.0
HC	3	0	0	0	0.0
HC	4	8	0	2	0.7
HC	5	26	1.5	4	2.2
HC	6	15	1	3	1.3
HC	7	6	0	2	0.5
HC	8	10	0	3	0.8
HC	9	3	0	1	0.3
HC	10	19	0	6	1.6
HC	11	21	1	6	1.8
HC	12	2	0	1	0.2
HC	13	0	0	0	0.0
HC	14	0	0	0	0.0
HC	15	13	0	3	1.1
HC	16	2	0	1	0.2
HC	17	1	0	0	0.1
HC	18	0	0	0	0.0
HC	19	0	0	0	0.0
HC	20	0	0	0	0.0
HC	21	3	0	1	0.3
HC	22	49	0.5	18	4.1
HC	23	41	2.5	8	3.4
HC	24	0	0	0	0.0
HC	25	31	1	6	2.6
HC	26	3	0	0	0.3
HC	27	0	0	0	0.0
HC	28	2	0	1	0.2
HC	29	17	0.5	4	1.4
HC	30	17	1	3	1.4
HC	31	9	0	2	0.8
HC	32	16	0	6	1.3
HC	33	16	0	2	1.3
HC	34	18	0.5	5	1.5
HC	35	0	0	0	0.0
HC	36	25	1	6	2.1
HC	37	10	0	2	0.8
HC	38	19	1	4	1.6
HC	39	13	0	3	1.1
HC	40	37	1.5	7	3.1
HC	41	9	0.5	1	0.8
HC	42	33	1	7	2.8
HC	43	5	0	2	0.4
HC	44	6	0	2	0.5
HC	45	3	0	1	0.3
Reef	1	0	0	0	0.0
Reef	2	2	0	0	0.2
Reef	3	3	0	1	0.3
Reef	4	15	0.5	2	1.3
Reef	5	11	0.5	3	0.9
Reef	6	3	0	1	0.3
Reef	7	0	0	0	0.0
Reef	8	0	0	0	0.0
Reef	9	7	0	2	0.6
Reef	10	1	0	0	0.1
Reef	11	6	0	1	0.5
Reef	12	0	0	0	0.0
Reef	13	2	0	1	0.2
Reef	14	2	0	0	0.1
Reef	15	13	0	4	1.1
Reef	16	9	0	3	0.8
Reef	17	2	0	1	0.2
Reef	18	3	0	1	0.3
Reef	19	9	0	2	0.8

Site	Series	Total	Median	Range	Mean
Reef	20	11	0.5	1	0.9
Reef	21	25	0.5	9	2.1
Reef	22	15	0.5	5	1.3
Reef	23	17	1	4	1.4
Reef	24	9	0	3	0.8
Reef	25	9	0	1	0.8
Reef	26	25	0.5	5	2.1
Reef	27	0	0	0	0.0
Reef	28	0	0	0	0.0
Reef	29	13	0	2	1.1
Reef	30	1	0	0	0.1
Reef	31	1	0	0	0.1
Reef	32	6	0	1	0.5
Reef	33	5	0	2	0.4
Reef	34	10	0	3	0.8
Reef	35	18	1.5	3	1.5
Reef	36	0	0	0	0.0
Reef	37	10	0	3	0.8
Reef	38	16	0	4	1.3
Reef	39	7	0	1	0.6
Reef	40	10	0	2	0.8
Reef	41	2	0	1	0.2
Reef	42	6	0	1	0.5
Reef	43	7	0	2	0.6
Reef	44	0	0	0	0.0
Reef	45	5	0	2	0.4
ShB	1	0	0	0	0.0
ShB	2	0	0	0	0.0
ShB	3	0	0	0	0.0
ShB	4	1	0	0	0.1
ShB	5	1	0	0	0.1
ShB	6	3	0	0	0.3
ShB	7	0	0	0	0.0
ShB	8	0	0	0	0.0
ShB	9	1	0	0	0.1
ShB	10	1	0	0	0.1
ShB	11	0	0	0	0.0
ShB	12	0	0	0	0.0
ShB	13	0	0	0	0.0
ShB	14	0	0	0	0.0
ShB	15	0	0	0	0.0
ShB	16	0	0	0	0.0
ShB	17	0	0	0	0.0
ShB	18	0	0	0	0.0
ShB	19	1	0	0	0.1
ShB	20	0	0	0	0.0
ShB	21	11	0	1	0.9
ShB	22	0	0	0	0.0
ShB	23	0	0	0	0.0
ShB	24	7	0	2	0.5
ShB	25	9	0	3	0.8
ShB	26	1	0	0	0.1
ShB	27	0	0	0	0.0
ShB	28	1	0	0	0.1
ShB	29	2	0	1	0.2

Site	Series	Total	Median	Range	Mean
ShB	30	0	0	0	0.0
ShB	31	4	0	0	0.3
ShB	32	0	0	0	0.0
ShB	33	0	0	0	0.0
ShB	34	3	0	1	0.3
ShB	35	7	0	1	0.6
ShB	36	4	0	1	0.4
ShB	37	0	0	0	0.0
ShB	38	1	0	0	0.1
ShB	39	2	0	1	0.2
ShB	40	2	0	1	0.2
ShB	41	24	0	0	2.0
ShB	42	10	0	0	0.8
ShB	43	0	0	0	0.0
ShB	44	0	0	0	0.0
ShB	45	1	0	0	0.1
Whau	1	0	0	0	0.0
Whau	2	3	0	1	0.3
Whau	3	10	0	2	0.8
Whau	4	14	0	4	1.1
Whau	5	3	0	1	0.3
Whau	6	12	0	3	1.0
Whau	7	3	0	1	0.3
Whau	8	5	0	1	0.4
Whau	9	15	0	3	1.3
Whau	10	4	0	1	0.3
Whau	11	1	0	0	0.1
Whau	12	0	0	0	0.0
Whau	13	0	0	0	0.0
Whau	14	0	0	0	0.0
Whau	15	3	0	1	0.3
Whau	16	1	0	0	0.1
Whau	17	3	0	1	0.3
Whau	18	2	0	0	0.2
Whau	19	4	0	1	0.3
Whau	20	14	1	3	1.2
Whau	21	18	0.5	3	1.5
Whau	22	10	0.5	2	0.8
Whau	23	11	1	2	0.9
Whau	24	7	0	2	0.6
Whau	25	4	0	1	0.3
Whau	26	4	0	1	0.3
Whau	27	2	0	1	0.2
Whau	28	3	0	1	0.3
Whau	29	13	0.5	3	1.1
Whau	30	11	0	4	0.9
Whau	31	1	0	0	0.1
Whau	32	3	0	1	0.3
Whau	33	3	0	1	0.3
Whau	34	2	0	1	0.2
Whau	35	6	0	1	0.5
Whau	36	3	0	1	0.3
Whau	37	1	0	0	0.1
Whau	38	6	0	1	0.5
Whau	39	5	0	1	0.4

Site	Series	Total	Median	Range	Mean
Whau	40	1	0	0	0.1
Whau	41	0	0	0	0.0
Whau	42	7	0.5	1	0.6
Whau	43	1	0	0	0.1
Whau	44	0	0	0	0.0
Whau	45	3	0	0	0.3

Species: ***Austrovenus stutchburyi***

Site	Series	Total	Median	Range	Mean
HBV	1	83	7	6	6.9
HBV	2	140	13	16	11.7
HBV	3	121	10	12	10.1
HBV	4	174	13	13	14.5
HBV	5	161	12	8	13.4
HBV	6	132	12	12	11.0
HBV	7	160	13	11	13.3
HBV	8	136	10	12	11.3
HBV	9	200	15.5	11	16.7
HBV	10	164	13	15	13.6
HBV	11	199	14.5	9	16.6
HBV	12	167	13.5	7	13.9
HBV	13	153	12	13	12.8
HBV	14	161	13	12	13.5
HBV	15	233	18.5	15	19.4
HBV	16	185	14	21	15.4
HBV	17	142	10.5	14	11.8
HBV	18	162	9	26	13.5
HBV	19	147	11	9	12.3
HBV	20	180	15	17	15.0
HBV	21	202	17	13	16.8
HBV	22	180	14	16	15.0
HBV	23	168	13.5	14	14.0
HBV	24	165	12	12	13.8
HBV	25	156	13	11	13.0
HBV	26	161	12.5	19	13.4
HBV	27	169	13	16	14.1
HBV	28	163	13	11	13.6
HBV	29	178	15.5	19	14.8
HBV	30	146	12	11	12.2
HBV	31	156	13	12	13.0
HBV	32	158	11	16	13.2
HBV	33	180	14	9	15.0
HBV	34	158	12.5	5	13.2
HBV	35	111	8.5	7	9.3
HBV	36	147	12.5	15	12.3
HBV	37	175	14.5	12	14.6
HBV	38	157	12	18	13.1
HBV	39	195	14.5	20	16.3
HBV	40	168	15	13	14.0
HBV	41	149	12	9	12.4
HBV	42	175	15.5	11	14.6
HBV	43	147	10.5	9	12.3
HBV	44	188	14	15	15.7
HBV	45	189	16.5	18	15.8
HC	1	210	14.5	24	17.5
HC	2	242	21.5	22	20.2
HC	3	358	32.5	26	29.8
HC	4	428	34.5	31	35.7
HC	5	454	38.5	40	37.8
HC	6	426	33	22	35.5
HC	7	433	31.5	36	36.1
HC	8	485	39	28	40.4
HC	9	450	36.5	25	37.5
HC	10	456	38.5	24	38.0
HC	11	424	34	21	35.3
HC	12	372	31	32	31.0
HC	13	299	26.5	16	24.9
HC	14	336	30	20	28.0
HC	15	500	41	34	41.7
HC	16	466	38	26	38.8
HC	17	386	32.5	19	32.2
HC	18	384	33	20	32.0
HC	19	447	39.5	21	37.3
HC	20	410	34	32	34.2
HC	21	376	32.5	20	31.3
HC	22	318	23	20	26.5
HC	23	337	26.5	22	28.1
HC	24	590	28.5	102	49.2
HC	25	257	23	33	21.4
HC	26	344	30	17	28.6
HC	27	305	27	25	25.5
HC	28	335	26.5	21	27.9
HC	29	371	33	25	30.9
HC	30	297	23.5	16	24.8
HC	31	273	25	29	22.8
HC	32	349	29.5	16	29.1
HC	33	243	19.5	21	20.3
HC	34	230	18.5	16	19.2
HC	35	198	14	16	16.5
HC	36	176	14.5	13	14.7
HC	37	166	14	14	13.8
HC	38	261	27	25	21.8
HC	39	188	13	21	15.6
HC	40	218	17.5	17	18.2
HC	41	181	14	6	15.1
HC	42	172	14.5	12	14.3
HC	43	153	13	10	12.8
HC	44	375	31	15	31.3
HC	45	330	26	28	27.5
Reef	1	3	0	0	0.3
Reef	2	173	14	16	14.4
Reef	3	53	3.5	9	4.4
Reef	4	49	2.5	10	4.1
Reef	5	24	1	3	2.0
Reef	6	16	1.5	3	1.3
Reef	7	10	0.5	2	0.8
Reef	8	29	1.5	6	2.4
Reef	9	31	1	8	2.6
Reef	10	3	0	1	0.3
Reef	11	3	0	1	0.3
Reef	12	0	0	0	0.0
Reef	13	13	1	2	1.1
Reef	14	18	1	3	1.5
Reef	15	4	0	1	0.3
Reef	16	3	0	1	0.3
Reef	17	6	0	2	0.5
Reef	18	45	2	12	3.8
Reef	19	124	6.5	17	10.3

Site	Series	Total	Median	Range	Mean
Reef	20	61	3.5	10	5.1
Reef	21	22	1.5	4	1.8
Reef	22	2	0	1	0.2
Reef	23	15	1	3	1.3
Reef	24	22	0.5	4	1.8
Reef	25	24	1	5	2.0
Reef	26	81	5	10	6.8
Reef	27	6	0	1	0.5
Reef	28	6	0	2	0.5
Reef	29	17	0	1	1.4
Reef	30	6	0	2	0.5
Reef	31	4	0	1	0.4
Reef	32	66	4.5	10	5.5
Reef	33	7	0.5	1	0.6
Reef	34	4	0	1	0.3
Reef	35	3	0	1	0.3
Reef	36	16	1	4	1.3
Reef	37	24	2	3	2.0
Reef	38	21	1.5	4	1.8
Reef	39	5	0	1	0.4
Reef	40	2	0	1	0.2
Reef	41	1	0	0	0.1
Reef	42	7	0	2	0.6
Reef	43	23	2	4	1.9
Reef	44	22	1	4	1.8
Reef	45	4	0	1	0.3
ShB	1	21	1.5	4	1.8
ShB	2	23	2	4	1.9
ShB	3	55	2	12	4.6
ShB	4	63	5	8	5.3
ShB	5	48	3	8	4.0
ShB	6	29	3	4	2.4
ShB	7	38	3	7	3.2
ShB	8	37	2.5	8	3.1
ShB	9	38	2.5	7	3.2
ShB	10	41	2	7	3.4
ShB	11	23	1.5	4	1.9
ShB	12	46	3	8	3.8
ShB	13	15	0.5	4	1.3
ShB	14	36	3	4	3.0
ShB	15	64	5	10	5.3
ShB	16	44	2.5	9	3.7
ShB	17	24	0.5	6	2.0
ShB	18	26	2	4	2.2
ShB	19	7	0	1	0.6
ShB	20	199	6	53	16.6
ShB	21	39	1.5	6	3.3
ShB	22	21	0	6	1.7
ShB	23	16	0	4	1.3
ShB	24	32	1	8	2.6
ShB	25	14	1	2	1.2
ShB	26	114	4.5	11	9.5
ShB	27	51	3	9	4.3
ShB	28	11	0	3	0.9
ShB	29	4	0	1	0.3

Site	Series	Total	Median	Range	Mean
ShB	30	14	0.5	2	1.2
ShB	31	22	1	4	1.8
ShB	32	19	1.5	4	1.6
ShB	33	17	0	6	1.4
ShB	34	13	0	2	1.1
ShB	35	2	0	1	0.2
ShB	36	11	0	2	0.9
ShB	37	19	0	4	1.6
ShB	38	38	2	7	3.2
ShB	39	0	0	0	0.0
ShB	40	16	0	4	1.3
ShB	41	26	0	8	2.2
ShB	42	15	1	3	1.3
ShB	43	8	0	3	0.7
ShB	44	33	2	8	2.8
ShB	45	17	1	4	1.4
Whau	1	149	11.5	16	12.4
Whau	2	322	22.5	45	26.8
Whau	3	513	41.5	35	42.8
Whau	4	96	8.5	7	8.0
Whau	5	210	16.5	20	17.5
Whau	6	197	16.5	17	16.4
Whau	7	135	10	13	11.3
Whau	8	404	34.5	25	33.7
Whau	9	233	16.5	24	19.4
Whau	10	0	0	0	0.0
Whau	11	119	9.5	13	9.9
Whau	12	125	9	13	10.4
Whau	13	71	6.5	8	5.9
Whau	14	157	12.5	17	13.1
Whau	15	253	17.5	21	21.1
Whau	16	252	14.5	29	21.0
Whau	17	328	26	19	27.3
Whau	18	141	10	12	11.8
Whau	19	206	18	19	17.2
Whau	20	759	68.5	56	63.3
Whau	21	157	8.5	25	13.1
Whau	22	84	6.5	9	7.0
Whau	23	103	9	11	8.6
Whau	24	127	9	11	10.6
Whau	25	92	7	8	7.7
Whau	26	1034	90	123	86.2
Whau	27	149	12	12	12.4
Whau	28	74	6	7	6.2
Whau	29	0	0	0	0.0
Whau	30	46	4	3	3.8
Whau	31	52	3.5	5	4.3
Whau	32	370	30.5	37	30.8
Whau	33	58	5.5	5	4.8
Whau	34	36	3	4	3.0
Whau	35	32	2	4	2.7
Whau	36	48	4	5	4.0
Whau	37	98	6	18	8.2
Whau	38	273	21	22	22.8
Whau	39	61	4.5	4	5.1

Site	Series	Total	Median	Range	Mean
Whau	40	113	8	14	9.4
Whau	41	71	3.5	11	5.9
Whau	42	52	2	8	4.3
Whau	43	152	12	13	12.7
Whau	44	212	17.5	14	17.7
Whau	45	121	7.5	18	10.1

Species: ***Boccardia syrtis***

Site	Series	Total	Median	Range	Mean
HBV	1	4	0	1	0.3
HBV	2	4	0	1	0.3
HBV	3	1	0	0	0.1
HBV	4	2	0	1	0.2
HBV	5	3	0	1	0.3
HBV	6	4	0	1	0.3
HBV	7	10	1	2	0.8
HBV	8	3	0	1	0.3
HBV	9	11	0.5	3	0.9
HBV	10	0	0	0	0.0
HBV	11	1	0	0	0.1
HBV	12	4	0	1	0.3
HBV	13	2	0	1	0.2
HBV	14	1	0	0	0.1
HBV	15	2	0	1	0.2
HBV	16	3	0	1	0.3
HBV	17	7	0.5	1	0.6
HBV	18	6	0	1	0.5
HBV	19	2	0	1	0.2
HBV	20	1	0	0	0.1
HBV	21	0	0	0	0.0
HBV	22	1	0	0	0.1
HBV	23	4	0	1	0.3
HBV	24	2	0	1	0.2
HBV	25	2	0	1	0.2
HBV	26	4	0	1	0.3
HBV	27	0	0	0	0.0
HBV	28	3	0	1	0.3
HBV	29	5	0	1	0.4
HBV	30	8	1	1	0.7
HBV	31	1	0	0	0.1
HBV	32	0	0	0	0.0
HBV	33	0	0	0	0.0
HBV	34	1	0	0	0.1
HBV	35	6	0	1	0.5
HBV	36	9	1	1	0.8
HBV	37	2	0	1	0.2
HBV	38	5	0	1	0.4
HBV	39	6	0	1	0.5
HBV	40	5	0	1	0.4
HBV	41	5	0	1	0.4
HBV	42	27	1.5	5	2.3
HBV	43	4	0	1	0.3
HBV	44	1	0	0	0.1
HBV	45	2	0	1	0.2
HC	1	98	5	19	8.2
HC	2	12	0.5	2	1.0
HC	3	19	1	4	1.6
HC	4	33	3	4	2.8
HC	5	40	2	8	3.3
HC	6	31	2.5	5	2.6
HC	7	15	0	1	1.3
HC	8	16	1	4	1.3
HC	9	5	0	1	0.4
HC	10	2	0	0	0.2
HC	11	2	0	1	0.2
HC	12	3	0	1	0.3
HC	13	7	0	2	0.6
HC	14	0	0	0	0.0
HC	15	3	0	1	0.2
HC	16	2	0	1	0.2
HC	17	1	0	0	0.1
HC	18	5	0	2	0.4
HC	19	7	0.5	1	0.6
HC	20	7	0	2	0.6
HC	21	3	0	1	0.3
HC	22	13	1	2	1.1
HC	23	2	0	1	0.2
HC	24	0	0	0	0.0
HC	25	5	0	1	0.4
HC	26	1	0	0	0.1
HC	27	2	0	0	0.2
HC	28	2	0	1	0.2
HC	29	3	0	1	0.3
HC	30	4	0	1	0.3
HC	31	6	0	1	0.5
HC	32	0	0	0	0.0
HC	33	3	0	1	0.3
HC	34	3	0	1	0.3
HC	35	2	0	1	0.2
HC	36	0	0	0	0.0
HC	37	6	0	2	0.5
HC	38	5	0	1	0.4
HC	39	4	0	1	0.4
HC	40	6	0	2	0.5
HC	41	4	0	1	0.3
HC	42	4	0	1	0.3
HC	43	4	0	1	0.3
HC	44	0	0	0	0.0
HC	45	2	0	1	0.2
Reef	1	14	0.5	3	1.2
Reef	2	9	0	1	0.8
Reef	3	11	0	1	0.9
Reef	4	12	1	2	1.0
Reef	5	23	2	3	1.9
Reef	6	19	1	4	1.6
Reef	7	3	0	1	0.3
Reef	8	3	0	1	0.3
Reef	9	2	0	1	0.2
Reef	10	4	0	1	0.4
Reef	11	9	0.5	1	0.8
Reef	12	3	0	1	0.3
Reef	13	6	0	1	0.5
Reef	14	6	0	1	0.5
Reef	15	6	0	2	0.5
Reef	16	13	0.5	2	1.1
Reef	17	40	2	7	3.3
Reef	18	42	1.5	10	3.5
Reef	19	39	2.5	6	3.3

Site	Series	Total	Median	Range	Mean
Reef	20	32	1.5	7	2.7
Reef	21	27	1.5	6	2.3
Reef	22	10	0	1	0.8
Reef	23	38	2.5	7	3.2
Reef	24	30	2	4	2.5
Reef	25	19	1	3	1.6
Reef	26	1	0	0	0.1
Reef	27	2	0	0	0.2
Reef	28	142	9	20	11.8
Reef	29	328	25	45	27.3
Reef	30	470	33.5	67	39.2
Reef	31	187	17	21	15.5
Reef	32	19	1	4	1.6
Reef	33	5	0	2	0.4
Reef	34	86	2	8	7.2
Reef	35	142	2	27	11.8
Reef	36	18	1	3	1.5
Reef	37	26	2	5	2.2
Reef	38	14	1	2	1.2
Reef	39	4	0	0	0.3
Reef	40	24	0.5	5	2.0
Reef	41	116	8	12	9.6
Reef	42	85	2	16	7.1
Reef	43	3	0	1	0.3
Reef	44	0	0	0	0.0
Reef	45	75	1.5	14	6.3
ShB	1	47	3.5	10	3.9
ShB	2	42	2	10	3.5
ShB	3	38	2.5	5	3.2
ShB	4	43	2	11	3.6
ShB	5	27	0	4	2.3
ShB	6	32	2	5	2.7
ShB	7	30	2.5	4	2.5
ShB	8	16	1	3	1.3
ShB	9	10	0.5	1	0.8
ShB	10	31	1.5	6	2.6
ShB	11	21	1	6	1.8
ShB	12	28	2	7	2.4
ShB	13	9	0	3	0.8
ShB	14	6	0	2	0.5
ShB	15	13	0	3	1.1
ShB	16	64	1	19	5.3
ShB	17	32	1	6	2.7
ShB	18	21	0.5	5	1.8
ShB	19	34	1	9	2.8
ShB	20	131	2	29	10.9
ShB	21	52	1.5	8	4.3
ShB	22	56	4	7	4.6
ShB	23	71	5	14	5.9
ShB	24	58	2	11	4.8
ShB	25	12	1	2	1.0
ShB	26	59	2.5	8	4.9
ShB	27	25	1.5	4	2.1
ShB	28	87	5.5	15	7.3
ShB	29	96	4.5	21	8.0

Site	Series	Total	Median	Range	Mean
ShB	30	51	2.5	9	4.3
ShB	31	82	4	20	6.8
ShB	32	56	2	12	4.7
ShB	33	44	2.5	5	3.7
ShB	34	92	5	22	7.7
ShB	35	10	0	3	0.8
ShB	36	62	4	9	5.2
ShB	37	72	4	15	6.0
ShB	38	45	1	10	3.8
ShB	39	80	2	8	6.7
ShB	40	56	2.5	10	4.7
ShB	41	56	1	15	4.7
ShB	42	41	1.5	8	3.4
ShB	43	103	3.5	28	8.6
ShB	44	29	1.5	4	2.4
ShB	45	31	1.5	4	2.6
Whau	1	24	1	4	2.0
Whau	2	17	1	4	1.4
Whau	3	9	0	1	0.8
Whau	4	20	0.5	4	1.6
Whau	5	27	0.5	8	2.3
Whau	6	17	1	4	1.4
Whau	7	8	0	2	0.7
Whau	8	17	1	3	1.4
Whau	9	8	0	3	0.7
Whau	10	6	0	2	0.5
Whau	11	3	0	1	0.3
Whau	12	9	0.5	2	0.8
Whau	13	4	0	1	0.3
Whau	14	8	0	2	0.7
Whau	15	21	1	2	1.8
Whau	16	27	1	7	2.3
Whau	17	16	1	3	1.3
Whau	18	16	0	5	1.3
Whau	19	4	0	1	0.3
Whau	20	26	1	5	2.2
Whau	21	61	3	12	5.1
Whau	22	32	1	7	2.7
Whau	23	41	2	8	3.4
Whau	24	26	1	5	2.2
Whau	25	30	2	5	2.5
Whau	26	27	2	5	2.3
Whau	27	5	0	1	0.4
Whau	28	34	1.5	8	2.8
Whau	29	15	1	4	1.3
Whau	30	12	0.5	2	1.0
Whau	31	9	0	2	0.8
Whau	32	13	1	2	1.1
Whau	33	5	0	1	0.4
Whau	34	6	0	1	0.5
Whau	35	9	0	2	0.8
Whau	36	42	3	7	3.5
Whau	37	20	2	2	1.6
Whau	38	11	1	2	0.9
Whau	39	6	0	2	0.5

Site	Series	Total	Median	Range	Mean
Whau	40	8	0	3	0.7
Whau	41	4	0	1	0.3
Whau	42	16	1	1	1.3
Whau	43	2	0	1	0.2
Whau	44	0	0	0	0.0
Whau	45	7	0	1	0.6

Species: *Colurostylis lemurum*

Site	Series	Total	Median	Range	Mean
HBV	1	13	1	3	1.1
HBV	2	10	0.5	2	0.8
HBV	3	11	1	1	0.9
HBV	4	50	3.5	9	4.2
HBV	5	26	2	3	2.2
HBV	6	42	3	6	3.5
HBV	7	26	2	4	2.2
HBV	8	21	1	4	1.8
HBV	9	15	1	2	1.3
HBV	10	71	4	10	5.9
HBV	11	47	3.5	7	3.9
HBV	12	56	4	10	4.7
HBV	13	28	2	5	2.3
HBV	14	19	0	5	1.5
HBV	15	35	1.5	8	2.9
HBV	16	29	1.5	5	2.4
HBV	17	10	1	2	0.8
HBV	18	20	1	6	1.7
HBV	19	20	1	4	1.7
HBV	20	26	1.5	5	2.2
HBV	21	30	1.5	5	2.5
HBV	22	21	1	4	1.8
HBV	23	17	1.5	3	1.4
HBV	24	36	2.5	6	3.0
HBV	25	37	3	5	3.1
HBV	26	20	1	4	1.7
HBV	27	11	1	2	0.9
HBV	28	11	1	2	0.9
HBV	29	16	1	4	1.3
HBV	30	55	4.5	5	4.6
HBV	31	26	2	4	2.2
HBV	32	24	2	3	2.0
HBV	33	21	1.5	4	1.8
HBV	34	20	1.5	3	1.7
HBV	35	21	1.5	5	1.8
HBV	36	36	2	5	3.0
HBV	37	16	1	3	1.3
HBV	38	40	2	6	3.3
HBV	39	7	0	2	0.6
HBV	40	53	3	9	4.4
HBV	41	26	1	6	2.2
HBV	42	22	1.5	4	1.8
HBV	43	21	2	4	1.8
HBV	44	27	2	5	2.3
HBV	45	46	3.5	4	3.8
HC	1	15	1	3	1.3
HC	2	10	1	2	0.8
HC	3	16	1	5	1.3
HC	4	17	0	4	1.4
HC	5	23	1.5	2	1.9
HC	6	32	2.5	4	2.7
HC	7	13	0.5	3	1.1
HC	8	15	0	5	1.3
HC	9	9	0	3	0.8
HC	10	24	1.5	6	2.0
HC	11	10	1	2	0.8
HC	12	26	2	5	2.2
HC	13	20	1.5	3	1.7
HC	14	10	0	3	0.8
HC	15	23	1	5	1.9
HC	16	9	0.5	2	0.8
HC	17	12	1	3	1.0
HC	18	20	1	5	1.7
HC	19	22	1	4	1.8
HC	20	22	1	4	1.8
HC	21	14	1	1	1.2
HC	22	39	2	6	3.3
HC	23	25	2	4	2.1
HC	24	27	1.5	5	2.3
HC	25	16	1	2	1.3
HC	26	36	3	4	3.0
HC	27	3	0	0	0.3
HC	28	13	0.5	2	1.1
HC	29	31	1	7	2.6
HC	30	41	2	7	3.4
HC	31	20	2	3	1.7
HC	32	19	1	4	1.6
HC	33	22	1	5	1.8
HC	34	9	0	3	0.8
HC	35	16	1	3	1.3
HC	36	1	0	0	0.1
HC	37	3	0	1	0.3
HC	38	6	0	1	0.5
HC	39	15	1	3	1.3
HC	40	41	3	8	3.4
HC	41	15	1	3	1.3
HC	42	14	0.5	3	1.2
HC	43	32	2.5	3	2.7
HC	44	67	5	10	5.6
HC	45	29	2	6	2.4
Reef	1	4	0	2	0.3
Reef	2	19	1	5	1.6
Reef	3	9	0	2	0.8
Reef	4	94	4.5	17	7.8
Reef	5	218	9.5	44	18.2
Reef	6	11	0.5	1	0.9
Reef	7	8	0	2	0.7
Reef	8	2	0	0	0.2
Reef	9	9	0	2	0.8
Reef	10	55	4	8	4.5
Reef	11	22	2	3	1.8
Reef	12	2	0	1	0.2
Reef	13	6	0	1	0.5
Reef	14	5	0	1	0.4
Reef	15	9	0	3	0.8
Reef	16	48	1.5	8	4.0
Reef	17	44	1	10	3.7
Reef	18	7	1	1	0.6
Reef	19	72	6.5	10	6.0

Site	Series	Total	Median	Range	Mean
Reef	20	22	1	5	1.8
Reef	21	4	0	1	0.3
Reef	22	31	2	6	2.6
Reef	23	23	1	4	1.9
Reef	24	35	1.5	8	2.9
Reef	25	6	0	1	0.5
Reef	26	29	2	4	2.4
Reef	27	11	0.5	2	0.9
Reef	28	12	0.5	2	1.0
Reef	29	11	0	2	0.9
Reef	30	8	0	2	0.7
Reef	31	15	0	3	1.3
Reef	32	3	0	1	0.3
Reef	33	2	0	1	0.2
Reef	34	16	1	3	1.3
Reef	35	45	1	12	3.8
Reef	36	32	1	3	2.7
Reef	37	30	2	5	2.5
Reef	38	11	1	2	0.9
Reef	39	7	0	2	0.6
Reef	40	18	1.5	3	1.5
Reef	41	60	5	11	5.0
Reef	42	88	6.5	9	7.3
Reef	43	13	0	3	1.1
Reef	44	14	0	3	1.2
Reef	45	3	0	1	0.3
ShB	1	9	0	2	0.8
ShB	2	9	0	2	0.8
ShB	3	16	0	4	1.3
ShB	4	26	0.5	4	2.2
ShB	5	38	1	11	3.2
ShB	6	19	0	3	1.6
ShB	7	17	1	4	1.4
ShB	8	22	1	4	1.8
ShB	9	31	0.5	8	2.6
ShB	10	113	8	17	9.4
ShB	11	7	0	2	0.6
ShB	12	13	0	3	1.1
ShB	13	6	0	2	0.5
ShB	14	17	1	3	1.4
ShB	15	61	4.5	8	5.1
ShB	16	34	1.5	5	2.8
ShB	17	22	1	6	1.8
ShB	18	18	1.5	3	1.5
ShB	19	41	2.5	8	3.4
ShB	20	45	3.5	10	3.8
ShB	21	6	0	1	0.5
ShB	22	19	1	3	1.5
ShB	23	3	0	1	0.3
ShB	24	10	0	3	0.8
ShB	25	18	1	4	1.5
ShB	26	26	0	2	2.2
ShB	27	29	2	5	2.4
ShB	28	6	0	1	0.5
ShB	29	9	0	1	0.8

Site	Series	Total	Median	Range	Mean
ShB	30	14	1	3	1.2
ShB	31	15	0	3	1.3
ShB	32	4	0	1	0.3
ShB	33	7	0	2	0.6
ShB	34	15	0.5	3	1.3
ShB	35	9	0	2	0.8
ShB	36	14	0	3	1.2
ShB	37	20	0.5	6	1.7
ShB	38	33	1.5	8	2.8
ShB	39	2	0	1	0.2
ShB	40	4	0	1	0.3
ShB	41	11	0	1	0.9
ShB	42	14	0	3	1.2
ShB	43	11	0	4	0.9
ShB	44	27	1.5	5	2.3
ShB	45	18	0	4	1.5
Whau	1	13	1	2	1.1
Whau	2	14	1	3	1.2
Whau	3	6	0	1	0.5
Whau	4	18	2	2	1.5
Whau	5	50	3	7	4.2
Whau	6	12	0	4	1.0
Whau	7	11	1	2	0.9
Whau	8	7	0.5	1	0.6
Whau	9	18	2	2	1.5
Whau	10	80	5.5	12	6.7
Whau	11	10	0.5	2	0.8
Whau	12	41	3	6	3.4
Whau	13	5	0	1	0.4
Whau	14	8	0.5	2	0.7
Whau	15	4	0	1	0.3
Whau	16	29	1.5	4	2.4
Whau	17	21	1	4	1.8
Whau	18	25	1.5	3	2.1
Whau	19	27	2	5	2.3
Whau	20	19	1.5	3	1.6
Whau	21	5	0	2	0.4
Whau	22	18	1	3	1.5
Whau	23	27	1	1	2.3
Whau	24	47	4.5	5	3.9
Whau	25	14	1	3	1.2
Whau	26	20	1.5	3	1.7
Whau	27	21	2	2	1.8
Whau	28	15	1	4	1.3
Whau	29	16	1	3	1.3
Whau	30	19	1	4	1.6
Whau	31	20	2	3	1.7
Whau	32	16	1	3	1.3
Whau	33	28	2	3	2.3
Whau	34	70	5	10	5.8
Whau	35	55	5	7	4.6
Whau	36	24	1.5	4	2.0
Whau	37	17	1	3	1.5
Whau	38	7	0.5	1	0.6
Whau	39	27	3	4	2.3

Site	Series	Total	Median	Range	Mean
Whau	40	51	3.5	9	4.3
Whau	41	33	2	4	2.8
Whau	42	56	5	8	4.7
Whau	43	19	1.5	3	1.6
Whau	44	68	5	10	5.7
Whau	45	36	3	4	3.0

Species: ***Diloma subrostrata***

Site	Series	Total	Median	Range	Mean
HBV	1	6	0	2	0.5
HBV	2	3	0	1	0.3
HBV	3	0	0	0	0.0
HBV	4	5	0	1	0.4
HBV	5	10	1	2	0.8
HBV	6	1	0	0	0.1
HBV	7	0	0	0	0.0
HBV	8	0	0	0	0.0
HBV	9	2	0	1	0.2
HBV	10	11	1	2	0.9
HBV	11	10	0.5	2	0.8
HBV	12	5	0	1	0.4
HBV	13	2	0	1	0.2
HBV	14	9	1	2	0.7
HBV	15	1	0	0	0.1
HBV	16	19	2	3	1.6
HBV	17	8	0.5	1	0.7
HBV	18	3	0	1	0.3
HBV	19	6	0	1	0.5
HBV	20	7	0.5	1	0.6
HBV	21	2	0	1	0.2
HBV	22	2	0	1	0.2
HBV	23	2	0	1	0.2
HBV	24	12	0.5	3	1.0
HBV	25	14	1	4	1.2
HBV	26	6	0	2	0.5
HBV	27	11	1	2	0.9
HBV	28	3	0	1	0.3
HBV	29	8	0	2	0.7
HBV	30	2	0	1	0.2
HBV	31	15	0	4	1.3
HBV	32	12	0.5	3	1.0
HBV	33	1	0	0	0.1
HBV	34	13	1	2	1.1
HBV	35	5	0	1	0.4
HBV	36	9	0.5	2	0.8
HBV	37	6	0	1	0.5
HBV	38	5	0	1	0.4
HBV	39	4	0	0	0.3
HBV	40	11	0	3	0.9
HBV	41	10	0.5	2	0.8
HBV	42	19	1	3	1.6
HBV	43	12	0.5	2	1.0
HBV	44	0	0	0	0.0
HBV	45	12	0.5	3	1.0
HC	1	16	2	2	1.3
HC	2	14	1	2	1.2
HC	3	2	0	1	0.2
HC	4	8	0	2	0.7
HC	5	8	0.5	1	0.7
HC	6	5	0	1	0.4
HC	7	43	3.5	7	3.6
HC	8	4	0	1	0.3
HC	9	14	1	2	1.2
HC	10	26	1.5	6	2.2
HC	11	18	1	4	1.5
HC	12	8	1	1	0.6
HC	13	2	0	1	0.2
HC	14	1	0	0	0.1
HC	15	5	0	1	0.4
HC	16	10	1	2	0.8
HC	17	8	0	2	0.7
HC	18	10	1	2	0.8
HC	19	5	0	2	0.4
HC	20	5	0	1	0.4
HC	21	4	0	1	0.3
HC	22	8	1	1	0.7
HC	23	5	0	1	0.4
HC	24	20	0	3	1.7
HC	25	12	1	3	1.0
HC	26	4	0	1	0.4
HC	27	8	0	2	0.6
HC	28	6	0	2	0.5
HC	29	6	0	1	0.5
HC	30	9	0.5	1	0.8
HC	31	4	0	1	0.3
HC	32	15	1	4	1.3
HC	33	2	0	0	0.2
HC	34	19	1	3	1.6
HC	35	40	2	10	3.3
HC	36	20	1	3	1.7
HC	37	7	0	1	0.6
HC	38	3	0	1	0.2
HC	39	7	0	1	0.5
HC	40	7	0.5	1	0.6
HC	41	29	2	5	2.4
HC	42	29	1.5	5	2.4
HC	43	23	1	6	1.9
HC	44	13	0.5	3	1.1
HC	45	13	1	2	1.1
Reef	1	2	0	0	0.2
Reef	2	3	0	1	0.3
Reef	3	1	0	0	0.1
Reef	4	0	0	0	0.0
Reef	5	0	0	0	0.0
Reef	6	1	0	0	0.1
Reef	7	0	0	0	0.0
Reef	8	0	0	0	0.0
Reef	9	0	0	0	0.0
Reef	10	2	0	1	0.2
Reef	11	0	0	0	0.0
Reef	12	0	0	0	0.0
Reef	13	0	0	0	0.0
Reef	14	0	0	0	0.0
Reef	15	0	0	0	0.0
Reef	16	0	0	0	0.0
Reef	17	0	0	0	0.0
Reef	18	0	0	0	0.0
Reef	19	0	0	0	0.0

Site	Series	Total	Median	Range	Mean
Reef	20	0	0	0	0.0
Reef	21	0	0	0	0.0
Reef	22	0	0	0	0.0
Reef	23	0	0	0	0.0
Reef	24	0	0	0	0.0
Reef	25	1	0	0	0.1
Reef	26	0	0	0	0.0
Reef	27	0	0	0	0.0
Reef	28	0	0	0	0.0
Reef	29	0	0	0	0.0
Reef	30	0	0	0	0.0
Reef	31	0	0	0	0.0
Reef	32	0	0	0	0.0
Reef	33	0	0	0	0.0
Reef	34	0	0	0	0.0
Reef	35	0	0	0	0.0
Reef	36	2	0	0	0.2
Reef	37	0	0	0	0.0
Reef	38	0	0	0	0.0
Reef	39	0	0	0	0.0
Reef	40	2	0	1	0.2
Reef	41	0	0	0	0.0
Reef	42	0	0	0	0.0
Reef	43	0	0	0	0.0
Reef	44	0	0	0	0.0
Reef	45	1	0	0	0.1
ShB	1	6	0	2	0.5
ShB	2	5	0	1	0.4
ShB	3	2	0	1	0.2
ShB	4	9	0	2	0.8
ShB	5	3	0	0	0.3
ShB	6	0	0	0	0.0
ShB	7	2	0	0	0.2
ShB	8	1	0	0	0.1
ShB	9	0	0	0	0.0
ShB	10	9	0.5	2	0.8
ShB	11	5	0	1	0.4
ShB	12	3	0	1	0.3
ShB	13	1	0	0	0.1
ShB	14	0	0	0	0.0
ShB	15	2	0	1	0.2
ShB	16	1	0	0	0.1
ShB	17	8	0	2	0.7
ShB	18	1	0	0	0.1
ShB	19	0	0	0	0.0
ShB	20	3	0	1	0.3
ShB	21	1	0	0	0.1
ShB	22	2	0	0	0.2
ShB	23	4	0	2	0.3
ShB	24	14	1	3	1.2
ShB	25	8	1	1	0.7
ShB	26	4	0	1	0.3
ShB	27	4	0	1	0.3
ShB	28	2	0	1	0.2
ShB	29	4	0	1	0.3

Site	Series	Total	Median	Range	Mean
ShB	30	10	0	2	0.8
ShB	31	6	0	2	0.5
ShB	32	8	0	2	0.7
ShB	33	0	0	0	0.0
ShB	34	0	0	0	0.0
ShB	35	1	0	0	0.1
ShB	36	1	0	0	0.1
ShB	37	7	0	1	0.6
ShB	38	1	0	0	0.1
ShB	39	5	0	1	0.4
ShB	40	1	0	0	0.1
ShB	41	3	0	1	0.3
ShB	42	5	0	2	0.4
ShB	43	1	0	0	0.1
ShB	44	0	0	0	0.0
ShB	45	2	0	0	0.2
Whau	1	0	0	0	0.0
Whau	2	8	0.5	1	0.7
Whau	3	5	0	1	0.4
Whau	4	3	0	1	0.3
Whau	5	1	0	0	0.1
Whau	6	3	0	1	0.3
Whau	7	0	0	0	0.0
Whau	8	0	0	0	0.0
Whau	9	2	0	1	0.2
Whau	10	0	0	0	0.0
Whau	11	2	0	1	0.2
Whau	12	0	0	0	0.0
Whau	13	0	0	0	0.0
Whau	14	0	0	0	0.0
Whau	15	3	0	1	0.3
Whau	16	2	0	1	0.2
Whau	17	0	0	0	0.0
Whau	18	1	0	0	0.1
Whau	19	3	0	1	0.3
Whau	20	1	0	0	0.1
Whau	21	2	0	1	0.2
Whau	22	1	0	0	0.1
Whau	23	1	0	0	0.1
Whau	24	1	0	0	0.1
Whau	25	2	0	1	0.2
Whau	26	1	0	0	0.1
Whau	27	1	0	0	0.1
Whau	28	1	0	0	0.1
Whau	29	2	0	0	0.2
Whau	30	4	0	1	0.3
Whau	31	0	0	0	0.0
Whau	32	1	0	0	0.1
Whau	33	1	0	0	0.1
Whau	34	2	0	1	0.2
Whau	35	1	0	0	0.1
Whau	36	0	0	0	0.0
Whau	37	4	0	1	0.4
Whau	38	1	0	0	0.1
Whau	39	0	0	0	0.0

Site	Series	Total	Median	Range	Mean
Whau	40	1	0	0	0.1
Whau	41	1	0	0	0.1
Whau	42	3	0	1	0.3
Whau	43	1	0	0	0.1
Whau	44	0	0	0	0.0
Whau	45	2	0	1	0.2

Species: *Euchone* sp.

Site	Series	Total	Median	Range	Mean
HBV	1	0	0	0	0.0
HBV	2	0	0	0	0.0
HBV	3	0	0	0	0.0
HBV	4	0	0	0	0.0
HBV	5	0	0	0	0.0
HBV	6	0	0	0	0.0
HBV	7	0	0	0	0.0
HBV	8	0	0	0	0.0
HBV	9	0	0	0	0.0
HBV	10	0	0	0	0.0
HBV	11	0	0	0	0.0
HBV	12	0	0	0	0.0
HBV	13	0	0	0	0.0
HBV	14	0	0	0	0.0
HBV	15	0	0	0	0.0
HBV	16	0	0	0	0.0
HBV	17	0	0	0	0.0
HBV	18	0	0	0	0.0
HBV	19	0	0	0	0.0
HBV	20	0	0	0	0.0
HBV	21	0	0	0	0.0
HBV	22	0	0	0	0.0
HBV	23	0	0	0	0.0
HBV	24	0	0	0	0.0
HBV	25	0	0	0	0.0
HBV	26	0	0	0	0.0
HBV	27	0	0	0	0.0
HBV	28	0	0	0	0.0
HBV	29	0	0	0	0.0
HBV	30	0	0	0	0.0
HBV	31	0	0	0	0.0
HBV	32	0	0	0	0.0
HBV	33	0	0	0	0.0
HBV	34	0	0	0	0.0
HBV	35	0	0	0	0.0
HBV	36	17	0	4	1.4
HBV	37	0	0	0	0.0
HBV	38	3	0	1	0.3
HBV	39	0	0	0	0.0
HBV	40	0	0	0	0.0
HBV	41	0	0	0	0.0
HBV	42	0	0	0	0.0
HBV	43	0	0	0	0.0
HBV	44	0	0	0	0.0
HBV	45	0	0	0	0.0
HC	1	0	0	0	0.0
HC	2	0	0	0	0.0
HC	3	0	0	0	0.0
HC	4	0	0	0	0.0
HC	5	1	0	0	0.1
HC	6	0	0	0	0.0
HC	7	0	0	0	0.0
HC	8	0	0	0	0.0
HC	9	0	0	0	0.0
HC	10	1	0	0	0.1
HC	11	0	0	0	0.0
HC	12	0	0	0	0.0
HC	13	0	0	0	0.0
HC	14	0	0	0	0.0
HC	15	0	0	0	0.0
HC	16	0	0	0	0.0
HC	17	0	0	0	0.0
HC	18	0	0	0	0.0
HC	19	0	0	0	0.0
HC	20	0	0	0	0.0
HC	21	0	0	0	0.0
HC	22	0	0	0	0.0
HC	23	0	0	0	0.0
HC	24	0	0	0	0.0
HC	25	8	0	2	0.7
HC	26	0	0	0	0.0
HC	27	0	0	0	0.0
HC	28	0	0	0	0.0
HC	29	1	0	0	0.1
HC	30	0	0	0	0.0
HC	31	1	0	0	0.1
HC	32	0	0	0	0.0
HC	33	0	0	0	0.0
HC	34	0	0	0	0.0
HC	35	0	0	0	0.0
HC	36	7	0	2	0.6
HC	37	0	0	0	0.0
HC	38	0	0	0	0.0
HC	39	0	0	0	0.0
HC	40	0	0	0	0.0
HC	41	0	0	0	0.0
HC	42	0	0	0	0.0
HC	43	0	0	0	0.0
HC	44	0	0	0	0.0
HC	45	0	0	0	0.0
Reef	1	55	3	8	4.6
Reef	2	139	8	18	11.6
Reef	3	57	3.5	9	4.8
Reef	4	97	6.5	20	8.1
Reef	5	452	35	71	37.7
Reef	6	648	37	87	54.0
Reef	7	251	22.5	18	20.9
Reef	8	59	4.5	7	4.9
Reef	9	43	2.5	8	3.6
Reef	10	44	2	8	3.6
Reef	11	107	4	24	8.9
Reef	12	24	1.5	5	2.0
Reef	13	177	10	24	14.8
Reef	14	35	1	7	2.9
Reef	15	24	1	6	2.0
Reef	16	80	4	14	6.7
Reef	17	790	58.5	124	65.8
Reef	18	525	27	88	43.8
Reef	19	482	33.5	50	40.2

Site	Series	Total	Median	Range	Mean
Reef	20	333	30.5	40	27.8
Reef	21	301	21.5	41	25.1
Reef	22	305	24.5	34	25.4
Reef	23	604	36.5	88	50.3
Reef	24	909	73	86	75.8
Reef	25	377	29.5	36	31.4
Reef	26	191	14	21	15.9
Reef	27	43	1	10	3.6
Reef	28	118	7	16	9.8
Reef	29	330	23.5	47	27.5
Reef	30	611	54	58	50.9
Reef	31	432	40	36	36.0
Reef	32	129	8.5	16	10.8
Reef	33	58	3.5	9	4.8
Reef	34	141	10.5	16	11.8
Reef	35	183	13.5	23	15.3
Reef	36	311	19	50	25.9
Reef	37	158	11.5	19	13.2
Reef	38	178	11	32	14.8
Reef	39	5	0	1	0.4
Reef	40	326	15.5	69	27.2
Reef	41	439	37	33	36.5
Reef	42	462	35	62	38.5
Reef	43	115	9	19	9.6
Reef	44	75	6.5	11	6.3
Reef	45	62	2.5	14	5.2
ShB	1	0	0	0	0.0
ShB	2	0	0	0	0.0
ShB	3	10	0	3	0.8
ShB	4	1	0	0	0.1
ShB	5	7	0	2	0.5
ShB	6	3	0	0	0.3
ShB	7	12	0.5	2	1.0
ShB	8	10	0	2	0.8
ShB	9	19	1	4	1.6
ShB	10	48	0	5	4.0
ShB	11	27	0	8	2.3
ShB	12	11	0	4	0.9
ShB	13	13	0	5	1.1
ShB	14	0	0	0	0.0
ShB	15	0	0	0	0.0
ShB	16	13	1	2	1.1
ShB	17	23	0	7	1.9
ShB	18	14	0.5	4	1.2
ShB	19	17	1	3	1.4
ShB	20	59	1.5	11	4.9
ShB	21	35	0.5	5	2.9
ShB	22	184	14	26	15.4
ShB	23	156	5.5	37	13.0
ShB	24	239	6	78	19.9
ShB	25	52	1.5	11	4.3
ShB	26	44	2	8	3.7
ShB	27	79	3.5	15	6.6
ShB	28	78	3	15	6.5
ShB	29	150	6	30	12.5

Site	Series	Total	Median	Range	Mean
ShB	30	52	1	11	4.3
ShB	31	76	1	18	6.3
ShB	32	37	1.5	5	3.1
ShB	33	19	1.5	3	1.6
ShB	34	100	2.5	19	8.3
ShB	35	189	4	49	15.8
ShB	36	216	11	27	18.0
ShB	37	67	3.5	11	5.6
ShB	38	47	2	7	3.9
ShB	39	11	0	3	0.9
ShB	40	98	1	24	8.2
ShB	41	48	1.5	10	4.0
ShB	42	45	1.5	6	3.8
ShB	43	39	0	6	3.3
ShB	44	10	0	4	0.8
ShB	45	19	1	4	1.6
Whau	1	0	0	0	0.0
Whau	2	0	0	0	0.0
Whau	3	0	0	0	0.0
Whau	4	0	0	0	0.0
Whau	5	1	0	0	0.1
Whau	6	0	0	0	0.0
Whau	7	0	0	0	0.0
Whau	8	0	0	0	0.0
Whau	9	0	0	0	0.0
Whau	10	0	0	0	0.0
Whau	11	0	0	0	0.0
Whau	12	0	0	0	0.0
Whau	13	0	0	0	0.0
Whau	14	0	0	0	0.0
Whau	15	1	0	0	0.1
Whau	16	0	0	0	0.0
Whau	17	0	0	0	0.0
Whau	18	0	0	0	0.0
Whau	19	0	0	0	0.0
Whau	20	10	0	2	0.8
Whau	21	2	0	1	0.2
Whau	22	0	0	0	0.0
Whau	23	2	0	0	0.2
Whau	24	3	0	0	0.3
Whau	25	2	0	1	0.2
Whau	26	2	0	1	0.2
Whau	27	0	0	0	0.0
Whau	28	0	0	0	0.0
Whau	29	0	0	0	0.0
Whau	30	2	0	0	0.2
Whau	31	0	0	0	0.0
Whau	32	13	0	2	1.1
Whau	33	1	0	0	0.1
Whau	34	7	0.5	1	0.6
Whau	35	9	0	2	0.8
Whau	36	73	2.5	15	6.1
Whau	37	14	0	3	1.2
Whau	38	8	0.5	2	0.7
Whau	39	0	0	0	0.0

Site	Series	Total	Median	Range	Mean
Whau	40	5	0	2	0.4
Whau	41	16	0	3	1.3
Whau	42	53	3	12	4.4
Whau	43	40	2.5	7	3.3
Whau	44	26	1	6	2.2
Whau	45	14	1	3	1.2

Species: *Exosphaeroma chilensis*

Site	Series	Total	Median	Range	Mean
HBV	1	1	0	0	0.1
HBV	2	1	0	0	0.1
HBV	3	12	1	2	1.0
HBV	4	17	1	3	1.4
HBV	5	6	0	2	0.5
HBV	6	0	0	0	0.0
HBV	7	0	0	0	0.0
HBV	8	0	0	0	0.0
HBV	9	14	1	3	1.2
HBV	10	67	5	8	5.5
HBV	11	36	2.5	6	3.0
HBV	12	4	0	1	0.3
HBV	13	0	0	0	0.0
HBV	14	0	0	0	0.0
HBV	15	3	0	1	0.3
HBV	16	1	0	0	0.1
HBV	17	8	0	2	0.7
HBV	18	2	0	0	0.2
HBV	19	0	0	0	0.0
HBV	20	1	0	0	0.1
HBV	21	14	1	3	1.2
HBV	22	0	0	0	0.0
HBV	23	6	0	1	0.5
HBV	24	7	0	2	0.6
HBV	25	4	0	1	0.4
HBV	26	5	0	1	0.4
HBV	27	9	1	2	0.8
HBV	28	3	0	1	0.3
HBV	29	7	0	1	0.6
HBV	30	4	0	1	0.3
HBV	31	6	0	1	0.5
HBV	32	11	0.5	2	0.9
HBV	33	1	0	0	0.1
HBV	34	0	0	0	0.0
HBV	35	0	0	0	0.0
HBV	36	4	0	1	0.3
HBV	37	3	0	1	0.3
HBV	38	3	0	1	0.3
HBV	39	6	0	2	0.5
HBV	40	10	0	3	0.8
HBV	41	6	0	2	0.5
HBV	42	10	0.5	2	0.8
HBV	43	5	0	1	0.4
HBV	44	0	0	0	0.0
HBV	45	14	0	3	1.2
HC	1	0	0	0	0.0
HC	2	3	0	1	0.3
HC	3	2	0	1	0.2
HC	4	0	0	0	0.0
HC	5	8	0	2	0.7
HC	6	4	0	1	0.3
HC	7	0	0	0	0.0
HC	8	9	0	2	0.8
HC	9	7	0	1	0.6
HC	10	2	0	0	0.2
HC	11	2	0	1	0.2
HC	12	3	0	0	0.3
HC	13	1	0	0	0.1
HC	14	6	0	1	0.5
HC	15	12	1	2	1.0
HC	16	4	0	1	0.3
HC	17	4	0	1	0.3
HC	18	0	0	0	0.0
HC	19	0	0	0	0.0
HC	20	7	0	2	0.6
HC	21	16	1	2	1.3
HC	22	5	0	2	0.4
HC	23	13	0	3	1.1
HC	24	5	0	1	0.4
HC	25	7	0.5	1	0.6
HC	26	12	1	2	1.0
HC	27	3	0	1	0.3
HC	28	7	1	1	0.6
HC	29	3	0	1	0.3
HC	30	9	0.5	2	0.8
HC	31	1	0	0	0.1
HC	32	5	0	1	0.4
HC	33	0	0	0	0.0
HC	34	6	0	2	0.5
HC	35	4	0	1	0.3
HC	36	0	0	0	0.0
HC	37	1	0	0	0.1
HC	38	9	1	2	0.8
HC	39	8	0	2	0.6
HC	40	19	1	3	1.6
HC	41	15	1	3	1.3
HC	42	7	0	2	0.6
HC	43	2	0	1	0.2
HC	44	15	0.5	5	1.3
HC	45	11	1	2	0.9
Reef	1	0	0	0	0.0
Reef	2	0	0	0	0.0
Reef	3	0	0	0	0.0
Reef	4	0	0	0	0.0
Reef	5	1	0	0	0.1
Reef	6	4	0	1	0.3
Reef	7	0	0	0	0.0
Reef	8	0	0	0	0.0
Reef	9	0	0	0	0.0
Reef	10	0	0	0	0.0
Reef	11	0	0	0	0.0
Reef	12	0	0	0	0.0
Reef	13	0	0	0	0.0
Reef	14	0	0	0	0.0
Reef	15	1	0	0	0.1
Reef	16	0	0	0	0.0
Reef	17	0	0	0	0.0
Reef	18	0	0	0	0.0
Reef	19	0	0	0	0.0

Site	Series	Total	Median	Range	Mean
Reef	20	0	0	0	0.0
Reef	21	0	0	0	0.0
Reef	22	0	0	0	0.0
Reef	23	0	0	0	0.0
Reef	24	1	0	0	0.1
Reef	25	0	0	0	0.0
Reef	26	0	0	0	0.0
Reef	27	0	0	0	0.0
Reef	28	0	0	0	0.0
Reef	29	0	0	0	0.0
Reef	30	0	0	0	0.0
Reef	31	0	0	0	0.0
Reef	32	0	0	0	0.0
Reef	33	0	0	0	0.0
Reef	34	0	0	0	0.0
Reef	35	0	0	0	0.0
Reef	36	0	0	0	0.0
Reef	37	0	0	0	0.0
Reef	38	0	0	0	0.0
Reef	39	0	0	0	0.0
Reef	40	0	0	0	0.0
Reef	41	0	0	0	0.0
Reef	42	0	0	0	0.0
Reef	43	0	0	0	0.0
Reef	44	0	0	0	0.0
Reef	45	0	0	0	0.0
ShB	1	0	0	0	0.0
ShB	2	0	0	0	0.0
ShB	3	1	0	0	0.1
ShB	4	2	0	1	0.2
ShB	5	0	0	0	0.0
ShB	6	0	0	0	0.0
ShB	7	0	0	0	0.0
ShB	8	1	0	0	0.1
ShB	9	0	0	0	0.0
ShB	10	1	0	0	0.1
ShB	11	1	0	0	0.1
ShB	12	0	0	0	0.0
ShB	13	0	0	0	0.0
ShB	14	3	0	1	0.3
ShB	15	0	0	0	0.0
ShB	16	2	0	1	0.2
ShB	17	1	0	0	0.1
ShB	18	0	0	0	0.0
ShB	19	0	0	0	0.0
ShB	20	0	0	0	0.0
ShB	21	0	0	0	0.0
ShB	22	2	0	1	0.2
ShB	23	0	0	0	0.0
ShB	24	2	0	1	0.2
ShB	25	1	0	0	0.1
ShB	26	4	0	1	0.3
ShB	27	0	0	0	0.0
ShB	28	0	0	0	0.0
ShB	29	1	0	0	0.1

Site	Series	Total	Median	Range	Mean
ShB	30	2	0	1	0.2
ShB	31	1	0	0	0.1
ShB	32	0	0	0	0.0
ShB	33	0	0	0	0.0
ShB	34	0	0	0	0.0
ShB	35	0	0	0	0.0
ShB	36	0	0	0	0.0
ShB	37	2	0	0	0.2
ShB	38	0	0	0	0.0
ShB	39	0	0	0	0.0
ShB	40	0	0	0	0.0
ShB	41	0	0	0	0.0
ShB	42	2	0	1	0.2
ShB	43	0	0	0	0.0
ShB	44	0	0	0	0.0
ShB	45	1	0	0	0.1
Whau	1	0	0	0	0.0
Whau	2	1	0	0	0.1
Whau	3	5	0	1	0.4
Whau	4	5	0	1	0.4
Whau	5	1	0	0	0.1
Whau	6	0	0	0	0.0
Whau	7	0	0	0	0.0
Whau	8	0	0	0	0.0
Whau	9	0	0	0	0.0
Whau	10	4	0	1	0.3
Whau	11	0	0	0	0.0
Whau	12	0	0	0	0.0
Whau	13	2	0	1	0.2
Whau	14	3	0	1	0.3
Whau	15	0	0	0	0.0
Whau	16	1	0	0	0.1
Whau	17	1	0	0	0.1
Whau	18	0	0	0	0.0
Whau	19	2	0	1	0.2
Whau	20	2	0	1	0.2
Whau	21	0	0	0	0.0
Whau	22	4	0	1	0.3
Whau	23	1	0	0	0.1
Whau	24	4	0	1	0.3
Whau	25	0	0	0	0.0
Whau	26	0	0	0	0.0
Whau	27	0	0	0	0.0
Whau	28	4	0	1	0.3
Whau	29	2	0	1	0.2
Whau	30	5	0	2	0.4
Whau	31	1	0	0	0.1
Whau	32	0	0	0	0.0
Whau	33	1	0	0	0.1
Whau	34	0	0	0	0.0
Whau	35	0	0	0	0.0
Whau	36	0	0	0	0.0
Whau	37	0	0	0	0.0
Whau	38	3	0	0	0.3
Whau	39	0	0	0	0.0

Site	Series	Total	Median	Range	Mean
Whau	40	4	0	1	0.3
Whau	41	4	0	1	0.3
Whau	42	2	0	1	0.2
Whau	43	0	0	0	0.0
Whau	44	0	0	0	0.0
Whau	45	0	0	0	0.0

Species: *Glycera* sp.

Site	Series	Total	Median	Range	Mean
HBV	1	0	0	0	0.0
HBV	2	1	0	0	0.1
HBV	3	3	0	1	0.3
HBV	4	4	0	1	0.3
HBV	5	1	0	0	0.1
HBV	6	5	0	1	0.4
HBV	7	5	0	1	0.4
HBV	8	2	0	1	0.2
HBV	9	0	0	0	0.0
HBV	10	2	0	1	0.2
HBV	11	3	0	1	0.3
HBV	12	4	0	1	0.3
HBV	13	1	0	0	0.1
HBV	14	4	0	1	0.4
HBV	15	0	0	0	0.0
HBV	16	5	0	1	0.4
HBV	17	2	0	1	0.2
HBV	18	2	0	1	0.2
HBV	19	1	0	0	0.1
HBV	20	2	0	0	0.2
HBV	21	1	0	0	0.1
HBV	22	5	0	1	0.4
HBV	23	5	0	2	0.4
HBV	24	1	0	0	0.1
HBV	25	4	0	1	0.4
HBV	26	4	0	1	0.3
HBV	27	5	0	1	0.4
HBV	28	0	0	0	0.0
HBV	29	1	0	0	0.1
HBV	30	0	0	0	0.0
HBV	31	1	0	0	0.1
HBV	32	1	0	0	0.1
HBV	33	2	0	1	0.2
HBV	34	2	0	1	0.2
HBV	35	2	0	1	0.2
HBV	36	4	0	1	0.3
HBV	37	3	0	1	0.3
HBV	38	2	0	1	0.2
HBV	39	1	0	0	0.1
HBV	40	4	0	1	0.3
HBV	41	3	0	1	0.3
HBV	42	4	0	1	0.3
HBV	43	6	0	1	0.5
HBV	44	11	1	2	0.9
HBV	45	16	1.5	2	1.3
HC	1	3	0	1	0.3
HC	2	3	0	1	0.3
HC	3	6	0	1	0.5
HC	4	6	0.5	1	0.5
HC	5	4	0	1	0.3
HC	6	13	1	2	1.1
HC	7	1	0	0	0.1
HC	8	11	1	1	0.9
HC	9	5	0	1	0.4
HC	10	5	0	1	0.4
HC	11	4	0	1	0.3
HC	12	1	0	0	0.1
HC	13	1	0	0	0.1
HC	14	1	0	0	0.1
HC	15	4	0	1	0.3
HC	16	1	0	0	0.1
HC	17	2	0	1	0.2
HC	18	1	0	0	0.1
HC	19	2	0	1	0.2
HC	20	2	0	1	0.2
HC	21	0	0	0	0.0
HC	22	0	0	0	0.0
HC	23	0	0	0	0.0
HC	24	0	0	0	0.0
HC	25	0	0	0	0.0
HC	26	0	0	0	0.0
HC	27	1	0	0	0.1
HC	28	5	0	1	0.4
HC	29	2	0	1	0.2
HC	30	4	0	1	0.3
HC	31	3	0	1	0.3
HC	32	2	0	1	0.2
HC	33	2	0	1	0.2
HC	34	4	0	1	0.3
HC	35	3	0	1	0.3
HC	36	4	0	1	0.3
HC	37	0	0	0	0.0
HC	38	5	0	1	0.4
HC	39	1	0	0	0.1
HC	40	1	0	0	0.1
HC	41	3	0	1	0.3
HC	42	2	0	1	0.2
HC	43	3	0	1	0.3
HC	44	4	0	1	0.3
HC	45	6	0	1	0.5
Reef	1	9	0	2	0.8
Reef	2	12	1	2	1.0
Reef	3	3	0	1	0.3
Reef	4	1	0	0	0.1
Reef	5	7	0	2	0.6
Reef	6	2	0	1	0.2
Reef	7	3	0	1	0.3
Reef	8	2	0	1	0.2
Reef	9	0	0	0	0.0
Reef	10	0	0	0	0.0
Reef	11	1	0	0	0.1
Reef	12	0	0	0	0.0
Reef	13	6	0.5	1	0.5
Reef	14	3	0	1	0.3
Reef	15	1	0	0	0.1
Reef	16	2	0	1	0.2
Reef	17	2	0	1	0.2
Reef	18	2	0	1	0.2
Reef	19	4	0	1	0.3

Site	Series	Total	Median	Range	Mean
Reef	20	24	1.5	4	2.0
Reef	21	20	1	2	1.7
Reef	22	8	0	2	0.7
Reef	23	8	0	2	0.7
Reef	24	12	1	3	1.0
Reef	25	14	1	3	1.2
Reef	26	4	0	1	0.3
Reef	27	7	0	2	0.6
Reef	28	6	0.5	1	0.5
Reef	29	5	0	1	0.4
Reef	30	6	0	1	0.5
Reef	31	11	1	2	0.9
Reef	32	16	1	3	1.3
Reef	33	14	1	2	1.2
Reef	34	2	0	1	0.2
Reef	35	5	0	1	0.4
Reef	36	1	0	0	0.1
Reef	37	0	0	0	0.0
Reef	38	2	0	1	0.2
Reef	39	0	0	0	0.0
Reef	40	6	0	1	0.5
Reef	41	3	0	1	0.3
Reef	42	4	0	1	0.3
Reef	43	14	1	3	1.2
Reef	44	17	1	2	1.4
Reef	45	12	1	2	1.0
ShB	1	5	0	1	0.4
ShB	2	8	0	3	0.7
ShB	3	7	0	2	0.6
ShB	4	2	0	1	0.2
ShB	5	1	0	0	0.1
ShB	6	2	0	1	0.2
ShB	7	3	0	1	0.3
ShB	8	3	0	1	0.3
ShB	9	5	0	1	0.4
ShB	10	2	0	1	0.2
ShB	11	1	0	0	0.1
ShB	12	1	0	0	0.1
ShB	13	2	0	1	0.2
ShB	14	3	0	1	0.3
ShB	15	0	0	0	0.0
ShB	16	0	0	0	0.0
ShB	17	0	0	0	0.0
ShB	18	2	0	1	0.2
ShB	19	2	0	0	0.2
ShB	20	1	0	0	0.1
ShB	21	9	0	2	0.8
ShB	22	8	1	1	0.6
ShB	23	8	0	0	0.7
ShB	24	3	0	1	0.3
ShB	25	0	0	0	0.0
ShB	26	2	0	1	0.2
ShB	27	7	0	2	0.6
ShB	28	6	0	1	0.5
ShB	29	3	0	1	0.3

Site	Series	Total	Median	Range	Mean
ShB	30	3	0	1	0.3
ShB	31	6	0	1	0.5
ShB	32	4	0	1	0.3
ShB	33	5	0	1	0.4
ShB	34	1	0	0	0.1
ShB	35	0	0	0	0.0
ShB	36	1	0	0	0.1
ShB	37	3	0	1	0.3
ShB	38	2	0	1	0.2
ShB	39	1	0	0	0.1
ShB	40	1	0	0	0.1
ShB	41	1	0	0	0.1
ShB	42	1	0	0	0.1
ShB	43	3	0	1	0.3
ShB	44	7	0	1	0.6
ShB	45	5	0	2	0.4
Whau	1	0	0	0	0.0
Whau	2	6	0.5	1	0.5
Whau	3	6	0	2	0.5
Whau	4	8	0	2	0.6
Whau	5	5	0	1	0.4
Whau	6	5	0	1	0.4
Whau	7	3	0	1	0.3
Whau	8	5	0	1	0.4
Whau	9	5	0	1	0.4
Whau	10	0	0	0	0.0
Whau	11	5	0	1	0.4
Whau	12	3	0	1	0.3
Whau	13	3	0	1	0.3
Whau	14	3	0	1	0.3
Whau	15	4	0	1	0.3
Whau	16	2	0	1	0.2
Whau	17	3	0	1	0.3
Whau	18	1	0	0	0.1
Whau	19	2	0	0	0.2
Whau	20	6	0.5	1	0.5
Whau	21	10	1	2	0.8
Whau	22	4	0	1	0.3
Whau	23	10	1	1	0.8
Whau	24	5	0	1	0.4
Whau	25	2	0	1	0.2
Whau	26	3	0	1	0.3
Whau	27	0	0	0	0.0
Whau	28	1	0	0	0.1
Whau	29	1	0	0	0.1
Whau	30	2	0	1	0.2
Whau	31	0	0	0	0.0
Whau	32	2	0	1	0.2
Whau	33	7	0.5	1	0.6
Whau	34	0	0	0	0.0
Whau	35	5	0	2	0.4
Whau	36	2	0	1	0.2
Whau	37	0	0	0	0.0
Whau	38	5	0	1	0.4
Whau	39	0	0	0	0.0

Site	Series	Total	Median	Range	Mean
Whau	40	2	0	1	0.2
Whau	41	1	0	0	0.1
Whau	42	2	0	1	0.2
Whau	43	3	0	1	0.3
Whau	44	4	0	1	0.3
Whau	45	4	0	1	0.3

Species: *Haminoea zelandiae*

Site	Series	Total	Median	Range	Mean
HBV	1	0	0	0	0.0
HBV	2	0	0	0	0.0
HBV	3	0	0	0	0.0
HBV	4	0	0	0	0.0
HBV	5	0	0	0	0.0
HBV	6	0	0	0	0.0
HBV	7	0	0	0	0.0
HBV	8	0	0	0	0.0
HBV	9	0	0	0	0.0
HBV	10	1	0	0	0.1
HBV	11	0	0	0	0.0
HBV	12	0	0	0	0.0
HBV	13	0	0	0	0.0
HBV	14	0	0	0	0.0
HBV	15	0	0	0	0.0
HBV	16	0	0	0	0.0
HBV	17	1	0	0	0.1
HBV	18	0	0	0	0.0
HBV	19	0	0	0	0.0
HBV	20	0	0	0	0.0
HBV	21	0	0	0	0.0
HBV	22	0	0	0	0.0
HBV	23	0	0	0	0.0
HBV	24	0	0	0	0.0
HBV	25	0	0	0	0.0
HBV	26	1	0	0	0.1
HBV	27	1	0	0	0.1
HBV	28	1	0	0	0.1
HBV	29	0	0	0	0.0
HBV	30	0	0	0	0.0
HBV	31	0	0	0	0.0
HBV	32	0	0	0	0.0
HBV	33	2	0	1	0.2
HBV	34	0	0	0	0.0
HBV	35	0	0	0	0.0
HBV	36	1	0	0	0.1
HBV	37	0	0	0	0.0
HBV	38	1	0	0	0.1
HBV	39	1	0	0	0.1
HBV	40	0	0	0	0.0
HBV	41	2	0	0	0.2
HBV	42	0	0	0	0.0
HBV	43	0	0	0	0.0
HBV	44	6	0	1	0.5
HBV	45	6	0	2	0.5
HC	1	2	0	0	0.2
HC	2	0	0	0	0.0
HC	3	1	0	0	0.1
HC	4	5	0	1	0.4
HC	5	0	0	0	0.0
HC	6	0	0	0	0.0
HC	7	0	0	0	0.0
HC	8	3	0	1	0.3
HC	9	0	0	0	0.0
HC	10	1	0	0	0.1
HC	11	2	0	1	0.2
HC	12	0	0	0	0.0
HC	13	0	0	0	0.0
HC	14	0	0	0	0.0
HC	15	0	0	0	0.0
HC	16	0	0	0	0.0
HC	17	3	0	1	0.3
HC	18	0	0	0	0.0
HC	19	0	0	0	0.0
HC	20	4	0	1	0.3
HC	21	7	0	2	0.6
HC	22	0	0	0	0.0
HC	23	1	0	0	0.1
HC	24	0	0	0	0.0
HC	25	2	0	1	0.2
HC	26	1	0	0	0.1
HC	27	5	0	1	0.5
HC	28	6	0	1	0.5
HC	29	5	0	1	0.4
HC	30	0	0	0	0.0
HC	31	1	0	0	0.1
HC	32	0	0	0	0.0
HC	33	1	0	0	0.1
HC	34	1	0	0	0.1
HC	35	2	0	1	0.2
HC	36	0	0	0	0.0
HC	37	0	0	0	0.0
HC	38	8	0	2	0.7
HC	39	4	0	1	0.4
HC	40	7	0	2	0.6
HC	41	5	0	1	0.4
HC	42	0	0	0	0.0
HC	43	0	0	0	0.0
HC	44	16	1	2	1.3
HC	45	2	0	1	0.2
Reef	1	10	0.5	2	0.8
Reef	2	20	1.5	4	1.7
Reef	3	3	0	1	0.3
Reef	4	4	0	1	0.3
Reef	5	2	0	1	0.2
Reef	6	4	0	1	0.3
Reef	7	1	0	0	0.1
Reef	8	8	0.5	2	0.7
Reef	9	10	1	2	0.8
Reef	10	3	0	1	0.3
Reef	11	1	0	0	0.1
Reef	12	0	0	0	0.0
Reef	13	0	0	0	0.0
Reef	14	1	0	0	0.1
Reef	15	33	2.5	3	2.8
Reef	16	2	0	1	0.2
Reef	17	5	0	2	0.4
Reef	18	6	0	1	0.5
Reef	19	8	0.5	2	0.7

Site	Series	Total	Median	Range	Mean
Reef	20	29	2	6	2.4
Reef	21	46	1	11	3.8
Reef	22	24	0.5	6	2.0
Reef	23	18	1	4	1.5
Reef	24	14	1	4	1.2
Reef	25	1	0	0	0.1
Reef	26	9	0	2	0.8
Reef	27	11	1	2	0.9
Reef	28	0	0	0	0.0
Reef	29	17	1	3	1.4
Reef	30	17	1.5	3	1.4
Reef	31	4	0	1	0.4
Reef	32	0	0	0	0.0
Reef	33	0	0	0	0.0
Reef	34	1	0	0	0.1
Reef	35	2	0	1	0.2
Reef	36	1	0	0	0.1
Reef	37	5	0	2	0.4
Reef	38	11	0.5	3	0.9
Reef	39	3	0	1	0.3
Reef	40	11	0.5	2	0.9
Reef	41	24	1	3	2.0
Reef	42	24	1.5	3	2.0
Reef	43	25	1	5	2.1
Reef	44	14	1	3	1.2
Reef	45	0	0	0	0.0
ShB	1	0	0	0	0.0
ShB	2	0	0	0	0.0
ShB	3	1	0	0	0.1
ShB	4	0	0	0	0.0
ShB	5	0	0	0	0.0
ShB	6	0	0	0	0.0
ShB	7	0	0	0	0.0
ShB	8	2	0	1	0.2
ShB	9	1	0	0	0.1
ShB	10	0	0	0	0.0
ShB	11	0	0	0	0.0
ShB	12	0	0	0	0.0
ShB	13	0	0	0	0.0
ShB	14	5	0	1	0.4
ShB	15	6	0	1	0.5
ShB	16	2	0	1	0.2
ShB	17	1	0	0	0.1
ShB	18	0	0	0	0.0
ShB	19	0	0	0	0.0
ShB	20	14	0	2	1.2
ShB	21	5	0	1	0.4
ShB	22	8	0	2	0.6
ShB	23	0	0	0	0.0
ShB	24	0	0	0	0.0
ShB	25	3	0	1	0.3
ShB	26	3	0	1	0.3
ShB	27	2	0	0	0.2
ShB	28	0	0	0	0.0
ShB	29	0	0	0	0.0

Site	Series	Total	Median	Range	Mean
ShB	30	0	0	0	0.0
ShB	31	0	0	0	0.0
ShB	32	0	0	0	0.0
ShB	33	5	0	1	0.4
ShB	34	1	0	0	0.1
ShB	35	1	0	0	0.1
ShB	36	0	0	0	0.0
ShB	37	0	0	0	0.0
ShB	38	2	0	1	0.2
ShB	39	0	0	0	0.0
ShB	40	2	0	1	0.2
ShB	41	2	0	0	0.2
ShB	42	19	0	1	1.6
ShB	43	3	0	1	0.3
ShB	44	3	0	1	0.3
ShB	45	5	0	1	0.4
Whau	1	0	0	0	0.0
Whau	2	1	0	0	0.1
Whau	3	7	0.5	1	0.6
Whau	4	0	0	0	0.0
Whau	5	0	0	0	0.0
Whau	6	1	0	0	0.1
Whau	7	1	0	0	0.1
Whau	8	2	0	1	0.2
Whau	9	7	0.5	1	0.6
Whau	10	0	0	0	0.0
Whau	11	0	0	0	0.0
Whau	12	0	0	0	0.0
Whau	13	0	0	0	0.0
Whau	14	0	0	0	0.0
Whau	15	9	0.5	2	0.8
Whau	16	2	0	1	0.2
Whau	17	2	0	1	0.2
Whau	18	0	0	0	0.0
Whau	19	0	0	0	0.0
Whau	20	43	3	5	3.6
Whau	21	32	3	4	2.7
Whau	22	0	0	0	0.0
Whau	23	3	0	1	0.3
Whau	24	2	0	1	0.2
Whau	25	0	0	0	0.0
Whau	26	8	0.5	1	0.7
Whau	27	15	1	3	1.3
Whau	28	4	0	1	0.3
Whau	29	0	0	0	0.0
Whau	30	0	0	0	0.0
Whau	31	0	0	0	0.0
Whau	32	5	0	1	0.4
Whau	33	4	0	1	0.3
Whau	34	2	0	0	0.2
Whau	35	0	0	0	0.0
Whau	36	0	0	0	0.0
Whau	37	0	0	0	0.0
Whau	38	5	0	1	0.4
Whau	39	19	1	4	1.6

Site	Series	Total	Median	Range	Mean
Whau	40	7	0	2	0.6
Whau	41	5	0	1	0.4
Whau	42	3	0	1	0.3
Whau	43	0	0	0	0.0
Whau	44	17	1.5	3	1.4
Whau	45	7	0.5	1	0.6

Species: *Heteromastus filiformis*

Site	Series	Total	Median	Range	Mean
HBV	1	0	0	0	0.0
HBV	2	1	0	0	0.1
HBV	3	0	0	0	0.0
HBV	4	0	0	0	0.0
HBV	5	3	0	1	0.3
HBV	6	4	0	1	0.3
HBV	7	3	0	1	0.3
HBV	8	11	1	2	0.9
HBV	9	3	0	1	0.3
HBV	10	4	0	2	0.4
HBV	11	10	1	2	0.8
HBV	12	2	0	0	0.2
HBV	13	7	0	1	0.6
HBV	14	1	0	0	0.1
HBV	15	2	0	1	0.2
HBV	16	3	0	1	0.3
HBV	17	0	0	0	0.0
HBV	18	3	0	1	0.3
HBV	19	1	0	0	0.1
HBV	20	0	0	0	0.0
HBV	21	0	0	0	0.0
HBV	22	7	0	2	0.6
HBV	23	1	0	0	0.1
HBV	24	3	0	1	0.3
HBV	25	2	0	1	0.2
HBV	26	5	0	2	0.4
HBV	27	0	0	0	0.0
HBV	28	2	0	0	0.2
HBV	29	4	0	1	0.3
HBV	30	5	0	1	0.4
HBV	31	2	0	1	0.2
HBV	32	6	0	2	0.5
HBV	33	3	0	1	0.3
HBV	34	5	0	1	0.4
HBV	35	1	0	0	0.1
HBV	36	6	0	1	0.5
HBV	37	1	0	0	0.1
HBV	38	2	0	1	0.2
HBV	39	0	0	0	0.0
HBV	40	3	0	1	0.3
HBV	41	5	0	1	0.4
HBV	42	3	0	1	0.3
HBV	43	0	0	0	0.0
HBV	44	9	0	2	0.8
HBV	45	0	0	0	0.0
HC	1	4	0	1	0.3
HC	2	1	0	0	0.1
HC	3	3	0	1	0.3
HC	4	0	0	0	0.0
HC	5	13	1	2	1.1
HC	6	13	1	3	1.1
HC	7	6	0	1	0.5
HC	8	5	0	1	0.4
HC	9	13	0.5	3	1.1
HC	10	4	0	1	0.3
HC	11	6	0	1	0.5
HC	12	4	0	1	0.4
HC	13	3	0	1	0.3
HC	14	6	0.5	1	0.5
HC	15	5	0	1	0.4
HC	16	6	0	1	0.5
HC	17	3	0	1	0.3
HC	18	5	0	1	0.4
HC	19	8	0.5	2	0.7
HC	20	6	0	1	0.5
HC	21	1	0	0	0.1
HC	22	10	0.5	2	0.8
HC	23	6	0	1	0.5
HC	24	7	0	1	0.6
HC	25	10	1	2	0.8
HC	26	4	0	1	0.4
HC	27	0	0	0	0.0
HC	28	0	0	0	0.0
HC	29	4	0	1	0.3
HC	30	6	0	1	0.5
HC	31	13	1	2	1.1
HC	32	4	0	1	0.3
HC	33	12	1	2	1.0
HC	34	4	0	1	0.3
HC	35	7	0	2	0.6
HC	36	7	0	2	0.6
HC	37	15	1	3	1.3
HC	38	6	0	1	0.5
HC	39	2	0	1	0.2
HC	40	9	1	2	0.8
HC	41	5	0	1	0.4
HC	42	8	0.5	2	0.7
HC	43	2	0	0	0.2
HC	44	7	0	2	0.6
HC	45	2	0	0	0.2
Reef	1	0	0	0	0.0
Reef	2	0	0	0	0.0
Reef	3	0	0	0	0.0
Reef	4	5	0	1	0.4
Reef	5	0	0	0	0.0
Reef	6	0	0	0	0.0
Reef	7	13	1	3	1.1
Reef	8	9	0	2	0.8
Reef	9	11	0	2	0.9
Reef	10	8	0	2	0.6
Reef	11	9	0.5	1	0.8
Reef	12	8	1	1	0.7
Reef	13	9	0	2	0.8
Reef	14	9	1	1	0.8
Reef	15	7	0	1	0.6
Reef	16	12	0.5	3	1.0
Reef	17	28	1.5	6	2.3
Reef	18	81	4.5	14	6.8
Reef	19	89	5.5	17	7.4

Site	Series	Total	Median	Range	Mean
Reef	20	66	2.5	15	5.5
Reef	21	55	4.5	11	4.6
Reef	22	39	1	11	3.3
Reef	23	76	5	8	6.3
Reef	24	93	7	11	7.8
Reef	25	123	11	17	10.3
Reef	26	137	12	17	11.4
Reef	27	5	0	2	0.4
Reef	28	72	4	11	6.0
Reef	29	131	10	11	10.9
Reef	30	198	18.5	14	16.5
Reef	31	459	21	21	38.3
Reef	32	112	9.5	9	9.3
Reef	33	107	9	14	8.9
Reef	34	203	15.5	21	16.9
Reef	35	189	17	16	15.8
Reef	36	179	14.5	21	14.9
Reef	37	220	18	20	18.3
Reef	38	226	19.5	12	18.8
Reef	39	0	0	0	0.0
Reef	40	240	15	29	20.0
Reef	41	408	37	29	34.0
Reef	42	428	36	23	35.7
Reef	43	266	19	28	22.2
Reef	44	316	25.5	35	26.3
Reef	45	203	17.5	20	16.9
ShB	1	0	0	0	0.0
ShB	2	0	0	0	0.0
ShB	3	0	0	0	0.0
ShB	4	0	0	0	0.0
ShB	5	1	0	0	0.1
ShB	6	0	0	0	0.0
ShB	7	4	0	1	0.3
ShB	8	8	1	1	0.7
ShB	9	11	0.5	2	0.9
ShB	10	10	0.5	2	0.8
ShB	11	7	0	2	0.6
ShB	12	5	0	1	0.5
ShB	13	6	0.5	1	0.5
ShB	14	5	0	1	0.4
ShB	15	12	1	2	1.0
ShB	16	4	0	1	0.3
ShB	17	17	1	3	1.4
ShB	18	8	0	2	0.7
ShB	19	19	1	5	1.6
ShB	20	22	1	2	1.8
ShB	21	8	0	1	0.7
ShB	22	31	2	4	2.5
ShB	23	37	2	5	3.1
ShB	24	35	1	4	2.9
ShB	25	44	4	7	3.7
ShB	26	39	2.5	8	3.3
ShB	27	31	1	7	2.6
ShB	28	31	2	7	2.6
ShB	29	65	4	8	5.4

Site	Series	Total	Median	Range	Mean
ShB	30	11	0.5	2	0.9
ShB	31	46	4	6	3.8
ShB	32	29	2	4	2.4
ShB	33	43	3	5	3.6
ShB	34	42	2	9	3.5
ShB	35	32	1	7	2.7
ShB	36	25	1	6	2.1
ShB	37	38	2.5	7	3.2
ShB	38	39	2	5	3.3
ShB	39	5	0	2	0.4
ShB	40	19	1	4	1.6
ShB	41	64	4.5	12	5.3
ShB	42	22	1	4	1.8
ShB	43	32	1	8	2.7
ShB	44	60	3	9	5.0
ShB	45	11	1	1	0.9
Whau	1	1	0	0	0.1
Whau	2	0	0	0	0.0
Whau	3	0	0	0	0.0
Whau	4	0	0	0	0.0
Whau	5	0	0	0	0.0
Whau	6	2	0	1	0.2
Whau	7	0	0	0	0.0
Whau	8	1	0	0	0.1
Whau	9	0	0	0	0.0
Whau	10	6	0	1	0.5
Whau	11	7	0	2	0.6
Whau	12	1	0	0	0.1
Whau	13	1	0	0	0.1
Whau	14	0	0	0	0.0
Whau	15	1	0	0	0.1
Whau	16	0	0	0	0.0
Whau	17	1	0	0	0.1
Whau	18	0	0	0	0.0
Whau	19	0	0	0	0.0
Whau	20	2	0	0	0.2
Whau	21	4	0	1	0.3
Whau	22	8	0.5	2	0.7
Whau	23	3	0	1	0.3
Whau	24	2	0	1	0.2
Whau	25	4	0	1	0.3
Whau	26	7	0	2	0.6
Whau	27	0	0	0	0.0
Whau	28	0	0	0	0.0
Whau	29	1	0	0	0.1
Whau	30	4	0	1	0.3
Whau	31	3	0	1	0.3
Whau	32	2	0	1	0.2
Whau	33	3	0	1	0.3
Whau	34	1	0	0	0.1
Whau	35	2	0	1	0.2
Whau	36	2	0	0	0.2
Whau	37	2	0	1	0.2
Whau	38	4	0	1	0.3
Whau	39	0	0	0	0.0

Site	Series	Total	Median	Range	Mean
Whau	40	5	0	2	0.4
Whau	41	1	0	0	0.1
Whau	42	3	0	1	0.3
Whau	43	10	0.5	1	0.8
Whau	44	7	0	2	0.6
Whau	45	1	0	0	0.1

Species: ***Macomona liliana***

Site	Series	Total	Median	Range	Mean
HBV	1	12	1	2	1.0
HBV	2	28	2	3	2.3
HBV	3	23	1.5	2	1.9
HBV	4	14	1	2	1.2
HBV	5	29	2	3	2.4
HBV	6	24	2	2	2.0
HBV	7	27	2	3	2.3
HBV	8	17	1	3	1.4
HBV	9	32	3	3	2.7
HBV	10	19	2	2	1.5
HBV	11	20	1.5	3	1.7
HBV	12	8	0	2	0.7
HBV	13	29	2	3	2.4
HBV	14	10	1	2	0.8
HBV	15	18	1	3	1.5
HBV	16	14	1	2	1.2
HBV	17	24	2	3	2.0
HBV	18	7	0.5	1	0.6
HBV	19	15	1	2	1.3
HBV	20	7	0.5	1	0.6
HBV	21	17	2	2	1.4
HBV	22	13	1	3	1.1
HBV	23	12	1	2	1.0
HBV	24	18	1	3	1.5
HBV	25	11	1	2	0.9
HBV	26	22	1.5	4	1.8
HBV	27	21	1	2	1.8
HBV	28	20	2	3	1.7
HBV	29	25	2	3	2.1
HBV	30	25	2	4	2.1
HBV	31	28	2	4	2.3
HBV	32	7	0	2	0.6
HBV	33	20	1	3	1.7
HBV	34	19	1	3	1.6
HBV	35	25	2	4	2.1
HBV	36	13	1	2	1.1
HBV	37	30	2	3	2.5
HBV	38	20	1.5	3	1.7
HBV	39	22	1.5	2	1.8
HBV	40	30	2	4	2.5
HBV	41	20	1	2	1.7
HBV	42	19	1.5	3	1.6
HBV	43	20	2	4	1.7
HBV	44	30	2	4	2.5
HBV	45	35	3	4	2.9
HC	1	6	0.5	1	0.5
HC	2	8	1	1	0.7
HC	3	4	0	1	0.3
HC	4	2	0	1	0.2
HC	5	11	1	2	0.9
HC	6	7	0	1	0.6
HC	7	4	0	1	0.3
HC	8	8	0	1	0.7
HC	9	9	0	2	0.8
HC	10	5	0	1	0.4
HC	11	3	0	1	0.3
HC	12	0	0	0	0.0
HC	13	0	0	0	0.0
HC	14	2	0	1	0.2
HC	15	5	0	1	0.4
HC	16	0	0	0	0.0
HC	17	3	0	1	0.3
HC	18	4	0	1	0.3
HC	19	2	0	0	0.2
HC	20	2	0	1	0.2
HC	21	3	0	1	0.3
HC	22	8	0.5	2	0.7
HC	23	4	0	1	0.3
HC	24	4	0	1	0.3
HC	25	7	0.5	1	0.6
HC	26	1	0	0	0.1
HC	27	2	0	1	0.2
HC	28	6	0	1	0.5
HC	29	6	0	2	0.5
HC	30	11	0.5	3	0.9
HC	31	13	0	3	1.1
HC	32	5	0	1	0.4
HC	33	3	0	1	0.3
HC	34	4	0	1	0.3
HC	35	3	0	1	0.3
HC	36	6	0.5	1	0.5
HC	37	6	0	1	0.5
HC	38	6	0	1	0.5
HC	39	5	0	1	0.5
HC	40	12	0	3	1.0
HC	41	15	1	2	1.3
HC	42	9	0	2	0.8
HC	43	28	2	3	2.3
HC	44	26	2	3	2.2
HC	45	14	1	1	1.2
Reef	1	10	1	2	0.8
Reef	2	11	1	2	0.9
Reef	3	6	0	1	0.5
Reef	4	12	1	2	1.0
Reef	5	13	1	3	1.1
Reef	6	18	1	3	1.5
Reef	7	10	1	2	0.8
Reef	8	19	2	2	1.6
Reef	9	18	1	1	1.5
Reef	10	21	2	2	1.7
Reef	11	12	1	2	1.0
Reef	12	8	1	1	0.7
Reef	13	9	0.5	2	0.8
Reef	14	8	1	1	0.6
Reef	15	12	1	2	1.0
Reef	16	20	1	4	1.7
Reef	17	21	1	3	1.8
Reef	18	23	2	2	1.9
Reef	19	38	3	4	3.2

Site	Series	Total	Median	Range	Mean
Reef	20	25	2	2	2.1
Reef	21	15	1	1	1.3
Reef	22	32	2.5	3	2.7
Reef	23	45	3.5	6	3.8
Reef	24	17	2	2	1.4
Reef	25	30	2.5	4	2.5
Reef	26	35	3	4	2.9
Reef	27	17	1.5	3	1.4
Reef	28	24	1	6	2.0
Reef	29	61	3	5	5.1
Reef	30	40	4	3	3.3
Reef	31	26	2	3	2.2
Reef	32	17	1	1	1.4
Reef	33	8	0.5	2	0.7
Reef	34	22	1	5	1.8
Reef	35	31	3	3	2.6
Reef	36	24	2	4	2.0
Reef	37	22	2	4	1.8
Reef	38	13	1	1	1.1
Reef	39	6	0	1	0.5
Reef	40	42	3.5	5	3.5
Reef	41	33	2	6	2.7
Reef	42	21	1.5	2	1.8
Reef	43	14	1	2	1.2
Reef	44	7	0.5	1	0.6
Reef	45	4	0	1	0.3
ShB	1	11	1	1	0.9
ShB	2	11	1	1	0.9
ShB	3	18	1	3	1.5
ShB	4	41	3	7	3.4
ShB	5	12	1	3	1.0
ShB	6	12	1	2	1.0
ShB	7	11	1	2	0.9
ShB	8	18	1	3	1.5
ShB	9	10	1	2	0.8
ShB	10	19	1	4	1.6
ShB	11	20	1.5	2	1.7
ShB	12	16	2	2	1.4
ShB	13	10	1	1	0.8
ShB	14	9	1	1	0.8
ShB	15	14	1	2	1.2
ShB	16	8	0.5	1	0.7
ShB	17	5	0	1	0.4
ShB	18	16	1	3	1.3
ShB	19	12	1	2	1.0
ShB	20	1	0	0	0.1
ShB	21	18	1	3	1.5
ShB	22	17	1	3	1.5
ShB	23	15	1	3	1.3
ShB	24	25	2	2	2.1
ShB	25	21	1.5	3	1.8
ShB	26	13	1	2	1.1
ShB	27	13	1	2	1.1
ShB	28	23	1	3	1.9
ShB	29	6	0	1	0.5
ShB	30	13	1	2	1.1
ShB	31	22	1	3	1.8
ShB	32	5	0	1	0.4
ShB	33	8	0	1	0.7
ShB	34	15	1	2	1.3
ShB	35	13	0	3	1.1
ShB	36	12	1	3	1.0
ShB	37	13	1	2	1.1
ShB	38	11	0	3	0.9
ShB	39	11	0.5	2	0.9
ShB	40	9	0	1	0.8
ShB	41	17	1	3	1.4
ShB	42	14	1	3	1.2
ShB	43	6	0.5	1	0.5
ShB	44	8	0	1	0.7
ShB	45	6	0	1	0.5
Whau	1	33	3	3	2.8
Whau	2	33	2.5	3	2.8
Whau	3	25	2	2	2.1
Whau	4	68	5	4	5.6
Whau	5	21	2	3	1.8
Whau	6	19	1	2	1.6
Whau	7	27	2	3	2.3
Whau	8	25	1.5	5	2.1
Whau	9	24	2	4	2.0
Whau	10	0	0	0	0.0
Whau	11	23	2	3	1.9
Whau	12	12	1	0	1.0
Whau	13	12	1	2	1.0
Whau	14	8	1	1	0.7
Whau	15	37	3	4	3.1
Whau	16	11	1	3	0.9
Whau	17	52	4	7	4.3
Whau	18	17	1	1	1.4
Whau	19	50	3	7	4.2
Whau	20	67	6	4	5.6
Whau	21	73	5	9	6.1
Whau	22	64	5	6	5.3
Whau	23	77	5	10	6.4
Whau	24	75	4.5	11	6.3
Whau	25	93	6.5	11	7.8
Whau	26	122	9.5	14	10.2
Whau	27	103	6.5	13	8.6
Whau	28	88	6	10	7.3
Whau	29	100	6.5	10	8.3
Whau	30	111	10	11	9.3
Whau	31	92	6	10	7.7
Whau	32	102	8.5	8	8.5
Whau	33	64	5	7	5.3
Whau	34	59	5	4	4.9
Whau	35	60	6	9	5.0
Whau	36	75	7	8	6.3
Whau	37	70	5	9	5.8
Whau	38	64	5.5	7	5.3
Whau	39	23	1	4	1.9

Site	Series	Total	Median	Range	Mean
Whau	40	72	6	5	6.0
Whau	41	49	3.5	7	4.1
Whau	42	72	6	7	6.0
Whau	43	74	6	10	6.2
Whau	44	95	7	9	7.9
Whau	45	50	3.5	5	4.2

Species: ***Macroclymenella stewartensis***

Site	Series	Total	Median	Range	Mean
HBV	1	1	0	0	0.1
HBV	2	4	0	1	0.3
HBV	3	3	0	1	0.3
HBV	4	2	0	1	0.2
HBV	5	2	0	1	0.2
HBV	6	0	0	0	0.0
HBV	7	5	0	1	0.4
HBV	8	7	0	2	0.6
HBV	9	0	0	0	0.0
HBV	10	2	0	1	0.2
HBV	11	2	0	1	0.2
HBV	12	0	0	0	0.0
HBV	13	2	0	1	0.2
HBV	14	4	0	1	0.4
HBV	15	2	0	1	0.2
HBV	16	0	0	0	0.0
HBV	17	0	0	0	0.0
HBV	18	0	0	0	0.0
HBV	19	1	0	0	0.1
HBV	20	5	0	1	0.4
HBV	21	2	0	1	0.2
HBV	22	1	0	0	0.1
HBV	23	0	0	0	0.0
HBV	24	3	0	1	0.3
HBV	25	1	0	0	0.1
HBV	26	3	0	1	0.3
HBV	27	1	0	0	0.1
HBV	28	0	0	0	0.0
HBV	29	3	0	1	0.3
HBV	30	0	0	0	0.0
HBV	31	3	0	1	0.3
HBV	32	3	0	1	0.3
HBV	33	6	0	1	0.5
HBV	34	4	0	1	0.3
HBV	35	3	0	1	0.3
HBV	36	3	0	1	0.3
HBV	37	4	0	1	0.3
HBV	38	3	0	1	0.3
HBV	39	1	0	0	0.1
HBV	40	1	0	0	0.1
HBV	41	4	0	1	0.3
HBV	42	5	0	1	0.4
HBV	43	12	1	2	1.0
HBV	44	10	1	2	0.8
HBV	45	10	0.5	2	0.8
HC	1	8	0.5	1	0.7
HC	2	12	1	2	1.0
HC	3	4	0	1	0.3
HC	4	6	0.5	1	0.5
HC	5	2	0	1	0.2
HC	6	6	0	1	0.5
HC	7	15	1	3	1.3
HC	8	14	1	2	1.2
HC	9	7	0.5	1	0.6
HC	10	7	0	3	0.6
HC	11	8	0.5	1	0.7
HC	12	9	0	2	0.7
HC	13	5	0	1	0.4
HC	14	4	0	1	0.3
HC	15	3	0	0	0.2
HC	16	10	0.5	2	0.8
HC	17	5	0	1	0.4
HC	18	10	1	2	0.8
HC	19	9	0.5	2	0.8
HC	20	14	1	2	1.2
HC	21	7	0	2	0.6
HC	22	9	1	2	0.8
HC	23	10	1	1	0.8
HC	24	2	0	1	0.2
HC	25	5	0	1	0.4
HC	26	9	0	1	0.7
HC	27	2	0	1	0.2
HC	28	11	1	2	0.9
HC	29	7	0.5	1	0.6
HC	30	4	0	1	0.3
HC	31	17	1	3	1.4
HC	32	18	1.5	3	1.5
HC	33	21	1	4	1.8
HC	34	13	1	2	1.1
HC	35	27	2	3	2.3
HC	36	14	1	3	1.2
HC	37	28	2	3	2.3
HC	38	10	0	3	0.8
HC	39	13	1	2	1.1
HC	40	9	1	1	0.8
HC	41	5	0	1	0.4
HC	42	12	1	2	1.0
HC	43	33	2.5	4	2.8
HC	44	33	2.5	5	2.8
HC	45	21	2	3	1.8
Reef	1	24	2	4	2.0
Reef	2	27	2	3	2.3
Reef	3	38	2.5	5	3.2
Reef	4	30	2	5	2.5
Reef	5	20	2	3	1.7
Reef	6	18	1	3	1.5
Reef	7	15	1	3	1.3
Reef	8	16	1	3	1.3
Reef	9	10	0.5	2	0.8
Reef	10	11	1	2	0.9
Reef	11	11	1	2	0.9
Reef	12	4	0	1	0.3
Reef	13	12	0.5	3	1.0
Reef	14	11	1	2	0.9
Reef	15	30	2.5	3	2.5
Reef	16	15	1	3	1.3
Reef	17	9	0.5	2	0.8
Reef	18	12	1	2	1.0
Reef	19	19	1.5	3	1.6

Site	Series	Total	Median	Range	Mean
Reef	20	25	2	5	2.1
Reef	21	14	1	2	1.2
Reef	22	17	1.5	2	1.4
Reef	23	10	1	2	0.8
Reef	24	16	1.5	2	1.3
Reef	25	12	1	2	1.0
Reef	26	34	2.5	4	2.8
Reef	27	23	1	5	1.9
Reef	28	9	0.5	1	0.8
Reef	29	9	0.5	2	0.8
Reef	30	46	3	7	3.8
Reef	31	48	3	4	4.0
Reef	32	36	3	4	3.0
Reef	33	46	3	6	3.8
Reef	34	20	2	4	1.7
Reef	35	22	2	3	1.8
Reef	36	39	2	4	3.3
Reef	37	31	2	5	2.6
Reef	38	22	1.5	4	1.8
Reef	39	0	0	0	0.0
Reef	40	20	1.5	4	1.7
Reef	41	23	2	3	1.9
Reef	42	25	1.5	4	2.1
Reef	43	30	2	5	2.5
Reef	44	41	4	4	3.4
Reef	45	37	3.5	5	3.1
ShB	1	5	0	1	0.4
ShB	2	6	0	1	0.5
ShB	3	3	0	1	0.3
ShB	4	1	0	0	0.1
ShB	5	2	0	1	0.2
ShB	6	2	0	1	0.2
ShB	7	0	0	0	0.0
ShB	8	2	0	1	0.2
ShB	9	2	0	0	0.2
ShB	10	4	0	1	0.3
ShB	11	1	0	0	0.1
ShB	12	2	0	1	0.2
ShB	13	2	0	1	0.2
ShB	14	6	0	1	0.5
ShB	15	5	0	1	0.4
ShB	16	3	0	1	0.3
ShB	17	2	0	1	0.2
ShB	18	2	0	1	0.2
ShB	19	0	0	0	0.0
ShB	20	1	0	0	0.1
ShB	21	4	0	1	0.3
ShB	22	4	0	1	0.4
ShB	23	0	0	0	0.0
ShB	24	1	0	0	0.1
ShB	25	4	0	1	0.3
ShB	26	12	1	3	1.0
ShB	27	6	0	2	0.5
ShB	28	7	0	1	0.6
ShB	29	1	0	0	0.1

Site	Series	Total	Median	Range	Mean
ShB	30	4	0	2	0.3
ShB	31	3	0	1	0.3
ShB	32	4	0	1	0.3
ShB	33	7	0	1	0.6
ShB	34	6	0.5	1	0.5
ShB	35	0	0	0	0.0
ShB	36	8	1	1	0.6
ShB	37	13	1	2	1.1
ShB	38	4	0	1	0.3
ShB	39	3	0	1	0.3
ShB	40	6	0	1	0.5
ShB	41	3	0	1	0.3
ShB	42	4	0	1	0.3
ShB	43	11	1	2	0.9
ShB	44	7	0	2	0.6
ShB	45	10	1	2	0.8
Whau	1	29	2	3	2.4
Whau	2	33	2.5	4	2.8
Whau	3	33	2.5	3	2.8
Whau	4	3	0	1	0.3
Whau	5	26	2	2	2.2
Whau	6	24	2	2	2.0
Whau	7	38	3	4	3.2
Whau	8	71	6	5	5.9
Whau	9	61	3.5	10	5.1
Whau	10	46	2	8	3.8
Whau	11	47	4	3	3.9
Whau	12	47	3	7	3.9
Whau	13	26	2	3	2.2
Whau	14	45	3.5	6	3.8
Whau	15	31	2	4	2.6
Whau	16	36	3	5	3.0
Whau	17	24	1.5	3	2.0
Whau	18	36	3	4	3.0
Whau	19	30	2.5	4	2.5
Whau	20	58	4	6	4.8
Whau	21	68	6.5	5	5.7
Whau	22	53	4.5	5	4.4
Whau	23	49	5	4	4.1
Whau	24	33	2.5	4	2.8
Whau	25	121	8	9	10.1
Whau	26	0	0	0	0.0
Whau	27	44	3.5	6	3.7
Whau	28	50	4.5	6	4.2
Whau	29	45	4	4	3.8
Whau	30	53	4.5	6	4.4
Whau	31	108	10	7	9.0
Whau	32	102	8	8	8.5
Whau	33	89	6.5	10	7.4
Whau	34	95	7.5	9	7.9
Whau	35	67	5.5	7	5.6
Whau	36	53	5	6	4.4
Whau	37	107	8	8	8.9
Whau	38	86	7.5	7	7.2
Whau	39	26	2	4	2.2

Site	Series	Total	Median	Range	Mean
Whau	40	62	5.5	7	5.2
Whau	41	37	3.5	5	3.1
Whau	42	61	4.5	6	5.1
Whau	43	84	7	10	7.0
Whau	44	108	8	11	9.0
Whau	45	103	8	11	8.6

Species: ***Notoacmea helmsi***

Site	Series	Total	Median	Range	Mean
HBV	1	32	2	6	2.7
HBV	2	39	2	9	3.3
HBV	3	20	1	4	1.7
HBV	4	143	9.5	25	11.9
HBV	5	150	9	22	12.5
HBV	6	133	10.5	13	11.1
HBV	7	86	6.5	11	7.2
HBV	8	83	6.5	8	6.9
HBV	9	58	4	10	4.8
HBV	10	93	6	12	7.7
HBV	11	122	9.5	16	10.2
HBV	12	107	8.5	13	8.9
HBV	13	95	9	9	7.9
HBV	14	110	9	14	9.2
HBV	15	60	5	7	5.0
HBV	16	95	6	18	7.9
HBV	17	69	4	9	5.8
HBV	18	90	7	10	7.5
HBV	19	63	4	8	5.3
HBV	20	44	4	7	3.7
HBV	21	68	4.5	9	5.7
HBV	22	53	4.5	5	4.4
HBV	23	56	4	8	4.7
HBV	24	161	12.5	18	13.4
HBV	25	123	10	11	10.3
HBV	26	118	8.5	12	9.8
HBV	27	107	8.5	15	8.9
HBV	28	104	8.5	12	8.7
HBV	29	148	13	11	12.3
HBV	30	170	11	19	14.2
HBV	31	168	13	13	14.0
HBV	32	71	3.5	13	5.9
HBV	33	31	2	4	2.6
HBV	34	67	4.5	8	5.6
HBV	35	163	11.5	14	13.6
HBV	36	163	12	10	13.6
HBV	37	111	8.5	14	9.3
HBV	38	125	10	10	10.4
HBV	39	80	5.5	12	6.7
HBV	40	99	9.5	9	8.3
HBV	41	202	16	15	16.8
HBV	42	205	13.5	24	17.1
HBV	43	110	10	13	9.2
HBV	44	117	9.5	14	9.8
HBV	45	113	9	12	9.4
HC	1	136	11.5	15	11.3
HC	2	44	3.5	6	3.7
HC	3	26	2	4	2.2
HC	4	43	3.5	6	3.6
HC	5	173	13	21	14.4
HC	6	245	16.5	25	20.4
HC	7	208	16.5	13	17.3
HC	8	100	7	12	8.3
HC	9	98	7	11	8.2
HC	10	189	13.5	21	15.8
HC	11	132	9	21	11.0
HC	12	182	17	17	15.2
HC	13	116	10.5	8	9.7
HC	14	119	8.5	13	9.9
HC	15	80	4	11	6.7
HC	16	87	6.5	10	7.3
HC	17	3	0	1	0.3
HC	18	162	13.5	14	13.5
HC	19	173	14	16	14.4
HC	20	83	4	12	6.9
HC	21	31	2	6	2.6
HC	22	102	7	14	8.5
HC	23	99	8	8	8.3
HC	24	81	5.5	14	6.8
HC	25	137	12.5	11	11.4
HC	26	74	5	10	6.2
HC	27	65	5	9	5.5
HC	28	64	6	7	5.3
HC	29	188	15.5	21	15.7
HC	30	298	28.5	31	24.8
HC	31	109	8.5	13	9.1
HC	32	70	5.5	10	5.8
HC	33	76	6	6	6.3
HC	34	202	17	19	16.8
HC	35	407	35.5	22	33.9
HC	36	220	17.5	14	18.3
HC	37	55	3	7	4.6
HC	38	101	8	19	8.4
HC	39	140	11	15	11.6
HC	40	301	21.5	30	25.1
HC	41	323	22.5	32	26.9
HC	42	132	11.5	10	11.0
HC	43	104	8	11	8.7
HC	44	154	10.5	13	12.8
HC	45	112	9	13	9.3
Reef	1	5	0	1	0.4
Reef	2	2	0	1	0.2
Reef	3	10	0	2	0.8
Reef	4	6	0	2	0.5
Reef	5	2	0	1	0.2
Reef	6	9	0	2	0.8
Reef	7	5	0	1	0.4
Reef	8	4	0	1	0.3
Reef	9	13	0.5	3	1.1
Reef	10	2	0	1	0.2
Reef	11	4	0	1	0.3
Reef	12	2	0	1	0.2
Reef	13	1	0	0	0.1
Reef	14	5	0	1	0.4
Reef	15	3	0	1	0.3
Reef	16	0	0	0	0.0
Reef	17	2	0	1	0.2
Reef	18	2	0	1	0.2
Reef	19	4	0	1	0.3

Site	Series	Total	Median	Range	Mean
Reef	20	1	0	0	0.1
Reef	21	0	0	0	0.0
Reef	22	1	0	0	0.1
Reef	23	2	0	1	0.2
Reef	24	3	0	1	0.3
Reef	25	1	0	0	0.1
Reef	26	1	0	0	0.1
Reef	27	0	0	0	0.0
Reef	28	1	0	0	0.1
Reef	29	3	0	0	0.3
Reef	30	1	0	0	0.1
Reef	31	3	0	1	0.3
Reef	32	0	0	0	0.0
Reef	33	0	0	0	0.0
Reef	34	0	0	0	0.0
Reef	35	1	0	0	0.1
Reef	36	3	0	0	0.3
Reef	37	0	0	0	0.0
Reef	38	6	0	2	0.5
Reef	39	1	0	0	0.1
Reef	40	27	0	5	2.3
Reef	41	2	0	1	0.2
Reef	42	2	0	1	0.2
Reef	43	6	0	2	0.5
Reef	44	10	0	2	0.8
Reef	45	8	0	0	0.7
ShB	1	62	3.5	10	5.2
ShB	2	64	3.5	10	5.3
ShB	3	19	0.5	5	1.6
ShB	4	88	7	14	7.3
ShB	5	134	5	33	11.2
ShB	6	140	12.5	17	11.7
ShB	7	87	7	14	7.3
ShB	8	35	2	7	2.9
ShB	9	28	2	5	2.3
ShB	10	175	13	23	14.6
ShB	11	143	12.5	10	11.9
ShB	12	127	10	8	10.5
ShB	13	41	3	3	3.4
ShB	14	92	6.5	11	7.6
ShB	15	99	7	14	8.3
ShB	16	72	5	11	6.0
ShB	17	118	11	16	9.8
ShB	18	95	6.5	14	7.9
ShB	19	75	5	17	6.3
ShB	20	62	4	8	5.2
ShB	21	42	2.5	9	3.5
ShB	22	55	4	12	4.5
ShB	23	30	0.5	9	2.5
ShB	24	93	5	19	7.7
ShB	25	75	5.5	10	6.3
ShB	26	64	3.5	12	5.3
ShB	27	40	1.5	10	3.3
ShB	28	56	3.5	11	4.7
ShB	29	71	5	11	5.9
ShB	30	227	14	37	18.9
ShB	31	212	13	31	17.7
ShB	32	81	6.5	8	6.8
ShB	33	22	0.5	6	1.8
ShB	34	5	0	1	0.4
ShB	35	35	0	3	2.9
ShB	36	61	2	15	5.1
ShB	37	97	1.5	14	8.1
ShB	38	37	3	3	3.1
ShB	39	21	1.5	4	1.8
ShB	40	116	9.5	20	9.7
ShB	41	71	3.5	12	5.9
ShB	42	140	12	24	11.7
ShB	43	106	7.5	17	8.8
ShB	44	41	3.5	6	3.4
ShB	45	39	2	7	3.3
Whau	1	96	5	18	8.0
Whau	2	99	8	8	8.3
Whau	3	124	8.5	10	10.3
Whau	4	66	3.5	12	5.5
Whau	5	12	1	2	1.0
Whau	6	24	1	5	2.0
Whau	7	44	4	5	3.7
Whau	8	45	3	7	3.8
Whau	9	37	3.5	5	3.1
Whau	10	82	6	4	6.8
Whau	11	26	2	4	2.2
Whau	12	64	6	10	5.3
Whau	13	42	3	6	3.5
Whau	14	47	3.5	6	3.9
Whau	15	44	3.5	6	3.7
Whau	16	18	2	2	1.5
Whau	17	42	2	11	3.5
Whau	18	29	1	8	2.4
Whau	19	34	3	3	2.8
Whau	20	43	2.5	8	3.6
Whau	21	4	0	2	0.3
Whau	22	19	1	5	1.6
Whau	23	12	1	2	1.0
Whau	24	14	0	5	1.2
Whau	25	6	0	2	0.5
Whau	26	12	0.5	2	1.0
Whau	27	18	1	4	1.5
Whau	28	22	1.5	3	1.8
Whau	29	34	2	7	2.8
Whau	30	47	1	15	3.9
Whau	31	30	3	4	2.5
Whau	32	40	2	5	3.3
Whau	33	11	0	4	0.9
Whau	34	7	0	1	0.6
Whau	35	23	1	4	1.9
Whau	36	24	1	5	2.0
Whau	37	43	2	8	3.5
Whau	38	72	1.5	14	6.0
Whau	39	32	0	8	2.7

Site	Series	Total	Median	Range	Mean
Whau	40	23	1	5	1.9
Whau	41	91	1	18	7.6
Whau	42	35	2.5	6	2.9
Whau	43	13	1	3	1.1
Whau	44	38	2	8	3.2
Whau	45	23	1	6	1.9

Species: ***Nucula hartvigiana***

Site	Series	Total	Median	Range	Mean
HBV	1	308	21	39	25.7
HBV	2	447	30.5	46	37.3
HBV	3	527	36	63	43.9
HBV	4	646	55	45	53.8
HBV	5	520	38.5	48	43.3
HBV	6	639	59	54	53.3
HBV	7	654	55	34	54.5
HBV	8	659	61	54	54.9
HBV	9	667	56.5	50	55.6
HBV	10	712	54	43	59.4
HBV	11	667	55	53	55.6
HBV	12	600	48.5	33	50.0
HBV	13	817	72	56	68.1
HBV	14	760	60	54	63.4
HBV	15	526	46	36	43.8
HBV	16	586	50	37	48.8
HBV	17	476	38.5	38	39.7
HBV	18	796	73	52	66.3
HBV	19	635	50.5	49	52.9
HBV	20	704	56	30	58.7
HBV	21	600	43	61	50.0
HBV	22	643	50.5	43	53.6
HBV	23	661	49.5	56	55.1
HBV	24	592	55.5	59	49.3
HBV	25	573	52	53	47.7
HBV	26	541	44.5	37	45.1
HBV	27	683	59.5	41	56.9
HBV	28	503	40.5	53	41.9
HBV	29	532	40	51	44.3
HBV	30	461	35	43	38.4
HBV	31	640	53.5	40	53.3
HBV	32	554	41.5	58	46.2
HBV	33	574	47.5	32	47.8
HBV	34	468	32	38	39.0
HBV	35	504	41.5	26	42.0
HBV	36	610	48.5	38	50.8
HBV	37	591	47	36	49.3
HBV	38	656	50.5	49	54.7
HBV	39	317	26.5	53	26.4
HBV	40	359	30	46	29.9
HBV	41	465	37.5	36	38.8
HBV	42	423	38	38	35.3
HBV	43	396	35	25	33.0
HBV	44	541	43.5	25	45.1
HBV	45	534	46.5	45	44.5
HC	1	1150	86.5	98	95.8
HC	2	1059	84	55	88.3
HC	3	967	80	42	80.6
HC	4	1432	118.5	96	119.3
HC	5	1512	127	43	126.0
HC	6	1487	124.5	74	123.9
HC	7	1521	131	78	126.8
HC	8	1502	120	34	125.2
HC	9	1394	115	61	116.2
HC	10	1508	131	63	125.7
HC	11	1446	119	53	120.5
HC	12	1130	97	69	94.2
HC	13	1064	86.5	51	88.7
HC	14	1262	101.5	34	105.2
HC	15	1548	131	31	129.0
HC	16	1151	90	44	95.9
HC	17	1383	125	69	115.3
HC	18	1327	116	59	110.6
HC	19	1242	106	103	103.5
HC	20	1178	92.5	47	98.2
HC	21	1249	101.5	40	104.1
HC	22	1181	103	34	98.4
HC	23	1179	98	1	98.3
HC	24	1064	92.5	66	88.7
HC	25	1193	100.5	45	99.4
HC	26	1046	82	39	87.2
HC	27	1061	88	24	88.5
HC	28	1014	82.5	73	84.5
HC	29	1317	109	69	109.8
HC	30	1165	94.5	35	97.1
HC	31	1061	91	37	88.4
HC	32	1168	100.5	36	97.3
HC	33	1011	80	49	84.3
HC	34	1022	85	69	85.2
HC	35	1044	85.5	54	87.0
HC	36	908	77	25	75.7
HC	37	815	68	30	67.9
HC	38	950	89	53	79.1
HC	39	968	76	59	80.6
HC	40	979	82	21	81.6
HC	41	1021	81	58	85.1
HC	42	952	79.5	35	79.3
HC	43	845	69.5	41	70.4
HC	44	1248	110	35	104.0
HC	45	859	57.5	118	71.6
Reef	1	240	18	24	20.0
Reef	2	880	82.5	97	73.3
Reef	3	447	33	66	37.3
Reef	4	789	74.5	63	65.8
Reef	5	661	50.5	61	55.1
Reef	6	516	41.5	86	43.0
Reef	7	447	32.5	55	37.3
Reef	8	394	37	61	32.8
Reef	9	303	30	41	25.3
Reef	10	307	29	53	25.5
Reef	11	302	23.5	44	25.2
Reef	12	191	16.5	31	15.9
Reef	13	275	24.5	53	22.9
Reef	14	188	13	33	15.6
Reef	15	280	23.5	32	23.3
Reef	16	199	12	34	16.6
Reef	17	124	4.5	22	10.3
Reef	18	78	4.5	14	6.5
Reef	19	122	4.5	26	10.2

Site	Series	Total	Median	Range	Mean
Reef	20	108	6.5	19	9.0
Reef	21	64	2.5	15	5.3
Reef	22	121	6.5	24	10.1
Reef	23	63	3	13	5.3
Reef	24	73	1.5	14	6.1
Reef	25	28	0	5	2.3
Reef	26	59	1	14	4.9
Reef	27	35	0.5	10	2.9
Reef	28	51	0	13	4.3
Reef	29	51	2	11	4.3
Reef	30	40	1	9	3.3
Reef	31	3	0	1	0.3
Reef	32	14	1	2	1.2
Reef	33	3	0	1	0.3
Reef	34	11	1	2	0.9
Reef	35	7	0	2	0.6
Reef	36	8	0.5	1	0.7
Reef	37	2	0	1	0.2
Reef	38	6	0	2	0.5
Reef	39	7	0	2	0.6
Reef	40	10	0	3	0.8
Reef	41	4	0	1	0.4
Reef	42	16	1	4	1.3
Reef	43	11	0	3	0.9
Reef	44	42	2.5	5	3.5
Reef	45	16	1	3	1.3
ShB	1	223	18.5	34	18.6
ShB	2	237	22	34	19.8
ShB	3	237	12	14	19.8
ShB	4	448	31.5	38	37.3
ShB	5	415	36	31	34.5
ShB	6	408	30	30	34.0
ShB	7	282	25.5	27	23.5
ShB	8	280	21.5	19	23.3
ShB	9	247	13.5	35	20.6
ShB	10	418	31	31	34.8
ShB	11	389	21	43	32.4
ShB	12	482	39	58	40.2
ShB	13	171	16	16	14.3
ShB	14	107	9.5	16	8.9
ShB	15	245	15.5	38	20.4
ShB	16	327	24.5	47	27.3
ShB	17	256	17	47	21.3
ShB	18	234	20	31	19.5
ShB	19	99	4.5	20	8.3
ShB	20	218	10	41	18.2
ShB	21	121	8	22	10.1
ShB	22	92	2	22	7.6
ShB	23	62	4	12	5.2
ShB	24	224	4	58	18.6
ShB	25	99	1	9	8.3
ShB	26	105	2	27	8.8
ShB	27	175	3.5	57	14.6
ShB	28	34	1	8	2.8
ShB	29	21	0	6	1.8

Site	Series	Total	Median	Range	Mean
ShB	30	60	2	10	5.0
ShB	31	65	3.5	12	5.4
ShB	32	66	2	22	5.5
ShB	33	20	1	5	1.7
ShB	34	137	3	10	11.4
ShB	35	30	1	3	2.5
ShB	36	56	1	7	4.6
ShB	37	143	1	41	11.9
ShB	38	20	1	5	1.7
ShB	39	96	4	18	8.0
ShB	40	25	0.5	6	2.1
ShB	41	10	0	3	0.8
ShB	42	58	1	16	4.8
ShB	43	34	0	6	2.8
ShB	44	68	0.5	10	5.7
ShB	45	34	0.5	3	2.8
Whau	1	703	54.5	74	58.6
Whau	2	811	55.5	74	67.6
Whau	3	1616	136	123	134.7
Whau	4	435	28.5	49	36.3
Whau	5	1110	94.5	75	92.5
Whau	6	1124	94	98	93.7
Whau	7	993	93	87	82.8
Whau	8	717	62.5	29	59.8
Whau	9	982	81.5	74	81.8
Whau	10	858	71.5	39	71.5
Whau	11	542	45	34	45.2
Whau	12	671	58	32	55.9
Whau	13	551	47.5	27	45.9
Whau	14	385	34	41	32.1
Whau	15	786	74	75	65.5
Whau	16	558	49.5	42	46.5
Whau	17	910	76	77	75.8
Whau	18	819	69.5	57	68.3
Whau	19	837	75.5	63	69.8
Whau	20	716	58.5	53	59.7
Whau	21	177	13	20	14.8
Whau	22	397	24	64	33.1
Whau	23	286	14	61	23.8
Whau	24	231	23	43	19.3
Whau	25	190	9	35	15.8
Whau	26	216	10.5	41	18.0
Whau	27	206	10	34	17.2
Whau	28	296	12.5	43	24.7
Whau	29	339	14	62	28.3
Whau	30	444	25	78	37.0
Whau	31	337	21	67	28.1
Whau	32	286	13	68	23.8
Whau	33	317	15.5	65	26.4
Whau	34	314	7.5	78	26.2
Whau	35	442	31.5	74	36.8
Whau	36	274	19.5	50	22.8
Whau	37	326	38	48	27.2
Whau	38	241	13	44	20.1
Whau	39	487	45.5	89	40.6

Site	Series	Total	Median	Range	Mean
Whau	40	313	19	58	26.1
Whau	41	345	17	56	28.8
Whau	42	434	34.5	65	36.2
Whau	43	246	20.5	38	20.5
Whau	44	407	20.5	88	33.9
Whau	45	381	21	73	31.8

Species: *Paphies australis*

Site	Series	Total	Median	Range	Mean
HBV	1	48	4	8	4.0
HBV	2	39	1.5	9	3.3
HBV	3	46	3.5	7	3.8
HBV	4	85	5.5	16	7.1
HBV	5	37	4.5	5	3.1
HBV	6	77	4	12	6.4
HBV	7	38	2.5	5	3.2
HBV	8	43	2	8	3.6
HBV	9	57	0.5	22	4.8
HBV	10	60	2	18	5.0
HBV	11	31	1	8	2.6
HBV	12	48	3.5	7	4.0
HBV	13	23	1.5	5	1.9
HBV	14	62	2	7	5.2
HBV	15	89	4	20	7.4
HBV	16	65	4	13	5.4
HBV	17	21	1.5	3	1.8
HBV	18	39	2	9	3.3
HBV	19	54	3	7	4.5
HBV	20	57	1	17	4.8
HBV	21	12	0.5	3	1.0
HBV	22	38	3	6	3.2
HBV	23	26	1	4	2.2
HBV	24	49	1.5	11	4.1
HBV	25	56	3	10	4.6
HBV	26	70	3	8	5.8
HBV	27	66	3.5	12	5.5
HBV	28	41	2	9	3.4
HBV	29	75	3	12	6.3
HBV	30	43	1.5	10	3.6
HBV	31	45	1	11	3.8
HBV	32	38	1	3	3.2
HBV	33	16	0	3	1.3
HBV	34	38	0	12	3.2
HBV	35	15	0	3	1.3
HBV	36	16	1	3	1.3
HBV	37	43	0.5	8	3.6
HBV	38	32	0	1	2.7
HBV	39	36	0	1	3.0
HBV	40	24	0.5	6	2.0
HBV	41	43	0	11	3.6
HBV	42	37	1	4	3.1
HBV	43	20	1.5	3	1.7
HBV	44	46	0	4	3.8
HBV	45	62	0	19	5.2
HC	1	0	0	0	0.0
HC	2	0	0	0	0.0
HC	3	0	0	0	0.0
HC	4	0	0	0	0.0
HC	5	0	0	0	0.0
HC	6	1	0	0	0.1
HC	7	0	0	0	0.0
HC	8	0	0	0	0.0
HC	9	0	0	0	0.0
HC	10	0	0	0	0.0
HC	11	0	0	0	0.0
HC	12	0	0	0	0.0
HC	13	0	0	0	0.0
HC	14	0	0	0	0.0
HC	15	0	0	0	0.0
HC	16	0	0	0	0.0
HC	17	1	0	0	0.1
HC	18	0	0	0	0.0
HC	19	0	0	0	0.0
HC	20	0	0	0	0.0
HC	21	0	0	0	0.0
HC	22	0	0	0	0.0
HC	23	0	0	0	0.0
HC	24	0	0	0	0.0
HC	25	0	0	0	0.0
HC	26	0	0	0	0.0
HC	27	0	0	0	0.0
HC	28	3	0	1	0.3
HC	29	0	0	0	0.0
HC	30	3	0	1	0.3
HC	31	0	0	0	0.0
HC	32	0	0	0	0.0
HC	33	0	0	0	0.0
HC	34	0	0	0	0.0
HC	35	0	0	0	0.0
HC	36	0	0	0	0.0
HC	37	0	0	0	0.0
HC	38	0	0	0	0.0
HC	39	0	0	0	0.0
HC	40	0	0	0	0.0
HC	41	0	0	0	0.0
HC	42	6	0	2	0.5
HC	43	0	0	0	0.0
HC	44	1	0	0	0.1
HC	45	0	0	0	0.0
Reef	1	0	0	0	0.0
Reef	2	0	0	0	0.0
Reef	3	0	0	0	0.0
Reef	4	0	0	0	0.0
Reef	5	1	0	0	0.1
Reef	6	1	0	0	0.1
Reef	7	3	0	1	0.3
Reef	8	0	0	0	0.0
Reef	9	0	0	0	0.0
Reef	10	0	0	0	0.0
Reef	11	0	0	0	0.0
Reef	12	2	0	1	0.2
Reef	13	1	0	0	0.1
Reef	14	0	0	0	0.0
Reef	15	0	0	0	0.0
Reef	16	0	0	0	0.0
Reef	17	0	0	0	0.0
Reef	18	0	0	0	0.0
Reef	19	0	0	0	0.0

Site	Series	Total	Median	Range	Mean	Site	Series	Total	Median	Range	Mean
Reef	20	0	0	0	0.0	ShB	30	1	0	0	0.1
Reef	21	0	0	0	0.0	ShB	31	1	0	0	0.1
Reef	22	0	0	0	0.0	ShB	32	1	0	0	0.1
Reef	23	0	0	0	0.0	ShB	33	6	0	1	0.5
Reef	24	5	0	2	0.4	ShB	34	1	0	0	0.1
Reef	25	0	0	0	0.0	ShB	35	0	0	0	0.0
Reef	26	0	0	0	0.0	ShB	36	0	0	0	0.0
Reef	27	0	0	0	0.0	ShB	37	0	0	0	0.0
Reef	28	31	2	4	2.6	ShB	38	0	0	0	0.0
Reef	29	0	0	0	0.0	ShB	39	0	0	0	0.0
Reef	30	0	0	0	0.0	ShB	40	0	0	0	0.0
Reef	31	0	0	0	0.0	ShB	41	0	0	0	0.0
Reef	32	2	0	1	0.2	ShB	42	1	0	0	0.1
Reef	33	3	0	1	0.3	ShB	43	0	0	0	0.0
Reef	34	0	0	0	0.0	ShB	44	1	0	0	0.1
Reef	35	0	0	0	0.0	ShB	45	0	0	0	0.0
Reef	36	0	0	0	0.0	Whau	1	0	0	0	0.0
Reef	37	0	0	0	0.0	Whau	2	0	0	0	0.0
Reef	38	0	0	0	0.0	Whau	3	0	0	0	0.0
Reef	39	0	0	0	0.0	Whau	4	3	0	1	0.3
Reef	40	0	0	0	0.0	Whau	5	0	0	0	0.0
Reef	41	0	0	0	0.0	Whau	6	0	0	0	0.0
Reef	42	0	0	0	0.0	Whau	7	0	0	0	0.0
Reef	43	0	0	0	0.0	Whau	8	23	1.5	3	1.9
Reef	44	0	0	0	0.0	Whau	9	0	0	0	0.0
Reef	45	0	0	0	0.0	Whau	10	0	0	0	0.0
ShB	1	0	0	0	0.0	Whau	11	0	0	0	0.0
ShB	2	0	0	0	0.0	Whau	12	0	0	0	0.0
ShB	3	0	0	0	0.0	Whau	13	0	0	0	0.0
ShB	4	0	0	0	0.0	Whau	14	0	0	0	0.0
ShB	5	1	0	0	0.1	Whau	15	0	0	0	0.0
ShB	6	1	0	0	0.1	Whau	16	0	0	0	0.0
ShB	7	2	0	1	0.2	Whau	17	0	0	0	0.0
ShB	8	1	0	0	0.1	Whau	18	0	0	0	0.0
ShB	9	0	0	0	0.0	Whau	19	1	0	0	0.1
ShB	10	0	0	0	0.0	Whau	20	0	0	0	0.0
ShB	11	0	0	0	0.0	Whau	21	0	0	0	0.0
ShB	12	2	0	0	0.2	Whau	22	0	0	0	0.0
ShB	13	3	0	1	0.3	Whau	23	0	0	0	0.0
ShB	14	0	0	0	0.0	Whau	24	0	0	0	0.0
ShB	15	0	0	0	0.0	Whau	25	2	0	1	0.2
ShB	16	1	0	0	0.1	Whau	26	0	0	0	0.0
ShB	17	7	0	1	0.6	Whau	27	0	0	0	0.0
ShB	18	0	0	0	0.0	Whau	28	0	0	0	0.0
ShB	19	2	0	1	0.2	Whau	29	0	0	0	0.0
ShB	20	2	0	1	0.2	Whau	30	5	0	1	0.4
ShB	21	0	0	0	0.0	Whau	31	4	0	1	0.3
ShB	22	0	0	0	0.0	Whau	32	0	0	0	0.0
ShB	23	7	0	0	0.6	Whau	33	0	0	0	0.0
ShB	24	1	0	0	0.1	Whau	34	4	0	1	0.3
ShB	25	1	0	0	0.1	Whau	35	0	0	0	0.0
ShB	26	0	0	0	0.0	Whau	36	0	0	0	0.0
ShB	27	1	0	0	0.1	Whau	37	0	0	0	0.0
ShB	28	5	0	1	0.4	Whau	38	0	0	0	0.0
ShB	29	0	0	0	0.0	Whau	39	1	0	0	0.1

Site	Series	Total	Median	Range	Mean
Whau	40	1	0	0	0.1
Whau	41	0	0	0	0.0
Whau	42	0	0	0	0.0
Whau	43	1	0	0	0.1
Whau	44	0	0	0	0.0
Whau	45	0	0	0	0.0

Species: ***Prionospio aucklandica***

Site	Series	Total	Median	Range	Mean
HBV	1	46	3	9	3.8
HBV	2	53	2.5	9	4.4
HBV	3	111	8	11	9.3
HBV	4	140	11.5	17	11.7
HBV	5	104	7.5	16	8.7
HBV	6	112	6.5	24	9.3
HBV	7	108	7	15	9.0
HBV	8	71	5	7	5.9
HBV	9	86	7.5	12	7.2
HBV	10	94	7	9	7.8
HBV	11	72	6	8	6.0
HBV	12	66	4.5	8	5.5
HBV	13	75	5.5	9	6.3
HBV	14	76	6	10	6.4
HBV	15	64	5	10	5.3
HBV	16	61	4.5	6	5.1
HBV	17	39	2.5	5	3.3
HBV	18	59	5	6	4.9
HBV	19	42	3	7	3.5
HBV	20	51	3.5	5	4.3
HBV	21	48	2.5	10	4.0
HBV	22	48	4.5	5	4.0
HBV	23	35	2.5	5	2.9
HBV	24	34	1.5	6	2.8
HBV	25	41	4	7	3.5
HBV	26	40	3	5	3.3
HBV	27	42	2.5	7	3.5
HBV	28	43	3	5	3.6
HBV	29	41	2	6	3.4
HBV	30	29	2	3	2.4
HBV	31	32	2.5	3	2.7
HBV	32	16	1	3	1.3
HBV	33	35	3.5	5	2.9
HBV	34	34	2.5	4	2.8
HBV	35	27	2	2	2.3
HBV	36	27	2	5	2.3
HBV	37	34	2.5	4	2.8
HBV	38	27	1.5	4	2.3
HBV	39	15	1	3	1.3
HBV	40	40	3	8	3.3
HBV	41	34	2	7	2.8
HBV	42	20	2	3	1.7
HBV	43	31	2	5	2.6
HBV	44	62	5.5	8	5.2
HBV	45	118	8	12	9.8
HC	1	64	4.5	10	5.3
HC	2	36	1.5	7	3.0
HC	3	71	5.5	12	5.9
HC	4	111	7	8	9.3
HC	5	69	5.5	7	5.8
HC	6	142	9.5	22	11.8
HC	7	74	4	12	6.2
HC	8	45	3	5	3.8
HC	9	72	4.5	12	6.0
HC	10	36	1.5	9	3.0
HC	11	53	4	9	4.4
HC	12	47	4	6	3.9
HC	13	41	2	5	3.4
HC	14	49	4.5	4	4.1
HC	15	45	4	7	3.8
HC	16	36	2.5	5	3.0
HC	17	20	1.5	3	1.7
HC	18	40	3	6	3.3
HC	19	34	3.5	3	2.8
HC	20	37	3	4	3.1
HC	21	22	1	5	1.8
HC	22	37	4	4	3.1
HC	23	27	1.5	5	2.3
HC	24	30	2	4	2.5
HC	25	10	1	2	0.8
HC	26	14	1	3	1.2
HC	27	8	0	2	0.6
HC	28	14	1	3	1.2
HC	29	8	1	1	0.7
HC	30	10	0.5	2	0.8
HC	31	14	1	3	1.2
HC	32	9	0	2	0.8
HC	33	17	2	3	1.4
HC	34	21	1.5	4	1.8
HC	35	19	1	3	1.6
HC	36	5	0	1	0.4
HC	37	7	0	2	0.6
HC	38	4	0	1	0.3
HC	39	15	1	3	1.3
HC	40	15	1	3	1.3
HC	41	15	0.5	4	1.3
HC	42	28	2	5	2.3
HC	43	26	2	5	2.2
HC	44	44	3.5	5	3.7
HC	45	68	5	8	5.7
Reef	1	7	0.5	1	0.6
Reef	2	17	1	3	1.4
Reef	3	25	2	4	2.1
Reef	4	28	2	5	2.3
Reef	5	19	1	3	1.6
Reef	6	30	3	6	2.5
Reef	7	31	3	3	2.6
Reef	8	17	1	5	1.4
Reef	9	31	3	3	2.6
Reef	10	10	1	2	0.8
Reef	11	24	2	4	2.0
Reef	12	9	1	2	0.8
Reef	13	22	2	3	1.8
Reef	14	8	0	2	0.6
Reef	15	23	1	6	1.9
Reef	16	22	1	5	1.8
Reef	17	19	2	3	1.6
Reef	18	0	0	0	0.0
Reef	19	17	1	2	1.4

Site	Series	Total	Median	Range	Mean
Reef	20	67	5	9	5.6
Reef	21	76	7.5	6	6.3
Reef	22	71	4.5	12	5.9
Reef	23	78	6	9	6.5
Reef	24	64	4.5	9	5.3
Reef	25	39	2.5	5	3.3
Reef	26	39	3	5	3.3
Reef	27	11	0.5	2	0.9
Reef	28	53	4	7	4.4
Reef	29	18	1	3	1.5
Reef	30	32	2.5	4	2.7
Reef	31	44	3	4	3.6
Reef	32	24	2	2	2.0
Reef	33	33	3	3	2.8
Reef	34	55	4	6	4.6
Reef	35	36	3	5	3.0
Reef	36	33	2.5	3	2.8
Reef	37	20	1	2	1.7
Reef	38	27	2	3	2.3
Reef	39	9	1	2	0.8
Reef	40	34	3	3	2.8
Reef	41	33	3	5	2.7
Reef	42	20	1.5	4	1.7
Reef	43	39	2	4	3.3
Reef	44	190	10.5	19	15.8
Reef	45	101	9.5	11	8.4
ShB	1	4	0	1	0.3
ShB	2	5	0	1	0.4
ShB	3	10	0	3	0.8
ShB	4	21	0	6	1.8
ShB	5	8	0	1	0.6
ShB	6	11	0	2	0.9
ShB	7	9	0	3	0.8
ShB	8	6	0	1	0.5
ShB	9	24	1	4	2.0
ShB	10	20	1	3	1.7
ShB	11	27	2	3	2.3
ShB	12	34	1	7	2.8
ShB	13	7	0	2	0.6
ShB	14	6	0	2	0.5
ShB	15	4	0	1	0.3
ShB	16	22	1.5	4	1.8
ShB	17	29	2	4	2.4
ShB	18	29	2	5	2.4
ShB	19	26	1	6	2.2
ShB	20	27	0.5	6	2.3
ShB	21	32	2	5	2.7
ShB	22	29	3	5	2.5
ShB	23	81	4.5	15	6.8
ShB	24	57	3	13	4.7
ShB	25	16	1	4	1.3
ShB	26	27	1.5	5	2.3
ShB	27	15	1	3	1.3
ShB	28	40	2	6	3.3
ShB	29	31	2.5	5	2.6

Site	Series	Total	Median	Range	Mean
ShB	30	29	1	5	2.4
ShB	31	55	3	12	4.6
ShB	32	11	0	3	0.9
ShB	33	18	1.5	3	1.5
ShB	34	54	2.5	10	4.5
ShB	35	24	0	4	2.0
ShB	36	20	1	5	1.6
ShB	37	18	1	4	1.5
ShB	38	36	1	9	3.0
ShB	39	5	0	1	0.4
ShB	40	16	1	3	1.3
ShB	41	58	3	14	4.8
ShB	42	18	1.5	4	1.5
ShB	43	29	1	6	2.4
ShB	44	43	3.5	5	3.6
ShB	45	49	2	5	4.1
Whau	1	46	2	7	3.8
Whau	2	41	3	7	3.4
Whau	3	39	3	7	3.3
Whau	4	77	6	7	6.4
Whau	5	60	5	8	5.0
Whau	6	35	3	4	2.9
Whau	7	42	2.5	7	3.5
Whau	8	16	1	3	1.3
Whau	9	54	4	9	4.5
Whau	10	19	1	3	1.6
Whau	11	20	0.5	6	1.7
Whau	12	25	1	6	2.1
Whau	13	10	0.5	2	0.8
Whau	14	12	0	4	1.0
Whau	15	19	1	3	1.6
Whau	16	15	1	2	1.3
Whau	17	11	1	2	0.9
Whau	18	19	1	4	1.6
Whau	19	8	0	2	0.7
Whau	20	19	1.5	4	1.6
Whau	21	0	0	0	0.0
Whau	22	6	0	2	0.5
Whau	23	1	0	0	0.1
Whau	24	5	0	1	0.4
Whau	25	4	0	1	0.3
Whau	26	3	0	1	0.3
Whau	27	0	0	0	0.0
Whau	28	17	1	3	1.4
Whau	29	6	0	1	0.5
Whau	30	8	0	2	0.7
Whau	31	4	0	1	0.3
Whau	32	4	0	1	0.3
Whau	33	6	0	2	0.5
Whau	34	8	0.5	2	0.7
Whau	35	16	1	4	1.3
Whau	36	1	0	0	0.1
Whau	37	3	0	1	0.3
Whau	38	5	0	1	0.4
Whau	39	0	0	0	0.0

Site	Series	Total	Median	Range	Mean
Whau	40	11	0	3	0.9
Whau	41	11	1	2	0.9
Whau	42	6	0	2	0.5
Whau	43	9	0	1	0.8
Whau	44	5	0	1	0.4
Whau	45	9	1	2	0.8

Species: *Zeacumantus lutulentus*

Site	Series	Total	Median	Range	Mean
HBV	1	2	0	0	0.2
HBV	2	1	0	0	0.1
HBV	3	0	0	0	0.0
HBV	4	0	0	0	0.0
HBV	5	0	0	0	0.0
HBV	6	0	0	0	0.0
HBV	7	0	0	0	0.0
HBV	8	0	0	0	0.0
HBV	9	1	0	0	0.1
HBV	10	0	0	0	0.0
HBV	11	0	0	0	0.0
HBV	12	0	0	0	0.0
HBV	13	0	0	0	0.0
HBV	14	3	0	1	0.3
HBV	15	0	0	0	0.0
HBV	16	2	0	1	0.2
HBV	17	7	0.5	1	0.6
HBV	18	1	0	0	0.1
HBV	19	4	0	2	0.3
HBV	20	3	0	1	0.3
HBV	21	5	0	1	0.4
HBV	22	1	0	0	0.1
HBV	23	0	0	0	0.0
HBV	24	11	0.5	3	0.9
HBV	25	12	0	3	1.0
HBV	26	7	0	2	0.6
HBV	27	16	1	5	1.3
HBV	28	19	1	3	1.6
HBV	29	10	1	2	0.8
HBV	30	18	2	2	1.5
HBV	31	20	1	4	1.7
HBV	32	0	0	0	0.0
HBV	33	22	0.5	5	1.8
HBV	34	22	2	4	1.8
HBV	35	14	1	2	1.2
HBV	36	22	1.5	2	1.8
HBV	37	16	1	4	1.3
HBV	38	22	1.5	4	1.8
HBV	39	29	1.5	7	2.4
HBV	40	19	1	3	1.6
HBV	41	15	1	3	1.3
HBV	42	23	2	4	1.9
HBV	43	18	1	5	1.5
HBV	44	4	0	1	0.3
HBV	45	25	1.5	6	2.1
HC	1	0	0	0	0.0
HC	2	1	0	0	0.1
HC	3	0	0	0	0.0
HC	4	1	0	0	0.1
HC	5	1	0	0	0.1
HC	6	1	0	0	0.1
HC	7	1	0	0	0.1
HC	8	0	0	0	0.0
HC	9	0	0	0	0.0
HC	10	3	0	1	0.3
HC	11	0	0	0	0.0
HC	12	2	0	0	0.2
HC	13	0	0	0	0.0
HC	14	0	0	0	0.0
HC	15	12	1	2	1.0
HC	16	5	0	1	0.4
HC	17	13	1	2	1.1
HC	18	14	1	2	1.2
HC	19	6	0	1	0.5
HC	20	9	0	2	0.8
HC	21	27	1.5	5	2.3
HC	22	16	1.5	3	1.3
HC	23	36	2.5	6	3.0
HC	24	39	3	7	3.3
HC	25	21	1.5	3	1.8
HC	26	29	2	4	2.5
HC	27	28	2	4	2.4
HC	28	30	1	5	2.5
HC	29	52	4	5	4.3
HC	30	41	2	7	3.4
HC	31	55	3.5	7	4.6
HC	32	0	0	0	0.0
HC	33	65	5	6	5.4
HC	34	21	1.5	4	1.8
HC	35	69	5	13	5.8
HC	36	32	2	6	2.7
HC	37	7	0.5	1	0.6
HC	38	5	0	1	0.4
HC	39	8	1	1	0.6
HC	40	8	0	2	0.7
HC	41	7	0	2	0.6
HC	42	1	0	0	0.1
HC	43	11	0	3	0.9
HC	44	16	1	3	1.3
HC	45	13	0	3	1.1
Reef	1	25	2	3	2.1
Reef	2	8	0	2	0.7
Reef	3	31	2	4	2.6
Reef	4	11	0	2	0.9
Reef	5	0	0	0	0.0
Reef	6	2	0	1	0.2
Reef	7	0	0	0	0.0
Reef	8	2	0	1	0.2
Reef	9	2	0	1	0.2
Reef	10	3	0	1	0.3
Reef	11	4	0	1	0.3
Reef	12	0	0	0	0.0
Reef	13	0	0	0	0.0
Reef	14	8	0	2	0.6
Reef	15	15	1	3	1.3
Reef	16	10	1	1	0.8
Reef	17	17	1	4	1.4
Reef	18	7	0	2	0.6
Reef	19	11	1	2	0.9

Site	Series	Total	Median	Range	Mean	Site	Series	Total	Median	Range	Mean
Reef	20	14	0.5	3	1.2	ShB	30	1	0	0	0.1
Reef	21	18	1	4	1.5	ShB	31	2	0	1	0.2
Reef	22	4	0	1	0.3	ShB	32	0	0	0	0.0
Reef	23	21	2	3	1.8	ShB	33	0	0	0	0.0
Reef	24	14	1	4	1.2	ShB	34	0	0	0	0.0
Reef	25	11	0.5	2	0.9	ShB	35	3	0	1	0.3
Reef	26	18	1	3	1.5	ShB	36	1	0	0	0.1
Reef	27	27	2	3	2.3	ShB	37	0	0	0	0.0
Reef	28	21	0.5	4	1.8	ShB	38	0	0	0	0.0
Reef	29	39	3.5	4	3.3	ShB	39	2	0	0	0.2
Reef	30	42	3	7	3.5	ShB	40	0	0	0	0.0
Reef	31	31	2	4	2.5	ShB	41	1	0	0	0.1
Reef	32	2	0	1	0.2	ShB	42	2	0	1	0.2
Reef	33	0	0	0	0.0	ShB	43	5	0	1	0.4
Reef	34	34	2.5	6	2.8	ShB	44	0	0	0	0.0
Reef	35	11	0.5	3	0.9	ShB	45	0	0	0	0.0
Reef	36	17	1.5	3	1.4	Whau	1	1	0	0	0.1
Reef	37	30	2	3	2.5	Whau	2	9	0.5	1	0.8
Reef	38	22	2	4	1.8	Whau	3	1	0	0	0.1
Reef	39	27	2.5	3	2.3	Whau	4	14	1	2	1.1
Reef	40	19	1	4	1.6	Whau	5	0	0	0	0.0
Reef	41	43	2	8	3.5	Whau	6	1	0	0	0.1
Reef	42	30	2	6	2.5	Whau	7	3	0	1	0.3
Reef	43	14	0	4	1.2	Whau	8	1	0	0	0.1
Reef	44	21	1	3	1.8	Whau	9	4	0	1	0.3
Reef	45	5	0	1	0.4	Whau	10	0	0	0	0.0
ShB	1	0	0	0	0.0	Whau	11	0	0	0	0.0
ShB	2	0	0	0	0.0	Whau	12	0	0	0	0.0
ShB	3	0	0	0	0.0	Whau	13	0	0	0	0.0
ShB	4	0	0	0	0.0	Whau	14	0	0	0	0.0
ShB	5	0	0	0	0.0	Whau	15	4	0	1	0.3
ShB	6	0	0	0	0.0	Whau	16	1	0	0	0.1
ShB	7	0	0	0	0.0	Whau	17	0	0	0	0.0
ShB	8	0	0	0	0.0	Whau	18	0	0	0	0.0
ShB	9	0	0	0	0.0	Whau	19	3	0	1	0.3
ShB	10	0	0	0	0.0	Whau	20	2	0	1	0.2
ShB	11	0	0	0	0.0	Whau	21	5	0	1	0.4
ShB	12	0	0	0	0.0	Whau	22	0	0	0	0.0
ShB	13	0	0	0	0.0	Whau	23	2	0	1	0.2
ShB	14	0	0	0	0.0	Whau	24	8	0	3	0.7
ShB	15	0	0	0	0.0	Whau	25	7	0	1	0.6
ShB	16	0	0	0	0.0	Whau	26	7	0	2	0.6
ShB	17	0	0	0	0.0	Whau	27	5	0	2	0.4
ShB	18	0	0	0	0.0	Whau	28	9	1	2	0.8
ShB	19	0	0	0	0.0	Whau	29	5	0	1	0.4
ShB	20	0	0	0	0.0	Whau	30	0	0	0	0.0
ShB	21	0	0	0	0.0	Whau	31	8	0.5	2	0.7
ShB	22	0	0	0	0.0	Whau	32	7	1	1	0.6
ShB	23	1	0	0	0.1	Whau	33	6	0.5	1	0.5
ShB	24	3	0	1	0.3	Whau	34	14	1	2	1.2
ShB	25	1	0	0	0.1	Whau	35	4	0	1	0.3
ShB	26	0	0	0	0.0	Whau	36	12	1	2	1.0
ShB	27	1	0	0	0.1	Whau	37	12	1	2	1.0
ShB	28	2	0	0	0.2	Whau	38	12	1	3	1.0
ShB	29	0	0	0	0.0	Whau	39	11	1	3	0.9

Site	Series	Total	Median	Range	Mean
Whau	40	20	1.5	3	1.7
Whau	41	10	0.5	2	0.8
Whau	42	14	0	3	1.2
Whau	43	8	0.5	2	0.7
Whau	44	8	0	2	0.7
Whau	45	6	0	1	0.5