Fishery-independent by-catch survey to inform risk assessment of the Spencer Gulf Prawn Trawl Fishery

Report for PIRSA Fisheries

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August 2009

SARDI Publication No. F2009/000369-1
SARDI Research Report Series No. 390

This publication may be cited as:
Currie, D.R., Dixon, C.D., Roberts, S.D., Hooper, G.E., Sorokin, S.J. and Ward, T.M. (2009). Fishery-independent by-catch survey to inform risk assessment of the Spencer Gulf Prawn Trawl Fishery. Report to PIRSA Fisheries. South Australian Research and Development Institute (Aquatic Sciences), Adelaide.

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Printed in Adelaide: August 2009

SARDI Publication No. F2009/000369-1
SARDI Research Report Series No. 390
ISBN 978-1-921563-19-5

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Date: 28 August 2009
Distribution: PIRSA Fisheries; Spencer Gulf and West Coast Prawn Fisherman's Association; SARDI Aquatic Sciences Library; Spencer Gulf Prawn Fishery Licence Holders

Circulation: Public Domain

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EXECUTIVE SUMMARY

1. This study provides information to underpin a risk assessment of the vulnerability of by-catch species to prawn trawling in Spencer Gulf. To do this, a fishery-independent survey of Spencer Gulf was undertaken using commercial prawn trawlers. All species captured (including prawns) were identified to species level or putative taxa. Data were analysed to determine the correlations of environmental factors and historical fishing effort with spatial patterns in: 1) overall species richness, biomass and abundance; 2) community structure; 3) taxonomic groups, and; 4) common species.

2. Samples were collected from 120 sites between Point Lowly in the north and Thistle Island in the south. Site locations were selected to represent the range of habitats and depths (10-60 m) historically targeted by prawn trawlers. Some sites were located in areas that have been closed to trawling in recent years. Trawls of approximately 30-minutes duration were conducted at each site using the standard double-rig otter trawl used for commercial prawn fishing. One level bin (96 L) of homogenised catch was retained and frozen from a single trawl net at each sampling site.

3. During the last 20 years, prawns were harvested from 119 of the 125 reporting blocks for the Spencer Gulf Prawn Fishery. Historically trawled blocks were categorised by trawl intensity (hours trawling per km^2) for 5 year periods from 1988 to 2007. For the most recent period (2003-2007), there were 6, 27 and 86 fishing blocks in the high, medium and low trawl intensity categories, respectively. High intensity blocks comprised 2.7% of the historically trawled area and they contributed >40% of commercial catch and effort. Medium intensity blocks were 17.7% of the area and contributed >45% of commercial catch and effort. Low intensity blocks were 79.5% of the area and contributed <10% of commercial catch and effort. Of the 86 low intensity blocks, 15 (9.9% of area) were not trawled during 2003-07.

4. A total of 4.2 tonnes of catch samples belonging to 395 species was collected. The by-catch-to-prawn ratio was 2.0:1 in areas subjected to high trawling intensities and 3.2:1 and 8.7:1 in areas subject to moderate and low intensity trawling histories, respectively.

5. Total catch weight (biomass) was correlated with number of individuals (abundance). Both parameters were highest in the western gulf, where nutrient-rich water from the shelf flows inwards. In contrast, species richness was highest in the east where nutrient-depleted water flows out of the gulf.

6. Communities were similar at sites with different trawling histories. At a whole of gulf scale, putative trawl-related differences in community structure were small compared to those associated with latitude (north-south gradient). Four communities were identified: northern, mid-northern, central and southern.

7. Fish, prawns and crabs dominated the catch and together comprised 96% of the total abundance and 82% of the total biomass. These motile taxa also represented 38% of the total species richness. Degens leatherjacket, western king prawn and blue swimmer crab were the most common species encountered in the survey, individually occurring at more than 74% of sites and collectively accounting for 74% of the total abundance and 52% of the total biomass. In contrast, most other species were uncommon, with 74% occurring at fewer than 10% of sites. The abundances and biomasses of six of the 20 most common species (i.e. western king prawn, blue swimmer crab, rough leatherjacket, southern calamary, little scorpion fish and strawberry prawn) were significantly higher on moderate-to-heavily fished trawl grounds than grounds that have received low levels of trawling effort in recent years. In contrast, five of the 20 most common species (i.e. silverbelly, red mullet, silver whiting, doughboy scallop and bridled leatherjacket) had

significantly lower biomasses and abundances (red mullet only) on the most intensively trawled grounds.

8. The dominant species group, i.e. fish, explained most of the spatial patterns in community structure. However, a similar latitudinal gradient was observed in the invertebrates. Importantly, there was a significant correlation between the fish and invertebrate communities, with over 50% of the variation in the among-site relationships for fish explained by the among-site relationships in invertebrates. This suggests that these groups were strongly coupled, probably because sessile invertebrates (sponges) provide habitats for fishes. The importance of invertebrates on community structure suggests that the observed patterns may be temporally robust (i.e. independent of the timing of surveys).

9. The whole of gulf scale variations in community structure we observed did not appear to be related to trawl intensity. However, there were significantly lower biomasses of poriferans, bryozoans and fish in heavily trawled areas. These results correspond with previous studies which have shown that a) trawling can significantly reduce the abundance and biomass of poriferans and bryozoans, and b) that a reduction in these taxa can result in a reduction in the abundance and biomass of fish. Unfortunately, as there are no quantitative data on the benthic communites of Spencer Gulf prior to the commencement of prawn trawling, these hypotheses could not be formally tested. However, evidence such as the presence of several species of porifera in both the north and south of the gulf but an absence of these species in heavily trawled sites, suggest that prawn trawling is likely to have had detectable deleterious effects on the benthic faunal communities of Spencer Gulf.

10. Seven of the 395 species collected during the survey are listed under the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) as threatened, endangered or protected. All seven species belong to the Family Syngnathidae, which comprises seahorses, seadragons and pipefish. The total survey catch of 112 individuals included tiger pipefish (7), bigbelly seahorse (21), Macleays crested pipefish (1), brushtail pipefish (16), leafy seadragon (21), common seadragon (41) and spotted pipefish (5). The ecological consequences of prawn trawling for syngnathids are unknown. South Australian Museum records indicate that 11 other species of syngnathid have been recorded in Spencer Gulf but were not captured during this survey.

11. This study provides critical information on the spatial distribution of benthic organisms in Spencer Gulf and establishes a baseline for future assessments of the impacts of trawling. Future studies should account for structural differences among the four benthic communities identified in this study, and involve sampling areas that are both open and closed to commercial prawn trawling. Additional information that is needed to support future assessment includes: 1) seasonal patterns in the distribution of motile taxa and species composition of the catch; 2) species-specific changes in catch rates during commercial fishing (i.e. depletion studies); and 3) rates of post-trawl survival of species that are vulnerable to trawling, especially threatened, endangered and protected species.

1 INTRODUCTION

1.1 Impacts of trawling

Benthic communities are important functional components of estuarine ecosystems. Benthic organisms play a significant role in the diets of many seabirds and marine mammals and can profoundly influence the abundance and species composition of these tertiary consumers (Skagen and Oman, 1996; Bowen, 1997). Many benthic organisms also play an important role in the recycling of nutrients and the maintenance of water quality within estuarine systems (Harris, 1999; Peterson and Heck, 1999). Understanding factors that underpin community structure is important for the ecological sustainable management of estuaries.

Multiple biotic and abiotic factors affect the distribution of shallow-water benthic fauna and flora. Important physical influences include depth (Gray, 1981), sediment structure (Sundberg and Kennedy, 1993), salinity (Gaston and Nasci, 1988) and hydrology (Pearson and Rosenberg, 1987). Key biological factors include predation (Peterson, 1979), competition (Wilson, 1990) and recruitment (Olafsson *et al*., 1994). Estuarine benthic communities also respond to a range of human-induced impacts, including organic enrichment (Pearson and Rosenberg, 1987), chemical pollution (Warwick, 1988) and commercial fishing (Blaber *et al*., 2000). Few generalisations have emerged regarding the dominant processes structuring estuarine benthos, perhaps because structuring forces vary among estuaries.

Demersal trawling has significant impacts on estuarine benthic habitats and species (Andrew and Pepperell, 1992; Dayton *et al*., 1995; Jennings and Kaiser, 1998; Thrush and Dayton, 2002; Svane *et al.*, 2009). High mortality rates of by-catch species and significant modifications to community structure have been widely reported (Jennings and Kaiser, 1998; Tanner, 2003). Typically, trawling dislodges attached epifauna and flattens existing topographical features (Jennings and Kaiser 1998) which can disrupt sediment stratification, destroy burrows and other structures and reduce the number of ecological niches available (Sainsbury, 1988; Kaiser *et al*., 2000). Such changes can have cascade effects on ecosystem function (Pinnegar *et al*., 2000).

Increasing environmental awareness has focused attention on the need to assess the biological impacts of trawling (reviewed by Jennings and Kaiser, 1998; Thrush and Dayton, 2002). However, trawling impacts are difficult to assess because of the complexity of the biological communities and our limited understanding of their natural variability (Messieh *et al*., 1991). This problem is further complicated by the high costs associated with collecting, sorting and identifying benthic samples. Cost constraints have frequently necessitated compromises in the intensity, distribution, frequency and longevity of sampling programs. There are few long-term datasets with high levels of spatial and temporal replication on changes in community structure associated with trawling.

1.2 Spencer Gulf Prawn Fishery

Spencer Gulf is a shallow embayment <40 metres depth in northern areas and up to 60 metres depth in southern areas. Sediments are predominately sand and mud. Seagrass habitats are common at depths <10 metres, where trawling is prohibited. Due to the minimal freshwater inputs and high summer evaporation rates, Spencer Gulf is an inverse estuary, with salinity increasing towards the head of the gulf resulting in a mean annual salinity of ~45 ppt (Nunes & Lennon 1986; Nunes Vaz *et al.*, 1990).

The Spencer Gulf Prawn Fishery (SGPF) is managed by Primary Industries and Resources South Australia (PIRSA) under the framework provided by the *Fisheries Management Act 2007*. It is a limited entry fishery with 39 licensed operators. Fishers are entitled to harvest the target species western king prawn, *Melicertus latisulcatus*, and two by-product species:

southern calamary, *Sepioteuthis australis,* and Balmain bug, *Ibacus peronii*. Vessels are permitted to use double-rigged, demersal otter-trawls (Figure 1). Considerable technological advancements have been made in the fishery including the use of "crab bags" within the nets to exclude mega-fauna by-catch, and "hoppers" for efficient sorting and grading of prawns of and rapid return of by-catch. Trawling is not permitted during daylight hours. Gear restrictions include vessel size and power, type and number of trawl nets towed, maximum headline length and minimum mesh sizes. There are generally 6 fishing periods within each fishing year. Each fishing period lasts a maximum of 18 nights from the last to first quarters of the moon in November, December, March, April, May and June. Commercial trawl shots are generally less than 1 hour duration.

The SGPF produces approximately 2,000 t of western king prawns annually (Figure 2). Commercial prawn trawling in Spencer Gulf began in 1967 and large areas have been trawled at varying intensities (Carrick, 2003). Catches and trawling intensity increased dramatically over the first six years of the fishery. In 1973/74 more than 2,000 t of prawns were harvested with approximately 25,000 hrs of fishing effort (Figure 2). Since then, annual catches have remained relatively stable (~1,300-2,500 t). Fishing effort has declined from a peak of 45,786 hrs in 1978/79 to 18,438 hrs in 2007/08. The reduction in the number of hours trawled has occurred because the fleet works cooperatively to maximise economic returns and reduce costs. Pre-fishing surveys are conducted to identify areas that support high densities of large (high value) prawns. Fishing is formally confined to these areas through legislative notices signed by a delegate of the Minister for Fisheries. There are several areas of the Gulf that have not been fished for many years. These closure areas were determined by industry, and are identified on each legislative notice documented by Government.

Since 1999, the export of prawns from the Spencer Gulf has been controlled under the wildlife protection provisions of the *Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act* (DEH, 2004). To gain export status under the act (Part 13 and 13A), the South Australian Government must demonstrate that harvesting strategies for the fishery are ecologically sustainable. This includes demonstrating that impacts on the structure, productivity, function and biological diversity of the ecosystem are minimised. In 2004, the Commonwealth Government provided recommendations to enhance the ecologically sustainable fishing of prawns in the Spencer Gulf (DEH, 2004). These include recommendations to assess and mitigate ecological impacts on 1) by-catch species, 2) by-product species and 3) Threatened, Endangered and Protected species.

1.3 By-catch research

Several research projects have been conducted to obtain information on the ecological consequences of prawn trawling in Spencer Gulf. These studies have concentrated on documenting the magnitude and composition of non-target (by-catch) species captured incidentally during commercial fishing operations (Carrick, 1997), determining the fates and consequences of discarded by-catch (Svane, 2003, 2005; Svane *et al*., 2007, 2008) and impacts on benthic habitats and assemblages (Svane *et al.*, 2009). While these studies provide important information on by-catch, their focus on small areas of Spencer Gulf has limited their use for assessing trawling impacts at the scale of the fishery.

Few consistent patterns have emerged on the dominant components of the catch composition from prawn trawlers in Spencer Gulf, possibly as a result of spatial and temporal differences among surveys. Carrick (1997) reported that the by-catch composition in commercial trawls at 32 sites in the northern and central Spencer Gulf during February 1996 was dominated by small fin-fish which comprised 97% of the total by-catch by weight. In contrast, Svane *et al*. (2007) found that sessile benthos (i.e. sponges, bryozoans, bivalves) were the dominant by-catch group (by average weight) at five sites in the northern Spencer Gulf sampled during fishery independent surveys in October 2004 and January 2005. Svane *et al*. (2007) also

found relatively high proportions of sand trevally, blue crabs, sharks and rays in the by-catch. Few data are available to assess the diversity of organisms caught as by-catch in the Spencer Gulf Prawn Fishery. Carrick (1997) provides a list of 106 by-catch species that included fish, crustaceans or molluscs and motile invertebrates, but not sessile biota. Svane *et al*., (2007) reported by-catch in broad faunal categories (e.g. miscellaneous fish, benthos), which also limited assessment of by-catch biodiversity. While there are sound practical reasons for aggregating catch composition data into broad functional groups (e.g. field data can be acquired rapidly with limited taxonomic expertise), determining the identity and distributions of all captured species is necessary to evaluate ecological risk.

Many protected species including syngnathids (sea dragons, seahorses and pipefish), blue groper, marine turtles, white sharks, dolphins, seals and whales occur in Spencer Gulf, but levels of interaction with prawn trawlers are poorly understood. Some data on the capture rates of protected species have been recorded in commercial logbooks. However, few fishers have provided this information and the quality of data is unknown (Dixon *et al*., 2005). Reporting the capture of protected species became mandatory in 2008. There are two reports on the interactions of the Spencer Gulf Prawn Fishery with endangered, threatened or protected species. Carrick (1999) demonstrated that the capture of marine turtles in the fishery is extremely rare, while Svane (2005) showed that dolphins were significant consumers of prawn trawl by-catch during hauling.

Robust determination of the effects of trawling is complicated by financial and political issues in establishing appropriate experimental designs, e.g. including replicated control sites in untrawled areas. Spatial confounding of differences in community structure associated with environmental factors and levels of trawling effort has complicated interpretation of the results of many studies (Lindegarth *et. al.* 2000). However, a few replicated experiments have effectively demonstrated the negative effects of prawn trawling on sessile epibenthos. For example, Tanner (2003) experimentally showed the effects of prawn trawling in areas of Gulf St Vincent that had not been fished commerically for 15–20 years prior to that study.

The issues associated with quantitatively determining the direct effects of trawling have meant that most studies have focused on determining species composition, distribution patterns and relative abundance. One can, however, determine correlations between the composition of the catch and the abiotic factors that may affect it, such as trawling effort or environmental parameters. Svane *et al.* (2009) documented a negative correlation between commercial trawling effort and the biomass and abundance of by-catch at five sites in Spencer Gulf, and suggested that the observed differences among sites were caused by variations in trawl histories. This conclusion was based on the assumption that the confounding effects of differences among the sites associated with biophysical factors were minor. Here, we evaluate correlations with trawl effort history as well as a number of potential environmental factors, on the catch composition and community structure of the Spencer Gulf prawn trawl grounds.

1.4 Aims and objectives

This study provides information to underpin a risk assessment of the vulnerability of by-catch species to the trawling activity of the Spencer Gulf Prawn Fishery. The specific aims are:

1. To describe species composition and spatial distribution patterns of prawn trawl catch throughout Spencer Gulf.
2. To investigate relationships of i) historical trawl effort and ii) environmental parameters with:
    a. overall species richness, abundance and biomass
    b. community structure
    c. taxonomic groups
    d. common species
3. To assess catches of threatened, endangered or protected species.

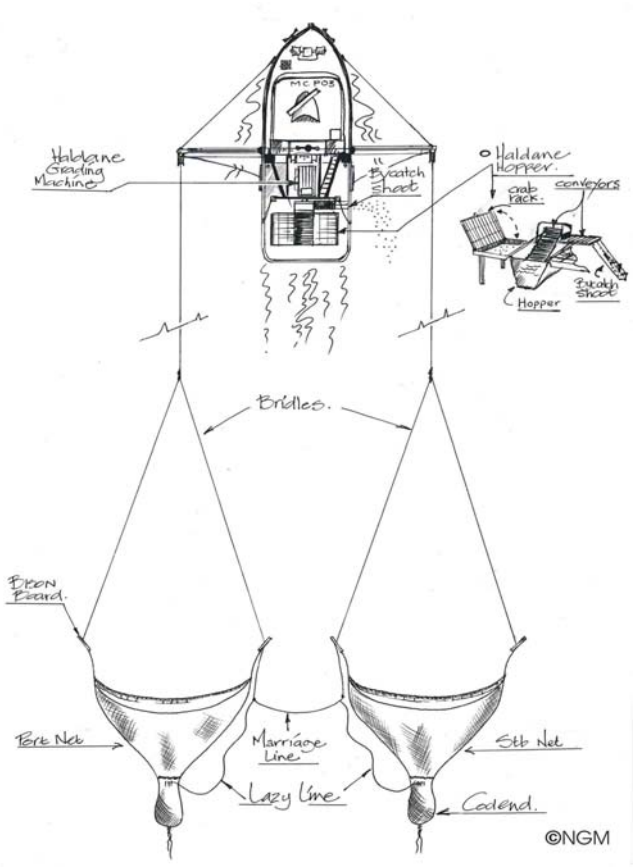

Figure 1. Double-rigged demeral otter trawl and location of hopper system used for sorting and prawn systems in the Spencer Gulf Prawn Fishery. Figure reproduced from Carrick (2003).

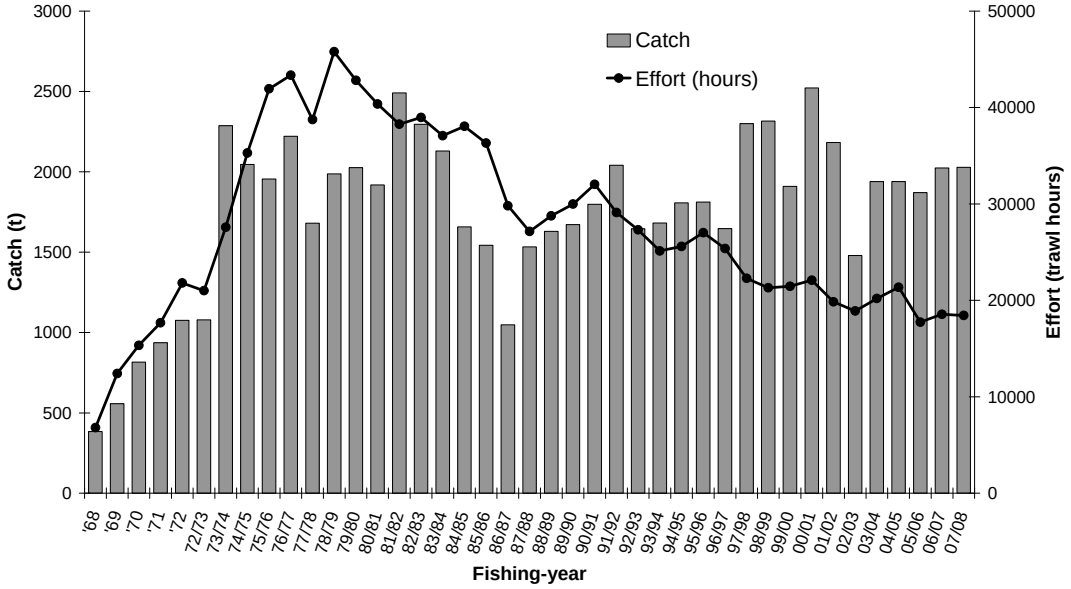

Figure 2. Total catch (t) and effort (hours) for Spencer Gulf from 1968 to 2007/08. Data for 1968-1972 are reported as calendar year. Data for 1972/73 are from January to October 1973. From 1973/74 data are from November to October each year (season).

2 METHODS

2.1 Catch sampling

Catch samples were collected from 120 sites in Spencer Gulf (Figure 3) trawled by eight commercial prawn trawlers over 4 successive nights (16-19 February 2007). The sites were selected *a priori* to provide a context for evaluating historical levels of fishing effort and were allocated, where practical, to one of the 125 fishery reporting blocks for Spencer Gulf (Figure 4). Sites were also stratified to reflect the range of depths (>10 m) historically fished and to maximise the variety of sediments (e.g. mud, sand, gravel, rhodolith) and sea-scapes (e.g. banks, gutters, bays) sampled.

Trawls of approximately 30-minute duration were conducted at each site using standard double-rig prawn gear (2 x 14.63 m-wide nets with 4.5 cm diamond mesh cod-ends). To maintain consistent ground coverage skippers were asked to maintain a speed over-ground of 3 knots. This was not always possible due to variations in tidal currents. Accordingly, the positions of the start and end points of each shot were recorded on a GPS plotter to provide accurate measures of trawl path and distance. Time-stamped depth profiles were also recorded on data-loggers attached to the otter boards to accurately determine the area of seafloor swept at each site.

One level fish bin (96 L) of homogenised catch was retained and frozen from a single trawl net at each sampling site. All large sharks and rays (>0.5 m length/width) that could not be effectively sub-sampled in each fishbin were individually measured and weighed before being released. The remaining catch was then weighed before being processed by the crew; with commercial sized prawns and by-product removed and the by-catch discarded overboard.

2.2 Laboratory processing

The entire contents of each sample was sorted into component taxa (i.e. fish, invertebrates, seagrass and algae) in the laboratory before being individually identified, counted, measured and weighed. During this process, fragments of the same non-unitary organism (e.g. colonial ascidians and plants) were consolidated and collectively weighed and counted as a single entity. Voucher specimens of all species collected were preserved in 70% ethanol and retained for future reference in the SARDI collection. Representative samples of fish guts (up to10/species/site) were also dissected from the by-catch samples and preserved in 10% formaldehyde solution to support future dietary studies.

2.3 Database

A relational MS Access database (SG_By-catch.mbd) was constructed to archive all data obtained during the by-catch survey. This database is presently held on the PIRSA server at \\Pirsaf02\USER8\Wild Fisheries\Prawns\By-catch Survey 2007\Database, and includes three primary tables:

Vessel - information related to each trawl shot position and duration.
Species - identification codes and taxonomic nomenclature for each organism.
Laboratory - individual measurement for all sub-samples processed in the laboratory.

In an effort to limit errors in this database, an intensive cross validation procedure was applied. A detailed account of all quality assurance procedures undertaken during this process is provided in Appendix 1.

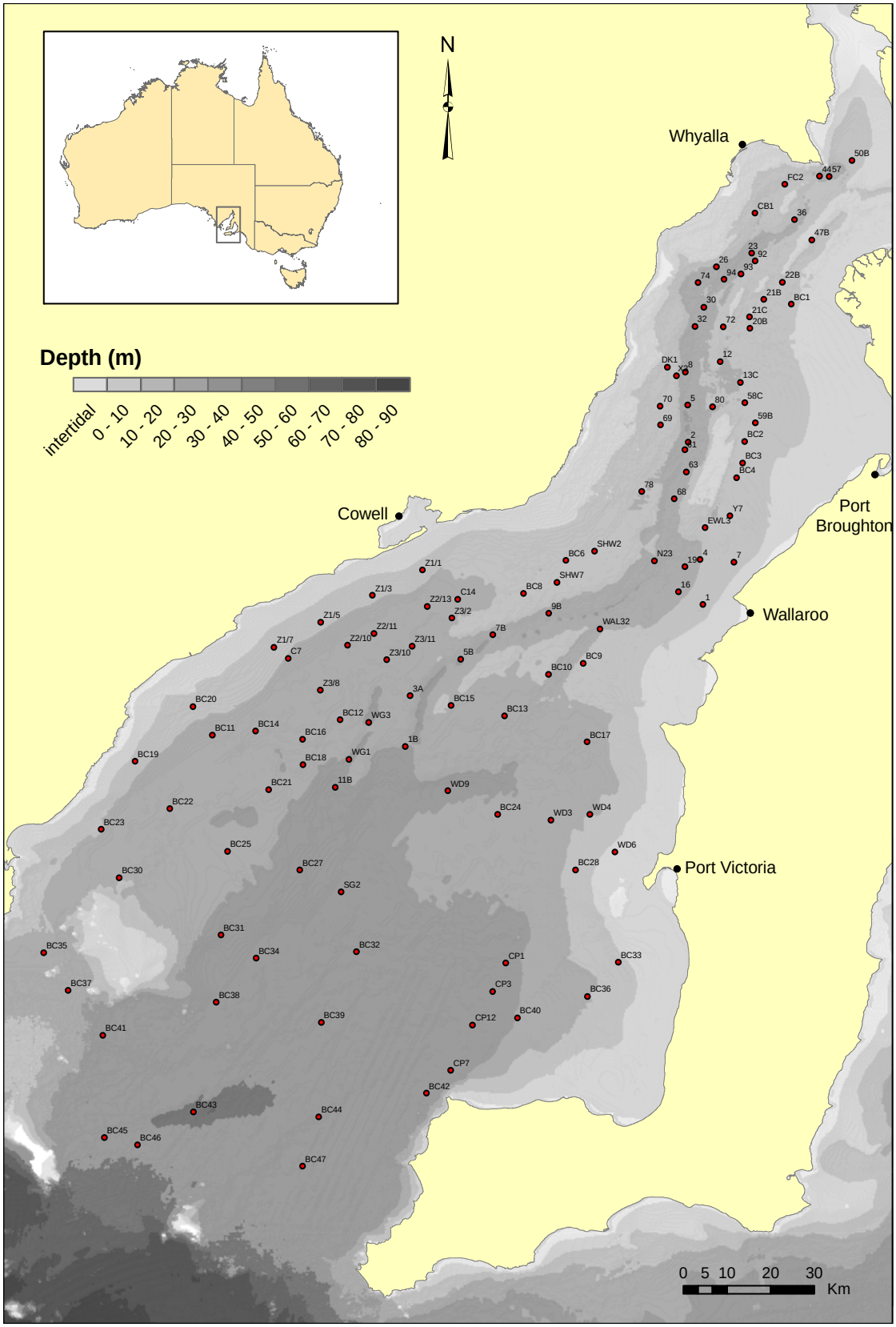

Figure 3. Bathymetric map of the Spencer Gulf showing the locations (small filled circles) of 120 sites sampled by commercial prawn trawlers during February 2007.

2.4 Data standardisation

Prior to all analyses, species abundance and biomass measures were standardised as either number (n) or weight (g) per area trawled (hectares, ha). The area *A* swept by each shot was estimated as follows:

$$A = (H * S * D) / 10{,}000$$

where *H* was the headline length of the net (i.e. 14.63 = 0.5*29.26 m (maximum permissible headline length for a double otter-trawl configuration)), *S* was the net spread factor (i.e. 0.75 from Carrick, 1996) and *D* was the distance trawled. Division by 10,000 converts the area from square metres to hectares.

By-catch ratios were calculated as the sum of the standardised weight of by-catch versus the sum of the standardised weight of prawns.

2.5 Environmental parameters

Temperature-depth profiles were recorded at each sampling site using data loggers attached to the otter boards of the trawl gear. Distance from top of gulf was calculated for each site as the straight line distance from Port Augusta.

2.6 Trawling history

For the period 1988 to 2007 the annual number of hours fished in each of 119 trawled reporting blocks (each 29 to 1031 km^2) was estimated from fishing effort data (hours fished per day per fisher) provided by licence holders to SARDI Aquatic Sciences. These data were standardised by the area of the reporting block (km^2) and averaged over four separate 5-year periods (1988-1992, 1993-1997, 1998-2002, 2003-2007).

As the most commonly caught species in Spencer Gulf were relatively short-lived (<5 years) and spawn annually, we used levels of prawn trawling effort over the last 5-years (2003-2007) to assign reporting blocks to categories of high, moderate and low fishing effort (Appendix 2). Some blocks included in the low trawl effort category for 2003-2007.

2.7 Data analysis

One-way analysis of variance (ANOVA) was used to test differences in total species richness, abundance and biomass of captured species across three fishing block groupings subjected to low, moderate and high levels of historical trawling effort. Differences in abundance and biomass were also tested independently for the 20 most commonly caught species, and the byproduct species southern calamary, *Sepioteuthis australis*, and Balmain bug, *Ibacus peronii*. This test could not be applied to the majority of other taxa due to their low and variable densities. Prior to conducting all ANOVAs, homogeneity of variance was examined using Levene's test and heterogeneity removed where necessary by $\log_{10}(n+1)$ and $1/(n+1)$ transformations.

Variations in community structure between the 120 trawl sites were examined using Bray-Curtis (B-C) dissimilarity measures (Bray and Curtis, 1957). This dissimilarity measure was chosen because it is not affected by joint absences, and it has consistently performed well in preserving ecological distance in a variety of simulations on different types of data (Field *et al*., 1982; Faith *et al*., 1987). Single square-root transformations were applied to the data before calculating the B-C dissimilarity measures to prevent a small number of abundant species from influencing the dissimilarity measures excessively (Clarke, 1993).

The computer package PRIMER was used to generate B-C dissimilarities and to undertake all multivariate analyses (Clarke and Gorley, 2001). Initially, differences in B-C community structure between low, moderate, and highly fished areas were tested using analysis of similarity (ANOSIM). A combination of hierarchical agglomerative clustering and non-metric multidimensional scaling (MDS) was then used to group sites according to their B-C community composition. This was complimented by a similarity percentage test (SIMPER) to determine those species contributing most to within and among site groupings.

To examine the cumulative influences of trawling on trophic structure, relationships between the three key trophic groupings (i.e. fish, invertebrates, plants/algae) were tested using the RELATE permutation procedure of Clarke and Gorley (2001). The extent to which measured environmental variables (i.e. depth, location, temperature, sediment grain-size) accounted for groupings was also tested using the BIOENV routine of Clarke and Ainsworth (1993).

3 RESULTS

3.1 Environmental parameters

Average sea surface temperature was 24.04±0.04°C in the north and 23.15±0.09°C in the south. Bottom water temperature was 23.91±0.03°C in the north and 22.48±0.07°C in the south of the gulf. Depth trawled during the survey ranged from 12 to 55 m.

3.2 Trawling history

During the last 20 years, prawns were harvested from 119 of the 125 fishing blocks in Spencer Gulf. The six unfished blocks represented 3.5% of the total area of fishing blocks and were not included in analyses. Despite apparent shifts in trawling effort, including a decline in effort in the northern blocks of the gulf since 2002, it is evident that most trawling has been concentrated in the same areas of the gulf since at least 1987 (Figure 4). In particular, high intensity trawling (>10 hours fishing per km^2) has consistently occurred in the near-shore waters off Wallaroo (i.e. blocks 43 and 44) and around Middlebank (i.e. blocks 31 and 36). Several blocks surrounding these areas and extending along the main channel to the south (42, 46, 51, 52, 53, 55 and 64) also consistently support moderate levels of fishing effort (1-10 hours fishing per km^2). In contrast, most blocks situated near the coast, or in the southern reaches of the gulf, consistently incur low levels of trawling (0-1 hours fishing per km^2).

Of the 119 historically fished blocks, six were designated as high trawl intensity for 2003-2007. These represented 2.7% of the historically fished area and comprised >40% of total catch and effort for this period (Table 1). A further 27 blocks were designated as medium intensity and comprised 17.7% of the area and >45% of total catch and effort. The 86 low intensity fishing blocks comprised 79.5% of the area and contributed <10% of total catch and effort. It should be noted that 15 blocks (9.9% of area) were not fished during 2003-2007, but are included as low intensity as they had been previously fished. Of the 120 survey shots, 10 shots (5 trawl hours), 27 shots (13 h) and 83 shots (39 h) were located in high, medium and low intensity blocks, respectively. It should also be noted that calculations of trawling intensity and area are based on the total area of fishing blocks, and do not necessarily reflect the actual area trawled within each block.

Table 1. Survey and fishery statistics for high, medium and low intensity fishing blocks from 2003-2007.

Intensity	No. of blocks	No. of survey shots	Proportion of historically fished area	% of commercial effort	% of commercial catch
High	6	10	2.7%	41.5%	47.5%
Medium	27	27	17.7%	48.7%	45.5%
Low	86	83	79.5%	9.8%	7.0%

3.3 Species composition and spatial distribution

3.3.1 Captured species

A total of 4.2 t of catch samples were collected from 120 sites trawled during the survey. From this, 395 species were identified from 12 phyla: Chordata (fish), Crustacea, Porifera (sponges), Mollusca, Chlorophyta, Phaeophyta, Rhodophyta, Magnoliophyta, Bryozoa, Urochordata, Cnideria and Echinodermata.

Detailed information for each species is provided in Appendix 3, including:

- a laboratory photograph, taxonomic classification and common name(s),
- a map of its spatial distribution, list of sites captured, and depth and size range of capture
- average biomass, rank biomass, average abundance and rank abundance.

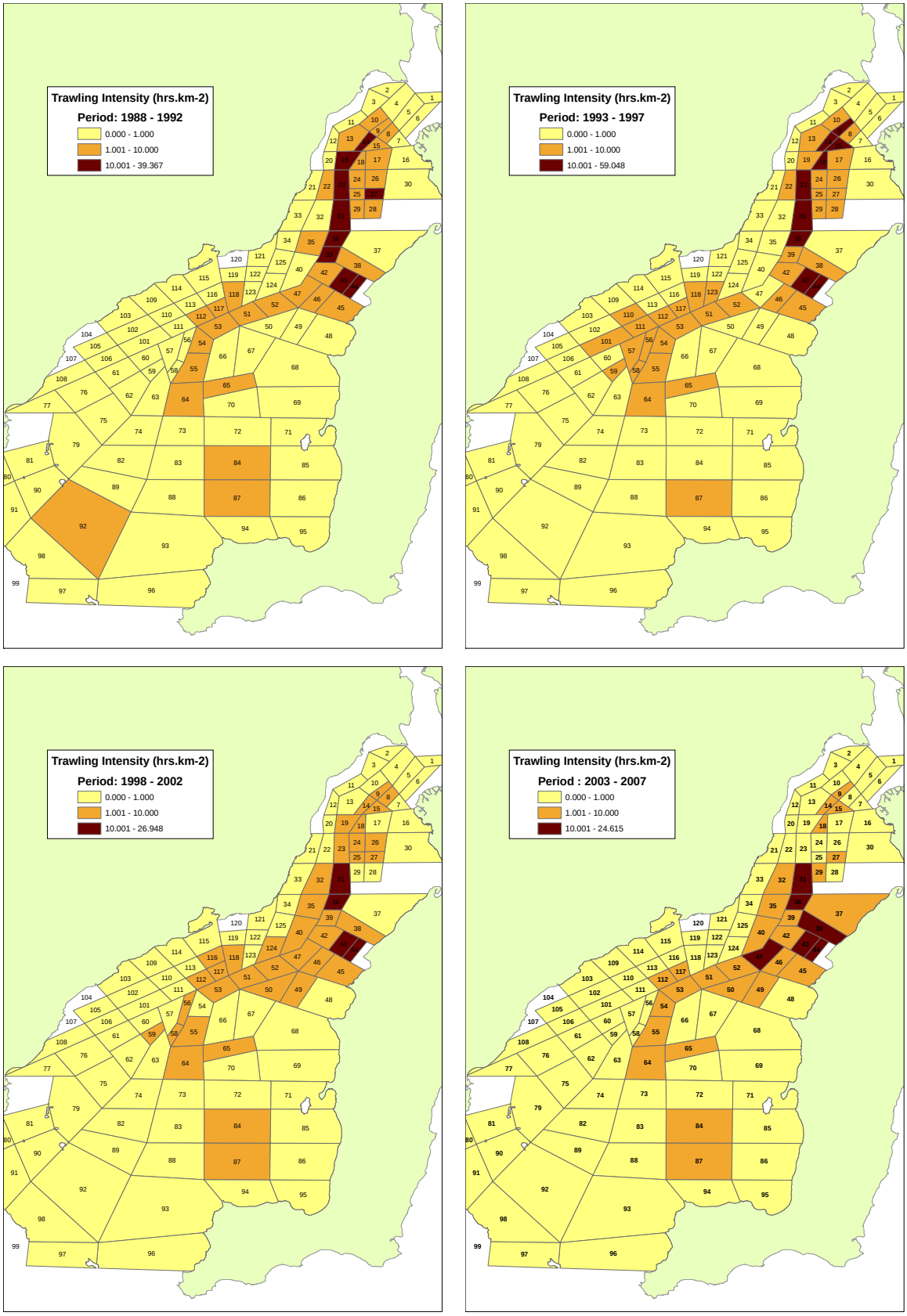

Figure 4. Map of mean (5-year average) prawn trawling effort (hours fished / km^2) reported for 119 fishing bocks in Spencer Gulf between 1988 and 2007.

3.3.2 By-catch to prawn ratio

The by-catch to prawn ratio was 6.0 ± 1.0:1 across the 120 sites surveyed. When considering trawl effort intensity, the by-catch to prawn ratio at high fishing intensity sites (n = 10) was 2.0 ± 0.6:1, while at medium fishing intensity sites (n = 27) the by-catch to prawn ratio was 3.2 ± 0.9:1 and at low fishing intensity sites (n = 83) it was 8.7 ± 1.8:1.

3.4 Relationships with trawl effort history and environmental parameters

3.4.1 Overall species richness, abundance and biomass

Overall species abundances and biomasses were highly correlated (Table 2). Distributional patterns of abundance and biomass were broadly similar (Figure 5). In general, the western side of the gulf supported the highest abundances and biomasses, while the eastern side (particularly the south-eastern region) supported the lowest abundances and biomasses. In contrast, species richness was generally higher in areas supporting low numbers of individuals and biomasses, as demonstrated by the significant negative correlations between species richness and both these parameters (Table 2).

Table 2. Spearman's rank correlation coefficients between depth, latitude, longitude, distance (from top of gulf TOG), bottom temperature, and abundance, biomass and richness. The sample-size for all correlations = 120. Significant correlations are denoted at the **1% level and *5% level.

	Depth	Latitude	Longitude	Distance	Temperature	Abundance	Biomass
Depth	.	.	.	.	.	.	.
Latitude	-0.568**	.	.	.	.	.	.
Longitude	-0.630**	0.832**	.	.	.	.	.
Distance from TOG	0.659**	-0.992**	-0.879**	.	.	.	.
Temperature	-0.584**	0.863**	0.683**	-0.851**	.	.	.
Abundance	-0.096	0.304**	0.076	-0.280**	0.226*	.	.
Biomass	-0.025	0.142	0.013	-0.120	0.127	0.783**	.
Richness	-0.030	-0.152	0.057	0.120	-0.153	-0.457**	-0.247**

Because of the generally lower abundances recorded in the south-eastern gulf, weak but significant correlations occurred between abundance and latitude (and it's proxy - distance from the top of the gulf). In addition, abundance was also weakly correlated with bottom temperature (which characteristically decreased with increased depth and latitude). No other bio-physical interdependencies were detected.

Mean species richness was highest (39 species per hectare) in areas subjected to low levels of trawling over recent years and lowest (36 species per hectare) in areas subjected to the highest effort levels (Figure 6). Similar trends were observed in overall abundance and biomass. The mean number of organisms caught was more than twice as high in areas trawled with low intensity than those subjected to the highest levels of effort (1402 *vs*. 575 individuals per hectare; Figure 6). Likewise, mean biomass on grounds subjected to low levels of recent fishing effort were approximately twice as high as those of grounds subjected to higher levels (42,109 *vs*. 21,825 grams per hectare; Figure 6). Notably, whilst the differences in mean abundance and biomass by trawl intensity were large, they were not statistically significant (Table 3). This was likely due to the exceptionally high abundance and biomass at a small number of stations (BC37, BC41 and 3A) which resulted in low power in the ANOVA test (<0.24).

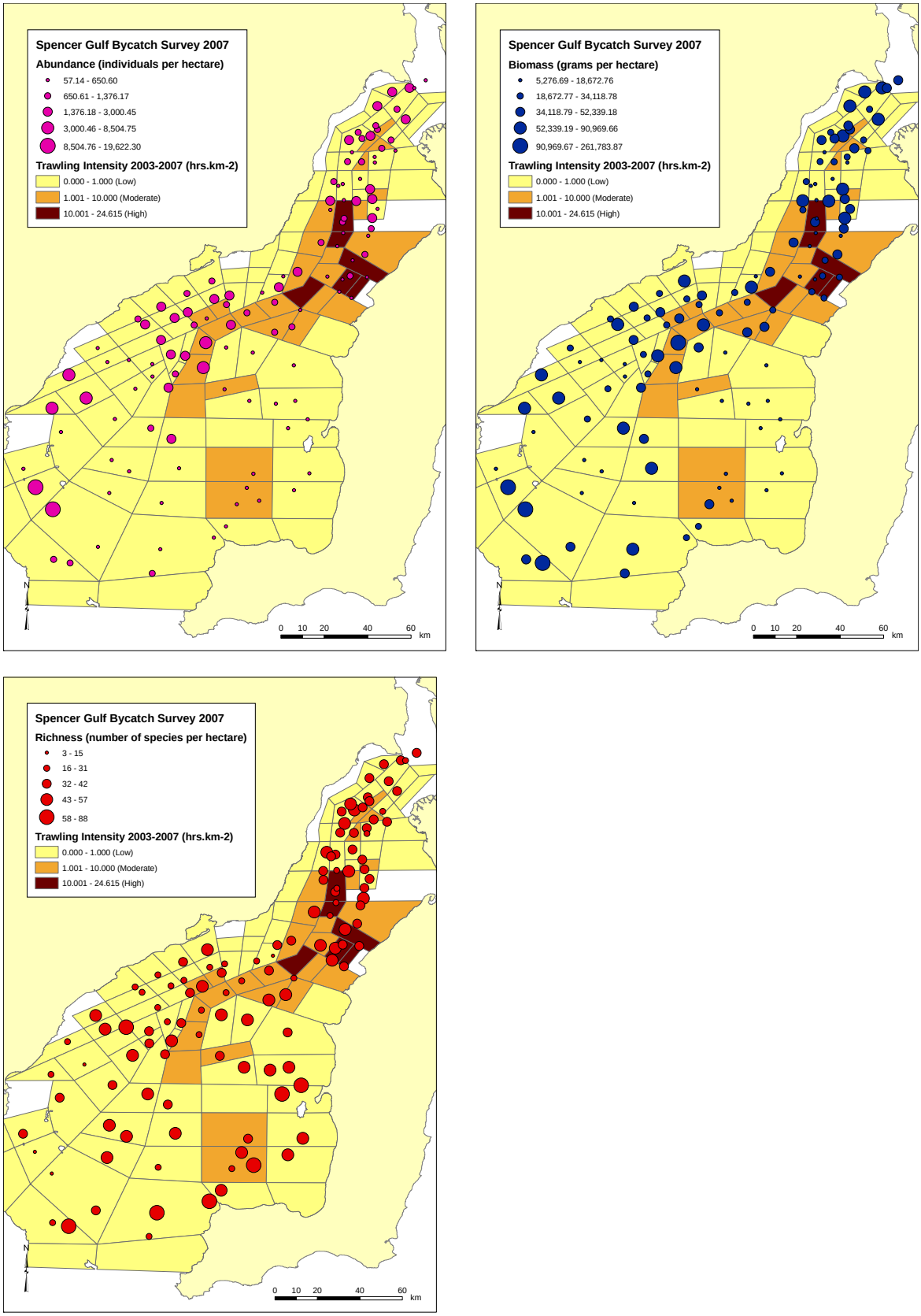

Figure 5. Bubble plots of abundance, biomass and richness at 120 trawl sites in the Spencer Gulf surveyed during February 2007. Note all values presented are standardised to an area of one hectare (1 ha) and are overlayed on a map of mean prawn trawling effort (hours fished / km^2) reported for 119 fishing bocks in Spencer Gulf for the 5-year period between 2003 and 2007.

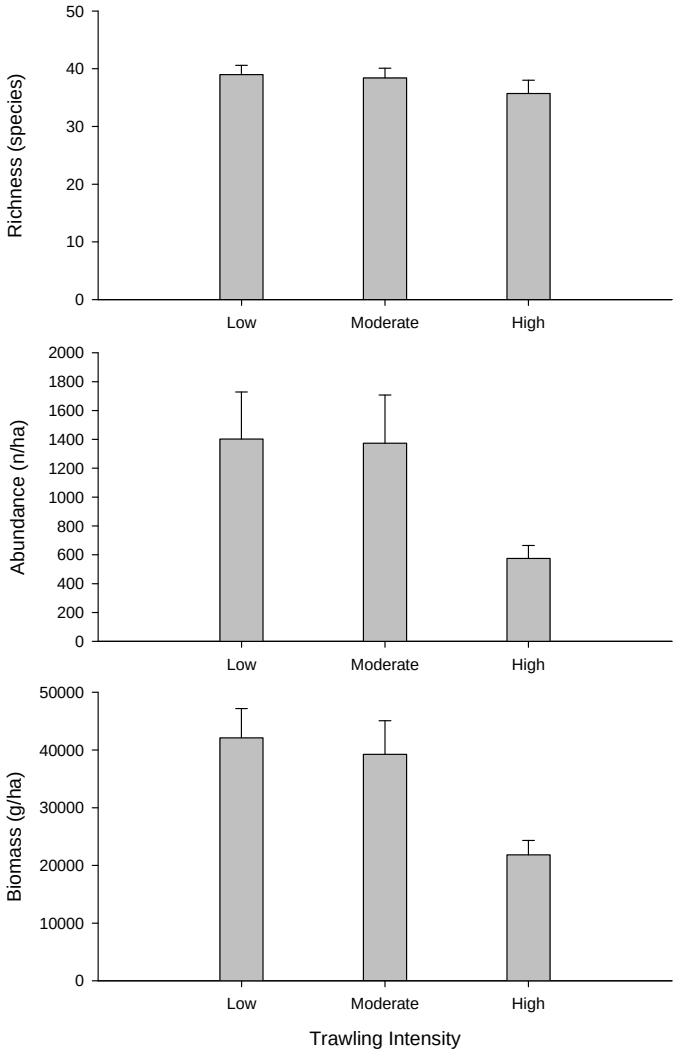

Figure 6. Bar graphs showing mean (± s.e) species richness (per shot), abundance and biomass (per hectare) of total catch collected from three areas of the Spencer Gulf subject to low (<1 hour fishing per km^2, n = 83), moderate (1-10 hours fishing per km^2, n = 27) and high levels (>10 hours fishing per km^2, n = 10) of prawn trawling effort over the period 2003 to 2007.

Table 3. Results of one-way ANOVA's on differences in species richness, abundance and biomass across three areas of the Spencer Gulf subject to low, moderate and high levels of prawn trawling over the period 2003 to 2007.

Dependent	**Source**	**Sum of Squares**	**df**	**Mean Square**	**F**	**Significance**	**Power** (α=0.05)
Richness	Between Groups	97.119	2	48.559	0.288	0.751	0.237
	Within Groups	19756.348	117	168.858			
	Total	19853.467	119				
Abundance	Between Groups	6186034.095	2	3093017.048	0.452	0.638	0.122
	Within Groups	8.008E8	117	6844618.850			
	Total	8.070E8	119				
Biomass	Between Groups	3.682E9	2	1.841E9	1.088	0.340	0.095
	Within Groups	1.979E11	117	1.692E9			
	Total	2.016E11	119				

3.4.2 Community structure

The primary MDS ordination (Figures 7) shows differences in community structure at the 120 trawl sites surveyed during February 2007. The stress coefficient (0.19) indicates that the ordination is not unduly distorted (Clarke, 1993) and is a fair representation of the input dissimilarities in two dimensions. In this ordination, there is considerable overlap in the spread of site numbers, and no clear patterns are readily apparent.

When symbols representing different trawl intensities are superimposed on the ordination (Figure 8) it is clear that low intensity trawling sites are scattered widely. In contrast, moderate and high intensity sites integrate as a less defuse group towards the right-hand edge of the plot. This pattern indicates that similar assemblages of captured species were obtained from sites that have received different levels of trawling intensity in recent years (2003-2007). An analysis of similarity test (ANOSIM) provides a formal assessment of the spatial differences in assemblage structure of captured species between sites identified *a priori* as being subject to low, moderate and high levels of trawl effort. As the observed *R* statistic (-0.152) falls within the main body of the distribution, there is no evidence for any trawl intensity-related differences in community structure.

When symbols representing different regions of the gulf were superimposed on the primary MDS ordination, a distinct latitudinal pattern is evident (Figure 9). Notably, symbols for sites sampled in the north, mid-north, central and south form quite discrete groupings and plot sequentially on the ordination from left to right. This pattern is also present when abundance rather than biomass data are used in the ordination, and highlights a robust and progressive shift in the community structure of captured species between the most northerly and southerly regions of the gulf (Figure 10).

The PRIMER routine BIOENV was used to assess the correspondence and significance of environmental and trawl intensity data to the four site groupings identified in the MDS analysis. Measures of latitude and longitude were excluded from these analyses because they are highly correlated and co-varied with the distance from the top of the Gulf (TOG). The best fit was with TOG distance ($\rho w = 0.567$), which in combination with depth gave a best fit of $\rho w = 0.641$. The remaining two variables considered in the analyses (temperature and trawling intensity) were apparently unrelated to the patterns in site groupings.

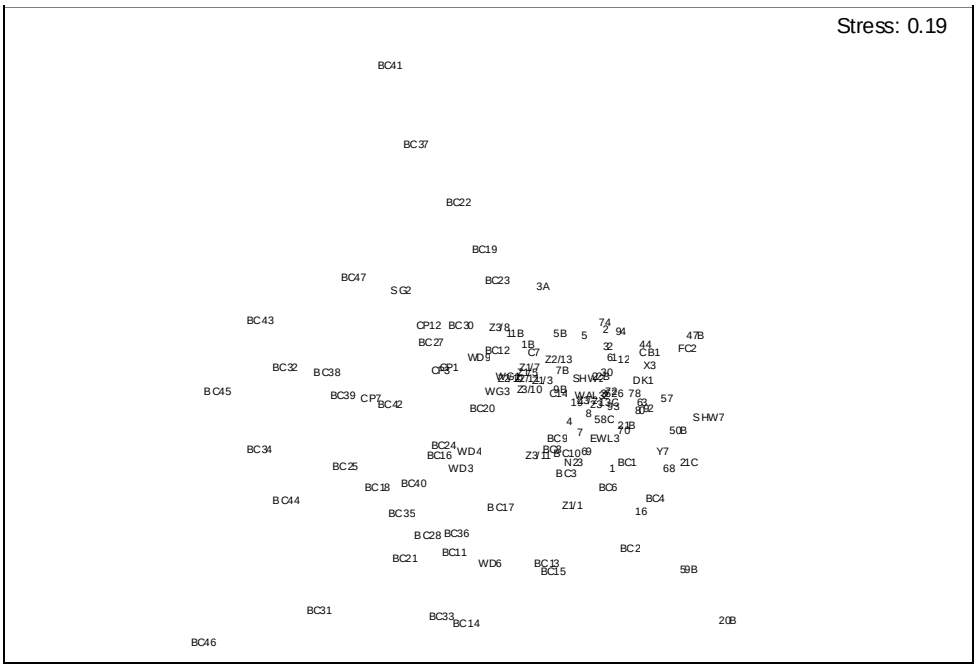

Figure 7. Non-metric MDS plot of by-catch community structure at 120 trawl sites in Spencer Gulf.

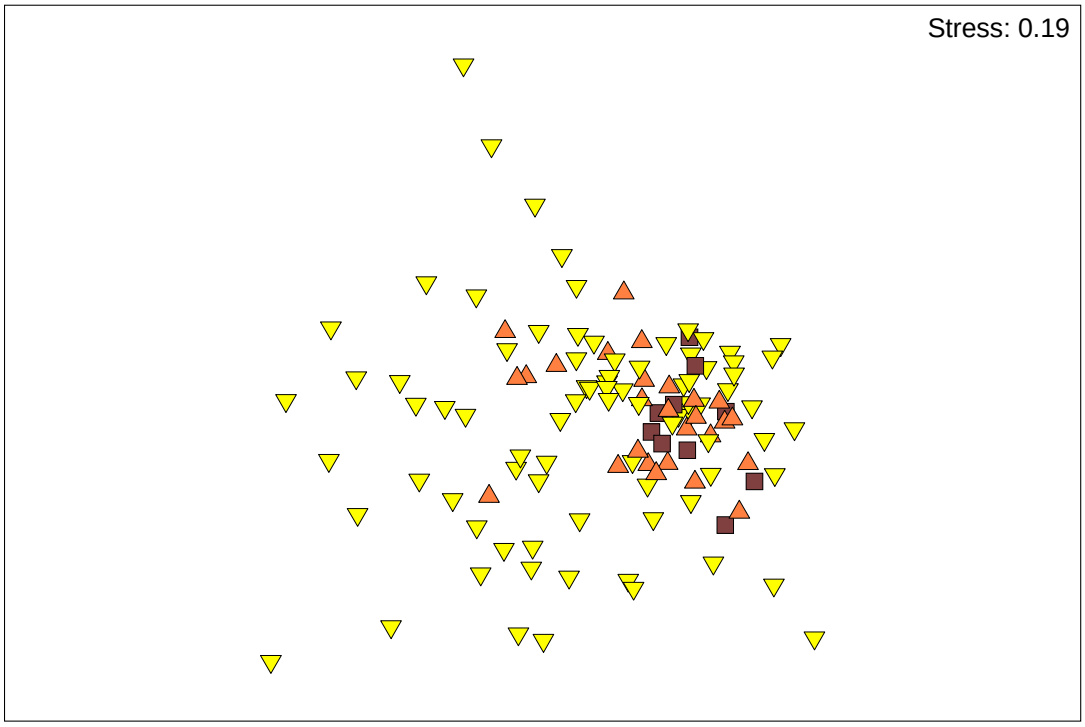

Figure 8. Non-metric MDS plots of average trawling intensity for period 2003-2007 superimposed on community ordination: yellow triangles = low intensity (<1 hours fishing per km^2), orange triangles = moderate intensity (1-10 hours fishing per km^2), brown squares = high intensity (10-25 hours fishing per km^2).

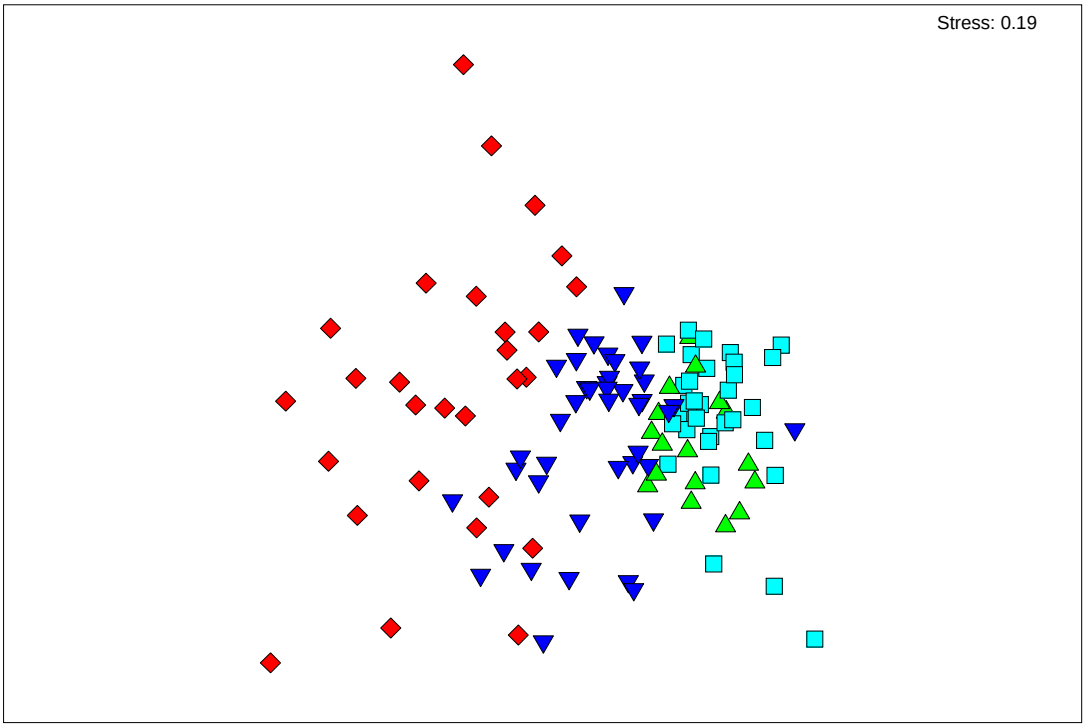

Figure 9. Non-metric MDS plots of bycatch community structure at 120 trawl sites sampled in Spencer Gulf during February 2007 with regional symbols superimposed on ordination: light-blue squares = north (<120 km from top of gulf (TOG)), green triangles = mid-north (120-160 km from TOG), dark-blue triangles = central (160-220 km from TOG), red diamonds = south (220-300 km from TOG).

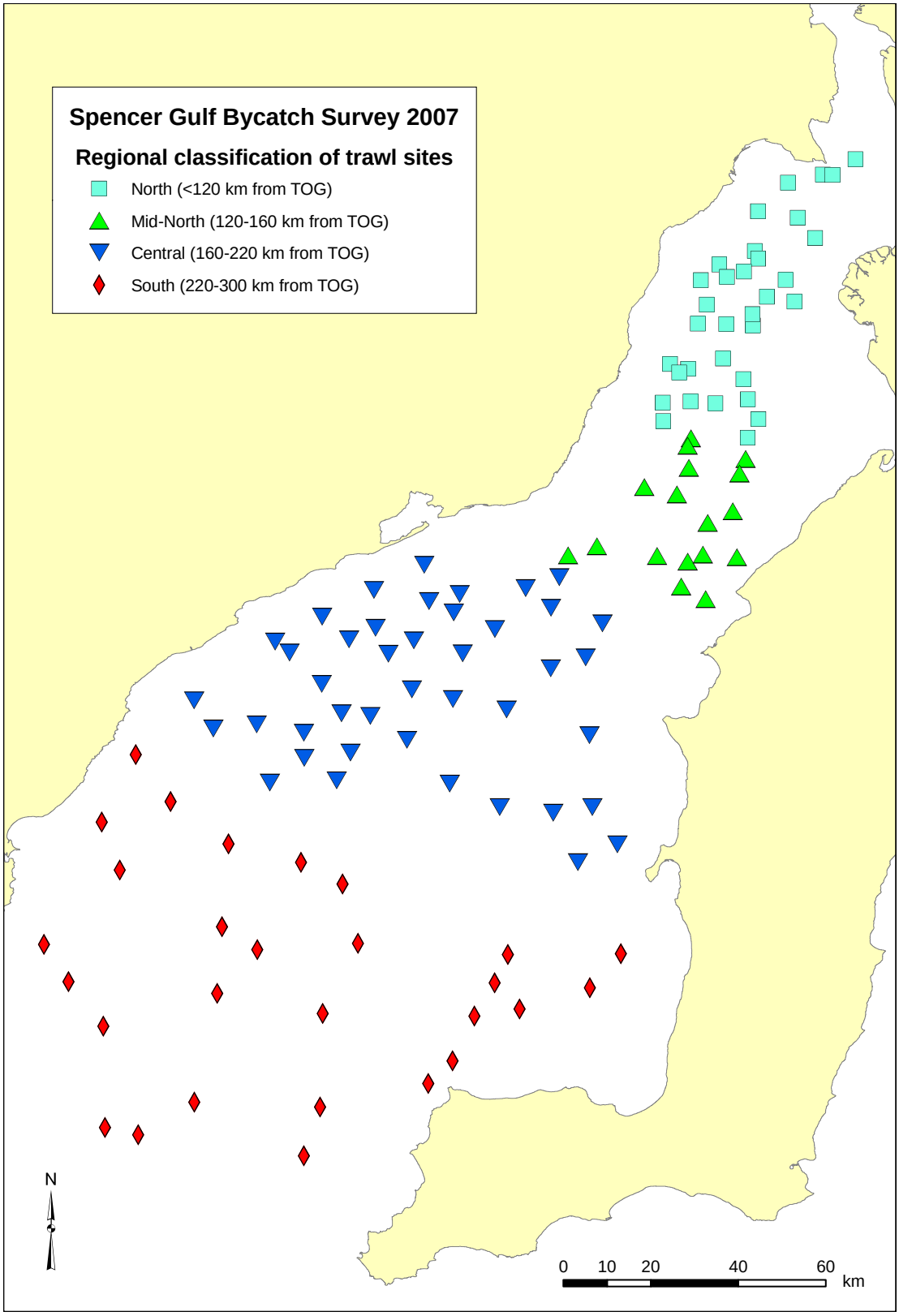

Figure 10. Map Spencer Gulf showing the locations of 120 trawl sampling sites surveyed during February 2007, and their classification into four regional groups.

3.4.3 Taxonomic groups

Chordata (fish) was the dominant phylum in terms of abundance, and accounted for 68% of the standardised catch (mean density $\overline{\chi}_D$ = 907 individuals per ha) (Figure 11a). Crustaceans (principally prawns and crabs) were also abundant, and comprised 28% of the catch ($\overline{\chi}_D$ = 368 individuals per ha). All other phyla collected, including Bryozoa (lace corals), Chlorophyta (green algae), Cnidaria (soft corals), Echinodermata (starfish), Magnoliophyta (seagrass), Mollusca (squid and snails), Phaeophyta (brown algae), Porifera (sponges), Rhodophyta (red algae) and Urochordata (sea squirts) were much less abundant, with each comprising < 3% of the catch ($\overline{\chi}_D$ < 37 individuals per ha).

The most abundant phyla were also the best represented in term of biomass (Figure 11b). Chordates accounted for over half (51%) of the total biomass (mean biomass $\overline{\chi}_B$ = 20,223 grams per ha), while a further third (32%) was made up of crustaceans ($\overline{\chi}_B$ = 12,937 grams per ha). Porifera were also well represented in term of biomass (on account of their frequently massive body size, i.e. > 1 m diameter), and this phyla accounted for 10% of the total biomass ($\overline{\chi}_B$ = 4,007 grams per ha). In contrast, all other phyla collected individually comprised only a small (< 3%) component of the total biomass ($\overline{\chi}_B$ < 1,139 grams per ha).

Chordata was also the best represented phylum in terms of species richness and accounted for 33% (132) of the species collected (Figure 11c). Porifera were also well represented, comprising 27% (108) of the total species richness. All other phyla collected, including Bryozoa, Chlorophyta, Cnidaria, Crustacea, Echinodermata, Magnoliophyta, Mollusca, Phaeophyta, Rhodophyta and Urochordata, were less diverse and represented by fewer than 8% (33) of the total species collected.

Chordata was also the most widely distributed phylum, and was collected at all 120 trawl sites (Figure 11d). Crustaceans and molluscs were also widespread, being found at all but one (119) of the survey sites. Other phyla collected, including Bryozoa, Cnidaria, Echinodermata, Magnoliophyta, Phaeophyta, Porifera, Rhodophyta and Urochordata, had more restricted distributions, being found at between 33% (40) and 78% (93) of the sites. The Chlorophyta had the narrowest distribution and was collected at only 18% (21) of the sites.

Significantly lower abundances of poriferans and bryozoans were recorded in heavily trawled areas (Table 4, Figure 12). In addition, the biomasses of porifera and bryozoa were more than an order-of-magnitude lower on intensely trawled grounds. The biomass of chordates was also significantly lower in these areas (Table 4, Figure 13). In contrast, the abundances and/or biomasses of crustaceans, rhodophytes and chlorophytes were significantly higher on moderate and/or intensely trawled areas (Table 4, Figures 12 and 13).

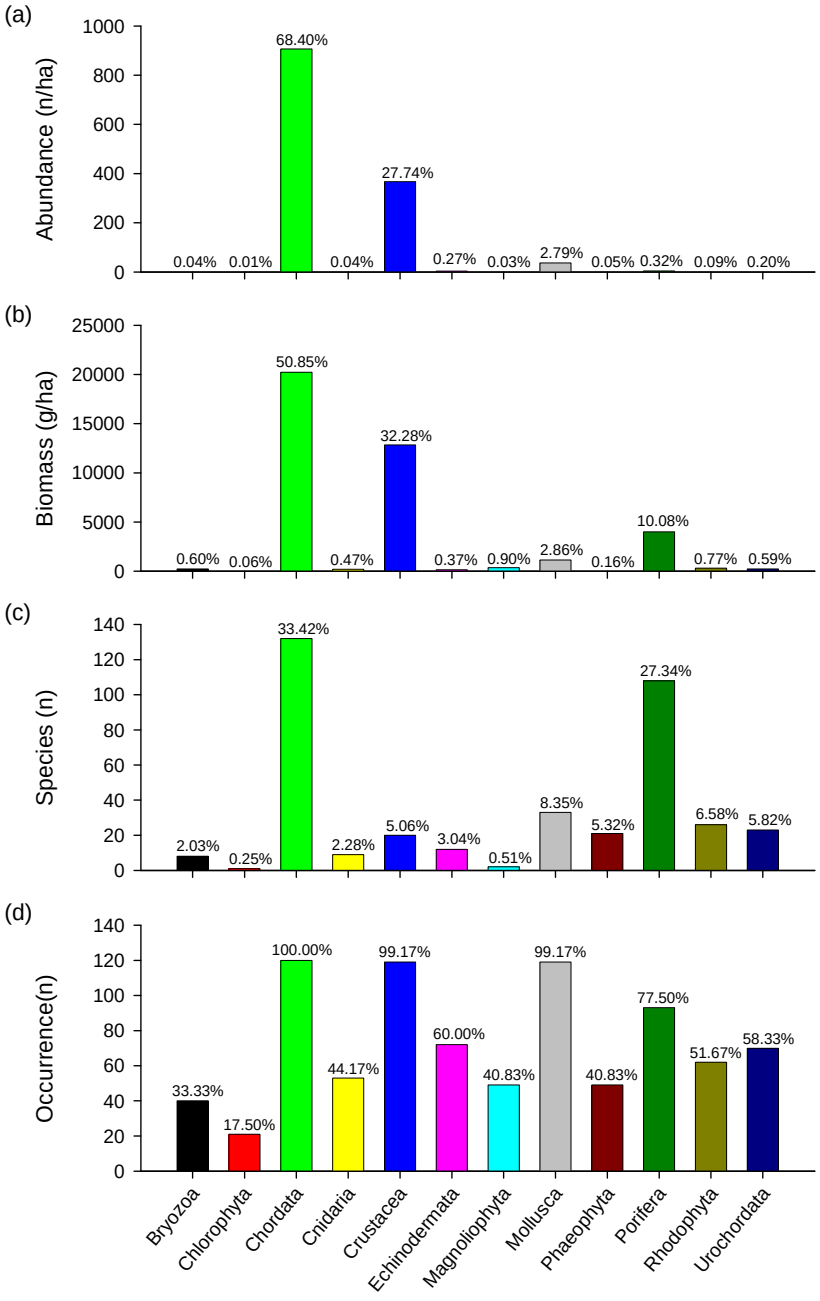

Figure 11. Average (a) number of individuals, (b) wet weights, and (c) total species of each major phyla collected during the by-catch survey, and (d) the total number of trawl sites (out of 120) at which specimens belonging to each major phylum were collected. Values for each variable are shown as percentages above each bar.

Table 4. Results of one-way ANOVA's for differences in abundance and biomass of catch grouped by phylum (bryozoa, chlorophyta, chordate, cnidaria, crustacean, echinodermata, magnoliophyta, mollusca, phaeophyta, porifera, rhodophyta, urochordata) from three areas of the Spencer Gulf subject to low, moderate and high levels of prawn trawling over the period 2003 to 2007. Phyla that display significant ($p < 0.05$) differences in abundance or biomass across the three trawl areas are highlighted bold. Homogeneous groups of means identified from *post hoc* SNK tests are highlighted by similar shades of grey backfill. Note all estimates have been back-transformed from Log10(x+1) to aid interpretation.

Dependant	**Phylum**	**Trawling Intensity**			**F(2,117)**	***p***
		Low	**Moderate**	**High**		
Abundance	Chordata	337.74 ± 0.15	357.63 ± 0.22	162.11 ± 0.15	1.821	0.166
	Crustacea	81.36 ± 0.24	368.85 ± 0.24	298.20 ± 0.25	8.745	**<0.001**
	Mollusca	14.88 ± 0.15	18.23 ± 0.22	23.62 ± 0.21	0.795	0.454
	Porifera	2.11 ± 0.11	1.56 ± 0.13	0.45 ± 0.21	3.587	**0.031**
	Echinodermata	1.50 ± 0.12	0.62 ± 0.14	0.90 ± 0.27	2.244	0.111
	Urochordata	0.93 ± 0.10	1.24 ± 0.18	0.82 ± 0.16	0.379	0.685
	Rhodophyta	0.64 ± 0.07	0.82 ± 0.14	2.03 ± 0.15	3.981	**0.021**
	Phaeophyta	0.38 ± 0.05	0.55 ± 0.11	0.93 ± 0.23	2.205	0.115
	Cnidaria	0.47 ± 0.05	0.28 ± 0.08	0.30 ± 0.13	1.109	0.333
	Bryozoa	0.42 ± 0.06	0.10 ± 0.04	0.04 ± 0.04	5.075	**0.008**
	Magnoliophyta	0.25 ± 0.04	0.44 ± 0.08	0.66 ± 0.14	3.133	0.057
	Chlorophyta	0.09 ± 0.03	0.17 ± 0.06	0.30 ± 0.09	2.597	0.079
Biomass	Chordata	12743.78 ± 0.13	9682.37 ± 0.18	5064.78 ± 0.17	4.106	**0.019**
	Crustacea	2963.03 ± 0.26	14545.34 ± 0.25	11587.06 ± 0.17	8.894	**<0.001**
	Mollusca	501.88 ± 0.17	526.31 ± 0.27	842.57 ± 0.19	0.647	0.525
	Porifera	329.01 ± 0.46	261.84 ± 0.69	11.05 ± 1.84	4.502	**0.013**
	Echinodermata	10.17 ± 0.30	3.60 ± 0.52	28.22 ± 1.58	2.540	0.083
	Urochordata	10.55 ± 0.33	19.39 ± 0.62	29.01 ± 1.07	0.969	0.383
	Rhodophyta	6.25 ± 0.32	12.14 ± 0.80	607.31 ± 0.64	12.869	**<0.001**
	Phaeophyta	3.10 ± 0.26	3.09 ± 0.48	14.24 ± 1.48	1.728	0.182
	Cnidaria	5.44 ± 0.32	1.91 ± 0.37	1.45 ± 0.53	1.747	0.179
	Bryozoa	6.26 ± 0.35	0.95 ± 0.34	0.28 ± 0.28	4.571	**0.012**
	Magnoliophyta	4.17 ± 0.34	6.12 ± 0.56	7.85 ± 0.78	0.309	0.735
	Chlorophyta	0.55 ± 0.16	1.20 ± 0.32	6.07 ± 0.95	4.988	**0.008**

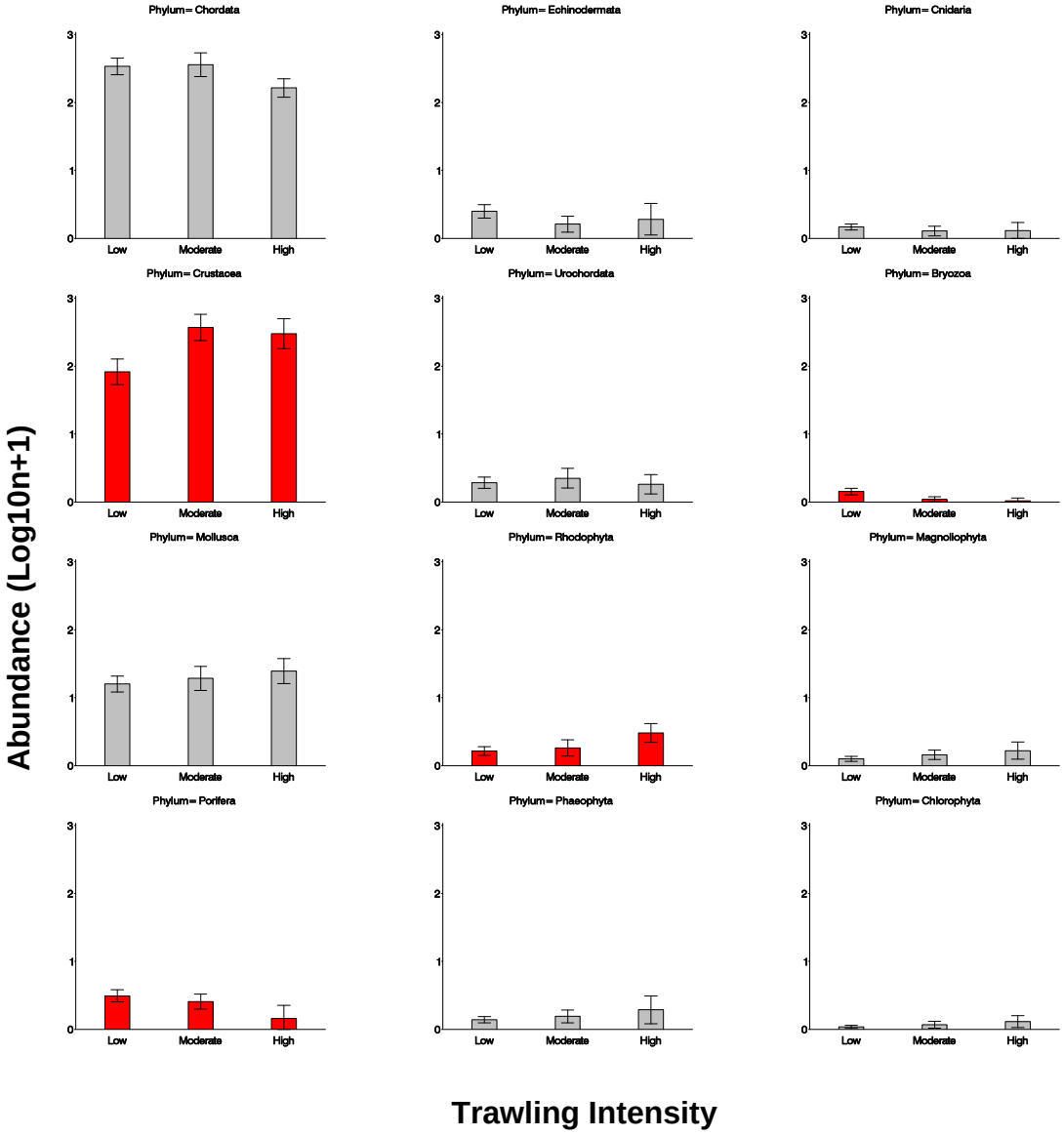

Figure 12. Mean abundance (Log10 n+1) of species grouped by phylum (bryozoa, chlorophyta, chordate, cnidaria, crustacean, echinodermata, magnoliophyta, mollusca, phaeophyta, porifera, rhodophyta, urochordata)) from three areas of the Spencer Gulf subject to low (<1 hour fishing per km^2, n = 83), moderate (1-10 hours fishing per km^2, n = 27) and high levels (>10 hours fishing per km^2, n = 10) of prawn trawling effort over the period 2003 to 2007. All estimates presented are standardised values per hectare ± 95% C.I. Red-filled graphs denote those phyla that display significant ($p < 0.05$) differences in abundance across the three trawl areas, while grey-filled graphs denote those phyla for which no significant differences are detectable.

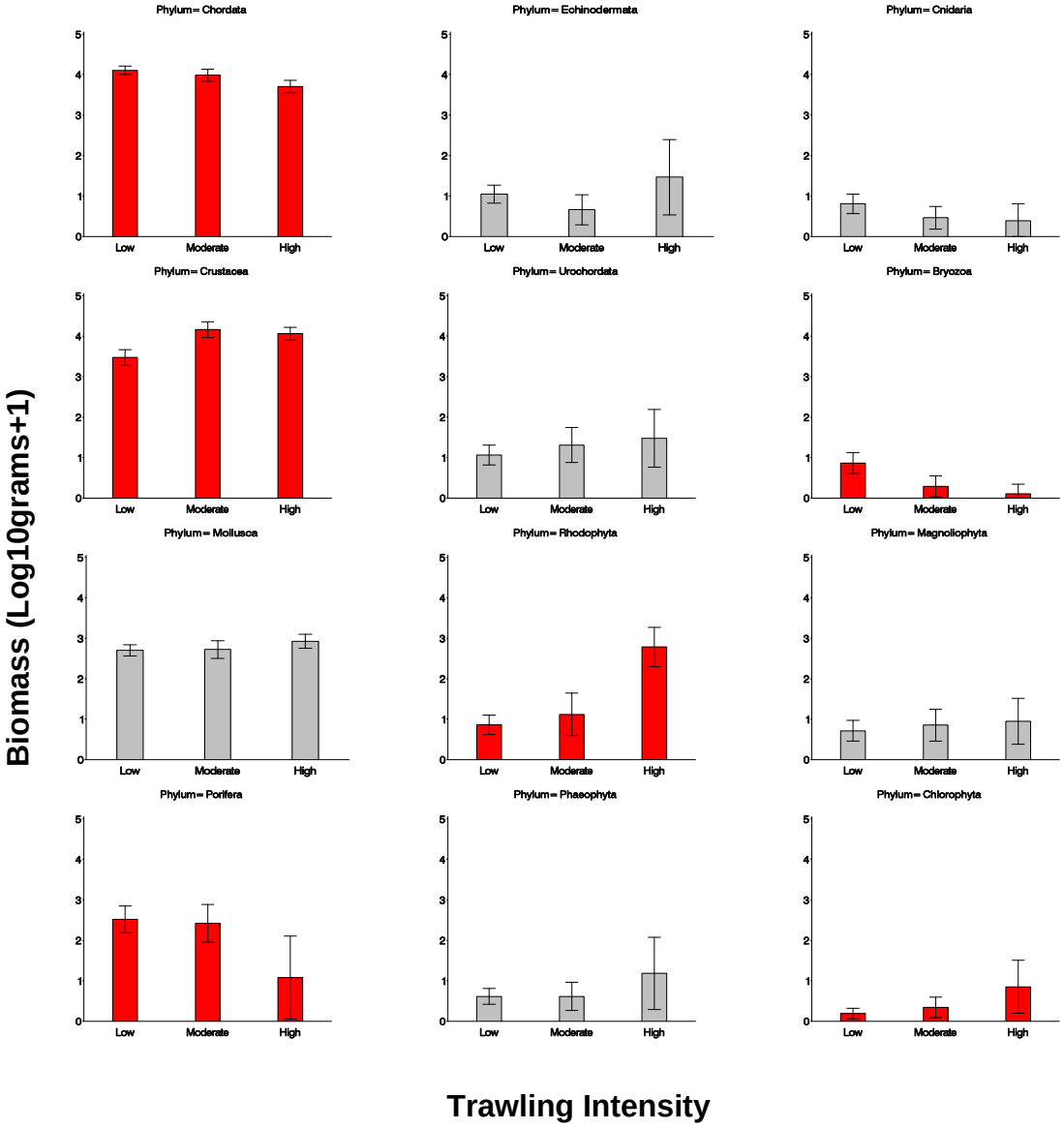

Figure 13. Mean biomass (Log10 wet weight (grams+1)) of species grouped by phylum (bryozoa, chlorophyta, chordate, cnidaria, crustacean, echinodermata, magnoliophyta, mollusca, phaeophyta, porifera, rhodophyta, urochordata)) from three areas of the Spencer Gulf subject to low (<1 hour fishing per km^2, n = 83), moderate (1-10 hours fishing per km^2, n = 27) and high levels (>10 hours fishing per km^2, n = 10) of prawn trawling effort over the period 2003 to 2007. All estimates presented are standardised values per hectare ± 95% C.I. Red-filled graphs denote those phyla that display significant ($p < 0.05$) differences in biomass across the three trawl areas, while grey-filled graphs denote those phyla for which no significant differences are detectable.

Non-metric MDS ordinations were individually constructed for three higher-order, taxonomic groups (fish, invertebrates and plants/algae; Figures 14a-c) in an effort to evaluate their relative contributions to the strong latitudinal gradient in community composition. It is immediately obvious, from comparisons with the primary MDS plot (Figure 7), that the ordinations for fish and invertebrates are remarkably consistent, whereas the plant/algae ordination bears no resemblance to the overall pattern. Because fish comprise the largest component of the overall species richness, abundance and biomass, it is not surprising that the north-south gradient in community structure is best defined by this group. While some overlap in the symbols denoting the four regions of the gulf occurs in the fish ordination (Figure 14a), there is clearly a progressive shift in fish community structure between the northern and southern areas of the gulf. A marked latitudinal shift in community structure is also readily apparent in the invertebrate ordination (Figure 14b), however the tight grouping of stations from the north, mid-north and central regions suggest that these areas support similar invertebrate assemblages. By comparison, stations from the south of the gulf are most dissimilar, and clearly support very different invertebrate communities. The lack of any regional patterns in the plant/algae MDS (Figure 14c), can be largely explained by the absence of these taxa from most deep sites in the south of the gulf.

The extent by which community patterns in plants/algae, invertebrates and fish are related was further assessed by calculating rank correlation coefficients for their respective dissimilarity matrices. The null hypothesis of no relationship between each pairwise comparison was subsequently tested using the RELATE permutation test in PRIMER. The results (Table 5) confirm that there is no strong spatial relationship between the plant/algae community structure in the Spencer Gulf and the overlaying fish and invertebrate assemblages. In comparison, a significant correlation between fish and invertebrate community structures is identified. This shows that over 50% of the variation in among-site relationships for fish may be explained by among-site relationships in invertebrates, and suggests that these two groups are strongly coupled.

Table 5. Mantel correlation coefficients (ρ) for pairwise comparisons of plants/algae, invertebrate and fish community structure in Spencer Gulf. Contrasts are based on root-transformed Bray-Curtis dissimilarities matrices that include 120 transect locations. Significance values for these correlations are provided in brackets.

	Plants/Algae	**Invertebrates**	**Fish**
Plants/Algae	-		
Invertebrates	0.051 (0.228)	-	
Fish	0.204 (0.100)	**0.532** (0.010)	-

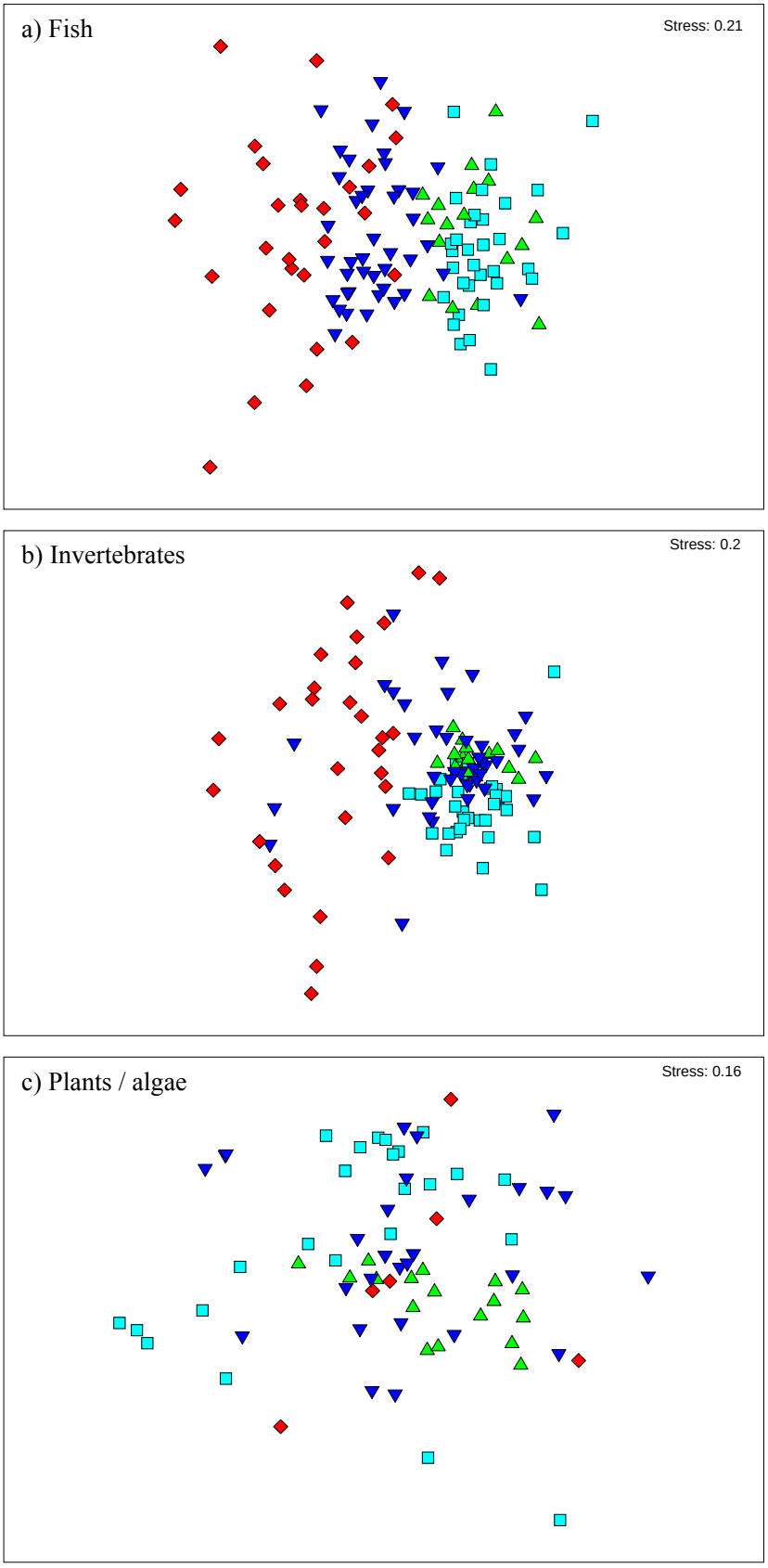

Figure 14. Non-metric MDS plots of (a) fish, (b) invertebrate, and (c) plant/algal community structure at 120 trawl sites sampled in Spencer Gulf during February 2007. Regional symbols superimposed on ordinations are: light-blue squares = north (<120 km from top of gulf (TOG)), green triangles = mid-north (120-160 km from TOG), dark-blue triangles = central (160-220 km from TOG), red diamonds = south (220-300 km from TOG).

3.4.4 Common species

Degens leatherjacket *Thamnaconus degeni* was the most common species collected during the trawl survey (Table 6). This small (< 20 cm) scavenging fish occurred at 75% (91/120) of survey sites and accounted for over 47% of the total abundance ($\overline{\chi}_D$ = 627 individuals per ha) and over 20% of the total biomass ($\overline{\chi}_B$ = 8,265 grams per ha). The target species, western king prawn *Melicertus latisulcatus,* was the second most common species collected. This species was found at 90% (108/120) of the survey sites, and accounted for over 19% of the total abundance ($\overline{\chi}_D$ = 257 individuals per ha), and over 14% of the total biomass ($\overline{\chi}_B$ = 5,705 grams per ha). Most notably, the western king prawn was not found in the deepest trawl sites (> 45 m) located in the extreme south of the gulf and was also absent from a few near-shore sites in the south-western gulf (Appendix 3). Two other species, the blue swimmer crab *Portunus pelagicus* and the skipjack trevally *Pseudocaranx wrighti*, comprised over 5% of the total abundance and more than 3% of the total biomass. The blue swimmer crab occurred at 89/120 sites and was not collected south of a line from Port Neill to Port Victoria (see Appendix 3). In contrast, skipjack trevally was broadly distributed, being encountered at 85% (102/120) of all sites.

Table 6. Mean abundance and biomass of the 20 numerically most common species collected from 120 prawn trawl shots in the Spencer Gulf. All estimates presented are standardised measures per hectare. Note that a total abundance of 1327 individuals per hectare and a total biomass of 39,768 grams per hectare were used to calculate relative (%) abundances and biomasses.

Rank Abundance	Species Name	Common Name	Abundance (n/ha)	Abundance (% total)	Biomass (g/ha)	Biomass (% total)
1	*Thamnaconus degeni*	Degens Leatherjacket	627.41	47.30	8265.79	20.79
2	*Melicertus latisulcatus*	Western King Prawn	257.77	19.43	5705.06	14.35
3	*Portunus (Portunus) pelagicus*	Blue Swimmer crab	100.96	7.61	6852.95	17.23
4	*Pseudocaranx wrighti*	Skipjack Trevally	75.74	5.71	1461.67	3.68
5	*Scobinichthys granulatus*	Rough Leatherjacket	43.43	3.27	753.96	1.90
6	*Parequula melbournensis*	Silverbelly	27.37	2.06	408.25	1.03
7	*Upeneichthys vlamingii*	Red Mullet	26.27	1.98	784.59	1.97
8	*Sepioteuthis australis*	Southern Calamary	13.40	1.01	412.94	1.04
9	*Acanthaluteres vittiger*	Toothbrush Leatherjacket	13.29	1.00	227.46	0.57
10	*Trichomya hirsuta*	Hairy Mussel	11.93	0.90	223.90	0.56
11	*Trachurus declivis*	Jack Mackerel	11.31	0.85	515.06	1.30
12	*Parapriacanthus elongatus*	Slender Bullseye	10.46	0.79	57.37	0.14
13	*Repomucenus calcaratus*	Spotted Stinkfish	9.90	0.75	135.44	0.34
14	*Lepidotrigla papilio*	Spiny Gurnard	8.27	0.62	110.27	0.28
15	*Sillago bassensis*	Silver Whiting	5.92	0.45	259.16	0.65
16	*Mimachlamys asperrima*	Doughboy Scallop	4.82	0.36	50.36	0.13
17	*Maxillicosta scabriceps*	Little Scorpion Fish	4.55	0.34	58.55	0.15
18	*Acanthaluteres spilomelanurus*	Bridled Leatherjacket	4.34	0.33	44.37	0.11
19	*Metapenaeopsis sp.*	Strawberry Prawn	3.97	0.30	12.72	0.03
20	*Neoplatycephalus richardsoni*	Tiger Flathead	3.66	0.28	260.03	0.65

A further sixteen species (including rough leatherjacket *Scobinichthys granulatus*, silverbelly *Parequula melbournensis*, red mullet *Upeneichthys vlamingii*, southern calamary *Sepioteuthis australis*, toothbrush leatherjacket *Acanthaluteres vittiger*, hairy mussel *Trichomya hirsute*, jack mackerel *Trachurus declivis*, slender bullseye *Parapriacanthus elongates*, spotted stinkfish *Repomucenus calcaratus*, spiny gurnard *Lepidotrigla papilio*, silver whiting *Sillago bassensis*, doughboy scallop *Mimachlamys asperrima*, little scorpion fish *Maxillicosta scabriceps*, bridled leatherjacket *Acanthaluteres spilomelanurus*, strawberry prawn *Metapenaeopsis* sp., and tiger flathead *Neoplatycephalus richardsoni*) accounted for between 0.28 and 3.27% of the total abundance ($\overline{\chi}_D$ = 3.66 - 43.43 individuals per ha), and between 0.65 and 1.97% of the total biomass ($\overline{\chi}_B$ = 12.72 - 784.59 grams per ha). All other organisms

(375 species) were found in relatively low densities, and collectively contributed less than 5% to the total abundance and 34% to the total biomass.

The densities of seven (western king prawn *Melicertus latisulcatus*, the blue swimmer crab *Portunus pelagicus*, the rough leatherjacket *Scobinichthys granulatus*, the red mullet *Upeneichthys vlamingii*, the southern calamary *Sepioteuthis australis*, the little scorpion fish *Maxillicosta scabriceps*, and the strawberry prawn *Metapenaeopsis* sp.) of the 20 most abundant species differed significantly among the three trawl intensities (Table 7, Figure 15). All but one of these species (red mullet) were significantly more abundant in the intensively fished areas (moderate and high). The target species, western king prawn *Melicertus latisulcatus*, was more than four times as abundant on moderate and highly fished grounds ($\overline{\chi}$ = 150-179 individuals per hectare) than lightly fished 'low intensity' grounds ($\overline{\chi}$ = 33 individuals per hectare). Blue swimmer crabs *Portunus pelagicus* and rough leatherjacket *Scobinichthys granulatus* were also more than four times as abundant on moderate and highly fished grounds than lightly fished ones. In contrast, the red mullet *Upeneichthys vlamingii,* was three times less prevalent on the most intensively fished grounds ($\overline{\chi}$ = 4 individuals per hectare), than on low and moderately fished areas ($\overline{\chi}$ = 13-18 individuals per hectare).

The biomasses of 12 of the 20 most common species differed significantly among categories of trawl effort intensity (Table 8, Figure 16), including all seven species displaying significant spatial differences in abundance. The other five species were: silverbelly *Parequula melbournensis*, jack mackerel *Trachurus declivis*, silver whiting *Sillago bassensis*, doughboy scallop *Mimachlamys asperrima* and bridled leatherjacket *Acanthaluteres spilomelanurus*.

Because abundance and biomass co-vary for most common species, spatial differences in biomass mirror observed trends in abundance. Consequently, biomasses for western king prawn *Melicertus latisulcatus*, blue swimmer crab *Portunus pelagicus*, rough leatherjacket *Scobinichthys granulatus,* southern calamary *Sepioteuthis australis*, little scorpion fish *Maxillicosta scabriceps*, and strawberry prawn *Metapenaeopsis* sp. were all significantly higher on the moderate to high intensity trawl grounds than low intensity grounds (Table 8). The abundance and biomass of red mullet, *Upeneichthys vlamingii*, was significantly lower on the high intensity trawl grounds. All additional taxa showing significant trawl-related differences (i.e. silverbelly *Parequula melbournensis*, jack mackerel *Trachurus declivis*, silver whiting *Sillago bassensis*, doughboy scallop *Mimachlamys asperrima* and bridled leatherjacket *Acanthaluteres spilomelanurus*) had significantly lower biomasses on the most intensively trawled grounds (i.e. moderate and/or high).

Two by-product species are harvested by Spencer Gulf prawn fishers, southern calamary *Sepioteuthis australis*, and Balmain bug *Ibacus peronii*. Southern calamary was the eighth most abundant species found in Spencer Gulf, while the Balmain bug was ranked 31 in terms of abundance. Both species were broadly distributed throughout the Gulf, with southern calamary and Balmain bugs found at 93% (112/120) and 53% (64/120) of survey sites respectively. Southern calamary accounted for 1% of the total abundance ($\overline{\chi}_D$ = 13.4 individuals per ha), and 1% of the total biomass ($\overline{\chi}_B$ = 413 grams per ha). Balmain bugs accounted for <0.1% of the total abundance ($\overline{\chi}_D$ = 1.23 individuals per ha), and <1% of the total biomass ($\overline{\chi}_B$ = 201 grams per ha). The proportion of both abundance and biomass of southern calamary and Balmain bugs found in high intensity trawl grounds was 14% and 3%, respectively. While the abundance and biomass of southern calamary was significantly higher in areas of high and medium trawl intensity compared to sites of low trawl intensity, the abundance and biomass of Balmain bugs did not differ significantly in relation to trawl intensity.

Table 7. Results of one-way ANOVA's for differences in species abundance across differing trawl effort intensities (low, moderate and high) over the period 2003 to 2007. Species that display significant ($p < 0.05$) differences in abundance across the three intensities are highlighted bold. Homogeneous groups of means identified from *post hoc* SNK tests are highlighted by similar shades of grey backfill. Note all densities presented have been back-transformed from Log10(n+1) to aid interpretation.

Rank	Species	Common Name	Mean Abundance (n/ha) ± s.e.			F (2,117)	*p*
			Low (n = 83)	**Moderate** (n = 27)	**High** (n = 10)		
1	*Thamnaconus degeni*	Degens Leatherjacket	14.76 ± 0.37	10.98 ± 0.59	8.12 ± 0.48	0.256	0.774
2	*Melicertus latisulcatus*	Western King Prawn	33.02 ± 0.31	178.40 ± 0.33	150.08 ± 0.56	6.969	**0.001**
3	*Portunus (Portunus) pelagicus*	Blue Swimmer crab	10.83 ± 0.27	67.80 ± 0.47	62.36 ± 0.32	8.878	**<0.001**
4	*Pseudocaranx wrighti*	Skipjack Trevally	14.91 ± 0.25	23.03 ± 0.41	9.80 ± 0.58	0.738	0.480
5	*Scobinichthys granulatus*	Rough Leatherjacket	8.21 ± 0.19	25.98 ± 0.40	55.23 ± 0.59	8.624	**<0.001**
6	*Parequula melbournensis*	Silverbelly	7.66 ± 0.22	6.20 ± 0.36	1.20 ± 0.39	2.901	0.059
7	*Upeneichthys vlamingii*	Red Mullet	12.60 ± 0.15	18.02 ± 0.23	4.21 ± 0.71	3.654	**0.029**
8	*Sepioteuthis australis*	Southern Calamary	5.69 ± 0.12	10.61 ± 0.23	19.21 ± 0.22	6.816	**0.002**
9	*Acanthaluteres vittiger*	Toothbrush Leatherjacket	5.61 ± 0.16	4.60 ± 0.26	3.25 ± 0.29	0.615	0.542
10	*Trichomya hirsuta*	Hairy Mussel	1.11 ± 0.17	1.27 ± 0.30	0.09 ± 0.09	1.186	0.309
11	*Trachurus declivis*	Jack Mackerel	1.18 ± 0.18	0.17 ± 0.09	0.18 ± 0.13	2.964	0.055
12	*Parapriacanthus elongatus*	Slender Bullseye	1.81 ± 0.15	3.65 ± 0.38	4.76 ± 0.59	2.229	0.112
13	*Repomucenus calcaratus*	Spotted Stinkfish	2.09 ± 0.17	3.22 ± 0.38	0.27 ± 0.20	2.533	0.084
14	*Lepidotrigla papilio*	Spiny Gurnard	2.90 ± 0.15	4.28 ± 0.28	1.98 ± 0.28	0.930	0.398
15	*Sillago bassensis*	Silver Whiting	0.94 ± 0.13	1.23 ± 0.22	0.00 ± 0.00	2.109	0.126
16	*Mimachlamys asperrima*	Doughboy Scallop	0.45 ± 0.12	0.04 ± 0.03	0.00 ± 0.00	2.213	0.114
17	*Maxillicosta scabriceps*	Little Scorpion Fish	1.48 ± 0.10	5.89 ± 0.21	3.94 ± 0.35	13.669	**<0.001**
18	*Acanthaluteres spilomelanurus*	Bridled Leatherjacket	1.60 ± 0.14	0.46 ± 0.19	0.70 ± 0.44	2.945	0.057
19	*Metapenaeopsis* sp.	Strawberry Prawn	1.30 ± 0.10	3.02 ± 0.25	3.54 ± 0.42	5.169	**0.007**
20	*Neoplatycephalus richardsoni*	Tiger Flathead	1.70 ± 0.12	1.10 ± 0.20	0.24 ± 0.12	2.972	0.055

Table 8. Results of one-way ANOVA's for differences in species biomass by trawl effort intensity (low, moderate and high) over the period 2003 to 2007. Species that display significant ($p < 0.05$) differences in biomass across the three intensities are highlighted bold. Homogeneous groups of means identified from *post hoc* SNK tests are highlighted by similar shades of grey backfill. Note all biomass estimates have been back-transformed from Log10(grams+1) to aid interpretation.

Rank	Species	Common Name	Mean Biomass (grams/ha) ± s.e.			F (2,117)	*p*
			Low (n = 83)	**Moderate** (n = 27)	**High** (n = 10)		
1	*Thamnaconus degeni*	Degens Leatherjacket	101.13 ± 0.52	80.24 ± 0.81	113.94 ± 0.79	0.053	0.948
2	*Melicertus latisulcatus*	Western King Prawn	525.24 ± 0.43	4778.16 ± 0.34	4413.43 ± 0.56	7.609	**0.001**
3	*Portunus (Portunus) pelagicus*	Blue Swimmer crab	233.54 ± 0.56	2532.92 ± 0.94	3898.58 ± 0.34	5.688	**0.004**
4	*Pseudocaranx wrighti*	Skipjack Trevally	182.66 ± 0.39	312.22 ± 0.62	133.69 ± 0.65	0.484	0.618
5	*Scobinichthys granulatus*	Rough Leatherjacket	118.01 ± 0.30	380.68 ± 0.49	715.16 ± 1.11	4.456	**0.014**
6	*Parequula melbournensis*	Silverbelly	58.12 ± 0.36	42.61 ± 0.61	5.03 ± 0.81	3.250	**0.042**
7	*Upeneichthys vlamingii*	Red Mullet	290.89 ± 0.24	423.69 ± 0.25	31.89 ± 1.73	6.743	**0.002**
8	*Sepioteuthis australis*	Southern Calamary	124.58 ± 0.23	248.95 ± 0.37	579.27 ± 0.21	4.166	**0.018**
9	*Acanthaluteres vittiger*	Toothbrush Leatherjacket	56.21 ± 0.28	41.47 ± 0.56	46.21 ± 0.60	0.197	0.821
10	*Trichomya hirsuta*	Hairy Mussel	3.3 ± 0.32	3.66 ± 0.61	0.53 ± 0.53	0.865	0.424
11	*Trachurus declivis*	Jack Mackerel	6.48 ± 0.40	0.72 ± 0.35	1.5 ± 0.85	3.309	**0.040**
12	*Parapriacanthus elongatus*	Slender Bullseye	5.27 ± 0.24	11.64 ± 0.53	16.83 ± 1.03	2.024	0.137
13	*Repomucenus calcaratus*	Spotted Stinkfish	9.36 ± 0.32	14.7 ± 0.74	0.99 ± 0.62	2.409	0.094
14	*Lepidotrigla papilio*	Spiny Gurnard	16.89 ± 0.30	32.06 ± 0.46	11.96 ± 0.63	0.972	0.381
15	*Sillago bassensis*	Silver Whiting	6.81 ± 0.35	9.74 ± 0.69	0.00	3.139	**0.047**
16	*Mimachlamys asperrima*	Doughboy Scallop	1.21 ± 0.20	0.09 ± 0.07	0.00	3.356	**0.038**
17	*Maxillicosta scabriceps*	Little Scorpion Fish	9.11 ± 0.24	58.42 ± 0.32	33.15 ± 0.65	10.553	**<0.001**
18	*Acanthaluteres spilomelanurus*	Bridled Leatherjacket	5.22 ± 0.25	0.93 ± 0.33	1.73 ± 0.93	4.030	**0.020**
19	*Metapenaeopsis* sp.	Strawberry Prawn	2.81 ± 0.16	6.45 ± 0.33	8.24 ± 0.47	3.751	**0.026**
20	*Neoplatycephalus richardsoni*	Tiger Flathead	29.38 ± 0.37	15.88 ± 0.74	2.56 ± 0.95	2.741	0.069

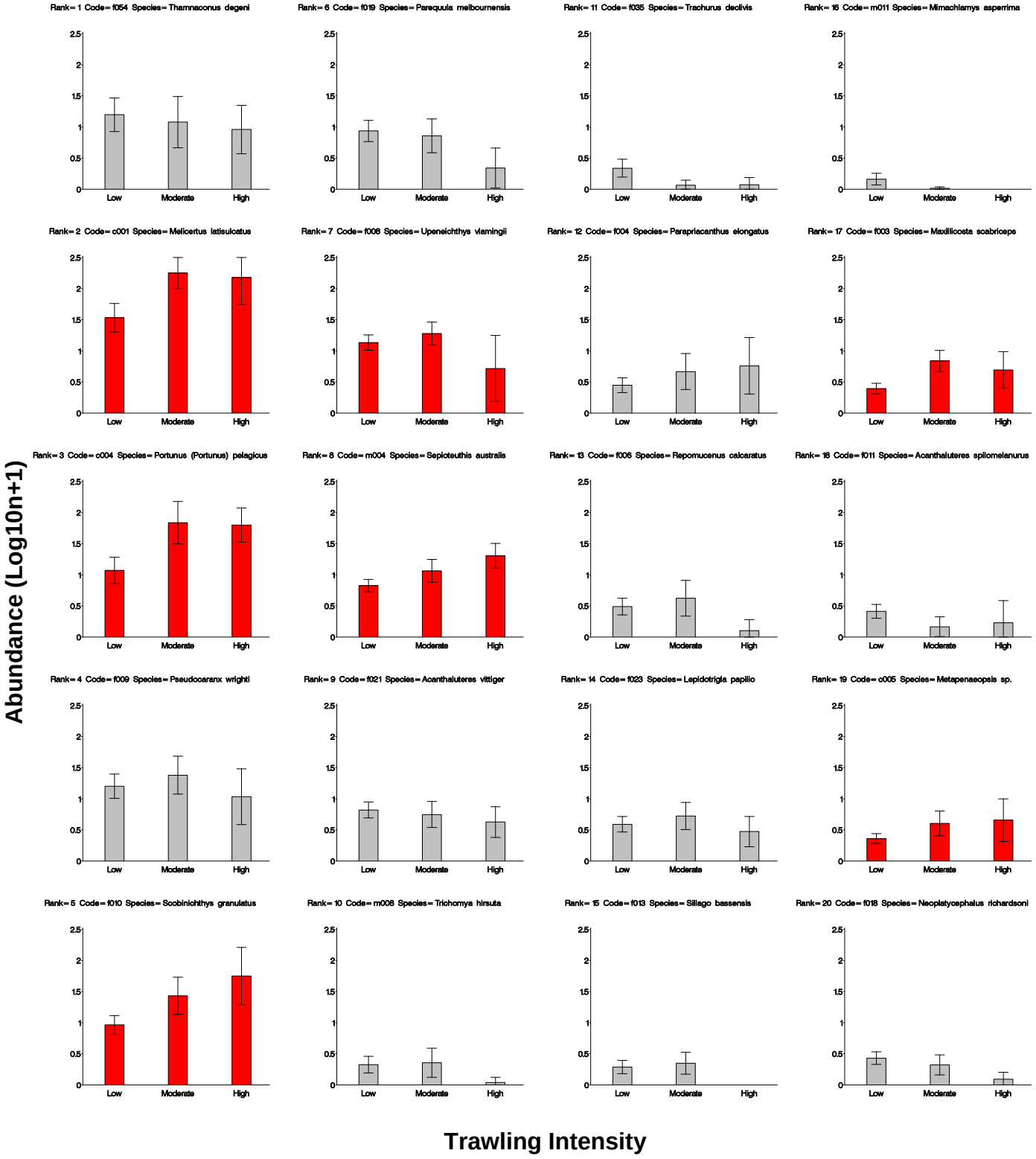

Figure 15. Mean abundance (Log10 (n+1)) of the 20 most abundant species collected from three areas of the Spencer Gulf subject to low (<1 hour fishing per km^2, n = 83), moderate (1-10 hours fishing per km^2, n = 27) and high levels (>10 hours fishing per km^2, n = 10) of prawn trawling effort over the period 2003 to 2007. Graphs are arranged by overall rank abundance and present estimates standardised per hectare ± 95% C.I. Red-filled graphs denote those species that display significant ($p < 0.05$) differences in abundance across the three trawl areas, while grey-filled graphs denote those species for which no significant differences in abundance were detected.

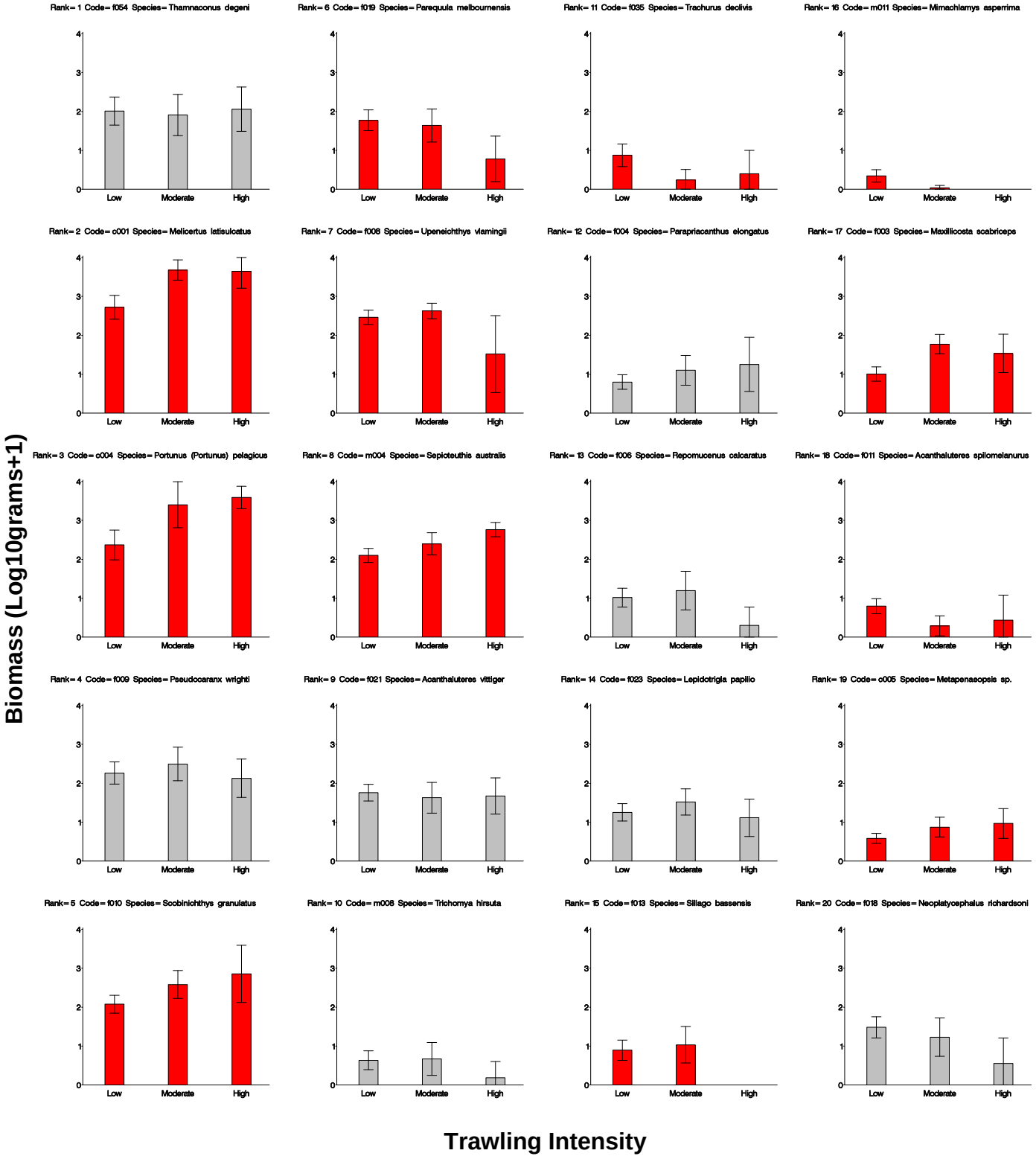

Figure 16. Mean biomass (Log10 wet weight (grams+1)) of the 20 most abundant species collected from three areas of the Spencer Gulf subject to low (<1 hour fishing per km^2, n = 83), moderate (1-10 hours fishing per km^2, n = 27) and high levels (>10 hours fishing per km^2, n = 10) of prawn trawling effort over the period 2003 to 2007. Graphs are arranged by overall rank abundance and present estimates standardised per hectare ± 95% C.I. Red-filled graphs denote those species that display significant ($p < 0.05$) differences in biomass across the three trawl areas, while grey-filled graphs denote those species for which no significant differences in biomass are detectable.

SIMPER analysis was undertaken to determine which species contributed most to similarities within and differences between the four regional (site) groupings. Biomasses of the 11 species contributing ≥ 5% to within-group similarity or between-group dissimilarity for at least one of the four regional groupings are listed in Table 9. Results from the SIMPER analysis indicate that all regional groups are characterised by relatively small subsets of species with wide distributions.

Table 9. Mean biomass (grams per hectare ± s.e.) of captured species in four regional (site) groups identified from MDS classification. Species listed were identified as contributing ≥ 5% to the similarity within and dissimilarity between regional groupings. Those species indicative of each regional grouping (i.e. contributing ≥ 5% to the total similarity within a group) are highlighted in bold. Species are ranked in order of decreasing biomass across all site groupings.

Species	Common Name	Region			
		North (n = 33)	Mid-North (n = 17)	Central (n = 42)	South (n = 28)
Thamnaconus degeni	Degens Leatherjacket	96.97 ± 33.87	308.03 ± 93.48	**7332.47 ± 2286.17**	**24124.8 ± 12124.17**
Portunus pelagicus	Blue Swimmer crab	**8946.59 ± 1841.78**	**7773.09 ± 1274.66**	**9404.14 ± 2189.44**	-
Melicertus latisulcatus	Western King Prawn	**11378.49 ± 1486.93**	**5468.72 ± 1232.85**	**4298.9 ± 794.51**	**1271.23 ± 388.8**
Pseudocaranx wrighti	Skipjack Trevally	**1451.35 ± 340.04**	626.57 ± 419.74	**2095.39 ± 496.68**	**1030.27 ± 286.37**
Heterodontus portusjacksoni	Port Jackson Shark	1101.03 ± 233.92	923.25 ± 268.28	**957.47 ± 165.97**	306.32 ± 154.92
Scobinichthys granulatus	Rough Leatherjacket	**1192.73 ± 247.28**	**1356.34 ± 204.34**	596.89 ± 136.3	106.7 ± 36.09
Upeneichthys vlamingii	Red Mullet	268.05 ± 51.37	511.04 ± 173.91	**1344.74 ± 229.08**	**719.23 ± 191.26**
Trachurus declivis	Jack Mackerel	1.07 ± 1.07	3.52 ± 3.52	52.79 ± 30.09	**2124.83 ± 878.4**
Sepioteuthis australis	Southern Calamary	469.59 ± 72.17	**684.62 ± 114.32**	290.94 ± 53.62	364.24 ± 119.7
Parequula melbournensis	Silverbelly	16.15 ± 5.81	50.98 ± 24.88	**846.78 ± 147.36**	429.5 ± 106.33
Neoplatycephalus richardsoni	Tiger Flathead	35.42 ± 9.94	39.29 ± 19.83	254.76 ± 62.45	**666.67 ± 150.55**

The North group consisted of 181 species, including 21 only collected from this area (e.g. the shield limpet *Tugali ciratricosa*, chiton *Ischnochiton (Heterozona) cariosus*, and six-spine leatherjacket *Meuschenia freycineti*). Like many species comprising this group, these organisms were never present at more than 6% (2/33) of the region's trawl sites. Four species representing two phyla typified this group and contributed more than 5% to the within-group similarity (Table 9). Western king prawn, *Melicertus latisulcatus*, was recognised as the principal species characterising the North group, on account of the organisms exceptionally high biomass (> 2x Mid-North, Central and South) and ubiquitous occurrence at the thirty-three sampling sites. Blue swimmer crab *Portunus pelagicus*, skipjack trevally *Pseudocaranx wrighti* and rough leatherjacket *Scobinichthys granulatus* also characterised the group on account of their widespread distributions (present at > 29/33 (88%) of sites) and their high biomasses, particularly in comparison with sites located in the south of the gulf.

The Mid-North group contained the smallest number of species (152), but also comprised the smallest number of trawl sites (17). This group also supported the smallest proportion of regionally rare species (i.e. only 6 of the 152 species or 4%) that were not sampled in other regions. These species included tommy rough *Arripis georgianus*, the bivalve molluscs *Dosinia victoriae* and *Eucrassatella kingicola*, the ascidians *Halocynthia dumosa* and *Pyura molguloides*, and the green algae *Hormosira banksii.* As was the case for the North group, none of the species confined to the Mid-North area were locally common, and thus were not encountered at a large proportion (>18%, 3/17) of the region's sites. Like the North group, the Mid-North grouping was also characterised by blue swimmer crab *Portunus pelagicus*, western king prawn *Melicertus latisulcatus* and rough leatherjacket *Scobinichthys granulatus*. In addition, southern calamary *Sepioteuthis australis* also typified the group, due to its high biomass and occurrence at all seventeen sites.

The Central group was composed of 252 species, 83% (210/252) of which were found elsewhere in the gulf. The remaining species comprising this group (42) had restricted distributions and were not found outside the Central region. Most organisms found in this group were either invertebrates (48%, 20/42; including black cowry *Zoila friendii thersites*, spindle shell *Fusinus australis* and razor clam *Atrina tasmanica*) or fish (29%, 12/42; including spotted pipefish *Stigmatopora argus*, Macleays crested pipefish *Histiogamphelus cristatus* and gulf catshark *Asymbolus vincenti*). Few, of these species were locally common and none were present at more than 12% (5/42) of the trawl sites in the region. Seven species consistently dominated the biomass at a majority of sampling sites in the region (83%, 35/42) and therefore characterised the areas benthos. These included Degens leatherjacket *Thamnaconus degeni*, western king prawn *Melicertus latisulcatus*, blue swimmer crab *Portunus pelagicus*, skipjack trevally *Pseudocaranx wrighti*, red mullet *Upeneichthys vlamingii*, Port Jackson shark *Heterodontus portusjacksoni* and silverbelly *Parequula melbournensis*.

The South group comprised the richest collection of species (278), and also displayed the highest level of group fidelity. More than one-third of species (94/278) collected from the twenty-eight sites in this area of the gulf were not encountered elsewhere. Of these species, most (71%, 67/94) were invertebrates, and a majority (51%, 48/94) were sponges. The sponge collection included the massive *Spheciospongia papillosa* (a species that can grow to more than 1 m diameter) and the large (0.2 m high) tabular form *Callyspongia bilamellata*. Other invertebrates found exclusively in the area included the little boot holothurian *Ceto cuvieria*, southern sand star *Luidia australiae* and wavy volute *Amoria undulata*. A large number of fish (23) were also only found in the south of the gulf. These included barber perch *Caesioperca razor*, butterfly perch *Caesioperca lepidoptera*, chinaman leatherjacket *Nelusetta ayraudi*, four-spine leatherjacket *Eubalichthys quadrispinis*, knifejaw *Oplegnathus woodwardi*, latchet *Pterygotrigla polyommata*, little pineapplefish *Sorosichthys ananassa*, magpie perch *Cheilodactylus nigripes*, Swallowtail *Centroberyx lineatus*, ornate wobbegong *Orectolobus maculates*, piked dogfish *Squalus megalops*, red cod *Pseudophycis bachus*, red gurnard *Chelidonichthys kumu*, rodless anglerfish *Histiophryne cryptacanthus*, saw shark *Pristiophorus nudipinnis*, senator wrasse *Pictilabrus laticlavius*, sergeant baker *Aulopus purpurissatus*, smooth anglerfish *Phyllophryne scortea*, smoothspine leatherjacket *Cantheschenia longipinnis*, southern roughy *Trachichthys australis*, western roughy *Optivus agrammus*, and whiskered prowfish *Neopataecus waterhousii*. Most of these fish were uncommon and not present at more than one-quarter (7/28) of the southern trawl sites.

A total of six species (including Degens leatherjacket *Thamnaconus degeni*, western king prawn *Melicertus latisulcatus,* skipjack trevally *Pseudocaranx wrighti*, red mullet *Upeneichthys vlamingii*, jack mackerel *Trachurus declivis*, and tiger flathead *Neoplatycephalus richardsoni*) dominated the biomass at most sites (75%, 21/28) in the south of the gulf and therefore typified the regional biota. Notably, the scavenging leatherjacket *Thamnaconus degeni,* was the key discriminator for this group, because of their exceptionally high biomass (> 3x North, Mid-North and Central) in the south of the gulf. It is also notable, that this group did not include the otherwise ubiquitous blue swimmer crab *Portunus pelagicus,* which was entirely absent from southern sites.

3.5 Threatened, endangered and protected species

Seven of the 395 species collected were listed under the *Environment Protection and Biodiversity Conservation Act 1999* as protected. All of these species belong to the Family Syngnathidae (Table 10). Figure 17 shows the distribution of the 112 individuals syngnathids found in the survey, with the "Wardang closure" and "Broughton closure" areas identified as hatchings. These areas are now closed to trawling under an industry code of practice. It should be noted that the abundance data presented in this section of the report represent only those syngnathids found in the sub-samples of the catch i.e. the abundance is not standardised as it is for previous analyses.

One syngnathid was captured in an area of high trawl intensity, while seven individuals from six different sites were captured in areas of moderate trawl intensity. Most syngnathids were captured from areas of low trawl intensity (65 individuals from 18 sites). Syngnathids were also captured within areas now closed to trawling, with 43 individuals found at eight sites.

The common seadragon, *Phyllopteryx taeniolatus*, was the most frequently captured syngnathid during the survey, with 41 individuals collected from 10 trawls. Most individuals were taken from blocks of low trawl intensity. Ten individuals were taken from closed areas and two were taken from areas of moderate fishing intensity.

Despite their contrasting spatial distributions, similar patterns of capture were also observed for the next two most-common syngnathid species, the leafy seadragon *Phycodurus eques* and bigbelly seahorse *Hippocampus abdominalis* (Table 10, Figure 17). For both species most individuals were captured in closed and low intensity trawl areas, and two individuals of each species were captured in medium intensity areas.

Other syngnathids encountered during the trawl survey (including brushtail pipefish *Leptoichthys fistularius*, spotted pipefish *Stigmatopora argus* and Macleays crested pipefish *Histiogamphelus cristatus*) were only collected from a small number trawl shots (<8) located on grounds that were of low trawl intensity or are now closed to trawling.

Of the seven species of syngnathid collected, the tiger pipefish, *Filicampus tigris,* had the highest incidence of capture on the most heavily trawled grounds with one individual captured in each of the high and moderate trawl intensity areas. Tiger pipefish were not captured in areas closed to prawn trawling.

Table 10. Total abundance and frequency of occurrence of seven syngnathid species collected as by-catch from Spencer Gulf during a prawn trawl survey of 120 sites in February 2007. Measures are presented for each species in relation to levels of fishing intensity between 2003 and 2007. Fishing intensity "closed" refers to sites located within areas now closed to prawn trawling. The number of sites in each intensity category is given in brackets.

	Species	Common Name	Abundance				Occurance			
			High	Mod.	Low	Closed	High	Mod.	Low	Closed
F027	*Filicampus tigris*	Tiger Pipefish	1	1	5	0	1	1	5	0
F095	*Hippocampus abdominalis*	Bigbelly Seahorse	0	2	6	13	0	2	5	4
F107	*Histiogamphelus cristatus*	Macleays Crested Pipefish	0	0	0	1	0	0	0	1
F044	*Leptoichthys fistularius*	Brushtail Pipefish	0	0	9	7	0	0	5	2
F045	*Phycodurus eques*	Leafy Seadragon	0	2	9	10	0	2	5	3
F046	*Phyllopteryx taeniolatus*	Common Seadragon	0	2	29	10	0	2	5	3
F078	*Stigmatopora argus*	Spotted Pipefish	0	0	3	2	0	0	3	2
Total			1	7	61	43	1 (10)	6 (27)	18 (75)	8 (8)

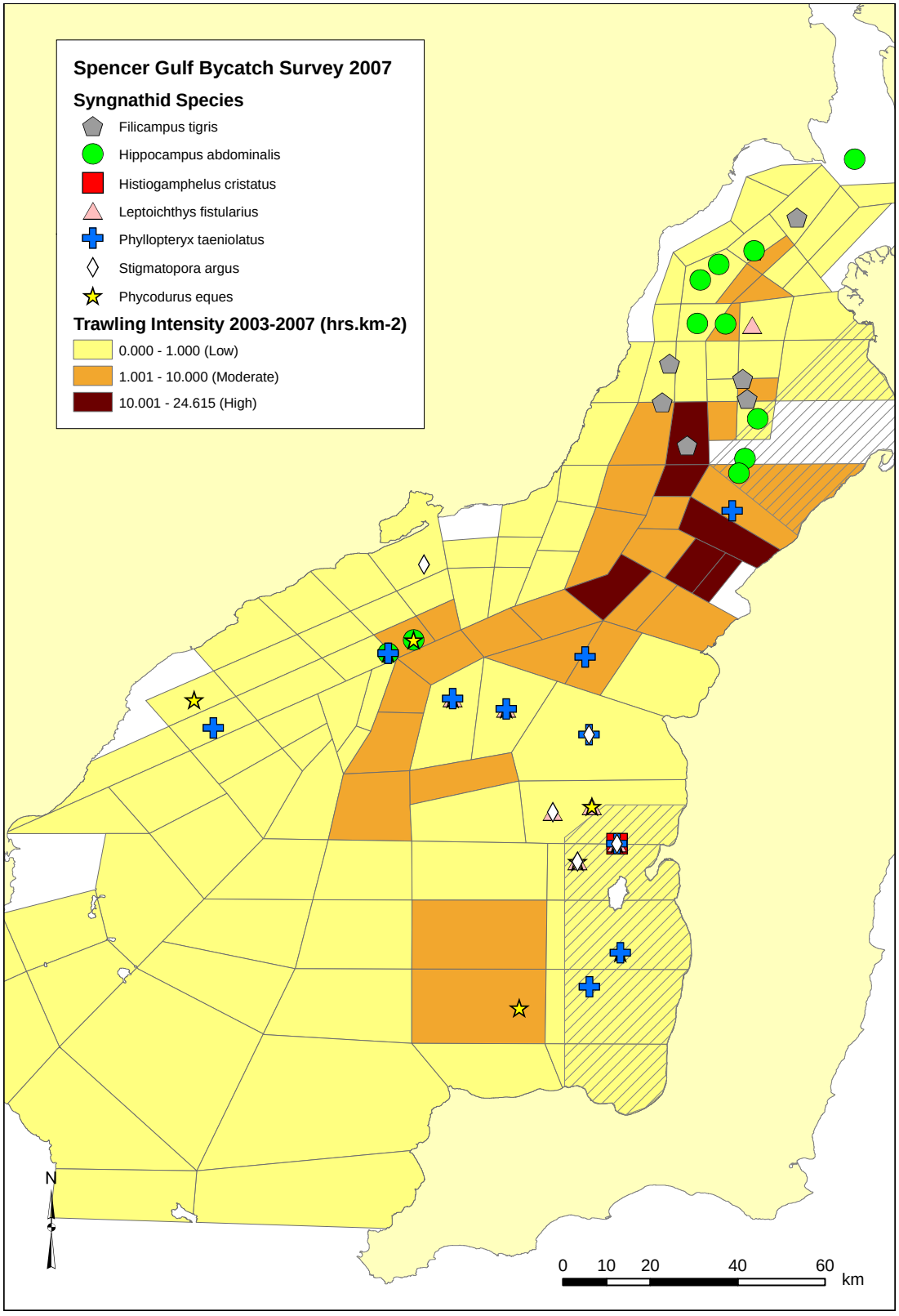

Figure 17. Map of the Spencer Gulf showing the distributions of 7 species of Syngnathid collected as by-catch during a prawn trawl survey of 120 sites in February 2007. Symbols denoting each species are overlayed on a map of mean prawn trawling effort (hours fished / km^2) reported for 119 fishing bocks in Spencer Gulf between 2003 and 2007. Hatched polygons on the eastern side of the gulf denote voluntary spatial closures at Broughton (north) and Wardang (south) implemented by the Spencer Gulf and West Coast Prawn Fisherman's Association.

4 DISCUSSION

4.1 Species composition and spatial distribution

The total of 395 species collected from the 120 x ~30 minute trawls in the present study is higher than the 106 species previously identified for the SGPF by Carrick (1997). The higher number of species collected in the present study reflects three major differences in approach. Firstly, we collected samples from 57 hours of trawling effort whereas Carrick (1997) collected samples from 16 hours of trawling. Secondly, our survey was conducted across a wider area of the Gulf, which included areas voluntarily closed to prawn fishing, whereas Carrick's samples were obtained from regularly fished areas only. Thirdly, we identified all organisms collected to the lowest taxonomic classification possible (generally to the species level), whereas Carrick (1997) only identified the teleosts and a few molluscs and crustaceans to the species level.

By-catch studies that include sites in low intensity trawl grounds (e.g. Stobutzki *et.al.*2003) may identify more species that are potentially impacted by prawn trawling than studies confined to the main fishing grounds (e.g. Kennelly *et al.,* 1998; Svane, 2007; Tonks *et. al.* 2008). Carrick (1997) surveyed at 32 sites in Spencer Gulf in areas of medium and high trawl intensity. Despite differences in the location of sites sampled by Carrick (1997) and in the present study, Carrick (1997) reported a similar number of fish species from a similar amount of trawl effort from those obtained from medium and high trawl intensity areas in the present study (Carrick, 95 species from 16 hours; present study, 85 species from 17.6 hours). The inclusion of low trawl intensity sites in the present study resulted in the collection of an additional 47 fish species that were not captured from areas of medium and high trawl intensity.

The by-catch-to-prawn ratios estimated in the present study differed among areas with varying trawl histories. The ratio in areas that have been subjected to high trawling intensities was 2.0:1, whereas areas with medium and low intensity trawling histories had ratios of 3.2:1 and 8.7:1, respectively. The by-catch-to-prawn ratios estimated for trawled areas in two previous studies of Spencer Gulf, i.e. 3.5:1 by Carrick (1997) and 2.2:1 by Svane *et al*. (2007), are comparable to the estimates obtained for medium and high intensity trawl grounds in the present study. Higher by-catch-to-prawn ratios have been reported for trawled areas in other Australian prawn fisheries. For example, by-catch-to-prawn ratios of 4.3:1 and 10.4:1 have been reported for heavily trawled areas in the North Queensland Prawn Fishery (Poiner *et al*., 1998) and New South Wales Oceanic Prawn Fishery, respectively (Kennelly *et al*., 1998). Hence, the by-catch-to-prawn ratio in regularly trawled areas of Spencer Gulf is relatively low in comparison to those in other Australian prawn fisheries. However, such comparisons must be interpreted with caution as differences in habitat type, fishing methodology, and the level and frequency of fishing effort make direct comparisons between fisheries difficult.

4.2 Relationships with trawl effort history and environmental parameters

4.2.1 Overall species richness, abundance and biomass

Patterns of total abundances and biomasses in Spencer Gulf may, in part, reflect differences in oceanographic conditions. The high total abundances and biomasses recorded at sites on the western side of the gulf may reflect the inflow of nutrient-rich water from the shelf in this region (Nunes Vaz *et. al.* 1990). In contrast, the total abundances and biomasses were generally low in the eastern gulf where nutrient-depleted water flows outward. Interestingly, species richness was inversely correlated with total abundance and biomass and was high in the eastern gulf and low in the west.

Whilst mean abundance and biomass was substantially lower at high trawl intensity sites, the differences among trawl intensity areas were not statistically significant, due to the extremely high abundance and biomass at a small number of sites in the north and south of the Gulf.

4.2.2 Community structure

Although distance from the top of the gulf, and to a lesser extent depth, explain most of the variation in community structure, it is unlikely that either variable is the primary casual factor in structuring the benthos. Depth, for example, co-varies with many other environmental variables (e.g. turbidity, sediment grain size) which directly affect the distribution of benthic species and communities, while both salinity and temperature generally decline with increasing distance from the top of the gulf (Heggie and Skyring, 1999). Studies conducted elsewhere in temperate Australia (Loneragan *et al*., 1989; Edgar *et al*., 1999; Hirst, 2004) have generally concluded that salinity predominantly structures diversity and community composition of estuarine biota and it seems reasonable to infer that the large north-south salinity gradient reported for the Spencer Gulf (Nunes and Lennon, 1986) also plays a role in structuring its marine benthos.

The identification of a strong north-south gradient in the species composition of the benthic communities in Spencer Gulf is an important finding because it provides a spatial framework for future assessment and management of the impacts of prawn trawling. Future studies should be designed to take into account these broad spatial patterns of distribution and abundance, i.e. the existence of North, Mid-North, Central and South groups. This is important because the regional differences among these communities appear to be larger than the variations resulting from the effects of trawling. These findings contrast with the conclusion of Svane *et al.* (2009) that the differences in community structure among five sites in Spencer Gulf were primarily due to differences in trawl effort rather than biophysical factors.

4.2.3 Taxonomic groups

The total abundances and biomasses recorded in this survey were dominated by chordates (fish) and crustaceans, which were both widely distributed in Spencer Gulf. These findings were consistent with those of Carrick (1997) who reported that small fin-fish dominated catches of commercial trawls at 32 sites in the northern and central Spencer Gulf during February 1996. Fish and crustaceans also comprise the majority of the catch of prawn fisheries in locations such as Joseph Bonaparte Gulf (Tonks *et al.* 2008) and oceanic waters off New South Wales (Kennelley *et. al.* 1998).

Poriferans (sponges) accounted for 10% of the biomass in the current study, which reflects their broad distribution and their frequently large size (i.e. >1 m diameter). In previous studies, Carrick (1997) reported relatively low levels of biomass for poriferans, whereas Svane *et al*. (2007) found that sessile epibenthos (i.e. sponges, bryozoans, bivalves) dominated the by-catch. These contrasting results are likely to reflect the spatial differences in the locations surveyed in the two previous studies. For example, Carrick (1997) only surveyed areas where trawl intensity was high or medium, and the study of Svane et al (2007) was limited to five sites in northern Spencer Gulf.

The very low biomasses of poriferans and bryozoans that we recorded in heavily trawled areas support the generalisation that these taxa are particularly susceptible to demersal trawling. This is because they are sessile, long-lived, slow growing, slow to recruit and thus may take years, or even decades, to recover from trawling impacts. Studies in north-western Australia have shown that a single fish trawl can remove up to 90% of the large sponges in its path (Sainsbury *et al*., 1992). Elsewhere in northern Australia, experimental prawn trawling has been shown to deplete sponge biomass by approximately 78% (Burridge *et al*., 2003).

Unfortunately, as no quantitative data are available on sponge and bryozoan distribution in Spencer Gulf prior to the commencement of the fishery, the hypothesis that trawling may explain the spatial differences in the abundances and biomasses of these taxa observed in the present study, could not be formally tested. However, the absence of several widely distributed species of poriferans in heavily trawled areas of Spencer Gulf suggests that prawn trawling may adversely affect these slow growing taxa.

Sessile emergent benthos provides important refuges for the juveniles and adults of some commercial species (Auster *et al*., 1996), and may support diverse faunal assemblages that are important prey for some organisms. The lack of sponges and other erect sessile fauna on the main trawl grounds of the Spencer Gulf may explain the apparently lower biomass of fish on those grounds. While some individual fish species, notably rough leatherjacket and little scorpion fish, did not follow this overall trend, fish biomasses were collectively lower on the most intensively fished grounds. This result is consistent with the findings of Sainsbury (1988) who reported that a measurable decrease in sponge by-catch during trawling led to a reduction in the catches of snappers and emperors, which sheltered among these structures and fed on the emergent fauna. Studies in the north Atlantic have also shown that a reduction in habitat complexity adversely affects the recruitment and survivorship of juvenile cod (Tupper and Boutilier, 1995).

The similarities in the spatial distribution patterns of invertebrates and fish observed in this study have important implications. As the survey was designed to provide comprehensive spatial coverage and did not involve temporal replication, it could be argued that the latitudinal gradient in community structure observed could be confounded with seasonal variation. However, as the invertebrate community was dominated by long-lived, sessile organisms (i.e. sponges) these patterns may be temporally stable. In addition, the high correlation between the underlying patterns in structure of the invertebrate and fish communities, suggest this latitudinal gradient would have been observed regardless of the timing of the survey.

In contrast to the poriferans, the abundances and/or biomasses of crustaceans, rhodophytes and chlorophytes were significantly higher on moderate and/or intensely trawled areas than lightly trawled areas. This may reflect the capacity of these fast growing and fecund groups to rapidly colonise areas disturbed by prawn trawling (e.g. Sainsbury *et al*., 1992).

4.2.4 Common species

Several species of motile benthic scavengers dominated catches throughout Spencer Gulf, including western king prawn, Degens leatherjacket, blue swimmer crab and skipjack trevally. These four species collectively accounted for over 80% of the total abundance and over 50% of the total biomass. This pattern of dominance by a small number of widespread species is not unusual in marine benthic communities. However, the prevalence of scavenging species is noteworthy in light of the large volume of by-catch discarded annually by prawn trawlers in Spencer Gulf and made available as food for these species (Svane *et al*., 2008). Svane *et al*. (2008) found that discarded by-catch is quickly consumed by the large numbers of generalist predators and scavengers at a rate eight times higher than in some tropical fisheries. Several studies have suggested that the discarding of unwanted catch may lead to increases in the size of some scavenging populations (Wassenberg and Hill, 1990; Kaiser and Spencer, 1996; Ramsay *et al*., 1998). It is unclear whether the prevalence of benthic scavengers in Spencer Gulf is a response to the increase in food generated by prawn trawling as no studies of the ecosystem were undertaken prior to the commencement of fishing.

The four community regions identified within Spencer Gulf were characterised by differences in the number of species. Survey stations comprising the northern region of the Spencer Gulf support a moderate-high number of species (181, of which 21 are unique to the area) and are

typified by exceptionally high biomasses of the target species, western king prawn. Stations from the mid-north, by comparison, are dominated by blue swimmer crabs, and support fewer bycatch species (152) and a smaller number of unique species (6). Blue swimmer crabs also characterise the bycatch taken from the central region, but this region also supports relatively higher numbers of species (252) and includes 42 species that are unique to the area. In contrast, stations from the south of the gulf are characterised by Degens leatherjacket, and are found to support the richest collection of species (278) and the highest number of locally unique species (94). Notably, this later group includes a large number of sponges and fish with open coastal affinities, and their rarity elsewhere in the gulf appears to be consistent with the intrusion of oceanic waters at the mouth of the gulf.

Spencer Gulf Prawn fishers can retain two by-product species: the southern calamary, *Sepioteuthis australis,* and Balmain bug, *Ibacus peronii*. Both species were distributed broadly throughout the Gulf. Southern calamary represented 1% of the total survey abundance and biomass, whereas Balmain bugs were <0.1% of total abundance and <1% of the total biomass. Southern calamary was significantly more abundant on high (×4) and medium (×2) intensity trawl grounds, than areas with historically low trawl intensity. Fish predation is considered very substantial in many marine food webs (Bax, 1991) and it may be that the higher abundance of calamary in trawled regions of Spencer Gulf is a result of the lower number of predatory fish in these areas. It may be also reflective of the favourable conditions that by-catch discarding creates for scavenging populations (Wassenberg and Hill, 1990; Kaiser and Spencer, 1996; Ramsay *et. al.*, 1998).

4.3 Threatened, Endangered and Protected species

During the present study, seven species of syngnathids were captured from waters greater than 10 m depth. South Australian Museum records indicate that 11 other syngnathid species have been recorded for Spencer Gulf but were not captured during this study. The most abundant species captured was the common seadragon, *Phyllopteryx taeniolatus,* followed by the leafy seadragon, *Phycodurus eques* and potbelly seahorse, *Hippocampus abdominalis*. Three species of pipefish, brushtail pipefish *Leptoichthys fistularius*, spotted pipefish *Stigmatopora argus* and Macleays crested pipefish *Histiogamphelus cristatus* were captured exclusively on grounds receiving low levels of trawling or areas now closed. In contrast to all other syngnathid species, the tiger pipefish, *Filicampus tigris,* was only captured in trawled areas, including those of medium and high intensity.

A total of 112 individuals were identified in the sub-samples of the trawl catch. This included 43 individuals captured from eight sites in areas now closed to fishing. Of the remainder, 61 were captured in areas of low trawl intensity (from 18 sites), seven were captured in areas of moderate intensity (from 6 sites) and one was captured in an area of high intensity. Due to the relatively small area surveyed and sub-sampling of the catch in this study it hard to accurately characterise the distribution and abundance of each species throughout Spencer Gulf.

There are several reasons why it is difficult to use the findings from our fishery-independent survey to quantify sygnathid capture during commercial fishing. Firstly, this survey provides only a snapshot and does not account for the effects of seasonal variation on population abundance e.g. migration (Lazzari and Able, 1990; Vincent and Sadler, 1995). Secondly, information on historical trawling effort is only available at the scale of fishing block and thus the effort applied at specific site locations is unknown. Finally, the depletion rates associated with commercial prawn trawl effort are unknown. Despite this uncertainty, our results suggest that thousands of syngnathids may be taken annually during commercial prawn trawling in Spencer Gulf (18,438 hrs of commercial trawl effort in 2007/08).

Whilst this is the most comprehensive data set available on syngnathid interactions with the SGPF, the ecological consequences for these species remain unknown. Many captured

syngnathids are likely to be returned to the water alive after trawling, but their subsequent fate is uncertain. It has been reported that syngnathids are taken as prey by several fish species (Whitley and Allan, 1958; Jordan and Gilbert, 1982) and they may be particularly vulnerable to predation after release. Physiological stress associated with trawl capture and release may also result in mortality (Thomas and Chick, 2007). Syngnathids that encounter trawl gear but are not captured by it may also be negatively affected.

A number of approaches could be taken to improve the understanding of the effects of prawn trawling on syngnathids in Spencer Gulf. It would seem sensible to use the current fishery-independent trawl surveys conducted in November, February and April to obtain information on the seasonal distribution and abundance of syngnathids in trawled areas. On-board observing during commercial fishing may also be conducted which could provide seasonal information on capture and depletion rates. Additional studies, such as survival experiments, may also be conducted to improve our understanding on the fate of discarded individuals.

4.4 Future monitoring and research

Most community concern regarding the impacts of prawn trawling is with the possible long-term effects. Unfortunately, natural cyclical change and random between-year variation make long-term trawling impacts difficult to detect. Like many estuaries with populated catchments, Spencer Gulf receives pollution from a wide range of sources including urban and industrial developments, commercial and recreational shipping and agriculture. While some impacts such as the introduction of exotic marine organisms may also be contributing to irreversible changes to the ecology of the Spencer Gulf, the relative significance of prawn trawling in relation to these impacts is unknown.

The magnitude and persistence of the effects of prawn trawling on the benthic communities of Spencer Gulf can only be assessed with a degree of certainty if controlled manipulative experiments are conducted at the scale of the fishery. However, the high costs of these types of studies have often limited their application (Currie and Parry, 1996). While several studies have been undertaken in Spencer Gulf to evaluate the fates and consequences of by-catch discards (Svane 2003, Svane *et al* 2007), no manipulative studies have been done to quantify the direct effects of prawn trawling on habitat structure or the indirect effects of habitat modification on the ecology of the Spencer Gulf. As a result, there is still considerable uncertainty surrounding the effects of prawn trawling on the gulf's benthic ecosystems. The permanent closure of two areas in the Spencer Gulf (off Port Broughton in the north-east, and Wardang Island in the south-east; Figure 4) provides an opportunity to investigate the contribution of prawn trawling to long-term changes in the gulf's ecology. Periodically re-sampling sites located on trawl grounds and in closed areas would provide insights into the future effects of prawn trawling on community structure.

This study provides critical information on the spatial distribution of benthic organisms in Spencer Gulf and provides a baseline for future assessments of trawling impacts. Future assessments of the ecological impacts of the SGPF should include high-quality data on all potentially deleterious human activities, including aquaculture and other commercial fishing activities in the region. Ideally, future surveys would be conducted annually to account for natural variations in recruitment, migration, sea temperature and rainfall. However, given the high costs of conducting these surveys it may be more appropriate to conduct monitoring surveys every 3-5 years. Future assessments will be enhanced by additional information on: 1) seasonal patterns in the distribution of motile taxa and species composition of the by-catch; 2) species-specific changes in catch rates during commercial fishing (i.e. depletion studies); and 3) rates of post-trawl survival of species that are vulnerable to trawling, especially threatened, endangered and protected species.

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6 ACKNOWLEDGEMENTS

Many people have made significant contributions to this project. In particular, we would like to thank the following onboard observers for efficiently overseeing the field work and ensuring a highly rigorous sampling regime: Alex Chalupa, Dave Craig, Derek Hamer, Chris Izzo and Kate Rodda. The support of the Spencer Gulf and West Coast Prawn Fisherman's Association is also gratefully acknowledged. We thank specially Greg Palmer, who coordinated the survey, and the skippers and crews of the following vessels that took part in the experimental trawling: 'C Vita B', 'Evelyn L', 'Kylett', 'Melanie B', 'Miss Rylee', 'Night Stalker', 'Sandy S' and 'Skandia'. We are also indebted to the skilled team of SARDI taxonomists (Luciana Bucater, Stuart Alexander, Lorenzo Andreacchio and Nadine Hackett) for sorting, identifying and curating an extraordinary amount of biological material during the study; without their dedication and commitment to this project it is unlikely that that the work would have been successfully completed. Funds for this research were provided by PIRSA Fisheries, and we would like to thank Sean Sloan and Martin Smallridge for facilitating this.

Appendix 1. Quality control procedures for by-catch database validation.

Shot nomenclature

- All shot names reconciled with field notes and transcription errors removed 23/07/2008.
- All duplicate shot names recoded and assigned unique key in access database 23/07/2008. This action was necessary as the historical names for some survey shots were repeated in different areas of the Spencer Gulf.

Shots excluded

- A total of 121 by-catch shots were undertaken during the February 2007 survey. One of these shots (Site 13C, Vessel Evelyn B, Date 18/02/2007) was physically duplicated and the fauna was processed in the laboratory. The electronic data for this shot has been places on file (\\Pirsaf02\USER8\Wild Fisheries\Prawns\By-catch Survey 2007\Database\Additional Data\DUPLICATED SHOT (13C).xls) but this information has not been included in the Access database.

Shot Length

- Co-ordinates for start and end-points of shots imported to ArcGIS layer. Distance estimates for extreme values (i.e. lowest = 0.854 km, highest = 4.194 km) checked against database. No correction required 23/07/2008.

Shot Mislabel

- CI inadvertently swapped labels from shots BC2 & 59B. This transcription error was corrected in the Laboratory table of the Access database on 24/07/2008.

Un-landed Shots

- Shot BC41 could not be landed on deck. SR estimated that the shot was similar in size and composition to BC37 (i.e ~20 tonnes of leatherjackets *Thamnaconus degeni,* plus a small number of calamary *Sepioteuthis australis* and jack mackerel *Trachurus declivis*). Following discussions with CD on 24/07/2008, it was agreed that an estimate for 2-nally bins of by-catch derived from BC37 be added to the Access database to account for the missing data at shot BC41. On 24/07/2008 the following three lines were added to the 'Laboratory' table of the Access database:

ID	Site	Code	Weight	Length	Sex	Remain Weight	Remain Count
41484	bc41	F054				40073	3127
41485	bc41	F035				156	4
41486	bc41	M004				368	10

Miscellaneous Shots

- CP1, Sandy S, 17/02/2007. As the deck crew removed half of the prawns from the by-catch nally bin, the total count (266) and weight (10922g) of prawns (C001 *Melicertus latisulcatus*) recorded for this shot has been doubled and inserted in the remainder count/weight cells of the 'Laboratory' table in the Access database: DC 24/07/2008.
- CP12, Sandy S, 17/02/2007. Because the deck crew removed half of the prawns from the by-catch nally bin, the total count (124) and weight (5617g) of prawns (C001 *Melicertus latisulcatus*) recorded for this shot has been doubled and inserted in the remainder count/weight cells of the 'Laboratory' table in the Access database: DC 24/07/2008.

Catch Estimate

- The electronic entry for total by-catch volume for each shot ('Vessel' table; nally bins) was double checked against the observer logs. No transcription errors and no correction required DC 25/07/2008.
- One level nally bin of by-catch was to be taken from each shot, however, half-bin subsamples were collected from eleven of the Miss Rylee shots (BC12, C7, Z1/7, Z2/10, Z2/11, Z3/8, 2, BC8, C14, SHW7, Z2/13) due to a lack of available freezer bags/tags (KR *pers. com.*). To ensure that the under-sampling is not overlooked during standardisation a new variable (BinSTD) was added to the 'Vessel' table of the Access database. This includes a 2x multiplier for the 11 aforementioned Miss Rylee shots.

Standardisation

- The total catch landed on deck, and subsequently retained for laboratory analysis, was less than one (<1) nally bin at 12 shots (BC24, WD3, WD9, BC33, BC35, BC18, 20B, 68, BC42, BC43, CP7, CP3). To ensure proportional representation of these data, the catch standardisation variable (BinSTD) for each of these shots has been coded '1' on the 'Vessel' table of the Access database.

Species Table

- Duplicate codes for Barber Perch (F066, F118) identified. On closer examination it appears that F066 is most probably a Butterfly Perch (*Caesioperca lepidoptera*). Species table updated accordingly. DC 28/07/2008.
- No abundance data were recorded for either the Masked Burrowing Crab (C021) or the White Spotted Skate (F102). These codes have therefore been removed from the species table. DC 28/08/2008.
- Two Demosponge sponge species (S017 & S025) were initially assigned duplicate common and scientific names (Demosponge sp. 5). The latter sponge (S025) has now been renamed Demosponge sp. 64.
- Two Chondropsid sponge species (S007 & S087) were initially assigned duplicate common and scientific names (Chondropsid sp. 1). The latter sponge (S087) has now been renamed Chondropsid sp. 3.
- Two sponges (S039 & S049) are now recognised as ascidians. These have been re-coded to A022 & A023, respectively. Photograph codes have been updated. Associated entries for these revised species have also been corrected in the Laboratory Table. DC 21/08/2008.
- One sponge (S109) but could not confidently assigned to any taxa (amorphous tangle of algae/seagrass/ascidian). As this voucher was only recoded from one location, it has been deleted from the species and laboratory tables. DC 21/08/2008.
- Refinement of the sponge identities has facilitated some consolidation of vouchers and data. The following sponges have now been amalgamated: (S012=S061=S095) (S004=S103), (S027=S036), (S042=S045), (S010=S033), (S040=S098), with the first code in each group taking precedence.
- Species dataset filtered and checked to ensure that all scientific names assigned to each alpha-numeric code are unique.
- The only abiotic code in the species table of the Access database (Rubble; R001) was removed (DC 28/07/2008) to prevent any confusion during interrogation. The associated data held in the Laboratory table was also removed and archived in \\Pirsaf02\USER8\Wild Fisheries\Prawns\By-catch Survey 2007\Database\Additional Data\Rubble.xls.
- New variable "Mobility" added to Species table. This will facilitate assessment of vulnerability and recovery associated with trawling impacts. Only two classes of adult mobility (sessile or motile) have been assigned at this stage (30/07/2008).
- New variable "Guild" added to Species table. This variable is used to classify species according to their primary feeding group. Using published literature (inc. Gomon *et al* for Fish, Edgar for invertebrates) seven trophic groups are assigned (primary producer, primary consumer (deposit), primary consumer (suspension), secondary consumer (benthic predator), tertiary consumer (piscivore), parasite, pelagic).

Laboratory Table

- Check to ensure that data from 120 by-catch shots (only) held in the laboratory table of the Access database. DC 28/07/2008.
- Power curves developed to predict weights for excess megafauna. The formulae used for each species is given below, and was generated using by-catch specimens processed in the laboratory. Were insufficient data were available we have used relationships developed by KR. Note all ray lengths are based on disk widths.

Code	Common Name	Scientific Name	Formula
F031	Port Jackson Shark	*Heterodontus portusjacksoni*	W = 0.000001* L^3.297
F061	Eagle Ray	*Myliobatis australis*	W = 0.0000005*L_{Width}^3.515
F073	Southern Fiddler Ray	*Trygonorrhina dumerilii*	W = 0.000006* L^2.9893
F077	Angel Shark	*Squatina australis*	W = 0.000009* L^3.004

F082	Melbourne Skate	*Dipturus whitleyi*	W = 0.000004* L^3.1225
F088	Southern Shovelnose	*Aptychotrema vincentiana*	W = 0.000006* L^2.8875
F097	Black Stingray	*Dasyatis thetidis*	W = 0.00001* L_{Width}^3.1184
F098	Smooth Stingray	*Dasyatis brevicaudata*	W = 0.00001* L_{Width}^3.1184
F099	Gummy Shark	*Mustelus antarcticus*	W = 0.000006* L^3.012

- Check to ensure no duplicate species or shot lines for remainder variables (i.e. weight & count) in the Laboratory Table of the Access Database. All good DC 4/08/2008.
- Check to ensure cumulative weights for each remainder species are consistent with count. All OK 4/08/2008. (species codes A011, M004, M008, M011, C001, C004, C005, F004, F006, F008, F009, F010, F013, F018, F019, F021, F022, F023, F025, F035, F042, F052, F054, F091).
- General length-weight relationships for extremes ends of Laboratory Table reviewed and outliers corrected, DC 4/08/2008.
- Duplicate case sensitive codes for 40 fish, 9 crustacean, 6 mollusc and 1 sponge species were identified during validation checks. To avoid any errors in summary statistics all alpha-numeric species codes in the Laboratory Table have been converted to lower case. DC 6/08/2008.
- Plots of length-weight relationship generated for all Ascidian and Bryozoan species, and used to identify and amend outliers in database. DC 6/08/2008.
- Balmain Bug (Code C002) plot suggest that a subset of data has used carapace lengths rather then widths as the primarily size measurement. All size measurements corrected by DC 7/08/2008.
- Blue Crab (C004) size-weight relationships verified/corrected for undamaged individuals.
- Size-weight relationships for all outstanding taxa (crustaceans, molluscs, fish) validated and corrected DC 10/08/2008.
- Weight of sponges, seagrass, algae and bryozoans validated DC 18/08/2008.
- "Remainder Count" and "Remainder Weight" scanned for duplicate entry lines (by species and site). All good 18/08/2008.
- Number-weight plots constructed for "Remainder Count" and "Remainder Weight" (by species) to identify outliers. Table corrected DC 18/08/2008.
- Uppercase letters in site codes transformed to lower case in all instances to avoid any duplicate sites. DC 18/08/2008.

Aggregation of Abundance and Biomass

- Abundance and biomass information from the Laboratory table were aggregated by Site and Species using the following steps:
    1. Data lines for non-excess species (Excess not equal to 1) extracted and summary table produced (TEMP 1 – 4564 lines) with total weight and counts.
    2. Data lines with entries for "Remainder Count" and "Remainder Weight" (not null) extracted and summary table produced (TEMP 2 – 390 lines) with total weight and counts.
    3. Summary table (TEMP 3) of all organisms processed in the laboratory at West Beach produced by merging counts and weights from TEMP1 with TEMP2.
    4. Total count and weight for each species in each shot (excluding excess species) derived by multiplying site data in TEMP 3 by standardisation integer (BinSTD variable in Vessel Table of Access database).
    5. Absolute count and weight for all species landed on deck during each shot generated by adding total count and weight information for all excess species (Excess = 1) to TEMP3.
    6. The final aggregated catch for each trawl shot has been added to the Access database as a new table (Catch). (DC 22/08/2008)

Standardising catch

- Standardised weight and count information for each species and shot have been included as new variables ('WtSTD' and 'CountSTD', respectively) in the Catch Table of the Access database. DC 26/08/2008

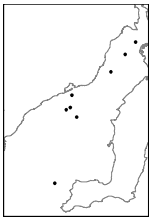
Appendix 2. Mean (5-year average) prawn trawling effort (hours fished / km^2) reported for 119 fishing bocks in Spencer Gulf between 1987 and 2007. Intensity classification employed in ANOVA groups are derived from rank order of fishing effort recorded for the period 2003-2007.

Block No.	1988 - 1992	1993 - 1997	1998 - 2002	2003 - 2007	Intensity Class
43	39.367	59.048	26.948	24.615	High
36	20.149	14.113	17.056	18.324	High
44	14.449	13.441	20.956	17.439	High
31	21.853	29.567	19.066	14.933	High
38	4.296	1.586	9.655	12.655	High
47	1.005	0.819	2.887	11.792	High
46	6.789	6.239	6.229	9.318	Moderate
39	10.415	6.775	7.465	8.752	Moderate
52	9.377	7.803	5.816	6.814	Moderate
35	1.698	0.307	3.867	5.609	Moderate
42	9.007	5.523	5.499	5.445	Moderate
87	2.065	2.390	4.319	3.950	Moderate
40	0.360	0.027	3.167	3.903	Moderate
14	10.957	20.365	2.253	3.596	Moderate
51	7.660	8.839	5.316	2.773	Moderate
65	2.088	5.810	3.291	2.746	Moderate
29	3.970	1.709	0.987	2.531	Moderate
45	1.453	2.274	1.988	2.281	Moderate
15	8.777	12.938	2.537	2.261	Moderate
55	1.429	2.472	2.304	1.709	Moderate
37	0.073	0.010	0.886	1.688	Moderate
50	0.042	0.000	3.579	1.655	Moderate
64	2.551	2.932	2.418	1.647	Moderate
9	9.463	19.552	1.939	1.642	Moderate
27	10.097	6.163	3.231	1.615	Moderate
117	5.623	3.467	2.236	1.578	Moderate
18	2.384	11.501	4.811	1.547	Moderate
53	3.508	2.440	3.789	1.389	Moderate
32	0.604	0.144	1.128	1.347	Moderate
49	0.022	0.018	2.277	1.047	Moderate
84	1.294	0.879	1.133	1.024	Moderate
54	2.069	1.659	0.833	1.013	Moderate
112	1.597	2.459	1.681	1.011	Moderate
26	6.083	5.910	1.151	0.980	Low
69	0.508	0.478	0.919	0.876	Low
124	0.250	0.345	1.621	0.855	Low
58	0.245	3.766	3.145	0.812	Low
59	0.020	2.492	1.129	0.790	Low
24	1.280	2.773	2.175	0.606	Low
8	4.473	6.737	1.377	0.598	Low
17	3.161	3.869	0.818	0.509	Low
94	0.151	0.072	0.340	0.490	Low
23	17.192	12.108	3.442	0.448	Low
118	3.638	1.361	1.197	0.379	Low
57	0.086	1.455	0.849	0.368	Low
25	5.095	1.749	1.235	0.343	Low
56	0.683	4.012	1.947	0.338	Low
28	2.046	1.272	0.698	0.328	Low
7	0.553	0.273	0.321	0.323	Low
68	0.512	0.979	0.256	0.318	Low
63	0.103	0.418	0.245	0.301	Low
92	1.146	0.651	0.770	0.197	Low
101	0.133	1.790	0.260	0.194	Low
110	0.091	1.096	0.747	0.188	Low
70	0.162	0.472	0.229	0.182	Low
102	0.505	0.906	0.204	0.179	Low
62	0.017	0.575	0.286	0.178	Low
111	0.162	2.532	0.649	0.173	Low
73	0.949	0.393	0.315	0.164	Low
116	0.701	0.437	1.488	0.142	Low
119	0.357	0.289	0.046	0.142	Low
19	13.336	6.047	1.604	0.126	Low
67	0.009	0.000	0.283	0.112	Low
60	0.004	0.537	0.144	0.091	Low

Block No.	1988 - 1992	1993 - 1997	1998 - 2002	2003 - 2007	Intensity Class
93	0.244	0.067	0.221	0.078	Low
123	0.284	1.093	0.307	0.076	Low
98	0.626	0.133	0.396	0.068	Low
113	0.123	0.431	0.407	0.064	Low
22	2.155	1.716	0.303	0.061	Low
109	0.019	0.027	0.185	0.054	Low
5	0.060	0.161	0.103	0.049	Low
20	0.117	0.000	0.015	0.049	Low
88	0.000	0.049	0.032	0.045	Low
82	0.000	0.021	0.006	0.041	Low
48	0.001	0.058	0.019	0.040	Low
33	0.000	0.010	0.004	0.035	Low
10	2.794	3.637	0.034	0.034	Low
13	5.122	3.029	0.353	0.033	Low
30	0.008	0.002	0.011	0.029	Low
72	0.153	0.127	0.106	0.027	Low
34	0.078	0.070	0.135	0.025	Low
103	0.095	0.252	0.139	0.025	Low
21	0.005	0.000	0.000	0.021	Low
71	0.077	0.005	0.133	0.020	Low
66	0.009	0.057	0.063	0.017	Low
114	0.004	0.019	0.040	0.017	Low
85	0.050	0.118	0.044	0.016	Low
16	0.067	0.134	0.166	0.015	Low
125	0.079	0.000	0.222	0.013	Low
86	0.042	0.080	0.048	0.009	Low
89	0.024	0.002	0.013	0.009	Low
61	0.000	0.110	0.058	0.008	Low
83	0.091	0.032	0.018	0.008	Low
91	0.021	0.001	0.007	0.005	Low
96	0.008	0.004	0.010	0.003	Low
97	0.000	0.006	0.009	0.003	Low
6	0.002	0.019	0.001	0.002	Low
74	0.008	0.053	0.009	0.002	Low
77	0.000	0.001	0.000	0.002	Low
3	0.013	0.024	0.023	0.001	Low
4	0.148	0.065	0.014	0.001	Low
80	0.002	0.026	0.001	0.001	Low
115	0.220	0.074	0.229	0.001	Low
1	0.000	0.000	0.002	0.000	Low
2	0.040	0.000	0.002	0.000	Low
11	0.014	0.005	0.000	0.000	Low
12	0.006	0.008	0.002	0.000	Low
75	0.000	0.007	0.005	0.000	Low
76	0.000	0.023	0.000	0.000	Low
79	0.000	0.013	0.000	0.000	Low
81	0.000	0.004	0.009	0.000	Low
90	0.002	0.001	0.009	0.000	Low
95	0.001	0.000	0.000	0.000	Low
100	0.043	0.005	0.000	0.000	Low
105	0.000	0.021	0.000	0.000	Low
106	0.000	0.033	0.001	0.000	Low
108	0.000	0.002	0.000	0.000	Low
121	0.000	0.000	0.043	0.000	Low
122	0.047	0.000	0.161	0.000	Low

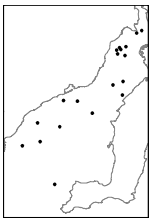
Appendix 3. Distribution of 395 species collected during Spencer Gulf prawn trawl survey.

A001 *Pyura gibbosa* (Heller, 1878) (Urochordata, Pyuridae) CAAB 35 032028



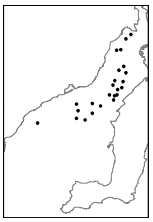
Common name = Sea Tulip
Length = To 405 mm
Depth range = 13.5 - 41.5 m
Sites = 21C, 47B, 69, BC15, BC44, Z1/1, Z3/10, Z3/11
Average biomass = 1.240 g/ha Rank biomass = 260
Average abundance = 0.158/ha Rank abundance = 85

A002 *Ascidia sydneiensis* Stimpson, 1855 (Urochordata, Ascididae) CAAB 35 002018



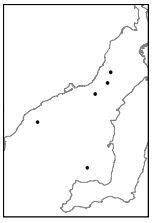
Common name = Blue Ascidian
Length = To 176 mm
Depth range = 13.5 - 41.5 m
Sites = 21C, 26, 30, 44, 50B, 68, 7, 74, 92, 94, BC10, BC11, BC25, BC30, BC4, BC44, C14, WG1, Z1/3
Average biomass = 17.567 g/ha Rank biomass = 125
Average abundance = 0.232/ha Rank abundance = 74

A003 *Herdmania momus* (Savigny, 1816) (Urochordata, Pyuridae) CAAB 35 032008



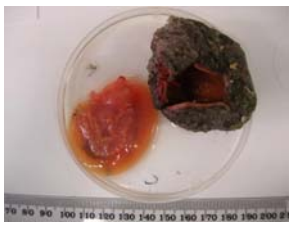
Common name = Spined Ascidian
Length = To 180 mm
Depth range = 13 - 33 m
Sites = 13C, 16, 19, 4, 59B, 5B, 63, 68, 74, 80, 94, 9B, BC10, BC11, BC13, BC15, BC4, CB1, EWL3, FC2, N23, WAL32, Y7, Z3/2
Average biomass = 35.106 g/ha Rank biomass = 90
Average abundance = 0.259/ha Rank abundance = 67

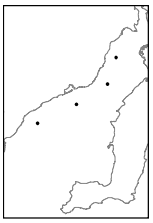
A004 *Polycarpa pedunculata* Heller, 1878 (Urochordata, Styelidae) CAAB 35 033086



Common name = Polycarpa
Length = To 88 mm
Depth range = 14.5 - 26 m
Sites = 69, 78, BC11, BC40, BC6
Average biomass = 0.459 g/ha Rank biomass = 301
Average abundance = 0.042/ha Rank abundance = 185

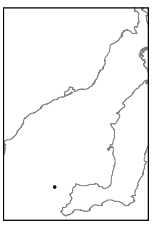
A005 *Pyura abradata* Kott, 1985 (Urochordata, Pyuridae) CAAB 35 032020





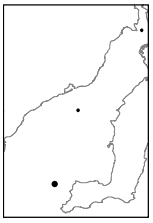
Common name = Pyura sp. 1
Length = To 88 mm
Depth range = 17 - 22.5 m
Sites = 32, 78, BC11, Z3/2
Average biomass = 0.772 g/ha Rank biomass = 280
Average abundance = 0.020/ha Rank abundance = 218

A006 *Tridemnum cerebriforme* Hartmeyer, 1913 (Urochordata, Didemnidae) CAAB 35 013049



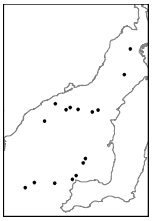
Common name = Tridemnum
Length = To 80 mm
Depth range = 41.5 - 41.5 m
Sites = BC44
Average biomass = 0.477 g/ha Rank biomass = 300
Average abundance = 0.010/ha Rank abundance = 271

A007 *Eudistoma sabulosum* Kott, 1990 (Urochordata, Polycitoridae) CAAB 35 018029



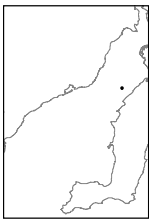
Common name = Eudistoma sp. 1
Length = Not recorded
Depth range = 16.5 - 41.5 m
Sites = 50B, 5B, BC44
Average biomass = 108.316 g/ha Rank biomass = 48
Average abundance = 0.032/ha Rank abundance = 196

A008 *Pyura australis* (Quoy & Gaimard, 1834) (Urochordata, Pyuridae) CAAB 35 032022



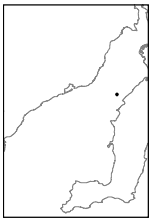
Common name = Sea Tulip sp. 2
Length = To 440 mm
Depth range = 13 - 54.5 m
Sites = 22B, 5B, BC10, BC14, BC2, BC42, BC43, BC44, BC46, BC9, CP1, CP3,
CP7, Z1/5, Z3/10, Z3/11
Average biomass = 30.314 g/ha Rank biomass = 96
Average abundance = 0.777/ha Rank abundance = 44

A009 *Pyura molguloides* (Herdman, 1899) (Urochordata, Pyuridae) CAAB 35 032032



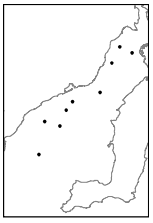
Common name = Pyura sp. 2
Length = To 98 mm
Depth range = 15.5 - 15.5 m
Sites = Y7
Average biomass = 2.087 g/ha Rank biomass = 229
Average abundance = 0.008/ha Rank abundance = 287

A010 *Halocynthia dumosa* (Stimpson, 1855) (Urochordata, Pyuridae) CAAB 35 032004



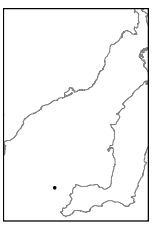
Common name = Christmas Tree Ascidian
Length = To 78 mm
Depth range = 21.5 - 21.5 m
Sites = 4
Average biomass = 0.250 g/ha Rank biomass = 328
Average abundance = 0.005/ha Rank abundance = 312

A011 *Cnemidocarpa radicosa* (Herdman, 1882) (Urochordata, Pyuridae) CAAB 35 033059



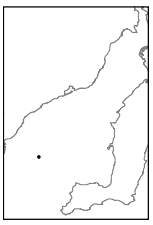
Common name = Cnemidocarpa
Length = To 69 mm
Depth range = 12 - 32 m
Sites = 26, BC1, BC14, BC31, DK1, SHW2, WG1, Z2/13, Z3/10
Average biomass = 4.091 g/ha Rank biomass = 190
Average abundance = 0.977/ha Rank abundance = 39

A012 *Pseudodistoma candens* Kott, 1992 (Urochordata, Pseudodistomidae) CAAB 35 021005



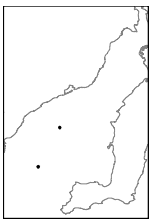
Common name = Pseudodistoma
Length = To 76 mm
Depth range = 41.5 - 41.5 m
Sites = BC44
Average biomass = 0.726 g/ha Rank biomass = 283
Average abundance = 0.010/ha Rank abundance = 271

A013 *Polyclinum marsupiale* Kott, 1963 (Urochordata, Polyclinidae) CAAB 35 019056



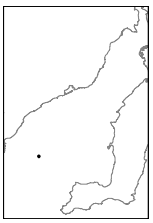
Common name = Polyclinum
Length = To 96 mm
Depth range = 32 - 32 m
Sites = BC31
Average biomass = 0.612 g/ha Rank biomass = 293
Average abundance = 0.006/ha Rank abundance = 301

A014 *Cystodytes dellachiajei* (Della Valle, 1877) (Urochordata, Polycitoridae) CAAB 35 018002



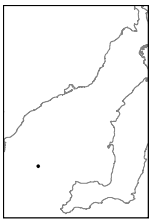
Common name = Cystodytes
Length = To 110 mm
Depth range = 28 - 43 m
Sites = BC38, WG1
Average biomass = 2.180 g/ha Rank biomass = 227
Average abundance = 0.007/ha Rank abundance = 291

A015 *Polysyncraton aspiculatum* Tokioka (Urochordata, Didemnidae) CAAB 35 013000



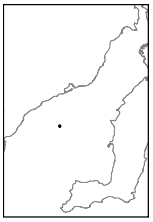
Common name = Polysyncraton
Length = To 40 mm
Depth range = 32 - 32 m
Sites = BC31
Average biomass = 0.032 g/ha Rank biomass = 378
Average abundance = 0.006/ha Rank abundance = 301

A016 *Sigillina cyanea* (Herdman, 1899) (Urochordata, Holozoidae) CAAB 35 015023



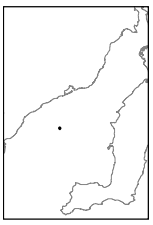
Common name = Sigillina
Length = To 126 mm
Depth range = 43 - 43 m
Sites = BC38
Average biomass = 0.458 g/ha Rank biomass = 302
Average abundance = 0.002/ha Rank abundance = 337

A017 *Phallusia obesa* (Herdman, 1880) (Urochordata, Ascidiidae) CAAB 35 002025



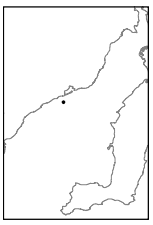
Common name = Phallusia
Length = To 119 mm
Depth range = 15 - 15 m
Sites = 93
Average biomass = 0.519 g/ha Rank biomass = 297
Average abundance = 0.009/ha Rank abundance = 282

A018 *Pyura stolonifera* (Heller, 1878) (Urochordata, Pyuridae) CAAB 35 032041



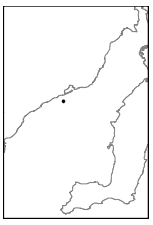
Common name = Cunjuvoi
Length = To 111 mm
Depth range = 28 - 28 m
Sites = WG1
Average biomass = 1.287 g/ha Rank biomass = 258
Average abundance = 0.005/ha Rank abundance = 319

A019 *Didemnum augusti* Michaelsen, 1920 (Urochordata, Didemnidae) CAAB 35 013002



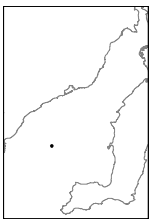
Common name = Didemnum
Length = To 95 mm
Depth range = 20 - 20 m
Sites = Z1/3
Average biomass = 0.697 g/ha Rank biomass = 287
Average abundance = 0.007/ha Rank abundance = 289

A020 *Sycozoa cerebriformis* (Quoy & Gaimard, 1834) (Urochordata, Holozoidae) CAAB 35 015031



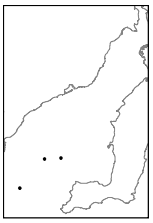
Common name = Holozoid
Length = To 108 mm
Depth range = 20 - 20 m
Sites = Z1/3
Average biomass = 0.220 g/ha Rank biomass = 329
Average abundance = 0.007/ha Rank abundance = 289

A021 *Eudistoma constrictum* Kott, 1990 (Urochordata, Polycitoridae) CAAB 35 018012



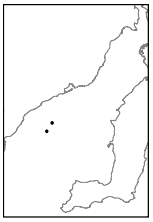
Common name = Eudistoma sp. 2
Length = Not recorded
Depth range = 33 - 33 m
Sites = BC27
Average biomass = 2.173 g/ha Rank biomass = 228
Average abundance = 0.009/ha Rank abundance = 280

A022 *Aplidium caeleste* Monniot, 1987 (Urochordata, Polyclinidae) CAAB 35 019010



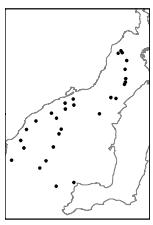
Common name = Sand ascidian
Length = Not recorded
Depth range = 34 - 46.5 m
Sites = BC32, BC34, BC45
Average biomass = 24.124 g/ha Rank biomass = 106
Average abundance = 0.090/ha Rank abundance = 120

A023 *Didemnum spongioides* Sluiter, 1909 (Urochordata, Didemnidae) CAAB 35 013016



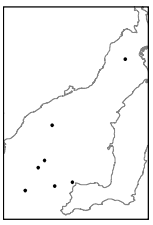
Common name = Sponge ascidian
Length = Not recorded
Depth range = 22 - 25 m
Sites = BC16, BC21
Average biomass = 2.352 g/ha Rank biomass = 223
Average abundance = 0.012/ha Rank abundance = 256

B001 *Celleporaria fusca* (Busk, 1854) (Bryozoa, Lepraliellidae) CAAB 20 418004



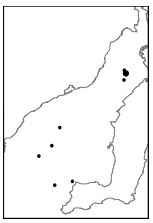
Common name = Celleporaria
Length = Not recorded
Depth range = 13 - 43 m
Sites = 11B, 13C, 19, 20B, 26, 74, 94, BC19, BC2, BC20, BC23, BC27, BC3, BC30, BC34, BC35, BC38, BC4, BC42, BC44, BC9, C7, N23, WG1, Z1/1, Z1/3, Z2/11, Z2/13, Z3/8
Average biomass = 89.294 g/ha Rank biomass = 55
Average abundance = 0.251/ha Rank abundance = 71

B002 *Adeona grisea* Lamouroux, 1816 (Bryozoa, Adeonidae) CAAB 20 405006



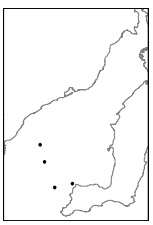
Common name = Adeona
Length = Not recorded
Depth range = 14 - 44 m
Sites = 20B, BC16, BC34, BC38, BC42, BC44, BC46
Average biomass = 38.117 g/ha Rank biomass = 87
Average abundance = 0.071/ha Rank abundance = 130

B003 *Steginoporella chartacea* (Lamarck, 1816) (Bryozoa, Steginoporellidae) CAAB 20 354006



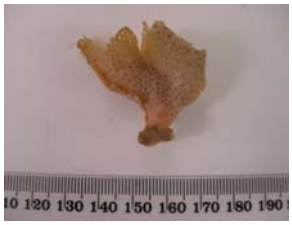
Common name = Steginoporella
Length = Not recorded
Depth range = 13 - 41.5 m
Sites = 58C, 59B, BC27, BC3, BC31, BC42, BC44, WG1
Average biomass = 104.930 g/ha Rank biomass = 50
Average abundance = 0.068/ha Rank abundance = 133

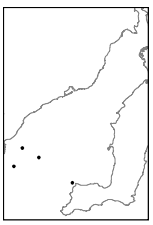
B004 *Cigclisula verticalis* (Maplestone, 1910) (Bryozoa, Stomachetosellidae) CAAB 20 460005



Common name = Cigclisula
Length = Not recorded
Depth range = 28 - 43 m
Sites = BC25, BC34, BC42, BC44
Average biomass = 4.730 g/ha Rank biomass = 178
Average abundance = 0.022/ha Rank abundance = 207

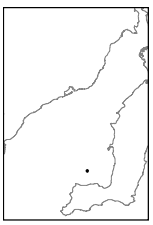
B005 *Triphyllozoon moniliferum* (MacGillivray, 1860) (Bryozoa, Phidoloporidae) CAAB 20 487002





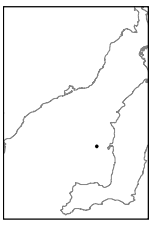
Common name = Lace Bryozoan
Length = Not recorded
Depth range = 22 - 41 m
Sites = BC30, BC31, BC37, BC42
Average biomass = 1.924 g/ha Rank biomass = 234
Average abundance = 0.062/ha Rank abundance = 141

B006 *Amathia tortuosa* Tenison Woods, 1880 (Bryozoa, Vesiculariidae) CAAB 20 231013



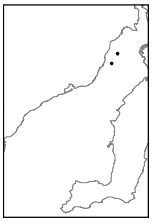
Common name = Amathia sp. 1
Length = Not recorded
Depth range = 26 - 26 m
Sites = BC40
Average biomass = 0.047 g/ha Rank biomass = 373
Average abundance = 0.003/ha Rank abundance = 334

B007 *Amathia wilsoni* Kirkpatrick, 1888 (Bryozoa, Vesiculariidae) CAAB 20 231014



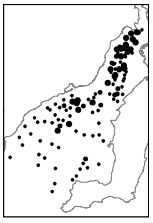
Common name = Amathia sp. 2
Length = Not recorded
Depth range = 20.8 - 20.8 m
Sites = BC28
Average biomass = 0.100 g/ha Rank biomass = 358
Average abundance = 0.002/ha Rank abundance = 341

B008 *Amathia* sp. 3 (Bryozoa, Vesiculariidae) CAAB 20 231000



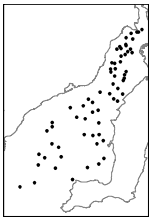
Common name = Amathia sp. 3
Length = Not recorded
Depth range = 14.5 - 21.5 m
Sites = 30, DK1
Average biomass = 0.166 g/ha Rank biomass = 342
Average abundance = 0.011/ha Rank abundance = 262

C001 *Melicertus latisulcatus* (Kishinouye, 1896) (Crustacea, Penaeidae) CAAB 28 711047



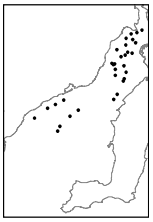
Common name = Western King Prawn
Length = To 64 mm
Depth range = 12 - 44.5 m
Sites = 1, 11B, 12, 13C, 16, 19, 1B, 2, 20B, 21B, 21C, 22B, 23, 26, 30, 32, 36, 3A, 4, 44, 47B, 5, 50B, 57, 58C, 59B, 5B, 61, 63, 68, 69, 7, 70, 72, 74, 78, 7B, 8, 80, 92, 93, 94, 9B, BC1, BC10, BC11, BC12, BC14, BC16, BC17, BC19, BC2, BC20, BC22, BC23, BC24, BC25, BC27, BC3, BC30, BC31, BC34, BC35, BC36, BC38, BC39, BC4, BC40, BC42, BC44, BC47, BC6, BC8, BC9, C14, C7, CB1, CP1, CP12, CP3, CP7, DK1, EWL3, FC2, N23, SG2, SHW2, SHW7, WAL32, WD3, WD4, WD6, WD9, WG1, WG3, X3, Y7, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 5,705.056 g/ha Rank biomass = 3
Average abundance = 257.774/ha Rank abundance = 2

C002 *Ibacus peronii* Leach, 1815 (Crustacea, Scyllaridae) CAAB 28 821004



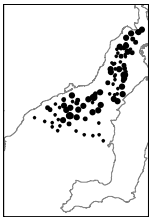
Common name = Balmain Bug (Eastern Balmain Bug)
Length = To 169 mm
Depth range = 12 - 54.5 m
Sites = 1, 12, 16, 21B, 21C, 22B, 23, 26, 36, 44, 5, 50B, 57, 59B, 61, 68, 69, 7, 70, 72, 74, 7B, 8, 92, 94, 9B, BC1, BC10, BC13, BC15, BC16, BC17, BC18, BC2, BC21, BC24, BC27, BC28, BC3, BC31, BC32, BC33, BC34, BC36, BC38, BC39, BC4, BC40, BC42, BC43, BC45, BC8, BC9, CB1, DK1, EWL3, FC2, N23, SG2, SHW2, WD3, WD4, WD6, Z3/11
Average biomass = 201.296 g/ha Rank biomass = 28
Average abundance = 1.231/ha Rank abundance = 31

C003 *Pilumnidae* sp. Leach, 1816 (Crustacea, Pilumnidae) CAAB 28 926000



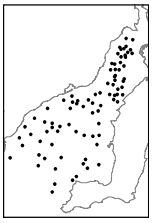
Common name = Hairy Shore Crab
Length = To 26 mm
Depth range = 12 - 33 m
Sites = 11B, 13C, 16, 2, 21B, 21C, 23, 36, 3A, 4, 44, 47B, 5, 50B, 59B, 5B, 72, 74, 8, BC1, BC20, BC3, BC4, CB1, DK1, FC2, WG1, X3, Z1/3, Z1/5, Z1/7
Average biomass = 2.631 g/ha Rank biomass = 212
Average abundance = 0.603/ha Rank abundance = 50

C004 *Portunus (Portunus) pelagicus* (Linnaeus, 1758) (Crustacea, Portunidae) CAAB 28 911005



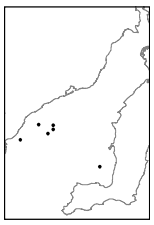
Common name = Blue Swimmer crab
Length = To 158 mm
Depth range = 12 - 33 m
Sites = 1, 11B, 12, 13C, 16, 19, 1B, 2, 20B, 21B, 21C, 22B, 23, 26, 30, 32, 36, 3A, 4, 44, 47B, 5, 50B, 57, 58C, 59B, 5B, 61, 63, 68, 69, 7, 70, 72, 74, 78, 7B, 8, 80, 92, 93, 94, 9B, BC1, BC10, BC12, BC13, BC14, BC15, BC16, BC17, BC18, BC2, BC20, BC24, BC3, BC4, BC6, BC8, BC9, C14, C7, CB1, DK1, EWL3, FC2, N23, SHW2, SHW7, WAL32, WD3, WD4, WD6, WD9, WG1, WG3, X3, Y7, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 6,852.946 g/ha Rank biomass = 2
Average abundance = 100.956/ha Rank abundance = 3

C005 *Metapenaeopsis* sp. (Crustacea, Penaeidae) CAAB 28 711913



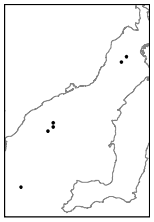
Common name = Strawberry Prawn
Length = To 25 mm
Depth range = 12 - 44.5 m
Sites = 1, 11B, 12, 13C, 16, 19, 1B, 2, 20B, 21B, 21C, 22B, 26, 30, 36, 4, 5, 61, 63, 68, 7, 70, 72, 78, 7B, 8, 80, 92, 93, 94, 9B, BC1, BC10, BC14, BC16, BC17, BC18, BC19, BC20, BC21, BC22, BC23, BC24, BC25, BC27, BC28, BC3, BC30, BC31, BC32, BC34, BC35, BC36, BC38, BC39, BC4, BC40, BC42, BC44, BC47, BC6, BC8, BC9, C14, CB1, CP1, CP3, CP7, DK1, EWL3, N23, SHW2, WAL32, WD3, WD4, WD9, WG1, Y7, Z1/1, Z1/3, Z1/7, Z2/13, Z3/11, Z3/2
Average biomass = 12.717 g/ha Rank biomass = 142
Average abundance = 3.973/ha Rank abundance = 19

C006 *Ovalipes australiensis* Stephenson & Rees, 1968 (Crustacea, Portunidae) CAAB 28 911003



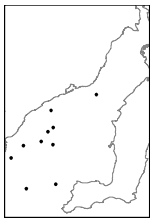
Common name = Sand Crab
Length = To 118 mm
Depth range = 17.5 - 25 m
Sites = BC11, BC16, BC18, BC21, BC23, BC36
Average biomass = 5.689 g/ha Rank biomass = 170
Average abundance = 0.044/ha Rank abundance = 183

C007 *Austrodromidia octodentata* (Haswell, 1882) (Crustacea, Dromiidae) CAAB 28 852001



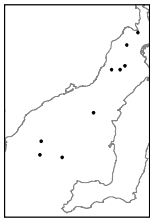
Common name = Bristled Sponge Crab
Length = To 60 mm
Depth range = 14 - 46.5 m
Sites = 12, 20B, BC16, BC18, BC21, BC45
Average biomass = 3.558 g/ha Rank biomass = 196
Average abundance = 0.034/ha Rank abundance = 194

C008 *Paguristes frontalis* (H. Milne Edwards, 1836) (Crustacea, Diogenidae) CAAB 28 827003



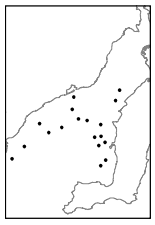
Common name = Common Hermit crab
Length = To 40 mm
Depth range = 15 - 44 m
Sites = BC18, BC21, BC25, BC27, BC30, BC35, BC44, BC46, BC6, C7
Average biomass = 0.924 g/ha Rank biomass = 270
Average abundance = 0.142/ha Rank abundance = 91

C009 *Lamarckdromia globosa* (Lamarck, 1818) (Crustacea, Dromiidae) CAAB 28 852002



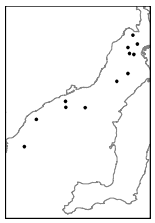
Common name = Shaggy Sponge Crab
Length = To 43 mm
Depth range = 14 - 34 m
Sites = 13C, 23, 44, 70, 80, BC10, BC25, BC31, BC32
Average biomass = 1.802 g/ha Rank biomass = 240
Average abundance = 0.094/ha Rank abundance = 116

C010 *Nectocarcinus integrifrons* (Latreille, 1825) (Crustacea, Portunidae) CAAB 28 911010



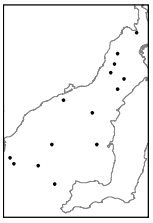
Common name = Rock Crab (Rough Rock Crab)
Length = To 65 mm
Depth range = 14.8 - 28 m
Sites = 16, BC11, BC13, BC15, BC17, BC21, BC28, BC30, BC33, BC35, BC36, EWL3, WD3, WD4, WD6, WG1, Z1/1, Z3/11
Average biomass = 17.483 g/ha Rank biomass = 126
Average abundance = 0.474/ha Rank abundance = 56

C011 *Alpheus villosus* (Olivier, 1811) (Crustacea, Alpheidae) CAAB 28 765001



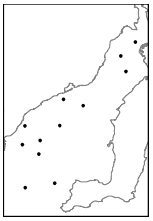
Common name = Snapping Prawn (Hairy Pistol Prawn)
Length = To 19 mm
Depth range = 12 - 27 m
Sites = 21B, 47B, 59B, 63, 7B, 92, BC1, BC20, BC30, FC2, Z1/3, Z2/11
Average biomass = 0.694 g/ha Rank biomass = 288
Average abundance = 0.143/ha Rank abundance = 90

C012 *Leptomithrax gaimardii* (H. Milne Edwards, 1834) (Crustacea, Majidae) CAAB 28 880010



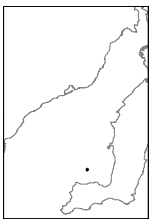
Common name = Great Spider Crab
Length = To 119 mm
Depth range = 13 - 43 m
Sites = 30, 44, 69, 8, BC10, BC27, BC28, BC3, BC35, BC37, BC38, BC44, EWL3, Z1/3
Average biomass = 8.666 g/ha Rank biomass = 161
Average abundance = 0.179/ha Rank abundance = 81

C013 *Actaea calculosa* (H. Milne Edwards, 1834) (Crustacea, Xanthidae) CAAB 28 920002



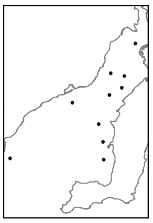
Common name = Facetted Crab
Length = To 19 mm
Depth range = 13 - 44 m
Sites = 47B, 59B, 72, 7B, BC19, BC25, BC30, BC31, BC44, BC46, WG1, Z1/3
Average biomass = 0.396 g/ha Rank biomass = 306
Average abundance = 0.221/ha Rank abundance = 77

C014 *Nerocila laticauda* Schioedte & Meinert, 1881 (Crustacea, Cymothoidae) CAAB 28 223007



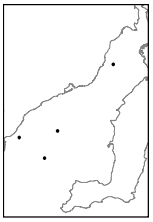
Common name = Nerocila
Length = To 29 mm
Depth range = 26 - 26 m
Sites = BC40
Average biomass = 0.008 g/ha Rank biomass = 390
Average abundance = 0.005/ha Rank abundance = 316

C015 *Naxia aries* (Guérin-Méneville, 1834) (Crustacea, Majidae) CAAB 28 880089



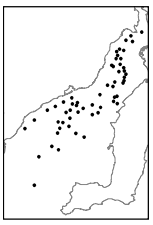
Common name = Spider Crab (Ramshorn Crab)
Length = To 74 mm
Depth range = 13 - 22 m
Sites = 47B, 69, BC17, BC2, BC33, BC35, N23, WD6, Y7, Z2/13
Average biomass = 1.415 g/ha Rank biomass = 254
Average abundance = 0.081/ha Rank abundance = 127

C016 *Alpheus lottini* Guérin-Méneville, 1829 (Crustacea, Alpheidae) CAAB 28 765006



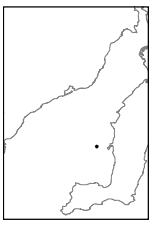
Common name = Pistol Shrimp (Coral Snapping Shrimp)
Length = To 11 mm
Depth range = 16.5 - 43 m
Sites = 11B, BC23, BC34, X3
Average biomass = 0.047 g/ha Rank biomass = 372
Average abundance = 0.032/ha Rank abundance = 197

C017 *Erugosquilla grahami* Ahyong & Manning, 1998 (Crustacea, Squillidae) CAAB 28 051032



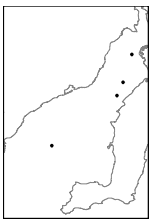
Common name = Mantis Shrimp
Length = To 29 mm
Depth range = 12 - 54.5 m
Sites = 1, 11B, 12, 13C, 16, 19, 1B, 26, 30, 32, 36, 3A, 4, 50B, 58C, 59B, 5B, 63, 68, 72, 74, 78, 7B, 80, 93, 9B, BC10, BC12, BC19, BC2, BC20, BC24, BC27, BC3, BC31, BC4, BC43, BC9, C14, CB1, DK1, FC2, SG2, SHW2, WAL32, WD9, WG1, WG3, X3, Z1/1, Z1/3, Z1/5, Z1/7, Z2/13, Z3/10, Z3/11, Z3/2
Average biomass = 18.900 g/ha Rank biomass = 122
Average abundance = 1.866/ha Rank abundance = 25

C018 *Processa gracilis* Baker, 1907 (Crustacea, Processidae) CAAB 28 768010



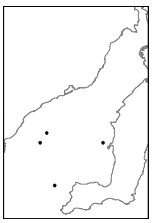
Common name = Long-Wristed Shrimp
Length = To 12 mm
Depth range = 20.8 - 20.8 m
Sites = BC28
Average biomass = 0.002 g/ha Rank biomass = 395
Average abundance = 0.002/ha Rank abundance = 341

C019 *Austrodromidia australis* (Rathbun, 1923) (Crustacea, Dromiidae) CAAB 28 852015



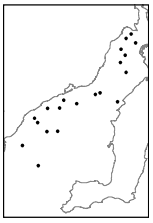
Common name = Southern Sponge Crab
Length = To 25 mm
Depth range = 12 - 33 m
Sites = 4, BC1, BC27, BC4
Average biomass = 0.263 g/ha Rank biomass = 326
Average abundance = 0.041/ha Rank abundance = 186

C020 *Naxia aurita* (Latreille, 1825) (Crustacea, Majidae) CAAB 28 880007



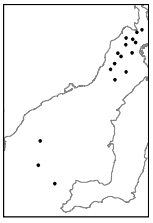
Common name = Smooth Seaweed Crab
Length = To 51 mm
Depth range = 18.7 - 41.5 m
Sites = BC21, BC25, BC44, WD6
Average biomass = 2.377 g/ha Rank biomass = 222
Average abundance = 0.030/ha Rank abundance = 199

E001 *Ophiothrix* (*Ophiothrix*) *caespitosa* Lyman, 1879 (Echinodermata, Ophiotrichidae) CAAB 25 192002



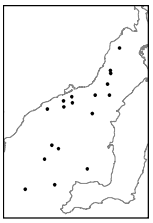
Common name = Ophiothrix caespitosa
Length = To 18 mm
Depth range = 12 - 43 m
Sites = 1, 11B, 12, 21C, 47B, 59B, 94, BC11, BC20, BC21, BC30, BC38, BC6, CB1, FC2, SHW2, Z1/3, Z1/7, Z2/10, Z3/2
Average biomass = 2.415 g/ha Rank biomass = 217
Average abundance = 1.078/ha Rank abundance = 34

E002 *Goniocidaris tubaria* (Lamarck, 1816) (Echinodermata, Cidaridae) CAAB 25 202007



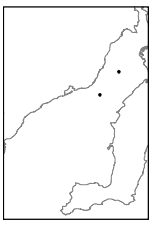
Common name = Thorny Sea Urchin
Length = To 57 mm
Depth range = 12 - 43 m
Sites = 23, 30, 36, 44, 47B, 50B, 59B, 63, 70, 72, 8, BC1, BC25, BC38, BC44, CB1
Average biomass = 13.840 g/ha Rank biomass = 139
Average abundance = 0.367/ha Rank abundance = 60

E003 *Ptilometra macronema* (Müller, 1846) (Echinodermata, Ptilometridae) CAAB 25 047001



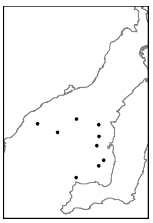
Common name = Passion Flower
Length = To 27 mm
Depth range = 14 - 44 m
Sites = 26, 69, 70, 78, BC10, BC27, BC34, BC40, BC44, BC46, BC6, N23, SG2, Z1/1, Z1/3, Z1/7, Z2/11, Z2/13
Average biomass = 4.876 g/ha Rank biomass = 177
Average abundance = 0.345/ha Rank abundance = 62

E004 *Ophionereis schayeri* (Müller & Troschel, 1844) (Echinodermata, Ophionereididae) CAAB 25 179009



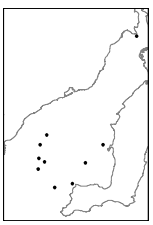
Common name = Schayer's brittlestar
Length = To 5 mm
Depth range = 17 - 20.1 m
Sites = 80, SHW2
Average biomass = 0.020 g/ha Rank biomass = 381
Average abundance = 0.020/ha Rank abundance = 216

E005 *Amblypneustes pallidus* (Lamarck, 1816) (Echinodermata, Temnopleuridae) CAAB 25 241007



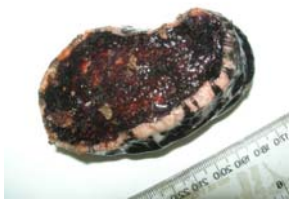
Common name = Sea Urchin
Length = To 73 mm
Depth range = 14.8 - 37 m
Sites = 11B, BC11, BC15, BC17, BC28, BC33, BC36, CP7, WD4
Average biomass = 0.925 g/ha Rank biomass = 269
Average abundance = 0.128/ha Rank abundance = 95

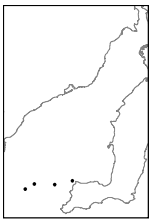
E007 *Conocladus australis* (Verrill, 1876) (Echinodermata, Gorgonocephalidae) CAAB 25 171001



Common name = Southern Basket Star
Length = To 50 mm
Depth range = 15 - 43 m
Sites = 44, BC21, BC25, BC31, BC34, BC38, BC42, BC44, CP1, WD6
Average biomass = 5.094 g/ha Rank biomass = 175
Average abundance = 0.125/ha Rank abundance = 99

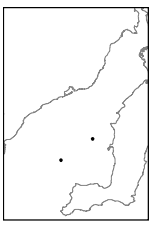
E008 *Ceto cuvieria* (Cuvier, 1817) (Echinodermata, Psolidae) CAAB 25 404001





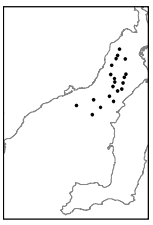
Common name = Little Boot Holothurian
Length = To 98 mm
Depth range = 41 - 54.5 m
Sites = BC42, BC43, BC44, BC46
Average biomass = 34.997 g/ha Rank biomass = 91
Average abundance = 1.016/ha Rank abundance = 37

E009 *Centrostephanus rodgersii* (A. Agassiz, 1863) (Echinodermata, Diadematidae) CAAB 25 211001



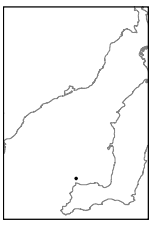
Common name = Longspine Sea Urchin
Length = To 82 mm
Depth range = 23.5 - 34 m
Sites = BC32, WD3
Average biomass = 5.072 g/ha Rank biomass = 176
Average abundance = 0.050/ha Rank abundance = 157

E010 *Holothuria* (*Thymiosycia*) *hartmeyeri* Erwe, 1913 (Echinodermata, Holothuriidae) CAAB 25 416053



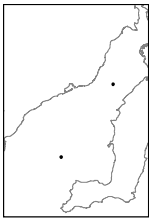
Common name = Handsome Sea Cucumber
Length = To 262 mm
Depth range = 13 - 25 m
Sites = 16, 20B, 26, 30, 32, 59B, 61, 63, 68, 69, BC10, BC2, BC4, DK1, EWL3, N23, SHW7, WAL32, Y7, Z3/2
Average biomass = 75.052 g/ha Rank biomass = 61
Average abundance = 0.445/ha Rank abundance = 59

E011 *Luidia australiae* Döderlein, 1920 (Echinodermata, Luidiidae) CAAB 25 105001



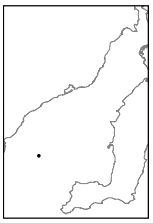
Common name = Southern Sand Star
Length = To 60 mm
Depth range = 37 - 37 m
Sites = CP7
Average biomass = 0.270 g/ha Rank biomass = 324
Average abundance = 0.003/ha Rank abundance = 336

E012 *Goniodiscaster seriatus* (Müller & Troschel, 1843) (Echinodermata, Oreasteridae) CAAB 25 127033



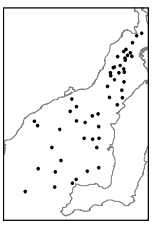
Common name = Goniodiscaster
Length = To 100 mm
Depth range = 21.5 - 34 m
Sites = 68, BC32
Average biomass = 4.187 g/ha Rank biomass = 188
Average abundance = 0.018/ha Rank abundance = 229

E013 *Astropecten triseriatus* Müller & Troschel, 1843 (Echinodermata, Astropectinidae) CAAB 25 111013



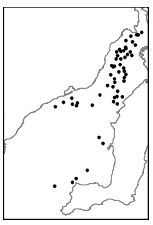
Common name = Astropecten
Length = To 35 mm
Depth range = 32 - 32 m
Sites = BC31
Average biomass = 0.290 g/ha Rank biomass = 318
Average abundance = 0.006/ha Rank abundance = 301

F001 *Sillaginodes punctata* (Cuvier, 1829) (Chordata, Sillaginidae) CAAB 37 330001



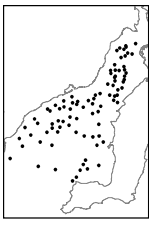
Common name = King George Whiting
Length = To 434 mm
Depth range = 12 - 44 m
Sites = 1, 12, 13C, 20B, 21B, 21C, 22B, 30, 36, 44, 50B, 58C, 61, 69, 7, 70, 78, 8, 80, 92, 93, BC1, BC10, BC11, BC13, BC15, BC17, BC20, BC24, BC27, BC28, BC3, BC32, BC36, BC38, BC39, BC40, BC42, BC44, BC46, BC9, CP7, N23, WD3, WD4, WG1, X3, Y7, Z1/1, Z3/11, Z3/2
Average biomass = 161.890 g/ha Rank biomass = 34
Average abundance = 1.109/ha Rank abundance = 33

F002 *Pseudorhombus jenynsii* (Bleeker, 1855) (Chordata, Paralichthyidae) CAAB 37 460002



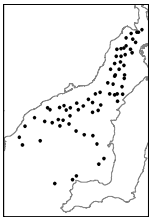
Common name = Small Tooth Flounder
Length = To 351 mm
Depth range = 12 - 41.5 m
Sites = 1, 12, 13C, 16, 19, 21B, 21C, 22B, 23, 26, 30, 32, 36, 4, 44, 47B, 50B, 57, 58C, 59B, 61, 63, 68, 69, 7, 72, 74, 78, 8, 80, 92, 93, 94, 9B, BC1, BC2, BC3, BC40, BC42, BC44, C14, CB1, CP7, DK1, EWL3, FC2, SHW2, WD4, WD6, X3, Z1/1, Z1/3, Z1/5, Z2/13, Z3/2
Average biomass = 194.012 g/ha Rank biomass = 29
Average abundance = 1.713/ha Rank abundance = 26

F003 *Maxillicosta scabriceps* Whitley, 1935 (Chordata, Neosebastidae) CAAB 37 287007



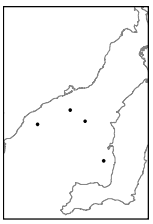
Common name = Little Scorpion Fish (Little Gurnard Perch)
Length = To 124 mm
Depth range = 12 - 43 m
Sites = 1, 11B, 13C, 16, 19, 1B, 2, 21B, 21C, 23, 26, 3A, 4, 47B, 5, 58C, 59B, 61, 63, 68, 69, 70, 72, 74, 78, 7B, 8, 80, 92, 93, 9B, BC1, BC10, BC11, BC12, BC15, BC16, BC17, BC18, BC19, BC2, BC20, BC21, BC22, BC23, BC24, BC25, BC27, BC28, BC3, BC30, BC35, BC36, BC38, BC39, BC4, BC40, BC42, BC6, BC8, BC9, C14, C7, CP1, CP12, CP3, CP7, EWL3, N23, SHW2, SHW7, WAL32, WD3, WD4, WD6, WD9, WG1, WG3, Y7, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/11, Z3/2
Average biomass = 58.550 g/ha Rank biomass = 69
Average abundance = 4.550/ha Rank abundance = 17

F004 *Parapriacanthus elongatus* (McCulloch, 1911) (Chordata, Pempheridae) CAAB 37 357002



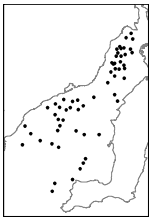
Common name = Slender Bullseye (Elongate Bullseye)
Length = To 100 mm
Depth range = 12 - 41.5 m
Sites = 1, 12, 13C, 19, 1B, 2, 21C, 22B, 32, 36, 3A, 4, 44, 47B, 50B, 57, 5B, 61, 68, 7, 70, 72, 74, 78, 7B, 8, 80, 92, 93, 94, 9B, BC1, BC10, BC12, BC14, BC16, BC19, BC2, BC20, BC23, BC24, BC25, BC28, BC3, BC30, BC33, BC36, BC42, BC44, BC6, BC8, BC9, C7, CB1, CP7, FC2, N23, SHW2, WAL32, WD3, WD9, WG1, WG3, Y7, Z1/7, Z2/10, Z2/11, Z3/10, Z3/11, Z3/2
Average biomass = 57.367 g/ha Rank biomass = 70
Average abundance = 10.458/ha Rank abundance = 12

F005 *Siphonognathus radiatus* (Quoy & Gaimard, 1834) (Chordata, Odacidae) CAAB 37 385007



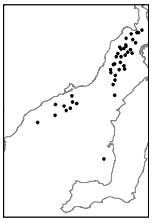
Common name = Longray Rock Whiting
Length = To 166 mm
Depth range = 14.8 - 21.5 m
Sites = BC11, BC13, BC33, Z3/11
Average biomass = 0.199 g/ha Rank biomass = 333
Average abundance = 0.020/ha Rank abundance = 216

F006 *Repomucenus calcaratus* (Macleay, 1881) (Chordata, Callionymidae) CAAB 37 427015



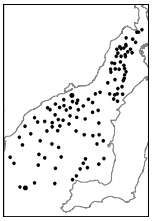
Common name = Spotted Stinkfish (Spotted Dragonet)
Length = To 226 mm
Depth range = 12 - 44.5 m
Sites = 1, 11B, 12, 13C, 19, 21C, 22B, 26, 30, 32, 36, 5, 58C, 5B, 61, 69, 72, 74, 78, 7B, 8, 80, 93, 94, BC1, BC12, BC19, BC22, BC24, BC25, BC27, BC3, BC30, BC42, BC44, BC47, C14, CB1, CP1, CP12, CP3, DK1, FC2, SG2, SHW7, WD4, WD9, WG1, WG3, X3, Z1/3, Z1/5, Z1/7, Z2/10, Z2/13, Z3/10, Z3/11, Z3/8
Average biomass = 135.441 g/ha Rank biomass = 37
Average abundance = 9.895/ha Rank abundance = 13

F007 *Pelates octolineatus* (Jenyns, 1840) (Chordata, Terapontidae) CAAB 37 321020



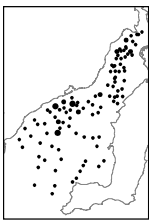
Common name = Striped Perch (Western Striped Grunter)
Length = To 250 mm
Depth range = 12 - 25.5 m
Sites = 12, 13C, 19, 2, 21B, 21C, 22B, 23, 26, 30, 32, 36, 44, 47B, 50B, 57, 58C, 63, 68, 69, 70, 72, 8, 80, 92, 93, 94, BC1, BC11, BC33, CB1, FC2, X3, Z1/1, Z1/5, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 139.397 g/ha Rank biomass = 36
Average abundance = 2.722/ha Rank abundance = 23

F008 *Upeneichthys vlamingii* (Cuvier, 1829) (Chordata, Mullidae) CAAB 37 355029



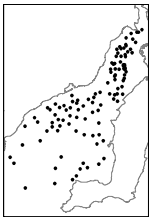
Common name = Red Mullet (Bluespotted Goatfish)
Length = To 235 mm
Depth range = 12 - 54.5 m
Sites = 1, 11B, 12, 13C, 16, 19, 1B, 20B, 21B, 21C, 22B, 23, 26, 30, 32, 36, 3A, 4, 44, 47B, 5, 50B, 57, 58C, 59B, 5B, 63, 69, 7, 70, 72, 74, 78, 7B, 8, 80, 92, 93, 94, 9B, BC1, BC10, BC11, BC12, BC13, BC14, BC15, BC16, BC17, BC18, BC19, BC2, BC20, BC21, BC22, BC23, BC24, BC25, BC27, BC28, BC3, BC30, BC31, BC32, BC33, BC34, BC35, BC36, BC37, BC38, BC39, BC4, BC40, BC42, BC43, BC44, BC45, BC46, BC6, BC8, BC9, C14, C7, CB1, CP1, CP12, CP3, CP7, DK1, EWL3, N23, SG2, SHW2, WD3, WD4, WD6, WD9, WG1, WG3, Y7, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 784.591 g/ha Rank biomass = 7
Average abundance = 26.269/ha Rank abundance = 7

F009 *Pseudocaranx wrighti* (Whitley, 1931) (Chordata, Carangidae) CAAB 37 337063



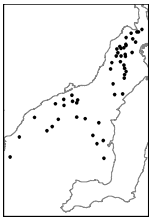
Common name = Skipjack Trevally
Length = To 204 mm
Depth range = 12 - 54.5 m
Sites = 1, 11B, 12, 13C, 16, 19, 1B, 2, 21B, 21C, 22B, 23, 26, 30, 32, 36, 3A, 4, 44, 47B, 5, 50B, 57, 58C, 5B, 61, 63, 68, 7, 70, 72, 74, 78, 7B, 8, 80, 92, 93, 94, 9B, BC1, BC10, BC11, BC12, BC14, BC19, BC20, BC21, BC22, BC23, BC24, BC25, BC27, BC28, BC3, BC30, BC31, BC32, BC33, BC34, BC36, BC38, BC39, BC42, BC43, BC44, BC47, BC6, BC8, BC9, C14, C7, CB1, CP1, CP12, CP3, CP7, DK1, EWL3, FC2, N23, SG2, SHW2, WAL32, WD3, WD4, WD9, WG1, WG3, X3, Y7, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 1,461.669 g/ha Rank biomass = 4
Average abundance = 75.739/ha Rank abundance = 4

F010 *Scobinichthys granulatus* (Shaw, 1790) (Chordata, Monacanthidae) CAAB 37 465007



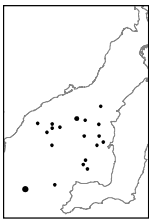
Common name = Rough Leatherjacket
Length = To 218 mm
Depth range = 12 - 44 m
Sites = 1, 11B, 12, 13C, 16, 19, 1B, 2, 20B, 21B, 21C, 22B, 23, 26, 30, 32, 36, 3A, 4, 44, 47B, 5, 50B, 57, 58C, 59B, 5B, 61, 63, 69, 7, 70, 72, 74, 78, 7B, 8, 80, 92, 93, 94, 9B, BC1, BC10, BC11, BC12, BC13, BC15, BC16, BC17, BC18, BC19, BC2, BC20, BC21, BC24, BC25, BC28, BC3, BC30, BC32, BC33, BC35, BC36, BC37, BC39, BC4, BC40, BC42, BC44, BC46, BC6, BC8, BC9, C14, C7, CB1, CP12, CP3, CP7, DK1, EWL3, FC2, N23, SHW2, SHW7, WAL32, WD3, WD4, WD6, WD9, WG1, WG3, X3, Y7, Z1/1, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 753.959 g/ha Rank biomass = 8
Average abundance = 43.435/ha Rank abundance = 5

F011 *Acanthaluteres spilomelanurus* (Quoy & Gaimard, 1824)(Chordata, Monacanthidae) CAAB 37 465043



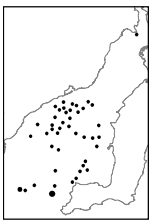
Common name = Bridled Leatherjacket
Length = To 150 mm
Depth range = 12 - 25 m
Sites = 12, 13C, 19, 20B, 21C, 23, 26, 30, 32, 36, 44, 47B, 50B, 57, 58C, 59B, 68, 7, 70, 72, 74, 92, 93, 94, BC1, BC12, BC13, BC15, BC17, BC18, BC2, BC20, BC21, BC23, BC28, BC3, BC33, BC35, C14, CB1, DK1, FC2, WD3, WD6, Z1/1, Z1/3, Z1/5, Z2/11, Z2/13, Z3/2
Average biomass = 44.365 g/ha Rank biomass = 81
Average abundance = 4.338/ha Rank abundance = 18

F012 *Kathetostoma laeve* (Bloch & Schneider, 1801) (Chordata, Uranoscopidae) CAAB 37 400003



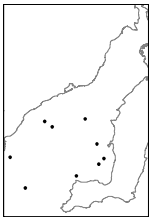
Common name = Common Stargazer
Length = To 571 mm
Depth range = 17 - 44 m
Sites = BC11, BC13, BC15, BC16, BC17, BC18, BC21, BC24, BC27, BC28, BC40, BC44, BC46, CP1, CP3, WAL32, WD4, WD6, WG1
Average biomass = 300.104 g/ha Rank biomass = 19
Average abundance = 0.254/ha Rank abundance = 70

F013 *Sillago bassensis* Cuvier, 1829 (Chordata, Sillaginidae) CAAB 37 330002



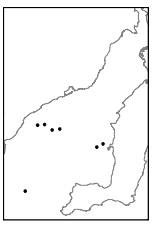
Common name = Silver Whiting (Sthn. School Whiting)
Length = To 292 mm
Depth range = 15 - 54.5 m
Sites = 11B, 1B, 3A, 44, 5B, 7B, 9B, BC11, BC16, BC17, BC18, BC21, BC22, BC24, BC27, BC28, BC39, BC40, BC42, BC43, BC44, BC45, BC46, BC47, BC8, CP1, CP12, CP3, CP7, SG2, WD3, WD4, WD9, WG1, WG3, Z1/3, Z1/5, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 259.157 g/ha Rank biomass = 21
Average abundance = 5.921/ha Rank abundance = 15

F014 *Pentaceropsis recurvirostris* (Richardson, 1845) (Chordata, Pentacerotidae) CAAB 37 367003



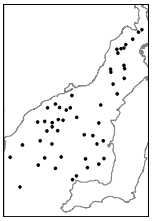
Common name = Longsnout Boarfish
Length = To 400 mm
Depth range = 14.8 - 44 m
Sites = BC13, BC14, BC18, BC28, BC33, BC35, BC36, BC46, CP7
Average biomass = 27.105 g/ha Rank biomass = 99
Average abundance = 0.040/ha Rank abundance = 187

F015 *Parazanclistius hutchinsi* Hardy, 1983 (Chordata, Pentacerotidae) CAAB 37 367010



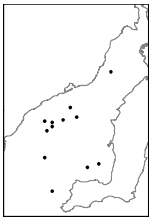
Common name = Short Boarfish
Length = To 244 mm
Depth range = 18.7 - 44 m
Sites = BC11, BC14, BC18, BC28, BC46, WD6, WG1
Average biomass = 9.292 g/ha Rank biomass = 159
Average abundance = 0.063/ha Rank abundance = 139

F016 *Diodon nicthemerus* Cuvier, 1818 (Chordata, Diodontidae) CAAB 37 469001



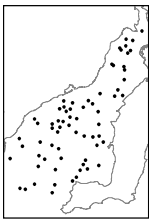
Common name = Spikey Globefish
Length = To 304 mm
Depth range = 13 - 46.5 m
Sites = 11B, 13C, 23, 30, 36, 4, 50B, 57, 58C, 68, 69, 70, 74, 93, 94, BC11, BC12, BC14, BC15, BC16, BC17, BC18, BC21, BC24, BC25, BC27, BC28, BC3, BC30, BC32, BC33, BC34, BC35, BC36, BC38, BC39, BC40, BC42, BC45, CP1, CP7, WAL32, WD3, WD6, WG3, Z1/1, Z1/5, Z1/7,
Z2/10, Z3/10, Z3/11
Average biomass = 228.293 g/ha Rank biomass = 24
Average abundance = 0.922/ha Rank abundance = 41

F017 *Omegophora armilla* (Waite & McCulloch, 1915) (Chordata, Tetraodontidae) CAAB 37 467002



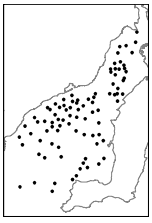
Common name = Ringed Toadfish
Length = To 212 mm
Depth range = 14.5 - 44.5 m
Sites = 69, BC14, BC15, BC16, BC18, BC21, BC34, BC36, BC40, BC47, WG3, Z3/11
Average biomass = 9.799 g/ha Rank biomass = 157
Average abundance = 0.126/ha Rank abundance = 97

F018 *Neoplatycephalus richardsoni* (Castelnau, 1872) (Chordata, Platycephalidae) CAAB 37 296001



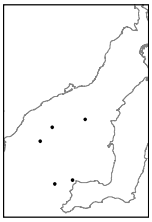
Common name = Tiger Flathead
Length = To 462 mm
Depth range = 13 - 54.5 m
Sites = 11B, 13C, 19, 1B, 21B, 22B, 23, 26, 36, 3A, 50B, 58C, 7, 7B, 94, 9B, BC11, BC12, BC15, BC16, BC17, BC18, BC20, BC23, BC24, BC25, BC27, BC28, BC3, BC30, BC31, BC32, BC34, BC35, BC36, BC38, BC39, BC40, BC42, BC43, BC44, BC45, BC46, BC47, BC8, BC9, CB1, CP1, CP12, CP3, CP7, DK1, EWL3, SG2, SHW2, WD3, WD4, WD6, WD9, WG1, WG3, X3, Z1/3, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11
Average biomass = 260.032 g/ha Rank biomass = 20
Average abundance = 3.655/ha Rank abundance = 20

F019 *Parequula melbournensis* (Castelnau, 1872) (Chordata, Gerreidae) CAAB 37 349001



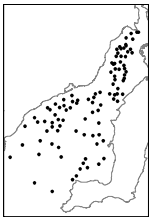
Common name = Silverbelly
Length = To 146 mm
Depth range = 12 - 54.5 m
Sites = 1, 11B, 12, 13C, 19, 1B, 2, 26, 30, 3A, 4, 44, 47B, 5, 58C, 59B, 5B, 68, 69, 7, 70, 7B, 8, 80, 92, 9B, BC1, BC10, BC11, BC12, BC13, BC14, BC15, BC16, BC17, BC18, BC19, BC20, BC21, BC22, BC23, BC24, BC25, BC27, BC28, BC3, BC30, BC31, BC32, BC33, BC34, BC36, BC4, BC40, BC42, BC43, BC44, BC45, BC47, BC6, BC8, BC9, C14, C7, CP1, CP12, CP3, CP7, EWL3, N23, SG2, SHW7, WD3, WD4, WD6, WD9, WG1, WG3, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 408.251 g/ha Rank biomass = 14
Average abundance = 27.375/ha Rank abundance = 6

F020 *Meuschenia scaber* (Forster, 1801) (Chordata, Monacanthidae) CAAB 37 465005



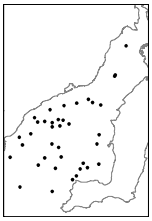
Common name = Velvet Leatherjacket
Length = To 181 mm
Depth range = 21.4 - 41.5 m
Sites = BC13, BC18, BC25, BC42, BC44
Average biomass = 4.058 g/ha Rank biomass = 191
Average abundance = 0.093/ha Rank abundance = 117

F021 *Acanthaluteres vittiger* (Castelnau, 1873) (Chordata, Monacanthidae) CAAB 37 465002



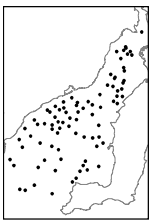
Common name = Toothbrush Leatherjacket
Length = To 193 mm
Depth range = 12 - 54.5 m
Sites = 1, 11B, 12, 13C, 16, 19, 20B, 21B, 22B, 23, 26, 30, 32, 36, 4, 44, 5, 57, 58C, 59B, 61, 63, 68, 69, 7, 72, 74, 8, 80, 92, 93, 94, 9B, BC1, BC10, BC11, BC12, BC13, BC14, BC16, BC17, BC18, BC19, BC2, BC20, BC21, BC24, BC25, BC27, BC28, BC3, BC30, BC31, BC32, BC33, BC35, BC36, BC4, BC40, BC42, BC43, BC47, BC6, BC8, BC9, C14, C7, CB1, CP1, CP12, CP3, CP7, DK1, EWL3, FC2, N23, SG2, SHW2, SHW7, WAL32, WD3, WD4, WD6, WD9, WG1, WG3, X3, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 227.464 g/ha Rank biomass = 25
Average abundance = 13.288/ha Rank abundance = 9

F022 *Foetorepus calauropomus* (Richardson, 1844) (Chordata, Callionymidae) CAAB 37 427001



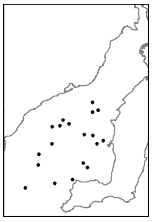
Common name = Common Stink Fish
Length = To 342 mm
Depth range = 14 - 46.5 m
Sites = 1B, 2, 61, 92, 9B, BC11, BC12, BC14, BC16, BC18, BC20, BC22, BC23, BC27, BC28, BC30, BC32, BC34, BC35, BC36, BC38, BC39, BC40, BC42, BC45, BC47, BC8, C7, CP12, CP3, CP7, SG2, WAL32, WD4, WG1, WG3, Z2/11, Z3/2
Average biomass = 75.353 g/ha Rank biomass = 60
Average abundance = 3.159/ha Rank abundance = 22

F023 *Lepidotrigla papilio* (Cuvier, 1829) (Chordata, Triglidae) CAAB 37 288002



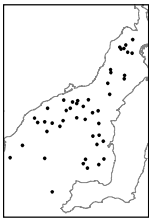
Common name = Spiny Gurnard
Length = To 170 mm
Depth range = 12 - 54.5 m
Sites = 1, 11B, 13C, 16, 1B, 2, 21B, 22B, 23, 3A, 4, 50B, 58C, 5B, 61, 68, 69, 7, 72, 74, 78, 7B, 92, 93, 9B, BC1, BC10, BC11, BC12, BC14, BC15, BC16, BC17, BC18, BC19, BC20, BC22, BC23, BC24, BC25, BC27, BC28, BC3, BC30, BC32, BC34, BC35, BC36, BC37, BC38, BC39, BC4, BC40, BC42, BC43, BC45, BC46, BC47, BC8, C14, C7, CP1, CP12, CP3, CP7, EWL3, SG2, SHW2, WAL32, WD3, WD4, WD6, WD9, WG1, WG3, Y7, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z3/10, Z3/2, Z3/8
Average biomass = 110.273 g/ha Rank biomass = 45
Average abundance = 8.272/ha Rank abundance = 14

F024 *Parapercis ramsayi* Steindachner, 1884 (Chordata, Pinguipedidae) CAAB 37 390002



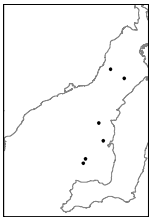
Common name = Spotted Grubfish
Length = To 170 mm
Depth range = 17.3 - 44 m
Sites = 1B, 9B, BC10, BC18, BC24, BC27, BC28, BC31, BC38, BC40, BC42, BC44, BC46, BC9, CP3, WD3, WD6, WG1, WG3
Average biomass = 4.356 g/ha Rank biomass = 185
Average abundance = 0.209/ha Rank abundance = 78

F025 *Aracana ornata* (Gray, 1838) (Chordata, Ostraciidae) CAAB 37 466001



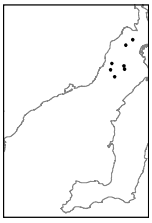
Common name = Ornate Cowfish
Length = To 175 mm
Depth range = 12 - 44.5 m
Sites = 21B, 23, 26, 36, 69, 70, 78, 7B, 93, 94, BC1, BC10, BC11, BC13, BC14, BC15, BC16, BC17, BC2, BC20, BC21, BC28, BC3, BC30, BC33, BC34, BC35, BC36, BC40, BC47, BC8, BC9, C14, CP1, CP3, N23, WD3, WD4, WD6, WG1, WG3, Z1/3, Z1/7, Z2/13, Z3/10, Z3/11, Z3/2
Average biomass = 109.939 g/ha Rank biomass = 47
Average abundance = 1.868/ha Rank abundance = 24

F026 *Taratretis derwentensis* Last, 1978 (Chordata, Pleuronectidae) CAAB 37 461011



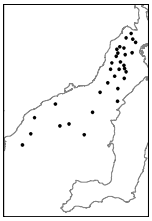
Common name = Derwent Flounder
Length = To 215 mm
Depth range = 13 - 36 m
Sites = 70, BC17, BC3, CP1, CP3, WD6
Average biomass = 1.650 g/ha Rank biomass = 246
Average abundance = 0.037/ha Rank abundance = 191

F027 *Filicampus tigris* (Castelnau, 1879) (Chordata, Syngnathidae) CAAB 37 282064



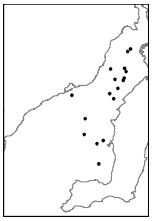
Common name = Tiger Pipefish
Length = To 269 mm
Depth range = 14 - 25 m
Sites = 13C, 23, 36, 58C, 61, 70, DK1
Average biomass = 0.298 g/ha Rank biomass = 317
Average abundance = 0.055/ha Rank abundance = 152

F028 *Parapercis haackei* (Steindachner, 1884) (Chordata, Pinguipedidae) CAAB 37 390004



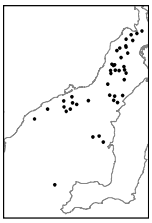
Common name = Wavy Grubfish
Length = To 93 mm
Depth range = 12 - 30.5 m
Sites = 1, 12, 13C, 1B, 21C, 26, 30, 32, 36, 47B, 58C, 59B, 61, 70, 74, 78, 80, 93, BC1, BC10, BC20, BC22, BC24, BC3, BC30, CB1, DK1, EWL3, FC2, SHW2, WG1, Z1/5
Average biomass = 2.396 g/ha Rank biomass = 219
Average abundance = 0.641/ha Rank abundance = 47

F029 *Thysanophrys cirronasa* (Richardson, 1848) (Chordata, Platycephalidae) CAAB 37 296045



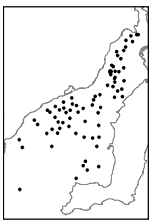
Common name = Rock Flathead
Length = To 298 mm
Depth range = 13 - 28 m
Sites = 16, 21B, 22B, 58C, 59B, 63, 70, BC13, BC24, BC28, BC3, BC36, BC4, EWL3, N23, WD6, Z1/1
Average biomass = 11.021 g/ha Rank biomass = 150
Average abundance = 0.120/ha Rank abundance = 104

F030 *Platycephalus speculator* Klunzinger, 1872 (Chordata, Platycephalidae) CAAB 37 296037



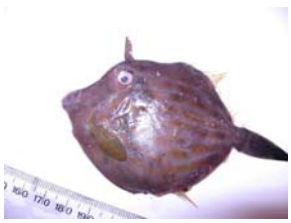
Common name = Yank Flathead
Length = To 525 mm
Depth range = 12 - 41.5 m
Sites = 1, 13C, 16, 19, 21B, 23, 26, 36, 44, 5, 50B, 58C, 59B, 69, 7, 70, 72, 74, 78, 8, 80, 92, BC20, BC3, BC44, BC8, CB1, DK1, FC2, N23, WD3, WD4, WD6, X3, Z1/1, Z1/3, Z1/7, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2
Average biomass = 113.140 g/ha Rank biomass = 42
Average abundance = 0.656/ha Rank abundance = 46

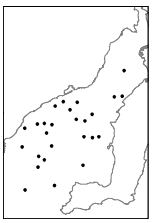
F031 *Heterodontus portusjacksoni* (Meyer, 1793) (Chordata, Heterodontidae) CAAB 37 007001



Common name = Port Jackson Shark
Length = To 870 mm
Depth range = 13 - 46.5 m
Sites = 11B, 13C, 19, 1B, 2, 23, 30, 36, 3A, 44, 5, 57, 5B, 61, 63, 68, 69, 7, 70, 72, 74, 78, 7B, 80, 93, 9B, BC11, BC12, BC13, BC17, BC18, BC20, BC21, BC23, BC24, BC27, BC28, BC3, BC30, BC36, BC40, BC45, BC6, BC9, C7, CB1, CP1, CP3, CP7, DK1, EWL3, FC2, SHW2, SHW7, WAL32, WD3, WD4, WD9, WG1, WG3, X3, Y7, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 840.167 g/ha Rank biomass = 6
Average abundance = 0.872/ha Rank abundance = 42

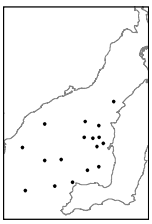
F032 *Eubalichthys mosaicus* (Ramsay & Ogilby, 1886) (Chordata, Monacanthidae) CAAB 37 465003





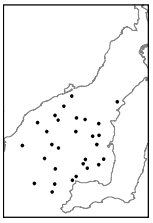
Common name = Mosaic Leatherjacket
Length = To 260 mm
Depth range = 16.1 - 44 m
Sites = 19, 58C, 7, BC10, BC11, BC13, BC14, BC15, BC16, BC19, BC21, BC24, BC27, BC30, BC31, BC34, BC38, BC44, BC46, C14, CP3, WD3, WD4, Z1/3, Z1/5, Z3/11
Average biomass = 40.457 g/ha Rank biomass = 84
Average abundance = 0.255/ha Rank abundance = 69

F033 *Pempheris klunzingeri* (McCulloch, 1911) (Chordata, Pempheridide) CAAB 37 357003



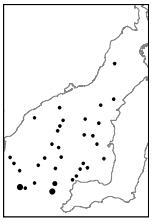
Common name = Rough bullseye
Length = To 173 mm
Depth range = 17 - 44 m
Sites = 16, BC13, BC14, BC17, BC24, BC28, BC30, BC32, BC34, BC36, BC40, BC42, BC44, BC46, WD3, WD4, WD6
Average biomass = 69.901 g/ha Rank biomass = 64
Average abundance = 1.442/ha Rank abundance = 28

F034 *Lophonectes gallus* Günther, 1880 (Chordata, Bothidae) CAAB 37 460001



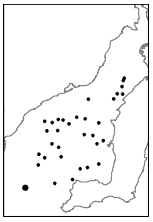
Common name = Crested Flounder
Length = To 229 mm
Depth range = 12 - 54.5 m
Sites = 1, BC11, BC12, BC13, BC15, BC17, BC21, BC27, BC28, BC30, BC33, BC34, BC36, BC39, BC40, BC42, BC43, BC44, BC47, CP1, CP3, CP7, SG2, WD3, WD4, WD9, Z1/1, Z2/11, Z3/8
Average biomass = 5.947 g/ha Rank biomass = 168
Average abundance = 0.286/ha Rank abundance = 64

F035 *Trachurus declivis* (Jenyns, 1841) (Chordata, Carangidae) CAAB 37 337002



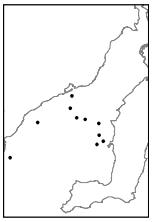
Common name = Jack Mackerel
Length = To 230 mm
Depth range = 14.8 - 54.5 m
Sites = 11B, 16, 8, BC13, BC17, BC20, BC24, BC27, BC28, BC32, BC33, BC34, BC35, BC37, BC38, BC39, BC40, BC41, BC42, BC43, BC44, BC45, BC46, BC47, CP12, CP3, CP7, SG2, WAL32, WD3, WG1, WG3, Z2/10
Average biomass = 515.063 g/ha Rank biomass = 11
Average abundance = 11.307/ha Rank abundance = 11

F036 *Neosebastes bougainvillii* (Cuvier, 1829) (Chordata, Neosebastidae) CAAB 37 287004



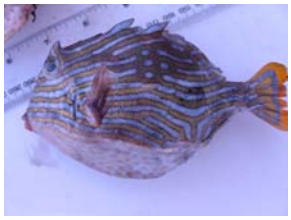
Common name = Gulf Gurnard Perch
Length = To 279 mm
Depth range = 13 - 44 m
Sites = 11B, 16, 1B, 4, 7, BC12, BC13, BC14, BC15, BC16, BC17, BC21, BC24, BC27, BC28, BC3, BC31, BC32, BC34, BC36, BC38, BC4, BC40, BC42, BC44, BC46, BC8, CP12, SG2, WD3, WD6, WG3, Y7
Average biomass = 187.367 g/ha Rank biomass = 30
Average abundance = 1.214/ha Rank abundance = 32

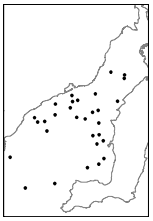
F037 *Sphyraena novaehollandiae* (Günther, 1860) (Chordata, Sphyraenidae) CAAB 37 382002



Common name = Snook (Shortfin seapike)
Length = To 578 mm
Depth range = 15 - 22 m
Sites = BC11, BC13, BC15, BC17, BC28, BC35, WD4, WD6, Z1/1, Z3/11
Average biomass = 26.119 g/ha Rank biomass = 101
Average abundance = 0.088/ha Rank abundance = 124

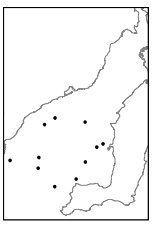
F038 *Aracana aurita* (Shaw, 1798) (Chordata, Ostraciidae) CAAB 37 466003





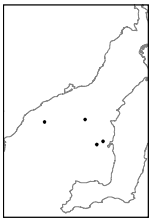
Common name = Shaws Cowfish
Length = To 189 mm
Depth range = 12 - 44 m
Sites = 1, 69, BC10, BC11, BC13, BC14, BC15, BC17, BC2, BC20, BC21, BC28, BC3, BC33, BC35, BC36, BC40, BC44, BC46, BC6, BC9, C14, WD3, WD4, WD6, Z1/1, Z1/5, Z2/13, Z3/11, Z3/8
Average biomass = 103.029 g/ha Rank biomass = 52
Average abundance = 1.031/ha Rank abundance = 36

F039 *Urolophus orarius* (Last & Gommon 1987) (Chordata, Urolophidae) CAAB 37 038022



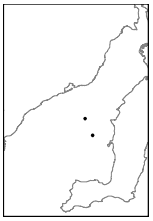
Common name = Coastal Stinaree
Length = To 342 mm
Depth range = 18.7 - 43 m
Sites = BC13, BC14, BC28, BC31, BC35, BC38, BC44, CP1, CP7, WD6, Z3/8
Average biomass = 13.560 g/ha Rank biomass = 141
Average abundance = 0.058/ha Rank abundance = 147

F040 *Odax acroptilus* (Richardson, 1846) (Chordata, Odacidae) CAAB 37 385010



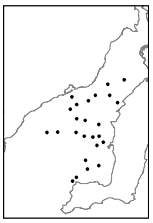
Common name = Rainbow Cale
Length = To 145 mm
Depth range = 18.7 - 23 m
Sites = BC13, BC14, BC28, WD6
Average biomass = 0.726 g/ha Rank biomass = 282
Average abundance = 0.026/ha Rank abundance = 202

F041 *Siphonognathus argyrophanes* (Richardson, 1858) (Chordata, Odacidae) CAAB 37 385008



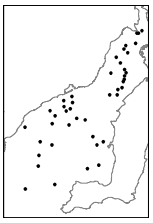
Common name = Tubemouth
Length = To 302 mm
Depth range = 21.4 - 23.5 m
Sites = BC13, WD3
Average biomass = 0.084 g/ha Rank biomass = 363
Average abundance = 0.005/ha Rank abundance = 314

F042 *Polyspina piosae* (Whitley, 1955) (Chordata, Tetraodontidae) CAAB 37 467049



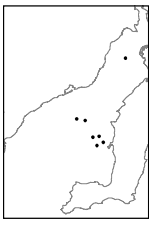
Common name = Orangebarred Puffer fish
Length = To 100 mm
Depth range = 12 - 41 m
Sites = 1, 11B, 78, BC13, BC15, BC17, BC21, BC24, BC28, BC3, BC36, BC40, BC42, BC6, BC8, CP1, CP7, N23, WD3, WD4, WD6, WD9, Z1/1, Z3/11, Z3/2
Average biomass = 10.953 g/ha Rank biomass = 151
Average abundance = 0.922/ha Rank abundance = 40

F043 *Vincentia badia* (Allen, 1987) (Chordata, Apogonidae) CAAB 37 327120



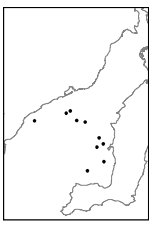
Common name = Scarlet Cardinal fish
Length = To 106 mm
Depth range = 13 - 44 m
Sites = 12, 1B, 21B, 23, 32, 4, 44, 47B, 50B, 57, 58C, 59B, 69, 93, BC13, BC15, BC16, BC19, BC2, BC25, BC27, BC28, BC3, BC31, BC36, BC38, BC4, BC40, BC44, BC46, C7, EWL3, N23, WD3, WD6, Y7, Z1/1, Z1/3, Z2/11, Z2/13, Z3/10, Z3/11, Z3/8
Average biomass = 10.927 g/ha Rank biomass = 152
Average abundance = 1.665/ha Rank abundance = 27

F044 *Leptoichthys fistularius* Kaup, 1853 (Chordata, Syngnathidae) CAAB 37 282013



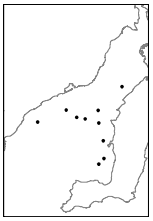
Common name = Brushtail Pipefish
Length = To 481 mm
Depth range = 14 - 23.5 m
Sites = 20B, BC13, BC15, BC28, WD3, WD4, WD6
Average biomass = 0.149 g/ha Rank biomass = 345
Average abundance = 0.052/ha Rank abundance = 155

F045 *Phycodurus eques* (Günther, 1865) (Chordata, Syngnathidae) CAAB 37 282001



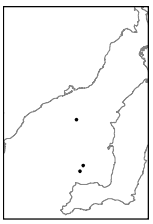
Common name = Leafy Seadragon
Length = To 279 mm
Depth range = 14.8 - 26 m
Sites = BC13, BC15, BC20, BC28, BC33, BC40, WD4, WD6, Z3/10, Z3/11
Average biomass = 0.941 g/ha Rank biomass = 268
Average abundance = 0.092/ha Rank abundance = 119

F046 *Phyllopteryx taeniolatus* (Lacépède, 1804) (Chordata, Syngnathidae) CAAB 37 282002



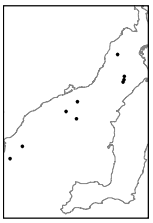
Common name = Common Seadragon
Length = To 286 mm
Depth range = 14.8 - 25.5 m
Sites = BC11, BC13, BC15, BC17, BC33, BC36, BC9, WD6, Y7, Z3/10
Average biomass = 2.472 g/ha Rank biomass = 216
Average abundance = 0.239/ha Rank abundance = 73

F047 *Eubalichthys gunnii* (Günther, 1870) (Chordata, Monacanthidae) CAAB 37 465034



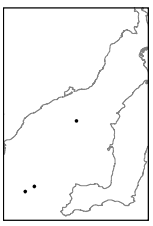
Common name = Gunn's Leatherjacket
Length = To 148 mm
Depth range = 19.2 - 37 m
Sites = BC15, CP12, CP3
Average biomass = 0.690 g/ha Rank biomass = 289
Average abundance = 0.013/ha Rank abundance = 253

F048 *Vincentia conspersa* (Klunzinger, 1872) (Chordata, Apogonidae) CAAB 37 327033



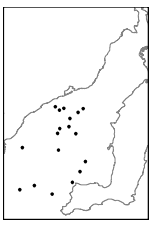
Common name = Southern Gobbleguts (Southern cardinalfish)
Length = To 90 mm
Depth range = 13 - 25.5 m
Sites = 30, BC15, BC2, BC3, BC30, BC35, BC4, C14, Z3/10
Average biomass = 1.450 g/ha Rank biomass = 252
Average abundance = 0.176/ha Rank abundance = 83

F049 *Vincentia macrocauda* (Allen, 1987) (Chordata, Apogonidae) CAAB 37 327122



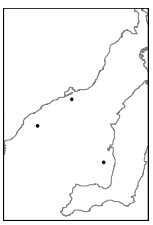
Common name = Smooth Cardinal fish
Length = To 106 mm
Depth range = 19.2 - 54.5 m
Sites = BC15, BC43, BC46
Average biomass = 1.537 g/ha Rank biomass = 251
Average abundance = 0.150/ha Rank abundance = 86

F050 *Thyrsites atun* (Euphrasen, 1791) (Chordata, Gempylidae) CAAB 37 439001



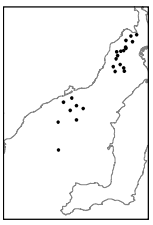
Common name = Barracouta
Length = To 368 mm
Depth range = 21 - 54.5 m
Sites = 11B, 1B, 3A, 5B, 7B, BC30, BC42, BC43, BC45, BC47, CP1, CP12, SG2, WD9, WG1, Z1/5, Z2/10, Z2/11
Average biomass = 27.635 g/ha Rank biomass = 97
Average abundance = 0.476/ha Rank abundance = 55

F051 *Cristiceps australis* Valenciennes, 1836 (Chordata, Clinidae) CAAB 37 416007



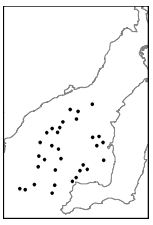
Common name = Southern Crested Weed Fish
Length = To 129 mm
Depth range = 14.8 - 20 m
Sites = BC11, BC33, Z1/1
Average biomass = 0.100 g/ha Rank biomass = 357
Average abundance = 0.020/ha Rank abundance = 214

F052 *Gymnapistes marmoratus* (Cuvier, 1829) (Chordata, Tetrarogidae) CAAB 37 287018



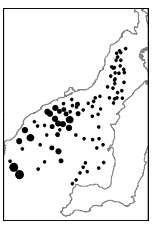
Common name = Soldier Fish
Length = To 118 mm
Depth range = 13.5 - 40 m
Sites = 12, 13C, 23, 30, 32, 36, 44, 5, 58C, 74, 7B, 92, 93, 94, BC12, BC15, CB1, FC2, SG2, X3, Z1/1, Z1/3, Z3/11, Z3/2
Average biomass = 40.070 g/ha Rank biomass = 85
Average abundance = 3.344/ha Rank abundance = 21

F053 *Urolophus paucimaculatus* Dixon, 1969 (Chordata, Urolophidae) CAAB 37 038004



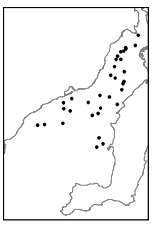
Common name = Sparsely-Spotted Stingaree
Length = To 485 mm
Depth range = 14.8 - 54.5 m
Sites = 11B, 5B, 9B, BC15, BC18, BC21, BC25, BC27, BC28, BC31, BC32, BC33, BC34, BC38, BC39, BC40, BC42, BC43, BC44, BC45, BC46, BC47, CP12, CP3, CP7, SG2, WD3, WD4, WD6, WG1, WG3, Z3/11
Average biomass = 107.731 g/ha Rank biomass = 49
Average abundance = 0.845/ha Rank abundance = 43

F054 *Thamnaconus degeni* (Regan, 1903) (Chordata, Monacanthidae) CAAB 37 465037



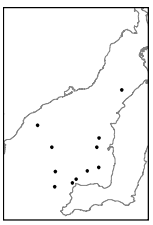
Common name = Degens Leatherjacket (Bluefin)
Length = To 183 mm
Depth range = 13 - 43 m
Sites = 11B, 12, 13C, 16, 19, 1B, 2, 23, 26, 30, 32, 3A, 4, 5, 58C, 5B, 61, 63, 68, 69, 7, 72, 74, 78, 7B, 8, 80, 94, 9B, BC10, BC11, BC12, BC14, BC16, BC17, BC19, BC20, BC21, BC22, BC23, BC24, BC25, BC27, BC28, BC3, BC30, BC32, BC33, BC34, BC35, BC36, BC37, BC38, BC40, BC41, BC42, BC6, BC8, BC9, C14, C7, CP1, CP12, CP3, CP7, DK1, EWL3, N23, SG2, SHW2, SHW7, WAL32, WD3, WD4, WD6, WD9, WG1, WG3, X3, Y7, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 8,265.789 g/ha Rank biomass = 1
Average abundance = 627.412/ha Rank abundance = 1

F055 *Brachaluteres jacksonianus* (Quoy & Gaimard, 1824) (Chordata, Monacanthidae) CAAB 37 465025



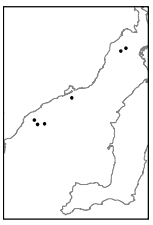
Common name = Sthn. Pygmy Leatherjacket
Length = To 81 mm
Depth range = 12 - 30 m
Sites = 1, 2, 23, 30, 32, 47B, 57, 58C, 69, 72, 8, 92, 93, 94, BC10, BC11, BC14, BC28, BC3, BC4, BC8, BC9, N23, SHW2, WAL32, WD4, WD6, WG3, Y7, Z1/1, Z1/3, Z2/11, Z3/11
Average biomass = 2.496 g/ha Rank biomass = 214
Average abundance = 0.465/ha Rank abundance = 57

F056 *Contusus brevicaudus* Hardy, 1981 (Chordata, Tetraodontidae) CAAB 37 467044



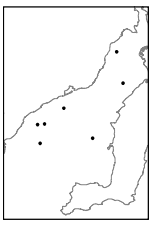
Common name = Prickly Toadfish
Length = To 120 mm
Depth range = 15.5 - 41.5 m
Sites = BC11, BC27, BC28, BC36, BC39, BC40, BC42, BC44, CP7, WD4, Y7
Average biomass = 3.426 g/ha Rank biomass = 197
Average abundance = 0.105/ha Rank abundance = 113

F057 *Hypnos monopterygium* (Shaw & Nodder, 1795) (Chordata, Hypnidae) CAAB 37 028001



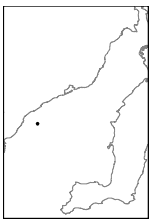
Common name = Australian Numbfish (Coffin Ray)
Length = To 425 mm
Depth range = 14 - 23 m
Sites = 92, 94, BC11, BC14, BC20, Z1/1
Average biomass = 56.556 g/ha Rank biomass = 71
Average abundance = 0.054/ha Rank abundance = 153

F058 *Chelmonops curiosus* Kuiter, 1986 (Chordata, Chaetodontidae) CAAB 37 365066



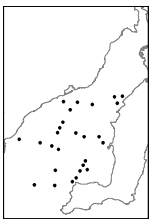
Common name = Squareback Butterflyfish
Length = To 191 mm
Depth range = 13.5 - 28 m
Sites = 74, BC11, BC14, BC25, BC4, WD3, Z2/11
Average biomass = 1.735 g/ha Rank biomass = 241
Average abundance = 0.056/ha Rank abundance = 149

F059 *Neoodax balteatus* (Valenciennes, 1840) (Chordata, Odacidae) CAAB 37 385005



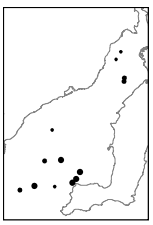
Common name = Little Rock Whiting
Length = To 105 mm
Depth range = 20 - 20 m
Sites = BC11
Average biomass = 0.019 g/ha Rank biomass = 382
Average abundance = 0.002/ha Rank abundance = 345

F060 *Cynoglossus broadhursti* Waite, 1905 (Chordata, Cynoglossidae) CAAB 37 463015



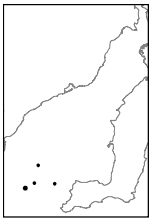
Common name = Southern Tongue Sole
Length = To 252 mm
Depth range = 12 - 54.5 m
Sites = 1, 11B, 19, 7, 9B, BC23, BC24, BC25, BC27, BC39, BC40, BC42, BC43, BC44, C14, CP1, CP12, CP3, CP7, SG2, WD4, WD6, WD9, WG1, WG3, Z1/3, Z3/11
Average biomass = 14.405 g/ha Rank biomass = 136
Average abundance = 0.309/ha Rank abundance = 63

F061 *Myliobatis australis* Macleay, 1881 (Chordata, Myliobatidae) CAAB 37 039001



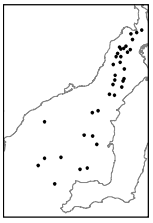
Common name = Eagle Ray
Length = To 1100 mm
Depth range = 13 - 54.5 m
Sites = 32, 94, BC18, BC2, BC3, BC32, BC34, BC42, BC43, BC44, BC45, CP12, CP7
Average biomass = 1,225.967 g/ha Rank biomass = 5
Average abundance = 0.146/ha Rank abundance = 89

F062 *Centroberyx lineatus* Cuvier, 1829 (Chordata, Berycidae) CAAB 37 258003



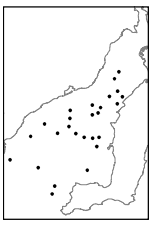
Common name = Swallowtail
Length = To 260 mm
Depth range = 41.5 - 54.5 m
Sites = BC38, BC43, BC44, BC46
Average biomass = 70.660 g/ha Rank biomass = 63
Average abundance = 0.448/ha Rank abundance = 58

F063 *Pagrus auratus* (Bloch & Schneider, 1801) (Chordata, Sparidae) CAAB 37 353001



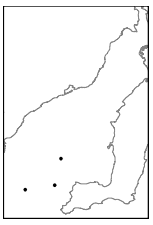
Common name = Snapper
Length = To 580 mm
Depth range = 13 - 43 m
Sites = 12, 19, 2, 21B, 22B, 26, 30, 32, 36, 44, 50B, 58C, 63, 68, 72, 92, 93, 94, BC10, BC14, BC24, BC28, BC3, BC32, BC34, BC38, BC4, BC40, BC44, BC9, CP12, FC2, N23, WD3, X3, Y7
Average biomass = 92.185 g/ha Rank biomass = 54
Average abundance = 0.622/ha Rank abundance = 49

F064 *Gonorynchus greyi* (Richardson, 1845) (Chordata, Gonorynchidae) CAAB 37 141001



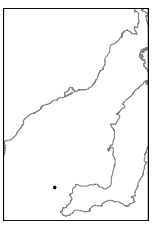
Common name = Beaked Salmon
Length = To 301 mm
Depth range = 12 - 44.5 m
Sites = 1, 11B, 1B, 3A, 61, 7, 80, 9B, BC10, BC14, BC22, BC24, BC28, BC35, BC38, BC40, BC44, BC47, BC9, EWL3, N23, WAL32, WD3, WD4, WD9, Z3/11
Average biomass = 16.583 g/ha Rank biomass = 128
Average abundance = 0.256/ha Rank abundance = 68

F065 *Trachichthys australis* Shaw, 1799 (Chordata, Trachichthyidae) CAAB 37 255015



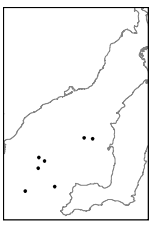
Common name = Roughy (Southern Roughy)
Length = To 140 mm
Depth range = 34 - 44 m
Sites = BC32, BC44, BC46
Average biomass = 8.739 g/ha Rank biomass = 160
Average abundance = 0.125/ha Rank abundance = 101

F066 *Caesioperca lepidoptera* (Bloch & Schneider, 1801) (Chordata, Serranidae) CAAB 37 311002



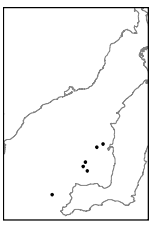
Common name = Butterfly Perch
Length = To 207 mm
Depth range = 41.5 - 41.5 m
Sites = BC44
Average biomass = 1.658 g/ha Rank biomass = 245
Average abundance = 0.010/ha Rank abundance = 271

F067 *Paratrachichthys macleayi* (Johnston, 1881) (Chordata, Trachichthyidae) CAAB 37 255003



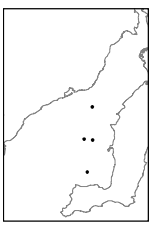
Common name = Sandpaper Fish
Length = To 117 mm
Depth range = 23.5 - 44 m
Sites = BC24, BC31, BC34, BC38, BC44, BC46, WD3
Average biomass = 2.209 g/ha Rank biomass = 226
Average abundance = 0.114/ha Rank abundance = 109

F068 *Ammotretis lituratus* (Richardson, 1844) (Chordata, Pleuronectidae) CAAB 37 461004



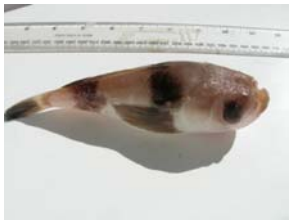
Common name = Spotted Flounder
Length = To 265 mm
Depth range = 18.7 - 44.5 m
Sites = BC28, BC40, BC47, CP1, CP3, WD6
Average biomass = 1.959 g/ha Rank biomass = 233
Average abundance = 0.021/ha Rank abundance = 208

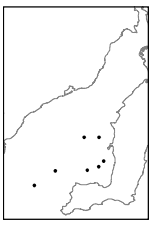
F069 *Zebrias scalaris* Gommon 1987 (Chordata, Soleidae) CAAB 37 462010



Common name = Many Banded Sole
Length = To 154 mm
Depth range = 23.5 - 28 m
Sites = 9B, BC24, BC40, WD3
Average biomass = 0.305 g/ha Rank biomass = 316
Average abundance = 0.011/ha Rank abundance = 260

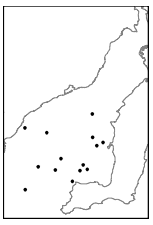
F070 *Ichthyscopus barbatus* Mees, 1960 (Chordata, Uranoscopidae) CAAB 37 400002





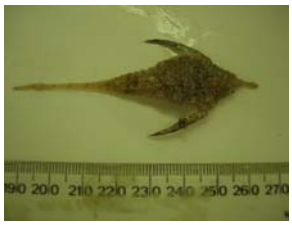
Common name = Fringed Stargazer
Length = To 247 mm
Depth range = 14.8 - 54.5 m
Sites = BC24, BC33, BC36, BC39, BC40, BC43, WD4
Average biomass = 3.784 g/ha Rank biomass = 194
Average abundance = 0.028/ha Rank abundance = 200

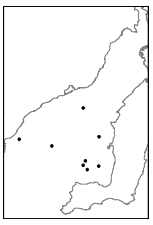
F071 *Neosebastes pandus* Richardson, 1842 (Chordata, Neosebastidae) CAAB 37 287003



Common name = Gurnard Perch
Length = To 354 mm
Depth range = 18.7 - 44 m
Sites = BC10, BC19, BC21, BC28, BC32, BC38, BC39, BC40, BC42, BC46, CP12, CP3, WD3, WD6
Average biomass = 62.103 g/ha Rank biomass = 67
Average abundance = 0.196/ha Rank abundance = 79

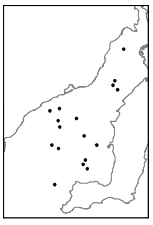
F072 *Pegasus lancifer* Kaup, 1861 (Chordata, Pegasidae) CAAB 37 309003





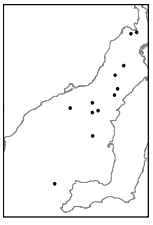
Common name = Sculptured Seamoth
Length = To 86 mm
Depth range = 17 - 36 m
Sites = 7B, BC23, BC27, BC36, BC40, CP1, CP3, WD4
Average biomass = 0.187 g/ha Rank biomass = 336
Average abundance = 0.067/ha Rank abundance = 134

F073 *Trygonorrhina dumerilii* , Castelnau, 1873 (Chordata, Rhinobatidae) CAAB 37 027002



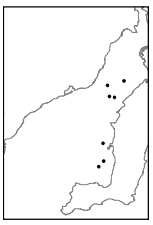
Common name = Southern Fiddler Ray
Length = To 1050 mm
Depth range = 15 - 41.5 m
Sites = 63, 68, 93, BC12, BC15, BC24, BC27, BC28, BC40, BC44, C7, CP1, CP3, EWL3, SG2, WG1, Z2/10
Average biomass = 131.244 g/ha Rank biomass = 38
Average abundance = 0.090/ha Rank abundance = 121

F074 *Sardinops neopilchardus* (Steindachner, 1879) (Chordata, Clupeidae) CAAB 37 085002



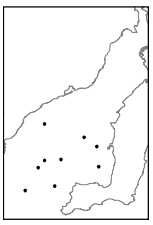
Common name = Pilchard
Length = To 152 mm
Depth range = 13.5 - 41.5 m
Sites = 13C, 19, 2, 44, 9B, BC10, BC44, BC9, EWL3, FC2, WD3, Z3/11
Average biomass = 1.039 g/ha Rank biomass = 264
Average abundance = 0.141/ha Rank abundance = 92

F075 *Hyporhamphus melanochir* (Valenciennes, 1847) (Chordata, Hemiramphidae) CAAB 37 234001



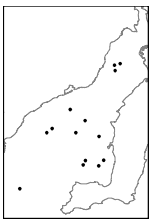
Common name = Southern Garfish
Length = To 262 mm
Depth range = 13 - 21.5 m
Sites = 19, 78, BC3, BC33, BC36, N23, WD6
Average biomass = 0.502 g/ha Rank biomass = 298
Average abundance = 0.053/ha Rank abundance = 154

F076 *Enoplosus armatus* (White, 1790) (Chordata, Enoplosidae) CAAB 37 366001



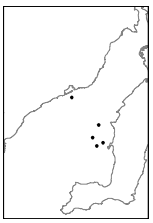
Common name = Old Wife
Length = To 217 mm
Depth range = 17.5 - 44 m
Sites = BC14, BC24, BC28, BC32, BC34, BC36, BC38, BC44, BC46
Average biomass = 24.548 g/ha Rank biomass = 105
Average abundance = 0.178/ha Rank abundance = 82

F077 *Squatina australis* Regan, 1906 (Chordata, Squatinidae) CAAB 37 024001



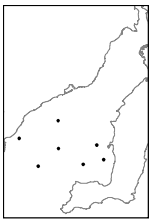
Common name = Angel Shark
Length = To 1040 mm
Depth range = 14.8 - 46.5 m
Sites = 12, 5, 8, BC13, BC18, BC21, BC33, BC36, BC45, CP1, CP3, WD4, WD9, Z3/11
Average biomass = 94.870 g/ha Rank biomass = 53
Average abundance = 0.064/ha Rank abundance = 137

F078 *Stigmatopora argus* (Richardson, 1840) (Chordata, Syngnathidae) CAAB 37 282017



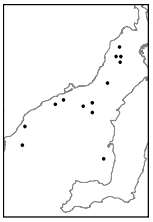
Common name = Spotted Pipefish
Length = To 278 mm
Depth range = 15 - 23.5 m
Sites = BC17, BC28, WD3, WD6, Z1/1
Average biomass = 0.050 g/ha Rank biomass = 370
Average abundance = 0.023/ha Rank abundance = 206

F079 *Callorhinchus milii* (Bory de Saint-Vincent, 1823) (Chordata, Callorhinchidae) CAAB 37 043001



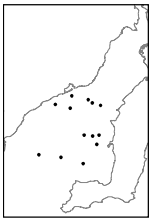
Common name = Elephant Fish
Length = To 738 mm
Depth range = 14.8 - 43 m
Sites = BC12, BC23, BC28, BC33, BC38, CP3, SG2
Average biomass = 53.862 g/ha Rank biomass = 74
Average abundance = 0.073/ha Rank abundance = 128

F080 *Hyperlophus vittatus* (Castelnau, 1875) (Chordata, Clupeidae) CAAB 37 085005



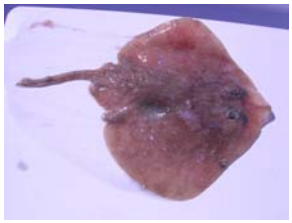
Common name = Sandy Spratt
Length = To 89 mm
Depth range = 14.8 - 27 m
Sites = 12, 26, 32, 72, 78, 7B, 9B, BC10, BC19, BC30, BC33, Z1/3, Z1/5
Average biomass = 0.846 g/ha Rank biomass = 274
Average abundance = 0.266/ha Rank abundance = 66

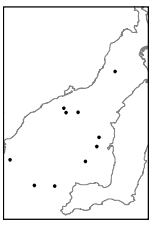
F081 *Genypterus tigerinus* Klunzinger, 1872 (Chordata, Ophidiidae) CAAB 37 228008



Common name = Rock Ling
Length = To 670 mm
Depth range = 15 - 36 m
Sites = 9B, BC24, BC28, BC31, BC32, BC8, CP3, WAL32, WD3, WD4, Z1/1, Z1/5, Z3/11
Average biomass = 56.497 g/ha Rank biomass = 72
Average abundance = 0.100/ha Rank abundance = 114

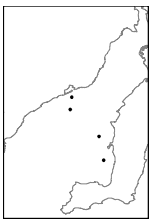
F082 *Dipturus whitleyi* (Iredale, 1938) (Chordata, Rajidae) CAAB 37 031006





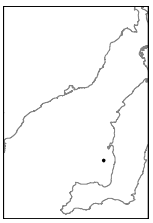
Common name = Melbourne Skate
Length = To 1070 mm
Depth range = 17 - 54.5 m
Sites = 5, 5B, BC28, BC35, BC43, BC44, CP1, WD4, Z2/11, Z3/10
Average biomass = 59.725 g/ha Rank biomass = 68
Average abundance = 0.052/ha Rank abundance = 156

F083 *Leviprora inops* (Jenyns, 1840) (Chordata, Platycephalidae) CAAB 37 296005



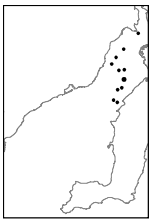
Common name = Longhead Flathead
Length = To 370 mm
Depth range = 14.8 - 21.5 m
Sites = BC33, WD4, Z1/1, Z3/11
Average biomass = 10.622 g/ha Rank biomass = 153
Average abundance = 0.039/ha Rank abundance = 188

F084 *Neopataecus waterhousii* (Castelnau, 1872) (Chordata, Pataecidae) CAAB 37 292005



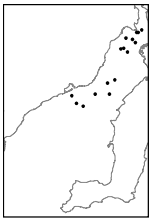
Common name = Whiskered Prowfish
Length = To 71 mm
Depth range = 14.8 - 14.8 m
Sites = BC33
Average biomass = 0.005 g/ha Rank biomass = 392
Average abundance = 0.003/ha Rank abundance = 332

F085 *Sutorectus tentaculatus* (Peters, 1865) (Chordata, Orectolobidae) CAAB 37 013012



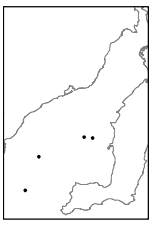
Common name = Cobbler Carpet Shark
Length = To 697 mm
Depth range = 12 - 22.5 m
Sites = 1, 16, 32, 57, 58C, 80, 93, BC3, DK1, EWL3, Y7
Average biomass = 183.684 g/ha Rank biomass = 31
Average abundance = 0.109/ha Rank abundance = 112

F086 *Tetractenos glaber* (Fréminville, 1813) (Chordata, Tetraodontidae) CAAB 37 467003



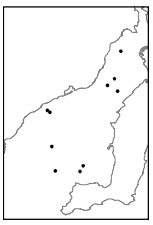
Common name = Smooth Toadfish
Length = To 235 mm
Depth range = 13.5 - 27 m
Sites = 21B, 36, 44, 47B, 50B, 57, 63, 78, 7B, 93, 94, BC6, CB1, N23, Z1/1, Z3/2
Average biomass = 34.365 g/ha Rank biomass = 93
Average abundance = 0.228/ha Rank abundance = 75

F087 *Parascyllium ferrugineum* McCulloch, 1911 (Chordata, Parascylliidae) CAAB 37 013005



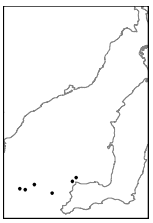
Common name = Rusty Catshark
Length = To 581 mm
Depth range = 23.5 - 44 m
Sites = BC24, BC31, BC46, WD3
Average biomass = 15.805 g/ha Rank biomass = 131
Average abundance = 0.055/ha Rank abundance = 150

F088 *Aptychotrema vincentiana* (Haacke, 1885) (Chordata, Rhinobatidae) CAAB 37 027001



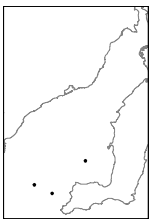
Common name = Southern Shovelnose Ray
Length = To 729 mm
Depth range = 17 - 40 m
Sites = 61, 78, 94, BC27, BC39, C7, CP12, CP3, EWL3, Z1/7
Average biomass = 20.748 g/ha Rank biomass = 117
Average abundance = 0.085/ha Rank abundance = 125

F089 *Pristiophorus nudipinnis* Günther, 1870 (Chordata, Pristiophoridae) CAAB 37 023001



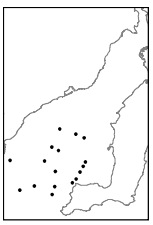
Common name = Saw Shark
Length = To 966 mm
Depth range = 37 - 54.5 m
Sites = BC42, BC43, BC45, BC46, BC47, CP7
Average biomass = 54.096 g/ha Rank biomass = 73
Average abundance = 0.574/ha Rank abundance = 51

F090 *Pterygotrigla polyommata* (Richardson, 1839) (Chordata, Triglidae) CAAB 37 288006



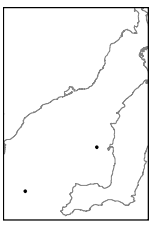
Common name = Latchet
Length = To 122 mm
Depth range = 33 - 54.5 m
Sites = BC43, BC47, CP1
Average biomass = 0.952 g/ha Rank biomass = 267
Average abundance = 0.069/ha Rank abundance = 132

F091 *Lepidotrigla spinosa* Gomon, 1987 (Chordata, Triglidae) CAAB 37 288028



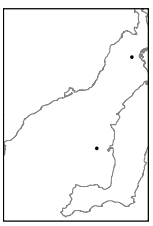
Common name = Southern Shortfin Gurnard
Length = To 200 mm
Depth range = 22 - 54.5 m
Sites = BC24, BC27, BC34, BC35, BC39, BC42, BC43, BC44, BC45, BC47, CP1, CP12, CP3, CP7, SG2, WD9, WG1
Average biomass = 42.152 g/ha Rank biomass = 82
Average abundance = 1.313/ha Rank abundance = 30

F092 *Sphyraena obtusata* Cuvier, 1829 (Chordata, Sphyraenidae) CAAB 37 382001



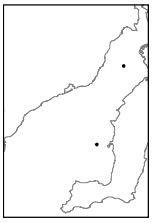
Common name = Striped Seapike
Length = To 396 mm
Depth range = 20.8 - 44 m
Sites = BC28, BC46
Average biomass = 22.823 g/ha Rank biomass = 111
Average abundance = 0.047/ha Rank abundance = 161

F093 *Siphonognathus attenuatus* (Ogilby, 1897) (Chordata, Odacidae) CAAB 37 385004



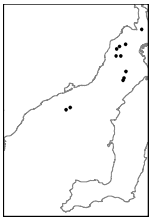
Common name = Slender Weed Whiting
Length = To 92 mm
Depth range = 12 - 20.8 m
Sites = BC1, BC28
Average biomass = 0.016 g/ha Rank biomass = 386
Average abundance = 0.014/ha Rank abundance = 249

F094 *Cnidoglanis macrocephalus* (Valenciennes, 1840) (Chordata, Plotosidae) CAAB 37 192001



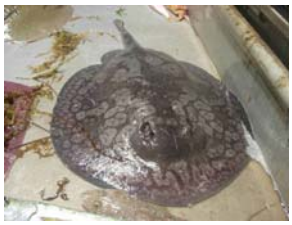
Common name = Estuary Catfish
Length = To 461 mm
Depth range = 17 - 20.8 m
Sites = 13C, BC28
Average biomass = 2.403 g/ha Rank biomass = 218
Average abundance = 0.016/ha Rank abundance = 237

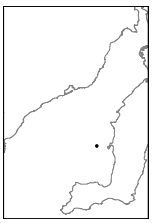
F095 *Hippocampus abdominalis* Lesson, 1827 (Chordata, Syngnathidae) CAAB 37 282120



Common name = Bigbelly Seahorse
Length = To 212 mm
Depth range = 13 - 25.5 m
Sites = 23, 26, 32, 50B, 59B, 72, 74, BC3, BC4, Z3/10, Z3/11
Average biomass = 1.693 g/ha Rank biomass = 242
Average abundance = 0.192/ha Rank abundance = 80

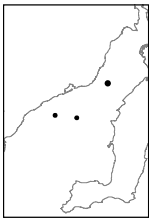
F096 *Urolophus gigas* Scott, 1954 (Chordata, Urolophidae) CAAB 37 038003





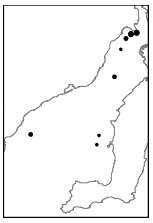
Common name = Spotted Stingaree
Length = To 400 mm
Depth range = 20.8 - 20.8 m
Sites = BC28
Average biomass = 1.811 g/ha Rank biomass = 238
Average abundance = 0.002/ha Rank abundance = 341

F097 *Dasyatis thetidis* Ogilby, 1899 (Chordata, Dasyatidae) CAAB 37 035002



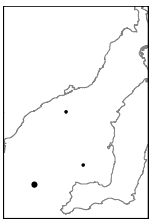
Common name = Black Stingray
Length = To 1200 mm
Depth range = 17 - 21 m
Sites = 78, BC15, Z3/8
Average biomass = 302.562 g/ha Rank biomass = 18
Average abundance = 0.015/ha Rank abundance = 248

F098 *Dasyatis brevicaudata* (Hutton, 1875) (Chordata, Dasyatidae) CAAB 37 035001



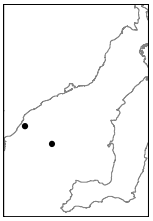
Common name = Smooth Stingray
Length = To 1110 mm
Depth range = 13.5 - 26 m
Sites = 44, 61, 94, BC22, BC28, CB1, FC2, WD4
Average biomass = 610.034 g/ha Rank biomass = 10
Average abundance = 0.038/ha Rank abundance = 190

F099 *Mustelus antarcticus* Günther, 1870 (Chordata, Triakidae) CAAB 37 017001



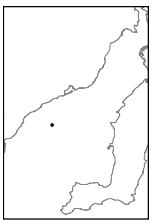
Common name = Gummy Shark
Length = To 1500 mm
Depth range = 25.5 - 54.5 m
Sites = BC43, CP3, Z3/10
Average biomass = 111.200 g/ha Rank biomass = 43
Average abundance = 0.016/ha Rank abundance = 240

F100 *Orectolobus maculatus* (Bonnaterre, 1788) (Chordata, Orectolobidae) CAAB 37 013003



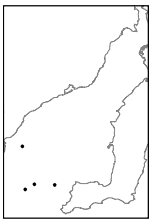
Common name = Ornate Wobbegong
Length = To 2200 mm
Depth range = 23 - 33 m
Sites = BC19, BC27
Average biomass = 327.668 g/ha Rank biomass = 16
Average abundance = 0.005/ha Rank abundance = 317

F101 *Pristiophorus cirratus* (Latham, 1794) (Chordata, Pristiophoridae) CAAB 37 023002



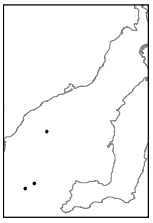
Common name = Common Sawshark
Length = To 475 mm
Depth range = 22 - 22 m
Sites = BC16
Average biomass = 0.446 g/ha Rank biomass = 303
Average abundance = 0.003/ha Rank abundance = 334

F104 *Chelidonichthys kumu* (Lesson, 1826) (Chordata, Triglidae) CAAB 37 288001



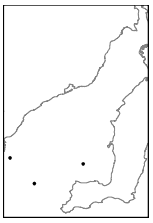
Common name = Red Gurnard
Length = To 521 mm
Depth range = 22 - 54.5 m
Sites = BC30, BC43, BC44, BC46
Average biomass = 18.376 g/ha Rank biomass = 123
Average abundance = 0.060/ha Rank abundance = 143

F105 *Nemadactylus valenciennesi* (Whitley 1937) (Chordata, Cheilodactylidae) CAAB 37 377002



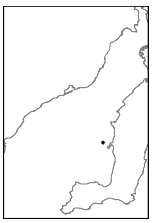
Common name = Queen snapper
Length = To 600 mm
Depth range = 25 - 54.5 m
Sites = BC21, BC43, BC46
Average biomass = 27.293 g/ha Rank biomass = 98
Average abundance = 0.018/ha Rank abundance = 228

F106 *Pseudophycis bachus* (Forster, 1801) (Chordata, Moridae) CAAB 37 224006



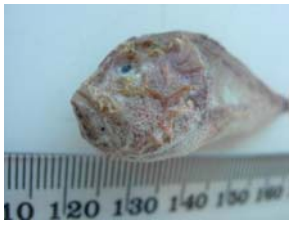
Common name = Red Cod
Length = To 315 mm
Depth range = 22 - 54.5 m
Sites = BC35, BC43, CP3
Average biomass = 1.849 g/ha Rank biomass = 235
Average abundance = 0.010/ha Rank abundance = 276

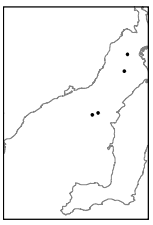
F107 *Histiogamphelus cristatus* (Macleay, 1881) (Chordata, Syngnathidae) CAAB 37 282081



Common name = Macleays Crested Pipefish
Length = To 235 mm
Depth range = 18.7 - 18.7 m
Sites = WD6
Average biomass = 0.012 g/ha Rank biomass = 387
Average abundance = 0.003/ha Rank abundance = 326

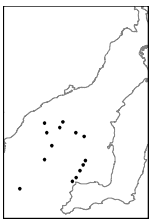
F108 *Kanekonia queenslandica* Whitley, 1952 (Chordata, Aploactinidae) CAAB 37 290007





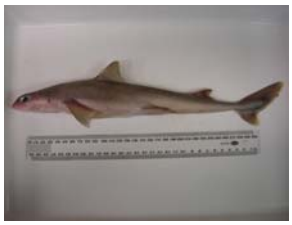
Common name = Deep Velvet fish
Length = To 54 mm
Depth range = 14 - 19.3 m
Sites = 21B, 58C, BC10, BC9
Average biomass = 0.104 g/ha Rank biomass = 356
Average abundance = 0.033/ha Rank abundance = 195

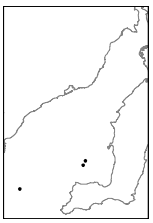
F109 *Neoplatycephalus aurimaculatus* (Knapp, 1987) (Chordata, Platycephalidae) CAAB 37 296035



Common name = Toothy Flathead
Length = To 483 mm
Depth range = 23 - 46.5 m
Sites = BC14, BC21, BC24, BC27, BC34, BC42, BC45, CP1, CP12, CP3, CP7, WD9, WG1, WG3
Average biomass = 26.471 g/ha Rank biomass = 100
Average abundance = 0.149/ha Rank abundance = 87

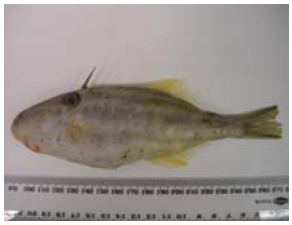
F110 *Squalus megalops* (Macleay, 1881) (Chordata, Squalidae) CAAB 37 020006

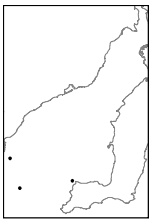




Common name = Piked Dogfish
Length = To 430 mm
Depth range = 33 - 46.5 m
Sites = BC45, CP1, CP3
Average biomass = 12.446 g/ha Rank biomass = 146
Average abundance = 0.045/ha Rank abundance = 162

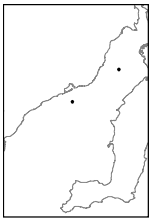
F111 *Nelusetta ayraudi* (Quoy & Gaimard, 1824) (Chordata, Monacanthidae) CAAB 37 465006





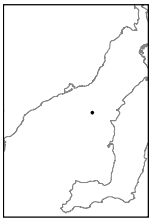
Common name = Chinaman Leather Jacket
Length = To 188 mm
Depth range = 22 - 46.5 m
Sites = BC35, BC42, BC45
Average biomass = 1.147 g/ha Rank biomass = 261
Average abundance = 0.017/ha Rank abundance = 235

F112 *Glyptauchen panduratus* (Richardson, 1850) (Chordata, Tetrarogidae) CAAB 37 287023



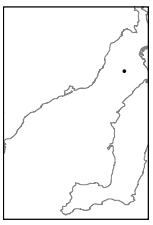
Common name = Goblin Fish
Length = To 97 mm
Depth range = 20 - 20.1 m
Sites = 80, Z2/13
Average biomass = 0.274 g/ha Rank biomass = 321
Average abundance = 0.021/ha Rank abundance = 212

F113 *Siphonognathus caninis* (Scott, 1976) (Chordata, Odacidae) CAAB 37 385011



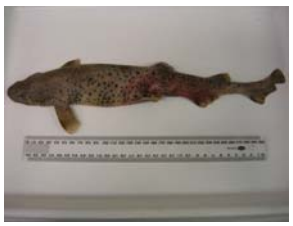
Common name = Sharpnose Weed Whiting
Length = To 65 mm
Depth range = 19.3 - 19.3 m
Sites = BC10
Average biomass = 0.017 g/ha Rank biomass = 385
Average abundance = 0.008/ha Rank abundance = 284

F114 *Meuschenia freycineti* (Quoy & Gaimard, 1824) (Chordata, Monacanthidae) CAAB 37 465036



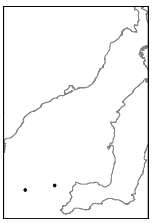
Common name = Six-spine Leather Jacket
Length = To 176 mm
Depth range = 16.1 - 16.1 m
Sites = 58C
Average biomass = 0.790 g/ha Rank biomass = 276
Average abundance = 0.007/ha Rank abundance = 293

F116 *Asymbolus* sp. 1 (Chordata, Scyliorhinidae) CAAB 37 015000



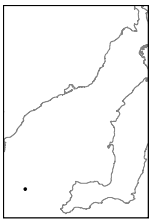
Common name = Saddled Catshark
Length = To 380 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 12.184 g/ha Rank biomass = 147
Average abundance = 0.045/ha Rank abundance = 172

F117 *Pictilabrus laticlavius* (Richardson, 1840) (Chordata, Labridae) CAAB 37 384020



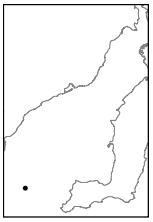
Common name = Senator Wrasse
Length = To 314 mm
Depth range = 41.5 - 44 m
Sites = BC44, BC46
Average biomass = 15.187 g/ha Rank biomass = 133
Average abundance = 0.055/ha Rank abundance = 151

F118 *Caesioperca rasor* (Richardson, 1839) (Chordata, Serranidae) CAAB 37 311003



Common name = Barber Perch
Length = To 190 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 20.187 g/ha Rank biomass = 119
Average abundance = 0.267/ha Rank abundance = 65

F119 *Aulopus* cf *purpurissatus* (Chordata, Aulopidae) CAAB 37 117802

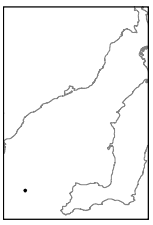


Common name = Sergeant Baker
Length = To 480 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 66.610 g/ha Rank biomass = 65
Average abundance = 0.089/ha Rank abundance = 122

F120 *Cheilodactylus nigripes* Richardson, 1850 (Chordata, Cheilodactylidae) CAAB 37 377001

Common name = Magpie Perch
Length = To 321 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 25.879 g/ha Rank biomass = 102
Average abundance = 0.045/ha Rank abundance = 172

F121 *Cantheschenia longipinnis* (Fraser-Brunner, 1941) (Chordata, Monacanthidae) CAAB 37 465053



Common name = Smoothspine Leather Jacket
Length = To 192 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 19.565 g/ha Rank biomass = 120
Average abundance = 0.222/ha Rank abundance = 76

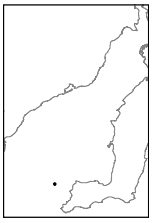
F122 *Eubalichthys quadrispinis* Hutchins, 1977 (Chordata, Monacanthidae) CAAB 37 465032

Common name = Four-spine Leather Jacket
Length = To 206 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 12.539 g/ha Rank biomass = 144
Average abundance = 0.089/ha Rank abundance = 122

F123 *Optivus agrammus* Gomon, 2004 (Chordata, Trachichthyidae) CAAB 37 255016

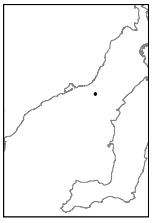
Common name = Western Roughy
Length = To 63 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 0.267 g/ha Rank biomass = 325
Average abundance = 0.045/ha Rank abundance = 172

F124 *Phyllophryne scortea* (McCulloch & Waite, 1918) (Chordata, Antennariidae) CAAB 37 210015



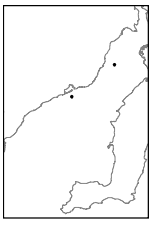
Common name = Smooth Anglerfish
Length = To 46 mm
Depth range = 41.5 - 41.5 m
Sites = BC44
Average biomass = 0.041 g/ha Rank biomass = 375
Average abundance = 0.010/ha Rank abundance = 271

F125 *Engraulis australis* (Shaw, 1790) (Chordata, Engraulidae) CAAB 37 086001



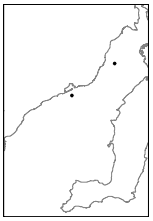
Common name = Australian Anchovy
Length = To 122 mm
Depth range = 14.5 - 27 m
Sites = 23, 44, 61, 7B, 94, BC36, CB1, DK1, SHW2, WAL32
Average biomass = 0.789 g/ha Rank biomass = 278
Average abundance = 0.127/ha Rank abundance = 96

F126 *Arripis georgianus* (Valenciennes, 1831) (Chordata, Arripidae) CAAB 37 344001



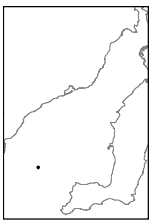
Common name = Tommy Rough (Australian Herring)
Length = To 114 mm
Depth range = 15 - 15 m
Sites = BC6
Average biomass = 0.182 g/ha Rank biomass = 337
Average abundance = 0.006/ha Rank abundance = 310

F127 *Rhycherus filamentosus* (Castelnau, 1872) (Chordata, Antennariidae) CAAB 37 210006



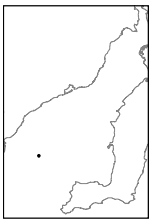
Common name = Tasselled Anglerfish
Length = To 110 mm
Depth range = 15 - 25 m
Sites = 8, Z1/1
Average biomass = 0.837 g/ha Rank biomass = 275
Average abundance = 0.018/ha Rank abundance = 233

F128 *Oplegnathus woodwardi* (Waite, 1900) (Chordata, Oplegnathidae) CAAB 37 369002



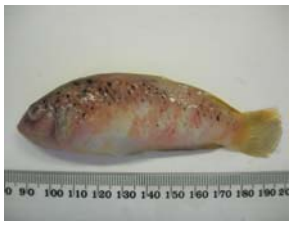
Common name = Knifejaw
Length = To 110 mm
Depth range = 43 - 43 m
Sites = BC38
Average biomass = 0.095 g/ha Rank biomass = 359
Average abundance = 0.002/ha Rank abundance = 337

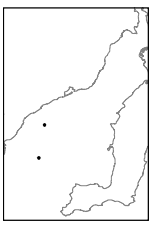
F129 *Histiophryne cryptacanthus* (Weber, 1913) (Chordata, Antennariidae) CAAB 37 210013



Common name = Rodless Anlgerfish
Length = To 102 mm
Depth range = 32 - 32 m
Sites = BC31
Average biomass = 0.322 g/ha Rank biomass = 312
Average abundance = 0.006/ha Rank abundance = 301

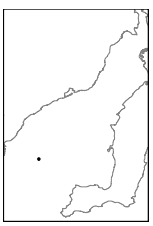
F130 *Austrolabrus maculatus* (Macleay, 1881) (Chordata, Labridae) CAAB 37 384025





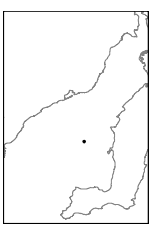
Common name = Blackspotted Wrasse
Length = To 108 mm
Depth range = 23 - 32 m
Sites = BC14, BC31
Average biomass = 0.180 g/ha Rank biomass = 339
Average abundance = 0.010/ha Rank abundance = 277

F131 *Sorosichthys ananassa* Whitley, 1945 (Chordata, Trachichthyidae) CAAB 37 255010



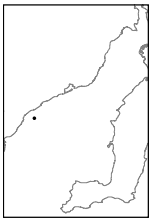
Common name = Little Pineapplefish
Length = To 81 mm
Depth range = 32 - 32 m
Sites = BC31
Average biomass = 0.110 g/ha Rank biomass = 355
Average abundance = 0.006/ha Rank abundance = 301

F132 *Pempheris multiradiata* Klunzinger, 1880 (Chordata, Pempheridídae) CAAB 37 357001



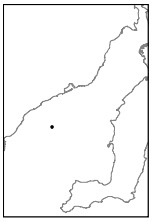
Common name = Common Bullseye (Bigscale Bullseye)
Length = To 88 mm
Depth range = 28 - 28 m
Sites = BC24
Average biomass = 0.312 g/ha Rank biomass = 315
Average abundance = 0.036/ha Rank abundance = 192

F133 *Spratelloides robustus* Ogilby, 1897 (Chordata, Clupeidae) CAAB 37 085003



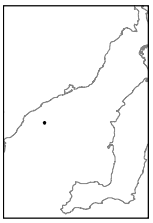
Common name = Blue Sprat
Length = To 97 mm
Depth range = 19 - 19 m
Sites = BC20
Average biomass = 0.135 g/ha Rank biomass = 350
Average abundance = 0.020/ha Rank abundance = 215

F134 *Urolophus cruciatus* (Lacépède, 1804) (Chordata, Urolophidae) CAAB 37 038002



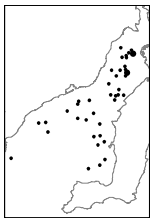
Common name = Banded Stingaree
Length = To 207 mm
Depth range = 22 - 22 m
Sites = BC18
Average biomass = 0.380 g/ha Rank biomass = 309
Average abundance = 0.003/ha Rank abundance = 326

F135 *Asymbolus vincenti* (Zietz, 1908) (Chordata, Scyliorhinidae) CAAB 37 015003



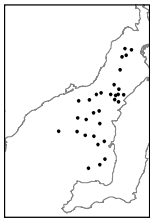
Common name = Gulf Catshark
Length = To 363 mm
Depth range = 23 - 23 m
Sites = BC14
Average biomass = 0.561 g/ha Rank biomass = 296
Average abundance = 0.003/ha Rank abundance = 323

G001 *Posidonia* sp. (Magnoliophyta, Posidoniaceae) CAAB 63 617000



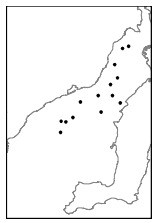
Common name = Strapweed
Length = Not recorded
Depth range = 12 - 26 m
Sites = 13C, 16, 19, 2, 20B, 21B, 21C, 22B, 26, 4, 58C, 59B, 7, 70, 72, 78, 80, BC1, BC10, BC11, BC13, BC14, BC15, BC17, BC2, BC21, BC28, BC33, BC35, BC36, BC40, BC8, C14, EWL3, N23, WD3, WD4, WD6, Z3/10, Z3/2
Average biomass = 342.494 g/ha Rank biomass = 15
Average abundance = N/A Rank abundance = N/A

G002 *Amphibolis antartica* (Labill.) Asch. (Magnoliophyta, Cymodoceaceae) CAAB 63 618004



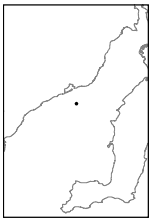
Common name = Amphibolis
Length = Not recorded
Depth range = 12 - 32 m
Sites = 1, 11B, 16, 19, 21C, 22B, 4, 68, 7, 72, 80, 93, BC10, BC13, BC15, BC17, BC24, BC28, BC33, BC36, BC40, BC6, BC8, BC9, C14, EWL3, N23, SHW2, WD3, WD6, WD9
Average biomass = 14.875 g/ha Rank biomass = 134
Average abundance = N/A Rank abundance = N/A

H001 *Halopteris campanula* (Busk, 1852) (Cnidaria, Halopteridae) CAAB 11 063001



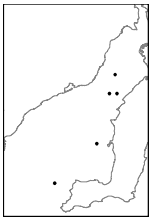
Common name = Halopteris sp. 1
Length = Not recorded
Depth range = 12 - 32 m
Sites = 1, 11B, 23, 26, 3A, 61, 78, BC12, BC6, BC9, C14, DK1, N23, WG3
Average biomass = 0.362 g/ha Rank biomass = 310
Average abundance = 0.139/ha Rank abundance = 93

H002 *Halopteris glutenosa* (Lamouroux, 1816) (Cnidaria, Halopteridiidae) CAAB 11 063008



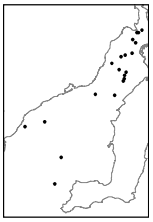
Common name = Halopteris sp. 2
Length = Not recorded
Depth range = 20.5 - 20.5 m
Sites = Z3/2
Average biomass = 0.136 g/ha Rank biomass = 348
Average abundance = 0.007/ha Rank abundance = 295

H003 *Nemertesia procumbens* (Spencer, 1891) (Cnidaria, Plumulariidae) CAAB 11 058004



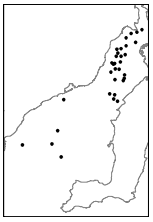
Common name = Plumularia
Length = Not recorded
Depth range = 20.8 - 41.5 m
Sites = 2, 4, BC28, BC44, N23
Average biomass = 0.790 g/ha Rank biomass = 277
Average abundance = 0.027/ha Rank abundance = 201

M001 *Lima vulgaris* (Link, 1807) (Mollusca, Limidae) CAAB 23 250020



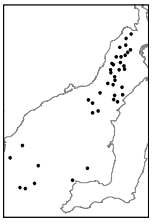
Common name = Lima Lima
Length = To 60 mm
Depth range = 12 - 41.5 m
Sites = 19, 21C, 36, 44, 47B, 50B, 57, 59B, 72, 80, BC1, BC14, BC19, BC2, BC3, BC32, BC4, BC44, BC6, DK1
Average biomass = 8.391 g/ha Rank biomass = 162
Average abundance = 1.065/ha Rank abundance = 35

M002 *Malleus* (*Malleus*) *meridianus* Cotton, 1930 (Mollusca, Malleidae) CAAB 23 237001



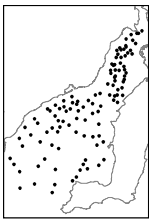
Common name = Southern Hammer Oyster
Length = To 163 mm
Depth range = 12 - 34 m
Sites = 1, 11B, 12, 16, 19, 21C, 30, 32, 44, 47B, 5, 50B, 63, 69, 72, 74, 8, 80, 92, 94, BC2, BC27, BC3, BC30, BC32, BC4, CB1, DK1, FC2, N23, X3, Z1/3
Average biomass = 40.918 g/ha Rank biomass = 83
Average abundance = 0.996/ha Rank abundance = 38

M003 *Octopus australis* Hoyle, 1885 (Mollusca, Octopodidae) CAAB 23 659001



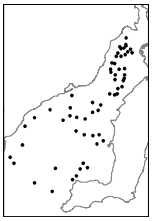
Common name = Southern Hammer Octopus
Length = To 91 mm
Depth range = 12 - 54.5 m
Sites = 1, 12, 13C, 16, 19, 21B, 21C, 22B, 23, 26, 32, 58C, 61, 63, 68, 69, 7, 70, 72, 78, 80, 9B, BC10, BC30, BC35, BC38, BC40, BC42, BC43, BC45, BC46, BC8, BC9, CB1, DK1, FC2, SHW2, X3, Y7
Average biomass = 31.124 g/ha Rank biomass = 95
Average abundance = 0.628/ha Rank abundance = 48

M004 *Sepioteuthis australis* Quoy & Gaimard, 1832 (Mollusca, Loliginidae) CAAB 23 617005



Common name = Southern Calamary
Length = To 257 mm
Depth range = 12 - 54.5 m
Sites = 1, 11B, 12, 13C, 16, 19, 1B, 2, 21B, 21C, 22B, 23, 26, 30, 32, 36, 4, 44, 47B, 5, 50B, 57, 58C, 59B, 5B, 61, 63, 68, 69, 7, 70, 72, 74, 78, 7B, 8, 80, 92, 93, 94, 9B, BC1, BC10, BC11, BC12, BC13, BC15, BC17, BC18, BC19, BC2, BC20, BC21, BC22, BC23, BC24, BC25, BC27, BC28, BC3, BC30, BC33, BC34, BC35, BC36, BC37, BC38, BC39, BC4, BC40, BC41, BC42, BC43, BC44, BC45, BC47, BC6, BC8, BC9, C14, C7, CB1, CP1, CP12, CP3, CP7, DK1, EWL3, FC2, N23, SG2, SHW2, WAL32, WD3, WD4, WD6, WD9, WG1, WG3, X3, Y7, Z1/1, Z1/3, Z1/5, Z1/7, Z2/10, Z2/11, Z2/13, Z3/10, Z3/11, Z3/2, Z3/8
Average biomass = 412.945 g/ha Rank biomass = 13
Average abundance = 13.404/ha Rank abundance = 8

M005 *Sepia novaehollandae* Hoyle, 1909 (Mollusca, Sepiidae) CAAB 23 607005

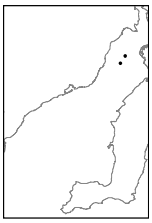


Common name = Nova Cuttlefish
Length = To 139 mm
Depth range = 12 - 54.5 m
Sites = 19, 2, 21B, 21C, 22B, 23, 26, 30, 32, 3A, 4, 58C, 63, 69, 70, 72, 8, 80, 92, 93, 94, 9B, BC1, BC10, BC13, BC15, BC19, BC2, BC20, BC24, BC28, BC3, BC30, BC35, BC37, BC39, BC4, BC40, BC42, BC43, BC47, BC9, C7, CB1, CP12, CP3, CP7, DK1, EWL3, N23, WAL32, WD3, WD4,
WD6, WD9, WG3, Y7, Z1/1, Z3/11
Average biomass = 85.456 g/ha Rank biomass = 57
Average abundance = 1.381/ha Rank abundance = 29

M006 *Ischnochiton* (*Heterozona*) *cariosus* Pilsbry, 1892 (Mollusca, Ischnochitonidae) CAAB 23 115023

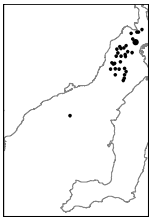
Common name = Chiton
Length = To 17 mm
Depth range = 15 - 15 m
Sites = 21C
Average biomass = 0.005 g/ha Rank biomass = 394
Average abundance = 0.005/ha Rank abundance = 315

M007 *Tugali cicatricosa* Adams, 1851 (Mollusca, Fissurellidae) CAAB 24 040007



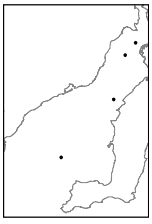
Common name = Shield Limpet
Length = To 30 mm
Depth range = 15 - 17.8 m
Sites = 12, 21C
Average biomass = 0.029 g/ha Rank biomass = 379
Average abundance = 0.008/ha Rank abundance = 288

M008 *Trichomya hirsuta* (Lamarck, 1819) (Mollusca, Mytilidae) CAAB 23 220006



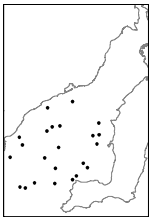
Common name = Hairy Mussel
Length = To 79 mm
Depth range = 12 - 26 m
Sites = 12, 2, 20B, 21B, 21C, 26, 30, 32, 36, 3A, 44, 47B, 5, 50B, 57, 58C, 59B, 70, 72, 74, 8, 80, 92, 93, 94, BC1, BC2, BC3, BC4, DK1, FC2, X3
Average biomass = 223.905 g/ha Rank biomass = 26
Average abundance = 11.926/ha Rank abundance = 10

M009 *Barbatia* (*Barbatia*) *pistachia* (Lamarck, 1819) (Mollusca, Arcidae) CAAB 23 226006



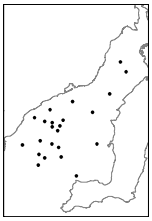
Common name = Ark Shell
Length = To 64 mm
Depth range = 13.5 - 34 m
Sites = 16, 21C, 47B, BC32
Average biomass = 2.392 g/ha Rank biomass = 220
Average abundance = 0.122/ha Rank abundance = 103

M010 *Nototodarus gouldi* (McCoy, 1888) (Mollusca, Ommastrephidae) CAAB 23 636004



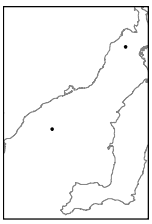
Common name = Red Arrow Squid
Length = To 232 mm
Depth range = 17 - 54.5 m
Sites = BC17, BC18, BC21, BC23, BC28, BC30, BC34, BC35, BC39, BC40, BC42, BC43, BC44, BC45, BC46, CP3, CP7, SG2, WD3, WD4, WG1, Z1/7, Z2/13
Average biomass = 32.337 g/ha Rank biomass = 94
Average abundance = 0.354/ha Rank abundance = 61

M011 *Mimachlamys asperrima* (Lamarck, 1819) (Mollusca, Pectinidae) CAAB 23 270006



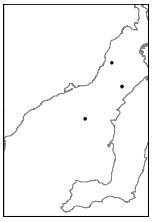
Common name = Doughboy Scallop (Sponge Scallop)
Length = To 60 mm
Depth range = 13 - 43 m
Sites = 11B, 12, 59B, BC10, BC14, BC16, BC18, BC20, BC25, BC27, BC28, BC30, BC31, BC32, BC34, BC38, C7, CP7, N23, SG2, WG1, WG3, Z2/13
Average biomass = 50.362 g/ha Rank biomass = 77
Average abundance = 4.824/ha Rank abundance = 16

M012 *Diodora lincolnensis* (Cotton, 1930) (Mollusca, Fissurellidae) CAAB 24 040002



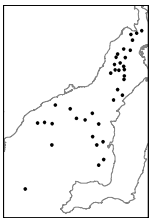
Common name = Limpet
Length = To 41 mm
Depth range = 22 - 22 m
Sites = 23, BC18
Average biomass = 0.136 g/ha Rank biomass = 349
Average abundance = 0.011/ha Rank abundance = 265

M013 *Acrosterigma cygnorum* (Deshayes, 1855) (Mollusca, Cardiidae) CAAB 23 335019



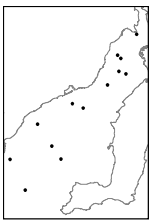
Common name = Cockle
Length = To 36 mm
Depth range = 14.5 - 21.4 m
Sites = BC13, DK1, Y7
Average biomass = 0.339 g/ha Rank biomass = 311
Average abundance = 0.025/ha Rank abundance = 203

M014 *Sepia apama* Gray, 1849 (Mollusca, Sepiidae) CAAB 23 607001



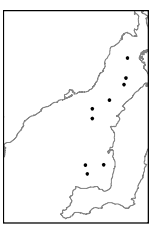
Common name = Giant Cuttlefish
Length = To 270 mm
Depth range = 13 - 44 m
Sites = 12, 13C, 16, 20B, 22B, 30, 32, 36, 44, 5, 50B, 58C, 69, 7, 8, 80, 93, BC10, BC11, BC13, BC14, BC15, BC16, BC17, BC2, BC27, BC28, BC3, BC33, BC36, BC46, EWL3, FC2, WD3, WD6, Z1/5, Z3/11
Average biomass = 205.296 g/ha Rank biomass = 27
Average abundance = 0.506/ha Rank abundance = 53

M015 *Ostrea* (*Eostrea*) *angasi* Sowerby, 1871 (Mollusca, Ostreidae) CAAB 23 257002



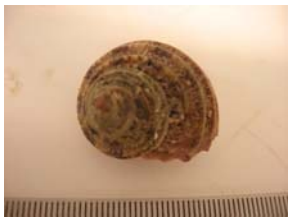
Common name = Mud Oyster (Native Oyster)
Length = To 104 mm
Depth range = 13 - 44 m
Sites = 30, 44, 59B, 72, 78, 7B, 80, BC11, BC27, BC32, BC35, BC46, Z2/13
Average biomass = 16.175 g/ha Rank biomass = 130
Average abundance = 0.486/ha Rank abundance = 54

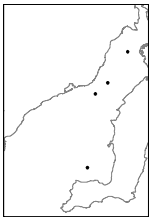
M016 *Sepiadarium austrinum* Berry, 1921 (Mollusca, Sepiadariidae) CAAB 23 608003



Common name = Southern Bottletail Squid
Length = To 25 mm
Depth range = 13 - 33 m
Sites = 21B, 59B, 9B, BC10, BC3, BC33, BC40, CP1, N23
Average biomass = 0.272 g/ha Rank biomass = 323
Average abundance = 0.062/ha Rank abundance = 142

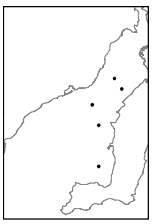
M017 *Clanculus flagellatus* (Philippi, 1848) (Mollusca, Trochidae) CAAB 24 046124





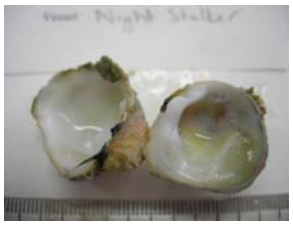
Common name = Clanculus
Length = To 30 mm
Depth range = 14 - 26 m
Sites = 21B, 78, BC40, BC6
Average biomass = 0.172 g/ha Rank biomass = 341
Average abundance = 0.031/ha Rank abundance = 198

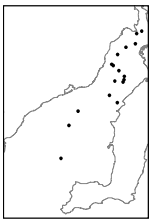
M018 *Calliostoma* (*Salsipotens*) *armillatum* (Wood, 1828) (Mollusca, Calliostomatidae) CAAB 24 047011



Common name = Topshell
Length = To 29 mm
Depth range = 15.5 - 25 m
Sites = 61, 9B, BC17, BC36, Y7
Average biomass = 0.259 g/ha Rank biomass = 327
Average abundance = 0.039/ha Rank abundance = 189

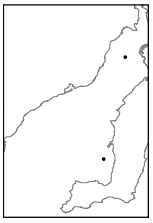
M019 *Cleidothaerus albidus* (Lamarck, 1819) (Mollusca, Cleidothaeridae) CAAB 23 423001





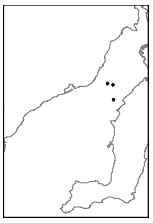
Common name = Rock Shell
Length = To 56 mm
Depth range = 12 - 34 m
Sites = 1, 1B, 30, 44, 47B, 50B, 5B, 63, 80, 92, BC2, BC3, BC32, BC4, DK1, N23, X3
Average biomass = 10.363 g/ha Rank biomass = 155
Average abundance = 0.724/ha Rank abundance = 45

M020 *Pinna bicolor* Gmelin, 1791 (Mollusca, Pinnidae) CAAB 23 245001



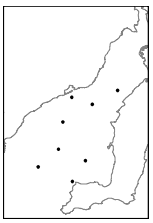
Common name = Razor Clam (Razor Fish)
Length = To 328 mm
Depth range = 14 - 14.8 m
Sites = 20B, BC33
Average biomass = 4.016 g/ha Rank biomass = 192
Average abundance = 0.011/ha Rank abundance = 266

M021 *Eucrassatella kingicola* (Lamarck, 1805) (Mollusca, Crassatellidae) CAAB 23 330004



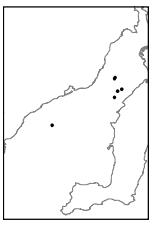
Common name = Crassatela
Length = To 89 mm
Depth range = 17 - 22 m
Sites = 16, 68, 78
Average biomass = 3.408 g/ha Rank biomass = 198
Average abundance = 0.021/ha Rank abundance = 213

M022 *Pecten fumatus* Reeve, 1852 (Mollusca, Pectinidae) CAAB 23 270007



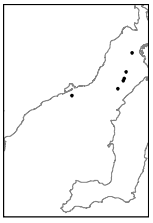
Common name = Commercial Scallop
Length = To 95 mm
Depth range = 15 - 43 m
Sites = 9B, BC38, BC42, CP1, EWL3, SG2, WG3, Z1/1
Average biomass = 2.388 g/ha Rank biomass = 221
Average abundance = 0.063/ha Rank abundance = 138

M023 *Equichlamys bifrons* (Lamarck, 1819) (Mollusca, Pectinidae) CAAB 23 270005



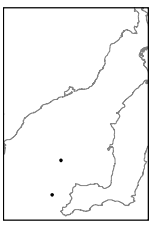
Common name = Queen Scallop
Length = To 82 mm
Depth range = 15.5 - 25 m
Sites = 19, 2, 61, BC16, EWL3, Y7
Average biomass = 2.746 g/ha Rank biomass = 211
Average abundance = 0.113/ha Rank abundance = 111

M024 *Sepioloidea lineolata* (Quoy & Gaimard, 1832) (Mollusca, Sepiadariidae) CAAB 23 608001



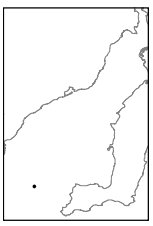
Common name = Striped Pyjama Squid
Length = To 27 mm
Depth range = 12 - 18 m
Sites = 59B, BC1, BC3, BC4, EWL3, Z1/1
Average biomass = 0.903 g/ha Rank biomass = 271
Average abundance = 0.116/ha Rank abundance = 106

M025 *Sassia* (*Cymatiella*) *verrucosa* (Reeve, 1844) (Mollusca, Ranellidae) CAAB 24 176057



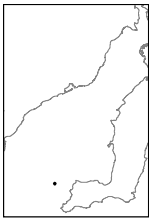
Common name = Triton
Length = To 31 mm
Depth range = 34 - 44.5 m
Sites = BC32, BC47
Average biomass = 0.073 g/ha Rank biomass = 367
Average abundance = 0.021/ha Rank abundance = 210

M026 *Amoria undulata* (Lamarck, 1804) (Mollusca, Volutidae) CAAB 24 207007



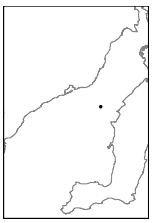
Common name = Wavyvolute
Length = To 87 mm
Depth range = 54.5 - 54.5 m
Sites = BC43
Average biomass = 0.213 g/ha Rank biomass = 330
Average abundance = 0.003/ha Rank abundance = 330

M027 *Ceratosoma brevicaudatum* Abraham, 1876 (Mollusca, Chromodorididae) CAAB 24 432001



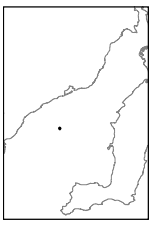
Common name = Nudibranch
Length = To 47 mm
Depth range = 41.5 - 41.5 m
Sites = BC44
Average biomass = 0.083 g/ha Rank biomass = 364
Average abundance = 0.010/ha Rank abundance = 271

M028 *Fusinus* (*Fusinus*) *australis* (Quoy & Gaimard, 1833) (Mollusca, Buccinidae) CAAB 24 202004



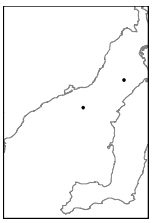
Common name = Spindle Shell
Length = To 75 mm
Depth range = 19 - 19 m
Sites = WAL32
Average biomass = 0.141 g/ha Rank biomass = 346
Average abundance = 0.005/ha Rank abundance = 312

M029 *Atrina* (*Servatrina*) *tasmanica* (Tenison Woods, 1876) (Mollusca, Pinnidae) CAAB 23 245007



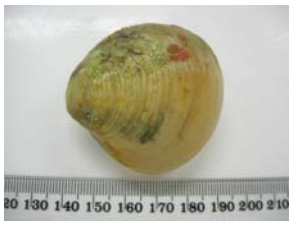
Common name = Razor Fish sp. 2
Length = To 208 mm
Depth range = 28 - 28 m
Sites = WG1
Average biomass = 0.774 g/ha Rank biomass = 279
Average abundance = 0.005/ha Rank abundance = 319

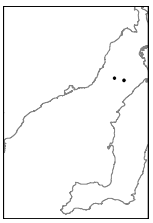
M030 *Glycymeris* (*Glycymeris*) *striatularis* (Lamarck, 1819) (Mollusca, Glycymerididae) CAAB 23 231001



Common name = Dog Cockle
Length = To 37 mm
Depth range = 13 - 27 m
Sites = 7B, BC3
Average biomass = 0.704 g/ha Rank biomass = 286
Average abundance = 0.066/ha Rank abundance = 135

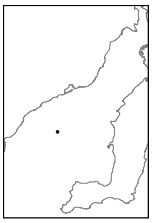
M031 *Dosinia victoriae* Gatliff & Gabriel, 1914 (Mollusca, Veneridae) CAAB 23 380013





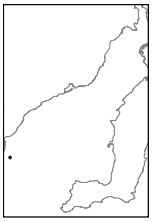
Common name = Venus Shell
Length = To 51 mm
Depth range = 13 - 25 m
Sites = 61, BC3
Average biomass = 0.689 g/ha Rank biomass = 290
Average abundance = 0.019/ha Rank abundance = 223

M032 *Zoila friendii thersites* (Gaskoin, 1849) (Mollusca, Cypraeidae) CAAB 24 155035



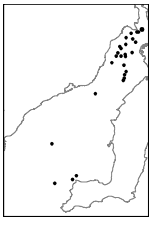
Common name = Black Cowry
Length = To 78 mm
Depth range = 32 - 32 m
Sites = 11B
Average biomass = 0.641 g/ha Rank biomass = 291
Average abundance = 0.009/ha Rank abundance = 280

M033 *Octopus berrima* (Mollusca, Octopodidae) CAAB 23 659002



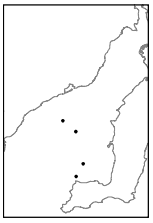
Common name = Southern Keeled Octopus
Length = To 116 mm
Depth range = 22 - 22 m
Sites = BC35
Average biomass = 0.872 g/ha Rank biomass = 273
Average abundance = 0.003/ha Rank abundance = 332

O001 *Carijoa multiflora* (Laackmann, 1909) (Cnidaria, Clavulariidae) CAAB 11 181002



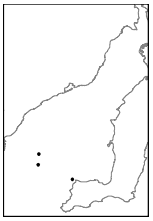
Common name = Carijoa
Length = Not recorded
Depth range = 12 - 41.5 m
Sites = 13C, 20B, 21C, 23, 26, 30, 32, 36, 44, 47B, 50B, 57, 59B, 72, 94, BC1, BC2, BC27, BC3, BC4, BC42, BC44, BC6, CB1, CP7, DK1, FC2
Average biomass = 180.502 g/ha Rank biomass = 33
Average abundance = 0.246/ha Rank abundance = 72

O002 *Sarcoptilus grandis* Gray, 1848 (Cnidaria, Pteroeididae) CAAB 11 219001



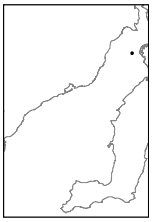
Common name = Sea Pen
Length = To 270 mm
Depth range = 30 - 37 m
Sites = CP3, CP7, WD9, WG3
Average biomass = 3.009 g/ha Rank biomass = 203
Average abundance = 0.020/ha Rank abundance = 218

O003 *Acabaria* sp. 1 Gray, 1859 (Cnidaria, Acabaria) CAAB 11 190000



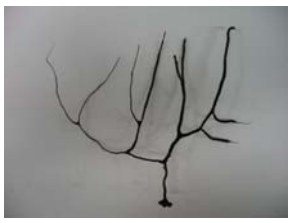
Common name = Acabaria sp. 1
Length = Not recorded
Depth range = 32 - 43 m
Sites = BC31, BC38, BC42
Average biomass = 0.131 g/ha Rank biomass = 351
Average abundance = 0.011/ha Rank abundance = 262

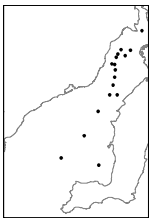
O004 *Capnella gaboensis* Verseveldt, 1977 (Cnidaria, Nephtheidae) CAAB 11 191002



Common name = Capnella
Length = Not recorded
Depth range = 12 - 12 m
Sites = BC1
Average biomass = 0.708 g/ha Rank biomass = 285
Average abundance = 0.012/ha Rank abundance = 258

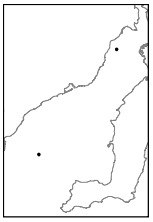
O005 *Plexauridae* sp. 1 (Cnidaria, Plexauridae) CAAB 11 196000





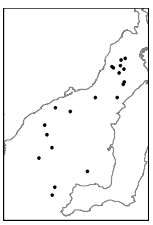
Common name = Plexauridae sp. 1
Length = Not recorded
Depth range = 14.5 - 34 m
Sites = 21C, 22B, 30, 32, 4, 5, 50B, 61, 68, 8, 94, BC24, BC32, BC36, BC9, DK1, N23
Average biomass = 2.578 g/ha Rank biomass = 213
Average abundance = 0.100/ha Rank abundance = 115

O006 *Mopsella zimmeri* Kükenthal, 1908 (Cnidaria, Melithaeidae) CAAB 11 190001



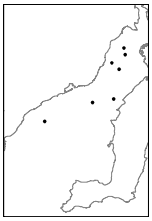
Common name = Mopsella
Length = Not recorded
Depth range = 23 - 32 m
Sites = 74, BC31
Average biomass = 0.127 g/ha Rank biomass = 353
Average abundance = 0.016/ha Rank abundance = 241

S001 *Clathria* sp. 1 (Porifera, Microcionidae) CAAB 10 066000



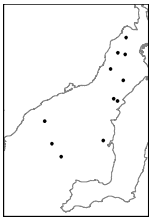
Common name = Clathria sp. 1
Length = Not recorded
Depth range = 13 - 44.5 m
Sites = 12, 13C, 21C, 4, 72, 80, BC14, BC21, BC27, BC3, BC31, BC4, BC40, BC44, BC47, BC6, DK1, X3, Z1/5, Z3/11
Average biomass = 124.382 g/ha Rank biomass = 40
Average abundance = 0.136/ha Rank abundance = 94

S002 *Ecionemia* sp. 1 (Porifera, Ancorinidae) CAAB 10 009000



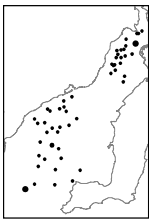
Common name = Cannon Ball Sponge
Length = To 210 mm
Depth range = 14.5 - 25 m
Sites = 16, 21C, 80, 93, 9B, BC14, DK1
Average biomass = 71.573 g/ha Rank biomass = 62
Average abundance = 0.048/ha Rank abundance = 159

S003 *Ircinia* sp. (Porifera, Irciniidae) CAAB 10 112000



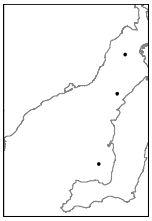
Common name = Ircinia sp. 1
Length = Not recorded
Depth range = 12 - 34 m
Sites = 1, 16, 21C, 30, 70, BC14, BC27, BC32, BC4, CB1, WD6
Average biomass = 109.990 g/ha Rank biomass = 46
Average abundance = 0.085/ha Rank abundance = 126

S004 *Poecilosclerid* sp. 1 (Porifera, Poecilosclerida (Order)) CAAB 10 000000



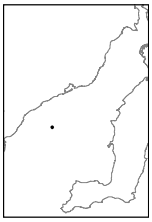
Common name = Poecilosclerid sp. 1
Length = Not recorded
Depth range = 12 - 54.5 m
Sites = 11B, 12, 1B, 21C, 23, 30, 32, 44, 47B, 5, 50B, 57, 69, 72, 74, 8, 93, 94, BC1, BC11, BC14, BC15, BC18, BC2, BC20, BC21, BC25, BC27, BC31, BC32, BC34, BC38, BC39, BC4, BC42, BC43, BC44, BC46, C7, CB1, CP12, DK1, SG2, WG1, X3, Z1/1, Z1/3, Z1/7, Z2/10, Z2/11, Z3/10
Average biomass = 673.514 g/ha Rank biomass = 9
Average abundance = 0.530/ha Rank abundance = 52

S005 *Dictyoceratid* sp. 1 (Porifera, Dictyoceratida (Order)) CAAB 10 000000



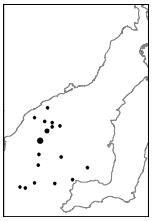
Common name = Dictyoceratid sp. 1
Length = Not recorded
Depth range = 15 - 21.5 m
Sites = 21C, 4, BC36
Average biomass = 14.842 g/ha Rank biomass = 135
Average abundance = 0.013/ha Rank abundance = 254

S006 *Ancorinid* sp. (Porifera, Ancorinidae) CAAB 10 009000



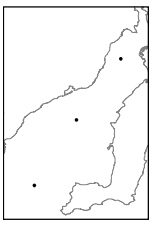
Common name = Ancorinid sp. 1
Length = Not recorded
Depth range = 22 - 22 m
Sites = BC18
Average biomass = 12.446 g/ha Rank biomass = 145
Average abundance = 0.003/ha Rank abundance = 326

S007 *Chondropsid* sp. 1 (Porifera, Chondropsidae) CAAB 10 078000



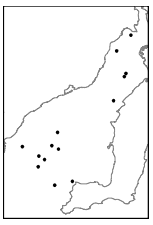
Common name = Chondropsid sp. 1
Length = Not recorded
Depth range = 19 - 54.5 m
Sites = BC14, BC16, BC18, BC20, BC21, BC25, BC31, BC32, BC38, BC40, BC42, BC43, BC44, BC45, BC46, WG1, Z1/7
Average biomass = 327.017 g/ha Rank biomass = 17
Average abundance = 0.172/ha Rank abundance = 84

S008 *Haplosclerid* sp. 1 (Porifera, Haplosclerida (Order)) CAAB 10 000000



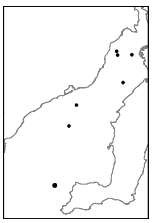
Common name = Haplosclerid sp. 1
Length = Not recorded
Depth range = 17 - 54.5 m
Sites = 72, BC15, BC43
Average biomass = 1.376 g/ha Rank biomass = 256
Average abundance = 0.017/ha Rank abundance = 234

S009 *Holopsamma laminaefavosa* Carter, 1885 (Porifera, Microcionidae) CAAB 10 066142



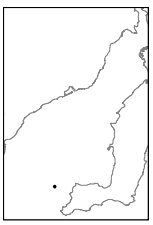
Common name = Honey Comb Sponge
Length = Not recorded
Depth range = 13 - 43 m
Sites = 11B, 16, 59B, 74, BC2, BC27, BC30, BC31, BC34, BC38, BC42, BC44, FC2, SG2
Average biomass = 49.273 g/ha Rank biomass = 79
Average abundance = 0.125/ha Rank abundance = 100

S010 *Demosponge* sp. 1 (Porifera, Demospongiae (Class)) CAAB 10 000000



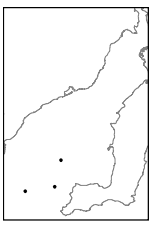
Common name = Demosponge sp. 1
Length = Not recorded
Depth range = 12 - 41.5 m
Sites = 1B, 30, 74, BC1, BC4, BC44, Z3/2
Average biomass = 103.116 g/ha Rank biomass = 51
Average abundance = 0.065/ha Rank abundance = 136

S011 *Demosponge* sp. 2 (Porifera, Demospongiae (Class)) CAAB 10 000000



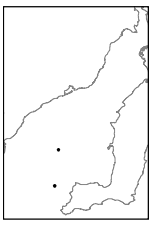
Common name = Demosponge sp. 2
Length = Not recorded
Depth range = 41.5 - 41.5 m
Sites = BC44
Average biomass = 22.801 g/ha Rank biomass = 112
Average abundance = 0.010/ha Rank abundance = 271

S012 *Demosponge* sp. 3 (Porifera, Demospongiae (Class)) CAAB 10 000000



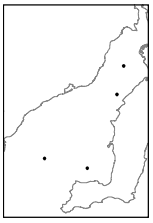
Common name = Demosponge sp. 3
Length = To 698 mm
Depth range = 34 - 44 m
Sites = BC32, BC44, BC46
Average biomass = 52.433 g/ha Rank biomass = 75
Average abundance = 0.115/ha Rank abundance = 108

S013 *Demosponge* sp. 4 (Porifera, Demospongiae (Class)) CAAB 10 000000



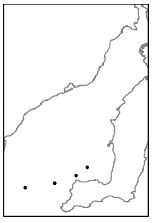
Common name = Demosponge sp. 4
Length = Not recorded
Depth range = 40 - 41.5 m
Sites = BC44, SG2
Average biomass = 4.492 g/ha Rank biomass = 181
Average abundance = 0.021/ha Rank abundance = 208

S014 *Spongiid* sp. 1 (Porifera, Spongiidae) CAAB 10 114000



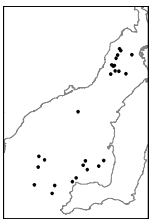
Common name = Spongiidae
Length = Not recorded
Depth range = 17 - 43 m
Sites = 13C, 4, BC34, BC40
Average biomass = 1.650 g/ha Rank biomass = 247
Average abundance = 0.020/ha Rank abundance = 221

S015 *Holopsamma* sp. 2 (Porifera, Microcionidae) CAAB 10 066000



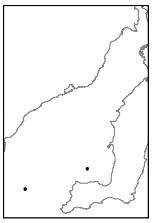
Common name = Holopsamma sp. 2
Length = Not recorded
Depth range = 26 - 44 m
Sites = BC40, BC44, BC46, CP7
Average biomass = 17.423 g/ha Rank biomass = 127
Average abundance = 0.062/ha Rank abundance = 140

S016 *Haplosclerid* sp. 2 (Porifera, Haplosclerida (Order)) CAAB 10 000000



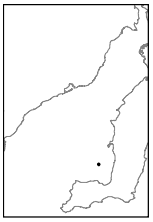
Common name = Haplosclerid sp. 2
Length = Not recorded
Depth range = 12 - 54.5 m
Sites = 26, 30, 32, 5, 59B, 5B, 69, 8, 80, 94, BC1, BC31, BC33, BC34, BC36, BC38, BC40, BC42, BC43, BC44, BC47, CP1, CP3, CP7, DK1, X3
Average biomass = 34.638 g/ha Rank biomass = 92
Average abundance = 0.148/ha Rank abundance = 88

S017 *Demosponge* sp. 5 (Porifera, Demospongiae (Class)) CAAB 10 000000



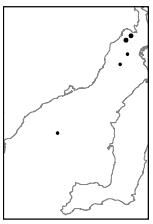
Common name = Demosponge sp. 5
Length = Not recorded
Depth range = 26 - 44 m
Sites = BC40, BC46
Average biomass = 21.676 g/ha Rank biomass = 114
Average abundance = 0.047/ha Rank abundance = 160

S018 *Thorectandra* sp. (Porifera, Thorectidae) CAAB 10 113000



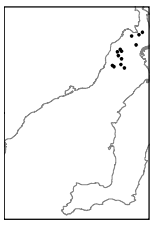
Common name = Thorectandra sp. 1
Length = To 414 mm
Depth range = 17.5 - 17.5 m
Sites = BC36
Average biomass = 2.792 g/ha Rank biomass = 208
Average abundance = 0.002/ha Rank abundance = 339

S019 *Dictyoceratid* sp. 2 (Porifera, Dictyoceratida (Order)) CAAB 10 000000



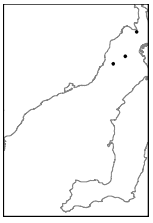
Common name = Dictyoceratid sp. 2
Length = Not recorded
Depth range = 13.5 - 32 m
Sites = 11B, 12, 21B, CB1, FC2
Average biomass = 142.787 g/ha Rank biomass = 35
Average abundance = 0.050/ha Rank abundance = 158

S020 *Poecilosclerid* sp. 2 (Porifera, Poecilosclerida (Order)) CAAB 10 000000



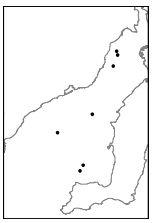
Common name = Poecilosclerid sp. 2
Length = Not recorded
Depth range = 13.5 - 23 m
Sites = 12, 13C, 26, 30, 47B, 50B, 57, 72, 74, 94, DK1, FC2, X3
Average biomass = 66.313 g/ha Rank biomass = 66
Average abundance = 0.116/ha Rank abundance = 107

S021 *Dictyoceratid* sp. 3 (Porifera, Dictyoceratida (Order)) CAAB 10 000000



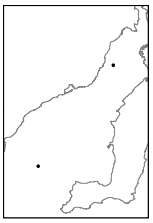
Common name = Dictyoceratid sp. 3
Length = Not recorded
Depth range = 14 - 16.5 m
Sites = 20B, 44, X3
Average biomass = 3.977 g/ha Rank biomass = 193
Average abundance = 0.018/ha Rank abundance = 227

S022 *Clathria* sp. 2 (Porifera, Microcionidae) CAAB 10 066000



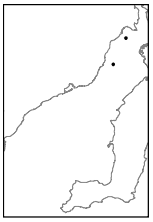
Common name = Clathria sp. 2
Length = Not recorded
Depth range = 16.5 - 37 m
Sites = 11B, 30, 74, BC10, CP12, CP3, X3
Average biomass = 22.861 g/ha Rank biomass = 110
Average abundance = 0.043/ha Rank abundance = 184

S023 *Thorectid* sp. (Porifera, Thorectidae) CAAB 10 113000



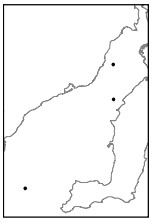
Common name = Thorectid sp. 1
Length = Not recorded
Depth range = 16.5 - 43 m
Sites = BC38, X3
Average biomass = 1.814 g/ha Rank biomass = 236
Average abundance = 0.009/ha Rank abundance = 283

S024 *Dictyoceratid* sp. 4 (Porifera, Dictyoceratida (Order)) CAAB 10 000000



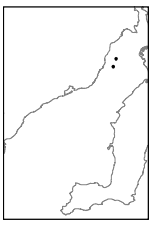
Common name = Dictyoceratid sp. 4
Length = Not recorded
Depth range = 14.5 - 16.5 m
Sites = CB1, X3
Average biomass = 24.065 g/ha Rank biomass = 107
Average abundance = 0.018/ha Rank abundance = 232

S025 *Demosponge* sp. 64 (Porifera, Demospongiae (Class)) CAAB 10 000000



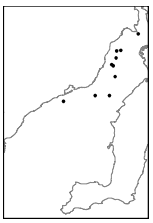
Common name = Demosponge sp. 64
Length = Not recorded
Depth range = 16.5 - 44 m
Sites = 16, BC46, X3
Average biomass = 9.355 g/ha Rank biomass = 158
Average abundance = 0.058/ha Rank abundance = 148

S026 *Chalinid* sp. (Porifera, Chalinidae) CAAB 10 099000



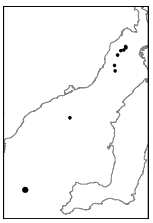
Common name = Chalinid sp. 1
Length = Not recorded
Depth range = 16.5 - 22.5 m
Sites = 32, X3
Average biomass = 1.393 g/ha Rank biomass = 255
Average abundance = 0.011/ha Rank abundance = 262

S027 *Demosponge* sp. 6 (Porifera, Demospongiae (Class)) CAAB 10 000000



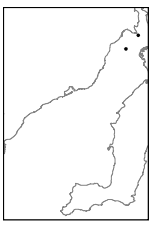
Common name = Demosponge sp. 6
Length = Not recorded
Depth range = 14.5 - 25 m
Sites = 2, 32, 57, 74, 94, BC6, DK1, N23, X3, Z1/3
Average biomass = 18.905 g/ha Rank biomass = 121
Average abundance = 0.073/ha Rank abundance = 129

S028 *Ecionemia* sp. 2 (Porifera, Ancorinidae) CAAB 10 009000



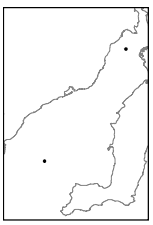
Common name = Ecionemia sp. 2
Length = Not recorded
Depth range = 14 - 44 m
Sites = 23, 30, 3A, 5, 8, 92, 93, 94, BC46
Average biomass = 243.166 g/ha Rank biomass = 22
Average abundance = 0.126/ha Rank abundance = 98

S029 *Spongiid* sp. 2 (Porifera, Spongiidae) CAAB 10 114000



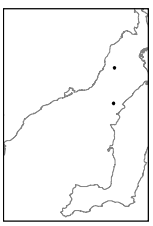
Common name = Bath Sponge
Length = To 158 mm
Depth range = 14 - 18.5 m
Sites = 57, 92
Average biomass = 4.293 g/ha Rank biomass = 187
Average abundance = 0.019/ha Rank abundance = 224

S030 *Demosponge* sp. 7 (Porifera, Demospongiae (Class)) CAAB 10 000000



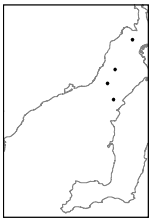
Common name = Demosponge sp. 7
Length = Not recorded
Depth range = 14 - 43 m
Sites = 92, BC34
Average biomass = 20.684 g/ha Rank biomass = 118
Average abundance = 0.011/ha Rank abundance = 264

S031 *Demosponge* sp. 8 (Porifera, Demospongiae (Class)) CAAB 10 000000



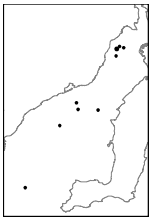
Common name = Demosponge sp. 8
Length = Not recorded
Depth range = 22 - 25 m
Sites = 16, 8
Average biomass = 20.855 g/ha Rank biomass = 116
Average abundance = 0.011/ha Rank abundance = 259

S032 *Demosponge* sp. 9 (Porifera, Demospongiae (Class)) CAAB 10 000000



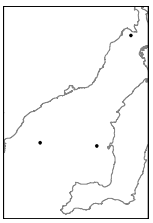
Common name = Demosponge sp. 9
Length = Not recorded
Depth range = 17 - 26 m
Sites = 16, 36, 5, 78
Average biomass = 3.695 g/ha Rank biomass = 195
Average abundance = 0.023/ha Rank abundance = 205

S034 *Dictyoceratid* sp. 6 (Porifera, Dictyoceratida (Order)) CAAB 10 000000



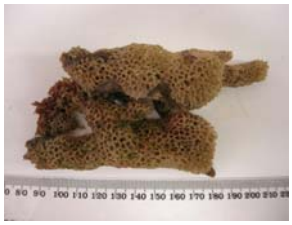
Common name = Dictyoceratid sp. 6
Length = Not recorded
Depth range = 15 - 44 m
Sites = 26, 32, 5B, 74, 93, BC46, BC9, WG1, Z3/2
Average biomass = 130.334 g/ha Rank biomass = 39
Average abundance = 0.123/ha Rank abundance = 102

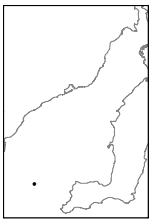
S035 *Dictyoceratid* sp. 7 (Porifera, Dictyoceratida (Order)) CAAB 10 000000



Common name = Dictyoceratid sp. 7
Length = Not recorded
Depth range = 13.5 - 28 m
Sites = BC25, BC28, FC2
Average biomass = 24.062 g/ha Rank biomass = 108
Average abundance = 0.024/ha Rank abundance = 204

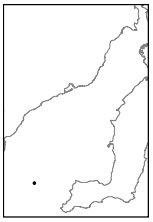
S037 *Holopsamma* sp. 3 (Porifera, Microcionidae) CAAB 10 066000





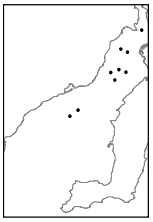
Common name = Holopsamma sp. 3
Length = Not recorded
Depth range = 54.5 - 54.5 m
Sites = BC43
Average biomass = 0.095 g/ha Rank biomass = 360
Average abundance = 0.003/ha Rank abundance = 330

S038 *Demosponge* sp. 11 (Porifera, Demospongiae (Class)) CAAB 10 000000



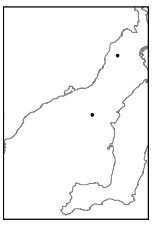
Common name = Demosponge sp. 11
Length = Not recorded
Depth range = 54.5 - 54.5 m
Sites = BC43
Average biomass = 0.018 g/ha Rank biomass = 384
Average abundance = 0.003/ha Rank abundance = 330

S040 *Demosponge* sp. 12 (Porifera, Demospongiae (Class)) CAAB 10 000000



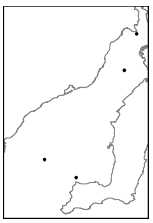
Common name = Demosponge sp. 12
Length = Not recorded
Depth range = 13 - 33 m
Sites = 21B, 3A, 50B, 59B, 5B, 63, 69, 80, 94
Average biomass = 35.787 g/ha Rank biomass = 88
Average abundance = 0.116/ha Rank abundance = 105

S041 *Demosponge* sp. 13 (Porifera, Demospongiae (Class)) CAAB 10 000000



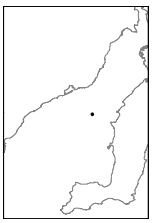
Common name = Demosponge sp. 13
Length = Not recorded
Depth range = 19.3 - 21.5 m
Sites = 30, BC10
Average biomass = 5.359 g/ha Rank biomass = 173
Average abundance = 0.014/ha Rank abundance = 252

S042 *Demosponge* sp. 14 (Porifera, Demospongiae (Class)) CAAB 10 000000



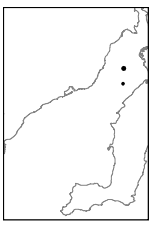
Common name = Demosponge sp. 14
Length = Not recorded
Depth range = 15 - 43 m
Sites = 44, 58C, BC34, CP7
Average biomass = 2.073 g/ha Rank biomass = 230
Average abundance = 0.020/ha Rank abundance = 220

S043 *Verongid* sp. 1 (Porifera, Verongida (Order)) CAAB 10 000000



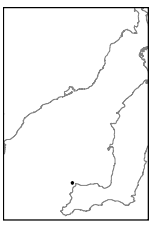
Common name = Verongid sp. 1
Length = To 216 mm
Depth range = 19.3 - 19.3 m
Sites = BC10
Average biomass = 0.282 g/ha Rank biomass = 320
Average abundance = 0.008/ha Rank abundance = 284

S044 *Dictyoceratid* sp. 8 (Porifera, Dictyoceratida (Order)) CAAB 10 000000



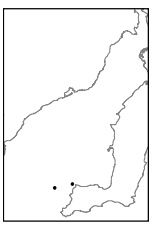
Common name = Dictyoceratid sp. 8
Length = To 245 mm
Depth range = 13.5 - 17 m
Sites = 13C, BC4
Average biomass = 49.960 g/ha Rank biomass = 78
Average abundance = 0.015/ha Rank abundance = 247

S046 *Siphonochalina* sp. (Porifera, Haplosclerida (Order)) CAAB 10 000000



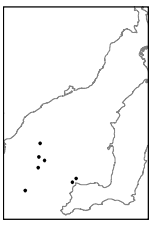
Common name = Siphonochalina sp. 1
Length = To 510 mm
Depth range = 41 - 41 m
Sites = BC42
Average biomass = 0.201 g/ha Rank biomass = 332
Average abundance = 0.004/ha Rank abundance = 321

S047 *Demosponge* sp. 16 (Porifera, Demospongiae (Class)) CAAB 10 000000



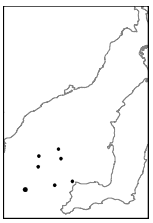
Common name = Demosponge sp. 16
Length = To 173 mm
Depth range = 41 - 41.5 m
Sites = BC42, BC44
Average biomass = 1.691 g/ha Rank biomass = 243
Average abundance = 0.012/ha Rank abundance = 255

S048 *Demosponge* sp. 17 (Porifera, Demospongiae (Class)) CAAB 10 000000



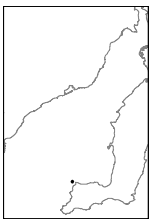
Common name = Demosponge sp. 17
Length = Not recorded
Depth range = 28 - 44 m
Sites = BC25, BC31, BC34, BC38, BC42, BC46, CP7
Average biomass = 39.004 g/ha Rank biomass = 86
Average abundance = 0.070/ha Rank abundance = 131

S050 *Demosponge* sp. 19 (Porifera, Demospongiae (Class)) CAAB 10 000000



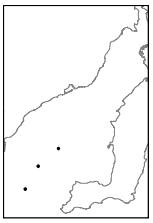
Common name = Demosponge sp. 19
Length = Not recorded
Depth range = 32 - 44 m
Sites = BC31, BC32, BC38, BC42, BC44, BC46, SG2
Average biomass = 86.005 g/ha Rank biomass = 56
Average abundance = 0.092/ha Rank abundance = 118

S051 *Demosponge* sp. 20 (Porifera, Demospongiae (Class)) CAAB 10 000000



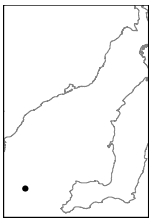
Common name = Demosponge sp. 20
Length = To 64 mm
Depth range = 41 - 41 m
Sites = BC42
Average biomass = 0.010 g/ha Rank biomass = 389
Average abundance = 0.002/ha Rank abundance = 343

S052 *Echinodictyum mesenterinum* (Lamarck, 1814) (Porifera, Raspailiidae) CAAB 10 067020



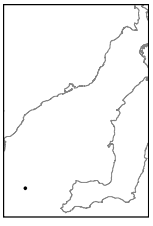
Common name = Echinodictyum
Length = Not recorded
Depth range = 40 - 44 m
Sites = BC38, BC46, SG2
Average biomass = 14.376 g/ha Rank biomass = 137
Average abundance = 0.058/ha Rank abundance = 146

S053 *Shpeciospongia papillosa* (Porifera, Clionaidae) CAAB 10 021000



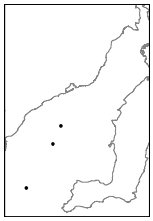
Common name = Spheciospongia
Length = Not recorded
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 415.754 g/ha Rank biomass = 12
Average abundance = 0.045/ha Rank abundance = 172

S054 *Callyspongia bilamellata* (Lamarck, 1814) (Porifera, Callyspongiidae) CAAB 10 098010



Common name = Callyspongia
Length = To 225 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 2.935 g/ha Rank biomass = 205
Average abundance = 0.045/ha Rank abundance = 172

S055 *Taonura* sp. (Porifera, Thorectidae) CAAB 10 113000

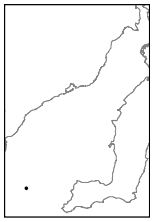


Common name = Taonura sp. 1
Length = To 310 mm
Depth range = 28 - 44 m
Sites = BC27, BC46, WG1
Average biomass = 21.704 g/ha Rank biomass = 113
Average abundance = 0.058/ha Rank abundance = 144

S056 *Cribrochalina* sp. (Porifera, Niphatidae) CAAB 10 100000

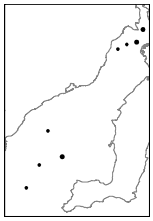
Common name = Cribrochalina sp. 1
Length = To 262 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 2.757 g/ha Rank biomass = 209
Average abundance = 0.045/ha Rank abundance = 172

S057 *Cliona* sp. (Porifera, Clionaidae) CAAB 10 021000



Common name = Cliona sp. 1
Length = To 300 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 17.786 g/ha Rank biomass = 124
Average abundance = 0.045/ha Rank abundance = 172

S058 *Thorecta* sp. (Porifera, Thorectidae) CAAB 10 113000

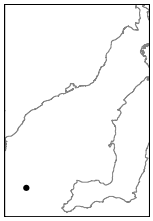


Common name = Thorecta sp. 1
Length = Not recorded
Depth range = 13.5 - 44 m
Sites = 23, 47B, 50B, 74, BC21, BC32, BC38, BC46
Average biomass = 239.275 g/ha Rank biomass = 23
Average abundance = 0.113/ha Rank abundance = 110

S059 *Jaspis* sp. (Porifera, Ancorinidae) CAAB 10 009000

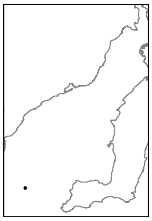
Common name = Jaspis sp. 1
Length = To 202 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 35.750 g/ha Rank biomass = 89
Average abundance = 0.045/ha Rank abundance = 172

S060 *Ancorina* sp. (Porifera, Ancorinidae) CAAB 10 009000



Common name = Ancorina sp. 1
Length = To 250 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 111.164 g/ha Rank biomass = 44
Average abundance = 0.045/ha Rank abundance = 172

S062 *Demosponge* sp. 22 (Porifera, Demospongiae (Class)) CAAB 10 000000

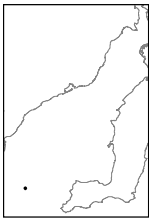


Common name = Demosponge sp. 22
Length = To 83 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 3.379 g/ha Rank biomass = 199
Average abundance = 0.045/ha Rank abundance = 172

S063 *Demosponge* sp. 23 (Porifera, Demospongiae (Class)) CAAB 10 000000

Common name = Demosponge sp. 23
Length = To 141 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 9.960 g/ha Rank biomass = 156
Average abundance = 0.045/ha Rank abundance = 172

S064 *Demosponge* sp. 24 (Porifera, Demospongiae (Class)) CAAB 10 000000

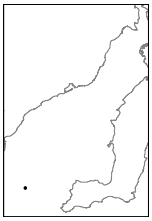


Common name = Demosponge sp. 24
Length = To 151 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 6.848 g/ha Rank biomass = 167
Average abundance = 0.045/ha Rank abundance = 172

S065 *Demosponge* sp. 25 (Porifera, Demospongiae (Class)) CAAB 10 000000

Common name = Demosponge sp. 25
Length = To 325 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 181.687 g/ha Rank biomass = 32
Average abundance = 0.045/ha Rank abundance = 172

S066 *Demosponge* sp. 26 (Porifera, Demospongiae (Class)) CAAB 10 000000

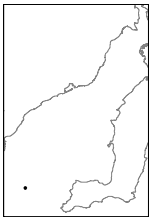


Common name = Demosponge sp. 26
Length = To 145 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 2.490 g/ha Rank biomass = 215
Average abundance = 0.045/ha Rank abundance = 172

S067 *Demosponge* sp. 27 (Porifera, Demospongiae (Class)) CAAB 10 000000

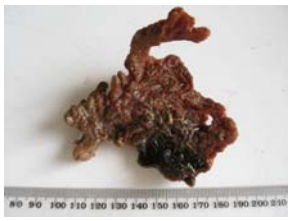
Common name = Demosponge sp. 27
Length = To 225 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 4.536 g/ha Rank biomass = 180
Average abundance = 0.045/ha Rank abundance = 172

S068 *Demosponge* sp. 28 (Porifera, Demospongiae (Class)) CAAB 10 000000



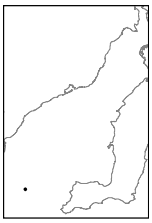
Common name = Demosponge sp. 28
Length = To 165 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 2.757 g/ha Rank biomass = 209
Average abundance = 0.045/ha Rank abundance = 172

S069 *Demosponge* sp. 29 (Porifera, Demospongiae (Class)) CAAB 10 000000



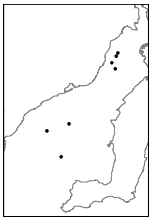
Common name = Demosponge sp. 29
Length = To 117 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 0.889 g/ha Rank biomass = 272
Average abundance = 0.045/ha Rank abundance = 172

S070 *Demosponge* sp. 30 (Porifera, Demospongiae (Class)) CAAB 10 000000



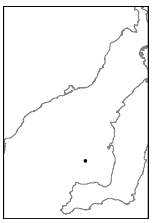
Common name = Demosponge sp. 30
Length = To 206 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 8.271 g/ha Rank biomass = 163
Average abundance = 0.045/ha Rank abundance = 172

S071 *Demosponge* sp. 31 (Porifera, Demospongiae (Class)) CAAB 10 000000



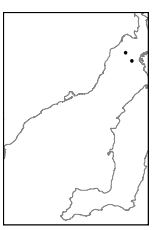
Common name = Demosponge sp. 31
Length = Not recorded
Depth range = 14.5 - 34 m
Sites = 1B, 30, 32, 5, BC21, BC32, DK1
Average biomass = 15.595 g/ha Rank biomass = 132
Average abundance = 0.058/ha Rank abundance = 145

S072 *Antho* (*Isopenectya*) *chartacea* (Whitelegge, 1907) (Porifera, Microcionidae) CAAB 10 066005



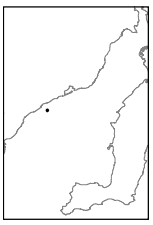
Common name = Chartacea
Length = To 287 mm
Depth range = 33 - 33 m
Sites = CP1
Average biomass = 0.174 g/ha Rank biomass = 340
Average abundance = 0.003/ha Rank abundance = 328

S073 *Demosponge* sp. 32 (Porifera, Demospongiae (Class)) CAAB 10 000000



Common name = Demosponge sp. 32
Length = Not recorded
Depth range = 12 - 22 m
Sites = 23, BC1
Average biomass = 2.823 g/ha Rank biomass = 207
Average abundance = 0.020/ha Rank abundance = 222

S074 *Demosponge* sp. 33 (Porifera, Demospongiae (Class)) CAAB 10 000000

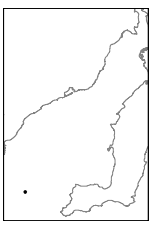


Common name = Demosponge sp. 33
Length = Not recorded
Depth range = 24 - 24 m
Sites = Z1/7
Average biomass = 5.854 g/ha Rank biomass = 169
Average abundance = 0.012/ha Rank abundance = 257

S075 *Demosponge* sp. 34 (Porifera, Demospongiae (Class)) CAAB 10 000000

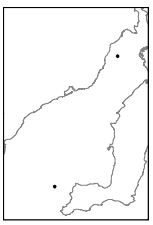
Common name = Demosponge sp. 34
Length = To 122 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 1.423 g/ha Rank biomass = 253
Average abundance = 0.045/ha Rank abundance = 172

S076 *Demosponge* sp. 35 (Porifera, Demospongiae (Class)) CAAB 10 000000



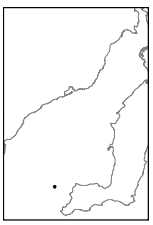
Common name = Demosponge sp. 35
Length = To 73 mm
Depth range = 44 - 44 m
Sites = BC46
Average biomass = 2.312 g/ha Rank biomass = 225
Average abundance = 0.045/ha Rank abundance = 172

S077 *Demosponge* sp. 36 (Porifera, Demospongiae (Class)) CAAB 10 000000



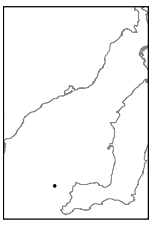
Common name = Demosponge sp. 36
Length = Not recorded
Depth range = 21.5 - 41.5 m
Sites = 30, BC44
Average biomass = 2.344 g/ha Rank biomass = 224
Average abundance = 0.016/ha Rank abundance = 244

S078 *Demosponge* sp. 37 (Porifera, Demospongiae (Class)) CAAB 10 000000



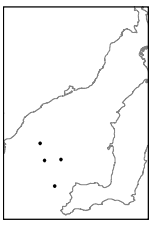
Common name = Demosponge sp. 37
Length = To 270 mm
Depth range = 41.5 - 41.5 m
Sites = BC44
Average biomass = 4.539 g/ha Rank biomass = 179
Average abundance = 0.010/ha Rank abundance = 271

S079 *Demosponge* sp. 38 (Porifera, Demospongiae (Class)) CAAB 10 000000



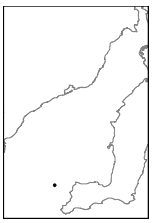
Common name = Demosponge sp. 38
Length = To 159 mm
Depth range = 41.5 - 41.5 m
Sites = BC44
Average biomass = 3.006 g/ha Rank biomass = 204
Average abundance = 0.021/ha Rank abundance = 211

S080 *Clathria* sp. 3 (Porifera, Microcionidae) CAAB 10 066000



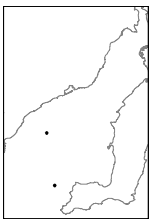
Common name = Clathria sp. 3
Length = To 500 mm
Depth range = 28 - 43 m
Sites = BC25, BC32, BC34, BC44
Average biomass = 23.558 g/ha Rank biomass = 109
Average abundance = 0.036/ha Rank abundance = 193

S081 *Demosponge* sp. 39 (Porifera, Demospongiae (Class)) CAAB 10 000000



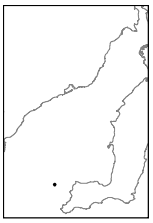
Common name = Demosponge sp. 39
Length = To 190 mm
Depth range = 41.5 - 41.5 m
Sites = BC44
Average biomass = 2.052 g/ha Rank biomass = 231
Average abundance = 0.010/ha Rank abundance = 271

S082 *Demosponge* sp. 40 (Porifera, Demospongiae (Class)) CAAB 10 000000



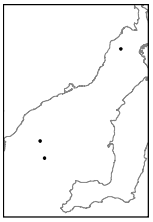
Common name = Demosponge sp. 40
Length = Not recorded
Depth range = 25 - 41.5 m
Sites = BC21, BC44
Average biomass = 14.375 g/ha Rank biomass = 138
Average abundance = 0.017/ha Rank abundance = 236

S083 *Demosponge* sp. 41 (Porifera, Demospongiae (Class)) CAAB 10 000000



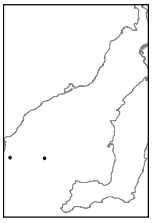
Common name = Demosponge sp. 41
Length = To 141 mm
Depth range = 41.5 - 41.5 m
Sites = BC44
Average biomass = 4.394 g/ha Rank biomass = 183
Average abundance = 0.010/ha Rank abundance = 271

S084 *Poecilosclerid* sp. 3 (Porifera, Poecilosclerida (Order)) CAAB 10 000000



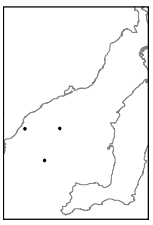
Common name = Poecilosclerid sp. 3
Length = Not recorded
Depth range = 20.5 - 43 m
Sites = 94, BC25, BC34
Average biomass = 16.353 g/ha Rank biomass = 129
Average abundance = 0.019/ha Rank abundance = 225

S085 *Haplosclerid* sp. 3 (Porifera, Haplosclerida (Order)) CAAB 10 000000



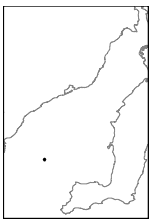
Common name = Haplosclerid sp. 3
Length = Not recorded
Depth range = 22 - 43 m
Sites = BC34, BC35
Average biomass = 1.027 g/ha Rank biomass = 265
Average abundance = 0.005/ha Rank abundance = 318

S086 *Poecilosclerid* sp. 4 (Porifera, Poecilosclerida (Order)) CAAB 10 000000



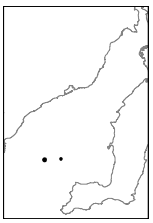
Common name = Poecilosclerid sp. 4
Length = Not recorded
Depth range = 23 - 43 m
Sites = BC19, BC34, WG1
Average biomass = 1.688 g/ha Rank biomass = 244
Average abundance = 0.018/ha Rank abundance = 230

S087 *Chondropsid* sp. 3 (Porifera, Chondropsidae) CAAB 10 078000



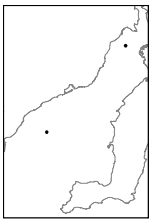
Common name = Chondropsid sp. 3
Length = To 419 mm
Depth range = 43 - 43 m
Sites = BC34
Average biomass = 11.833 g/ha Rank biomass = 148
Average abundance = 0.002/ha Rank abundance = 343

S088 *Demosponge* sp. 42 (Porifera, Demospongiae (Class)) CAAB 10 000000



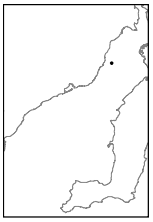
Common name = Demosponge sp. 42
Length = To 742 mm
Depth range = 34 - 43 m
Sites = BC32, BC34
Average biomass = 52.303 g/ha Rank biomass = 76
Average abundance = 0.018/ha Rank abundance = 230

S089 *Demosponge* sp. 43 (Porifera, Demospongiae (Class)) CAAB 10 000000



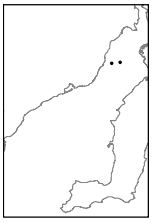
Common name = Demosponge sp. 43
Length = To 206 mm
Depth range = 22 - 25 m
Sites = 23, BC21
Average biomass = 11.193 g/ha Rank biomass = 149
Average abundance = 0.014/ha Rank abundance = 250

S090 *Demosponge* sp. 44 (Porifera, Demospongiae (Class)) CAAB 10 000000



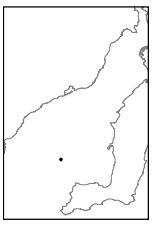
Common name = Demosponge sp. 44
Length = To 93 mm
Depth range = 14.5 - 14.5 m
Sites = DK1
Average biomass = 0.029 g/ha Rank biomass = 380
Average abundance = 0.006/ha Rank abundance = 310

S091 *Demosponge* sp. 45 (Porifera, Demospongiae (Class)) CAAB 10 000000



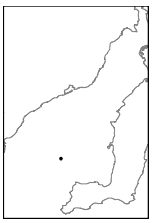
Common name = Demosponge sp. 45
Length = To 177 mm
Depth range = 14.5 - 17.8 m
Sites = 12, DK1
Average biomass = 2.911 g/ha Rank biomass = 206
Average abundance = 0.008/ha Rank abundance = 286

S092 *Demosponge* sp. 46 (Porifera, Demospongiae (Class)) CAAB 10 000000



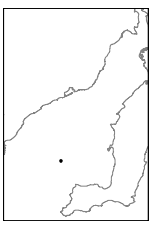
Common name = Demosponge sp. 46
Length = To 176 mm
Depth range = 34 - 34 m
Sites = BC32
Average biomass = 7.161 g/ha Rank biomass = 166
Average abundance = 0.016/ha Rank abundance = 244

S093 *Chondrilla* sp. (Porifera, Chondrillidae) CAAB 10 020000



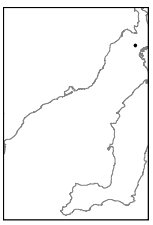
Common name = Chondrilla sp. 1
Length = Not recorded
Depth range = 34 - 34 m
Sites = BC32
Average biomass = 5.527 g/ha Rank biomass = 172
Average abundance = 0.016/ha Rank abundance = 244

S094 *Demosponge* sp. 47 (Porifera, Demospongiae (Class)) CAAB 10 000000



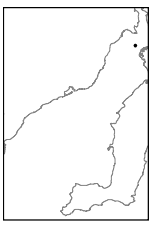
Common name = Demosponge sp. 47
Length = To 104 mm
Depth range = 34 - 34 m
Sites = BC32
Average biomass = 1.635 g/ha Rank biomass = 248
Average abundance = 0.016/ha Rank abundance = 244

S096 *Demosponge* sp. 48 (Porifera, Demospongiae (Class)) CAAB 10 000000



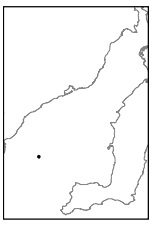
Common name = Demosponge sp. 48
Length = To 177 mm
Depth range = 13.5 - 13.5 m
Sites = 47B
Average biomass = 1.963 g/ha Rank biomass = 232
Average abundance = 0.016/ha Rank abundance = 238

S097 *Dictyoceratid* sp. 9 (Porifera, Dictyoceratida (Order)) CAAB 10 000000



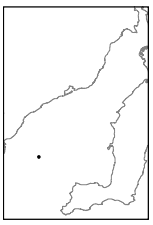
Common name = Dictyoceratid sp. 9
Length = To 125 mm
Depth range = 13.5 - 13.5 m
Sites = 47B
Average biomass = 5.234 g/ha Rank biomass = 174
Average abundance = 0.016/ha Rank abundance = 238

S099 *Verongid* sp. 2 (Porifera, Verongida (Order)) CAAB 10 000000



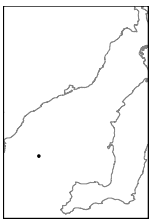
Common name = Verongid sp. 2
Length = To 70 mm
Depth range = 32 - 32 m
Sites = BC31
Average biomass = 0.090 g/ha Rank biomass = 362
Average abundance = 0.006/ha Rank abundance = 301

S100 *Demosponge* sp. 50 (Porifera, Demospongiae (Class)) CAAB 10 000000



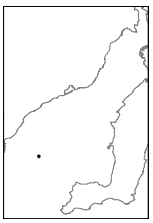
Common name = Demosponge sp. 50
Length = To 122 mm
Depth range = 32 - 32 m
Sites = BC31
Average biomass = 0.722 g/ha Rank biomass = 284
Average abundance = 0.006/ha Rank abundance = 301

S101 *Demosponge* sp. 51 (Porifera, Demospongiae (Class)) CAAB 10 000000



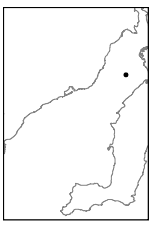
Common name = Demosponge sp. 51
Length = To 115 mm
Depth range = 32 - 32 m
Sites = BC31
Average biomass = 1.301 g/ha Rank biomass = 257
Average abundance = 0.006/ha Rank abundance = 301

S102 *Demosponge* sp. 52 (Porifera, Demospongiae (Class)) CAAB 10 000000



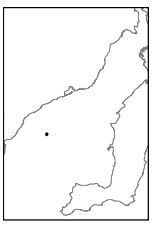
Common name = Demosponge sp. 52
Length = To 65 mm
Depth range = 32 - 32 m
Sites = BC31
Average biomass = 0.631 g/ha Rank biomass = 292
Average abundance = 0.006/ha Rank abundance = 301

S104 *Demosponge* sp. 54 (Porifera, Demospongiae (Class)) CAAB 10 000000



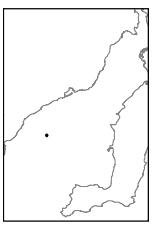
Common name = Demosponge sp. 54
Length = To 370 mm
Depth range = 13 - 13 m
Sites = 59B
Average biomass = 82.895 g/ha Rank biomass = 58
Average abundance = 0.016/ha Rank abundance = 242

S105 *Demosponge* sp. 55 (Porifera, Demospongiae (Class)) CAAB 10 000000



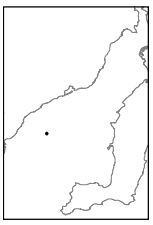
Common name = Demosponge sp. 55
Length = To 110 mm
Depth range = 25 - 25 m
Sites = BC21
Average biomass = 0.137 g/ha Rank biomass = 347
Average abundance = 0.006/ha Rank abundance = 307

S106 *Demosponge* sp. 56 (Porifera, Demospongiae (Class)) CAAB 10 000000



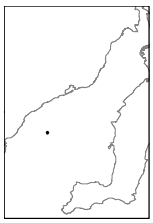
Common name = Demosponge sp. 56
Length = To 85 mm
Depth range = 25 - 25 m
Sites = BC21
Average biomass = 0.286 g/ha Rank biomass = 319
Average abundance = 0.006/ha Rank abundance = 307

S107 *Dictyoceratid* sp. 10 (Porifera, Dictyoceratida (Order)) CAAB 10 000000



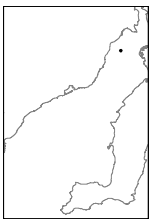
Common name = Dictyoceratid sp. 10
Length = To 85 mm
Depth range = 25 - 25 m
Sites = BC21
Average biomass = 0.050 g/ha Rank biomass = 371
Average abundance = 0.006/ha Rank abundance = 307

S108 *Demosponge* sp. 57 (Porifera, Demospongiae (Class)) CAAB 10 000000



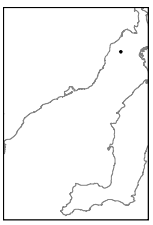
Common name = Demosponge sp. 57
Length = To 100 mm
Depth range = 25 - 25 m
Sites = BC21
Average biomass = 0.273 g/ha Rank biomass = 322
Average abundance = 0.006/ha Rank abundance = 307

S110 *Demosponge* sp. 59 (Porifera, Demospongiae (Class)) CAAB 10 000000



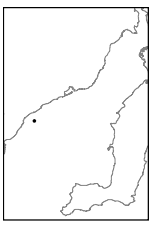
Common name = Demosponge sp. 59
Length = Not recorded
Depth range = 20.5 - 20.5 m
Sites = 94
Average biomass = 4.447 g/ha Rank biomass = 182
Average abundance = 0.007/ha Rank abundance = 293

S111 *Demosponge* sp. 60 (Porifera, Demospongiae (Class)) CAAB 10 000000



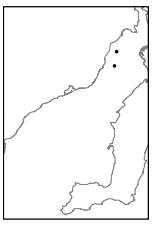
Common name = Demosponge sp. 60
Length = To 65 mm
Depth range = 20.5 - 20.5 m
Sites = 94
Average biomass = 0.953 g/ha Rank biomass = 266
Average abundance = 0.007/ha Rank abundance = 293

S112 *Demosponge* sp. 61 (Porifera, Demospongiae (Class)) CAAB 10 000000



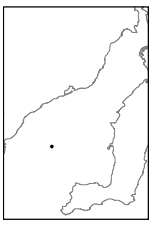
Common name = Demosponge sp. 61
Length = To 222 mm
Depth range = 19 - 19 m
Sites = BC20
Average biomass = 13.824 g/ha Rank biomass = 140
Average abundance = 0.007/ha Rank abundance = 296

S113 *Demosponge* sp. 62 (Porifera, Demospongiae (Class)) CAAB 10 000000



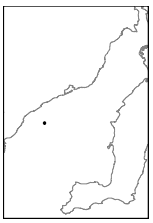
Common name = Demosponge sp. 62
Length = Not recorded
Depth range = 23 - 25 m
Sites = 74, 8
Average biomass = 1.084 g/ha Rank biomass = 262
Average abundance = 0.014/ha Rank abundance = 251

S114 *Haplosclerid* sp. 4 (Porifera, Haplosclerida (Order)) CAAB 10 000000



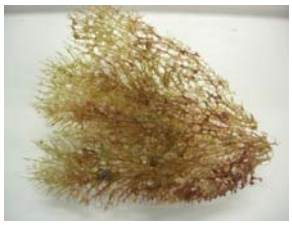
Common name = Haplosclerid sp. 4
Length = To 186 mm
Depth range = 33 - 33 m
Sites = BC27
Average biomass = 0.479 g/ha Rank biomass = 299
Average abundance = 0.009/ha Rank abundance = 280

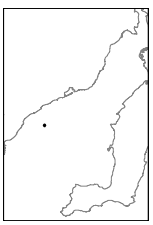
S115 *Demosponge* sp. 63 (Porifera, Demospongiae (Class)) CAAB 10 000000



Common name = Demosponge sp. 63
Length = To 320 mm
Depth range = 23 - 23 m
Sites = BC14
Average biomass = 10.527 g/ha Rank biomass = 154
Average abundance = 0.003/ha Rank abundance = 323

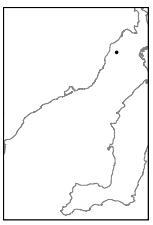
S116 *Arenochalina* sp. (Porifera, Mycalidae) CAAB 10 086000





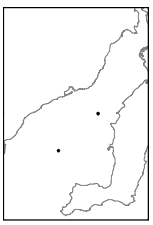
Common name = Arenochalina sp. 1
Length = Not recorded
Depth range = 23 - 23 m
Sites = BC14
Average biomass = 0.321 g/ha Rank biomass = 314
Average abundance = 0.003/ha Rank abundance = 323

S117 *Tethya* sp. 1 (Porifera, Tethyiidae) CAAB 10 029000



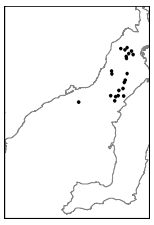
Common name = Tethya
Length = To 35 mm
Depth range = 23 - 23 m
Sites = 74
Average biomass = 0.189 g/ha Rank biomass = 334
Average abundance = 0.009/ha Rank abundance = 278

S118 *Dendrilla rosea* Lendenfeld, 1883 (Porifera, Darwinellidae) CAAB 10 120014



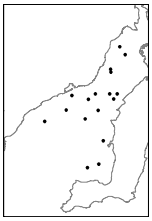
Common name = Dendrilla
Length = Not recorded
Depth range = 17.3 - 40 m
Sites = BC9, SG2
Average biomass = 0.392 g/ha Rank biomass = 307
Average abundance = 0.018/ha Rank abundance = 226

X001 *Caulerpa cactoides* (Turner) C.Agardh (Chlorophyta, Caulerpaceae) CAAB 56 197003



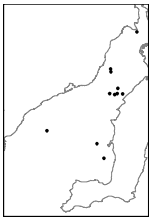
Common name = Caulerpa
Length = Not recorded
Depth range = 12 - 22 m
Sites = 16, 19, 20B, 21B, 21C, 22B, 26, 4, 59B, 69, 7, 70, 92, 93, BC1, BC3, BC4, C14, EWL3,
N23, Y7
Average biomass = 24.668 g/ha Rank biomass = 104
Average abundance = N/A Rank abundance = N/A

X003 *Hormophysa cuneiformis* (J.F.Gmelin) P.C.Silva (Phaeophyta, Cystoseiraceae) CAAB 54 103033



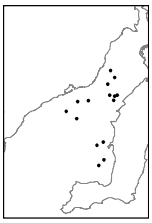
Common name = Hormophysa
Length = Not recorded
Depth range = 14 - 26 m
Sites = 16, 21C, 26, 4, 69, 70, BC13, BC14, BC36, BC40, BC6, BC8, BC9, N23, WD6, Z1/1, Z3/10
Average biomass = 4.385 g/ha Rank biomass = 184
Average abundance = N/A Rank abundance = N/A

X004 *Zonaria angustata* (Kützing) Papenfuss (Phaeophyta, Dictyotaceae) CAAB 54 025010



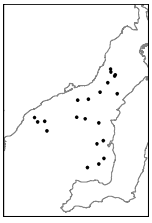
Common name = Zonaria sp. 1
Length = Not recorded
Depth range = 14 - 25 m
Sites = 19, 4, 44, 69, 7, 70, BC21, BC28, BC33, EWL3, N23
Average biomass = 24.780 g/ha Rank biomass = 103
Average abundance = N/A Rank abundance = N/A

X006 *Gracilaria secundata* Harvey (Rhodophyta, Gracilariaceae) CAAB 55 106002



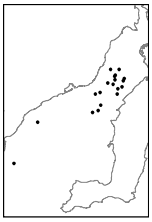
Common name = Gracilaria sp. 1
Length = Not recorded
Depth range = 14 - 25.5 m
Sites = 16, 19, 4, 61, 70, 78, BC15, BC28, BC33, BC36, BC8, C14, N23, WD6, Z3/10
Average biomass = 3.054 g/ha Rank biomass = 201
Average abundance = N/A Rank abundance = N/A

X007 *Gracilaria flageliformis* (Sonder) Womersley (Rhodophyta, Gracilariaceae) CAAB 55 106017



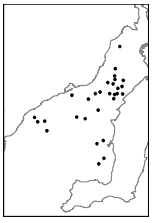
Common name = Gracilaria sp. 2
Length = Not recorded
Depth range = 14 - 26 m
Sites = 2, 4, 61, 69, 70, 78, BC11, BC13, BC14, BC15, BC17, BC20, BC21, BC28, BC33, BC36, BC40, BC8, C14, SHW2, WD6
Average biomass = 21.575 g/ha Rank biomass = 115
Average abundance = N/A Rank abundance = N/A

X008 *Sporolithon durum* (Foslie) Townsend & Woelkerling (Rhodophyta, Sporolithaceae) CAAB 55 120001



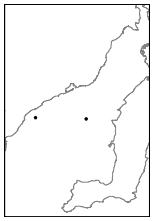
Common name = Popcorn
Length = Not recorded
Depth range = 13 - 25 m
Sites = 2, 4, 61, 63, 68, 70, 78, 80, BC10, BC11, BC3, BC37, BC4, BC6, BC9, EWL3, SHW2, WAL32, Y7
Average biomass = 123.839 g/ha Rank biomass = 41
Average abundance = N/A Rank abundance = N/A

X009 *Spongoclonium conspicuum* Sonder (Rhodophyta, Ceramiaceae) CAAB 55 130238



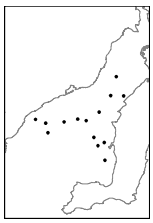
Common name = Spongoclonium
Length = Not recorded
Depth range = 13.5 - 26 m
Sites = 16, 19, 26, 4, 5, 61, 63, 68, 7, 78, BC11, BC13, BC14, BC15, BC20, BC21, BC28, BC33, BC36, BC4, BC6, BC8, BC9, EWL3, N23, SHW2, WD6, Y7, Z1/1
Average biomass = 80.886 g/ha Rank biomass = 59
Average abundance = N/A Rank abundance = N/A

X010 *Heterosiphonia gunniana* (Harvey) Reinbold (Rhodophyta, Dasyaceae) CAAB 55 132002



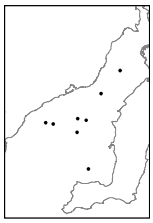
Common name = Heterosiphonia sp. 1
Length = Not recorded
Depth range = 19 - 21.4 m
Sites = BC13, BC20
Average biomass = 0.581 g/ha Rank biomass = 295
Average abundance = N/A Rank abundance = N/A

X011 *Osmundaria prolifera* J.V.Lamouroux (Rhodophyta, Rhodomelaceae) CAAB 55 133148



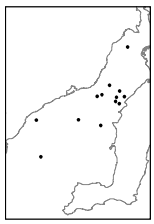
Common name = Osmundaria
Length = Not recorded
Depth range = 14.8 - 30 m
Sites = 2, 7, BC13, BC14, BC15, BC20, BC21, BC28, BC33, BC9, N23, WD3, WD6, WG3
Average biomass = 5.663 g/ha Rank biomass = 171
Average abundance = N/A Rank abundance = N/A

X012 *Dictyopteris muelleri* (Sonder) Reinbold (Phaeophyta, Dictyotaceae) CAAB 54 025003



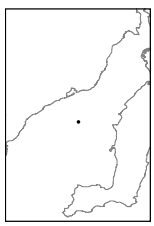
Common name = Dictyopteris sp. 1
Length = Not recorded
Depth range = 17 - 32 m
Sites = 80, BC13, BC14, BC15, BC16, BC40, SHW2, WD9
Average biomass = 1.807 g/ha Rank biomass = 239
Average abundance = N/A Rank abundance = N/A

X013 *Lobospira bicuspidata* Areschoug (Phaeophyta, Dictyotaceae) CAAB 54 025007



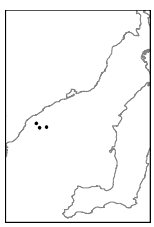
Common name = Lobospira
Length = Not recorded
Depth range = 12 - 32 m
Sites = 1, 16, 19, 23, 7, 78, BC15, BC17, BC20, BC31, BC6, EWL3, SHW2
Average biomass = 4.184 g/ha Rank biomass = 189
Average abundance = N/A Rank abundance = N/A

X014 *Plocamium cartilagineum* (Linnaeus) P.S.Dixon (Rhodophyta, Plocamiaceae) CAAB 55 090002



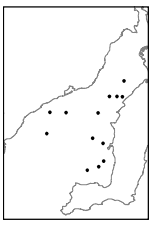
Common name = Plocamium
Length = Not recorded
Depth range = 19.2 - 19.2 m
Sites = BC15
Average biomass = 0.151 g/ha Rank biomass = 343
Average abundance = N/A Rank abundance = N/A

X015 *Asperococcus bullosus* J.V.Lamouroux (Phaeophyta, Punctariaceae) CAAB 54 067002



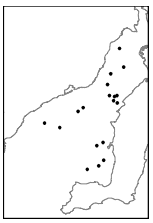
Common name = Brown Leaf Algae
Length = Not recorded
Depth range = 19 - 23 m
Sites = BC11, BC14, BC20
Average biomass = 12.640 g/ha Rank biomass = 143
Average abundance = N/A Rank abundance = N/A

X017 *Zonaria turneriana* J.Agardh (Phaeophyta, Dictyotaceae) CAAB 54 025074



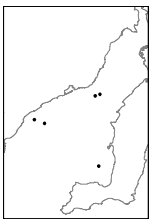
Common name = Zonaria sp. 2
Length = Not recorded
Depth range = 13 - 26 m
Sites = 4, 7, BC21, BC3, BC33, BC36, BC40, BC9, C7, N23, WD3, WD6, Z3/10
Average biomass = 7.191 g/ha Rank biomass = 165
Average abundance = N/A Rank abundance = N/A

X018 *Ectocarpus fasciculatus* Harvey (Phaeophyta, Ectocarpaceae) CAAB 54 001001



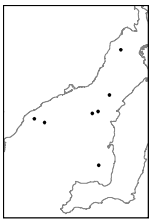
Common name = Ectocarpus
Length = Not recorded
Depth range = 12 - 33 m
Sites = 1, 13C, 16, 19, 26, 4, 5B, 69, 78, 7B, BC14, BC28, BC33, BC36, BC40, N23, WD6, WG1
Average biomass = 1.631 g/ha Rank biomass = 249
Average abundance = N/A Rank abundance = N/A

X020 *Cladostephus spongiosus* (Hudson) C.Agardh (Phaeophyta, Sphacelariaceae) CAAB 54 021001



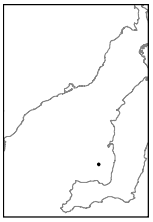
Common name = Cladostephus
Length = Not recorded
Depth range = 15 - 23 m
Sites = BC14, BC20, BC36, BC6, SHW2
Average biomass = 3.124 g/ha Rank biomass = 200
Average abundance = N/A Rank abundance = N/A

X021 *Phacelocarpus peperocarpus* (Poiret) (Rhodophyta, Phacelocarpaceae) CAAB 55 058002



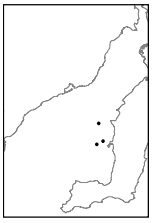
Common name = Phacelocarpus
Length = Not recorded
Depth range = 17.3 - 23 m
Sites = 94, BC10, BC14, BC20, BC36, BC9, N23
Average biomass = 0.766 g/ha Rank biomass = 281
Average abundance = N/A Rank abundance = N/A

X022 *Dictyopteris* sp. 2 (Phaeophyta, Dictyotaceae) CAAB 54 025000



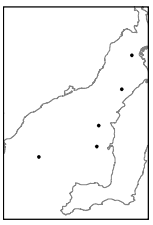
Common name = Dictyopteris sp. 2
Length = Not recorded
Depth range = 17.5 - 17.5 m
Sites = BC36
Average biomass = 0.012 g/ha Rank biomass = 388
Average abundance = N/A Rank abundance = N/A

X023 *Champia viridis* C.Agardh (Rhodophyta, Champiaceae) CAAB 55 111001



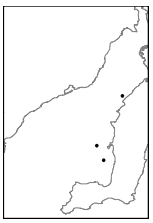
Common name = Champia
Length = Not recorded
Depth range = 18.7 - 20.8 m
Sites = BC17, BC28, WD6
Average biomass = 0.591 g/ha Rank biomass = 294
Average abundance = N/A Rank abundance = N/A

X024 *Erythroclonium muelleri* Sonder (Rhodophyta, Areschougiaceae) CAAB 55 056001



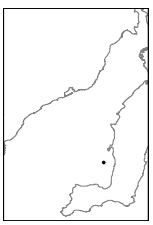
Common name = Erythroclonium
Length = Not recorded
Depth range = 12 - 32 m
Sites = BC1, BC17, BC28, BC31, Y7
Average biomass = 1.268 g/ha Rank biomass = 259
Average abundance = N/A Rank abundance = N/A

X025 *Dictyota ciliolata* Sonder ex Kützing (Phaeophyta, Dictyotaceae) CAAB 54 025030



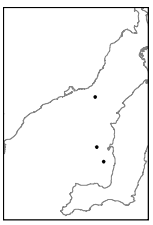
Common name = Dictyota
Length = Not recorded
Depth range = 14.8 - 20.8 m
Sites = 7, BC28, BC33
Average biomass = 0.065 g/ha Rank biomass = 368
Average abundance = N/A Rank abundance = N/A

X026 *Chordaria cladosipho* Kützing Sphaerotrichia divaricata (Phaeophyta,Chordariaceae) CAAB 54 012001



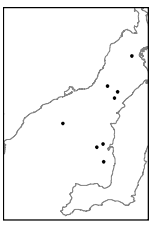
Common name = Chordaria
Length = Not recorded
Depth range = 14.8 - 14.8 m
Sites = BC33
Average biomass = 0.005 g/ha Rank biomass = 392
Average abundance = N/A Rank abundance = N/A

X027 *Cliftonaea pectinata* (Harvey) Harvey (Rhodophyta, Rhodomelaceae) CAAB 55 133051



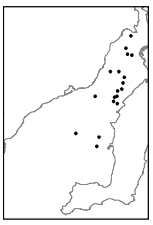
Common name = Cliftonaea
Length = Not recorded
Depth range = 14.8 - 20.8 m
Sites = BC28, BC33, BC6
Average biomass = 0.082 g/ha Rank biomass = 366
Average abundance = N/A Rank abundance = N/A

X028 *Solieria robusta* (Greville) Kylin (Rhodophyta, Areschougiaceae) CAAB 55 056002



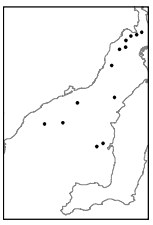
Common name = Solieria
Length = Not recorded
Depth range = 12 - 30 m
Sites = 19, 78, BC1, BC28, BC33, EWL3, WD6, WG3
Average biomass = 1.813 g/ha Rank biomass = 237
Average abundance = N/A Rank abundance = N/A

X029 *Botryocladia sonderi* P.C.Silva (Rhodophyta, Rhodymeniaceae) CAAB 55 110001



Common name = Botryocladia
Length = Not recorded
Depth range = 12 - 32 m
Sites = 1, 16, 19, 21B, 4, 70, 80, 92, BC1, BC2, BC28, BC4, BC6, EWL3, FC2, WD4, WD9, Y7
Average biomass = 49.143 g/ha Rank biomass = 80
Average abundance = N/A Rank abundance = N/A

X030 *Gracilaria* sp. 3 (Rhodophyta, Gracilariaceae) CAAB 55 106000

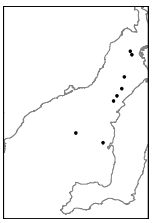


Common name = Gracilaria sp. 3
Length = Not recorded
Depth range = 13.5 - 30 m
Sites = 19, 23, 26, 44, 50B, BC14, BC28, C14, CB1, DK1, FC2, WD6, WG3
Average biomass = 4.303 g/ha Rank biomass = 186
Average abundance = N/A Rank abundance = N/A

X031 *Gelidium asperum* (C.Agardh) Greville (Rhodophyta, Gelidiaceae) CAAB 55 030001

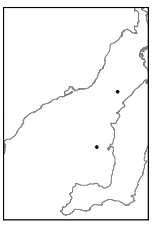
Common name = Gelidium sp. 1
Length = Not recorded
Depth range = 12 - 17 m
Sites = 1, BC8, FC2
Average biomass = 3.047 g/ha Rank biomass = 202
Average abundance = N/A Rank abundance = N/A

X033 *Zonaria crenata* J.Agardh (Phaeophyta, Dictyotaceae) CAAB 54 025072



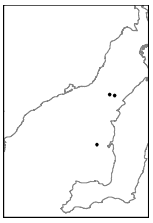
Common name = Zonaria sp. 3
Length = Not recorded
Depth range = 12 - 32 m
Sites = 16, 22B, 4, BC1, BC2, WD6, WD9, Y7
Average biomass = 0.209 g/ha Rank biomass = 331
Average abundance = N/A Rank abundance = N/A

X034 *Gelididum* sp. 2 (Rhodophyta, Gelidiaceae) CAAB 55 030000



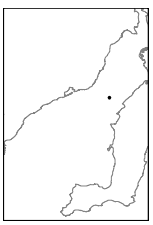
Common name = Gelidium sp. 2
Length = Not recorded
Depth range = 18 - 20.8 m
Sites = BC28, EWL3
Average biomass = 0.056 g/ha Rank biomass = 369
Average abundance = N/A Rank abundance = N/A

X035 *Cystophora* sp. 1 (Phaeophyta, Cystoseiraceae) CAAB 54 103000



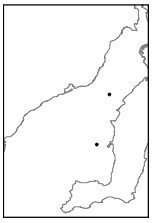
Common name = Cystophora sp. 1
Length = Not recorded
Depth range = 20.8 - 21.5 m
Sites = 19, BC28, N23
Average biomass = 0.127 g/ha Rank biomass = 352
Average abundance = N/A Rank abundance = N/A

X036 *Hormosira banksii* (Turner) Decaisne (Phaeophyta, Hormosiraceae) CAAB 54 100001



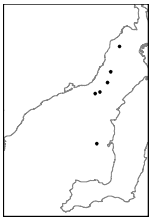
Common name = Hormosira
Length = Not recorded
Depth range = 21.5 - 21.5 m
Sites = N23
Average biomass = 0.181 g/ha Rank biomass = 338
Average abundance = N/A Rank abundance = N/A

X037 *Cystophora pectinata* J.Agardh (Phaeophyta, Cystoseiraceae) CAAB 54 103026



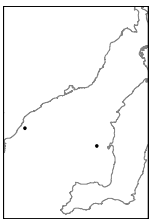
Common name = Cystophora sp. 2
Length = Not recorded
Depth range = 20.8 - 21.5 m
Sites = BC28, N23
Average biomass = 0.041 g/ha Rank biomass = 376
Average abundance = N/A Rank abundance = N/A

X039 *Melanthalia obtusata* (Labillardiére) J.Agardh (Rhodophyta, Gracilariaceae) CAAB 55 106034



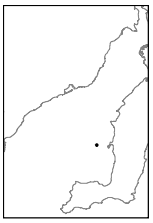
Common name = Melanthalia
Length = Not recorded
Depth range = 14.5 - 20.8 m
Sites = 26, 69, 78, BC28, BC6, SHW2
Average biomass = 1.067 g/ha Rank biomass = 263
Average abundance = N/A Rank abundance = N/A

X040 *Wrangelia nobilis* J.D. Hooker & Harvey (Rhodophyta, Ceramiaceae) CAAB 55 130006



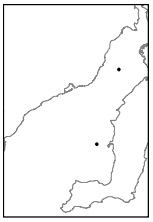
Common name = Wrangelia
Length = Not recorded
Depth range = 20.8 - 23 m
Sites = BC19, BC28
Average biomass = 0.040 g/ha Rank biomass = 377
Average abundance = N/A Rank abundance = N/A

X041 *Gracilaria blodgettii* Harvey (Rhodophyta, Gracilariaceae) CAAB 55 106013



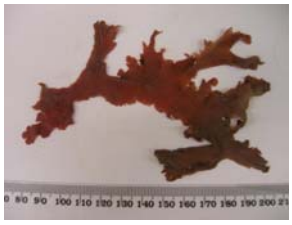
Common name = Gracilaria sp. 4
Length = Not recorded
Depth range = 20.8 - 20.8 m
Sites = BC28
Average biomass = 0.018 g/ha Rank biomass = 383
Average abundance = N/A Rank abundance = N/A

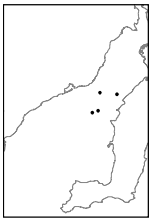
X042 *Thamnoclonium dichotomum* (J.Agardh) J.Agardh (Rhodophyta, Halymeniaceae) CAAB 55 095046



Common name = Thamnoclonium
Length = Not recorded
Depth range = 20.1 - 20.8 m
Sites = 80, BC28
Average biomass = 0.188 g/ha Rank biomass = 335
Average abundance = N/A Rank abundance = N/A

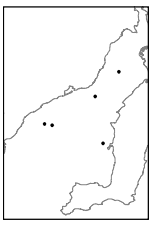
X043 *Rhodoglossum gigartinoides* (Sonder) (Rhodophyta, Gigartinaceae) CAAB 55 053003





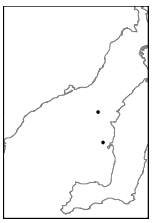
Common name = Rhodoglossum
Length = Not recorded
Depth range = 17 - 21.5 m
Sites = 4, BC10, BC9, SHW2
Average biomass = 0.424 g/ha Rank biomass = 304
Average abundance = N/A Rank abundance = N/A

X044 *Perithalia caudata* (Labillardière) Womersley (Phaeophyta, Sporochnaceae) CAAB 54 045002



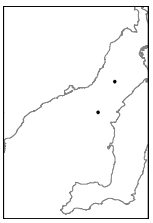
Common name = Perithalia
Length = Not recorded
Depth range = 15 - 23 m
Sites = 80, BC14, BC16, BC6, WD6
Average biomass = 1.581 g/ha Rank biomass = 250
Average abundance = N/A Rank abundance = N/A

X045 *Sargassum* sp. 1 (Phaeophyta, Sargassaceae) CAAB 54 105000



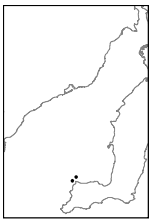
Common name = Sargassum sp. 1
Length = Not recorded
Depth range = 17.3 - 18.7 m
Sites = BC9, WD6
Average biomass = 0.387 g/ha Rank biomass = 308
Average abundance = N/A Rank abundance = N/A

X046 *Cystophora* sp. 3 (Phaeophyta, Cystoseiraceae) CAAB 54 103000



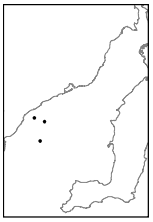
Common name = Cystophora sp. 3
Length = Not recorded
Depth range = 17.3 - 21 m
Sites = 63, BC9
Average biomass = 0.091 g/ha Rank biomass = 361
Average abundance = N/A Rank abundance = N/A

X048 *Laurencia filiformis* (C.Agardh) Montagne (Rhodophyta, Rhodomelaceae) CAAB 55 133008



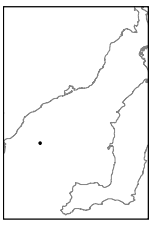
Common name = Laurencia
Length = Not recorded
Depth range = 37 - 41 m
Sites = BC42, CP7
Average biomass = 0.046 g/ha Rank biomass = 374
Average abundance = N/A Rank abundance = N/A

X051 *Ecklonia radiata* (C.Agardh) J.Agardh (Phaeophyta, Alariaceae) CAAB 54 080001



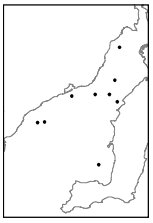
Common name = Ecklonia
Length = Not recorded
Depth range = 19 - 28 m
Sites = BC14, BC20, BC25
Average biomass = 0.322 g/ha Rank biomass = 313
Average abundance = N/A Rank abundance = N/A

X052 *Heterosiphonia muelleri* (Sonder) De Toni (Rhodophyta, Dasyaceae) CAAB 55 132038



Common name = Heterosiphonia sp. 2
Length = Not recorded
Depth range = 28 - 28 m
Sites = BC25
Average biomass = 0.407 g/ha Rank biomass = 305
Average abundance = N/A Rank abundance = N/A

X053 *Gracilaria* sp. 5 (Rhodophyta, Gracilariaceae) CAAB 55 106000

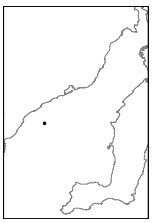


Common name = Gracilaria sp. 5
Length = Not recorded
Depth range = 12 - 23 m
Sites = 1, 26, 63, BC11, BC14, BC36, BC6, N23, Z1/1
Average biomass = 7.911 g/ha Rank biomass = 164
Average abundance = N/A Rank abundance = N/A

X054 *Dictyopteris* sp. 3 (Phaeophyta, Dictyotaceae) CAAB 54 025000

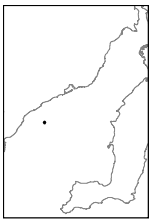
Common name = Dictyopteris sp. 3
Length = Not recorded
Depth range = 23 - 23 m
Sites = BC14
Average biomass = 0.007 g/ha Rank biomass = 391
Average abundance = N/A Rank abundance = N/A

X055 *Dasya extensa* Sonder ex Kützing (Rhodophyta, Dasyaceae) CAAB 55 132001



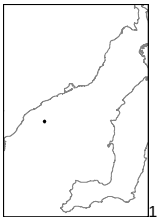
Common name = Dasya
Length = Not recorded
Depth range = 23 - 23 m
Sites = BC14
Average biomass = 0.150 g/ha Rank biomass = 344
Average abundance = N/A Rank abundance = N/A

X056 *Sporochnus comosus* C.Agardh (Phaeophyta, Sporochnaceae) CAAB 54 045012



Common name = Sporochnus
Length = Not recorded
Depth range = 23 - 23 m
Sites = BC14
Average biomass = 0.082 g/ha Rank biomass = 365
Average abundance = N/A Rank abundance = N/A

X057 *Hypnea ramentacea* (C.Agardh) J. Agardh (Rhodophyta, Hypneaceae) CAAB 55 061001



Common name = Hypnea
Length = Not recorded
Depth range = 23 - 23 m
Sites = BC14
Average biomass = 0.116 g/ha Rank biomass = 354
Average abundance = N/A Rank abundance = N/A