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Methodology

J. Barry Hutchins, Shirley M. Slack-Smith, Patrick F. Berry* and Diana S. Jones
Department of Aquatic Zoology, Western Australian Museum, Francis Street
Perth, Western Australia 6000, Australia
* Director, Science and Culture, Western Australian Museum, Francis Street
Perth, Western Australia 6000, Australia

The two diving expeditions (DAI/98 and DA3/99) and the dredging expedition (DA2/99) conducted surveys of a selected marine biota of the Dampier Archipelago, from the support vessels *Kimberley Quest*, *Top Gun II* and the Fisheries Research Vessel *Flinders*, respectively.

The selection of the groups of organisms studied was based mainly on two factors, the scientific expertise available and the ecological significance of the organisms in the Dampier Archipelago. The groups of organisms selected for study were as follows: marine algae, sponges, hard corals, crustaceans, molluscs, echinoderms and fishes. Marine reptiles, snakes and mammals were not included in the current survey. However, the Pilbara coastline and mangroves are important habitats for a number of marine turtles and sea snakes and at least 12 species of marine mammal have been recorded in the waters of the Dampier Archipelago (Carr and Livesey, 1966; Smith, 1974; Morris, 1995; Osborne *et al.*, 2000).

Diving Expeditions (DA1/98 and DA3/99)

Areas surveyed by diving expeditions

Stations were located throughout and seaward of the islands of the Dampier Archipelago and provided extensive sampling of a variety of shallow water habitats. (Figure 1). Samples were obtained from a total of 70 stations, from the intertidal to depths of 27 m (DA3/99) and 30 m (DA1/98), respectively. Thirty-five stations in the Burrup Peninsula area were visited by the DA1/98 expedition, all but two being to the north of Searipple Passage (Figure 1). The DA3/99 expedition sampled 35 stations in the area west of the Burrup Peninsula (Figure 1). For completeness, selected stations visited during the diving expedition DA4/00, which was associated with the international marine biological workshop held in 2000, are listed herein since some of the material collected is included in several of the papers of the present report (Figure 2).

The stations were located in a range of habitats, ranging from intertidal flats exposed at low water to deeper subtidal waters adjoining off-shore islands and shoals. Selection of stations showing potential for survey was made prior to the commencement of the expeditions. Coloured aerial photographs were viewed using a stereoscope and stations chosen to provide the best coverage of the region's marine environment. Two major marine habitats were identified – hard bottoms (indicated by dark colours in the photographs) and soft bottoms (pale colours). These were further divided into intertidal and subtidal stations. The subsequent ground-truthing of the selected stations is presented in the following brief summary and habitats are summarised in the station lists. (Table 1). Data for the selected stations from the workshop diving expedition DA4/00 are also summarised (Table 2).

Data on the position of the stations are from the bathymetric chart of the area produced by the Australian Hydrographic Office (Commonwealth of Australia, 1988) and position fixes aboard the vessels were made with the Global Positioning System, which is accurate to within ~100 m.

Substrate morphology

The predominant hard bottom type is limestone, which supports diverse coral reefs near the islands but tends to be more sparsely covered in deeper waters away from the islands. It forms subtidal spur and groove structures on the unprotected sides of islands and flat pavements in deeper waters. However, limestone pavements also line the protected shores of numerous embayments, sometimes supporting extensive algal beds. Offshore, limestone pavements are often colonised by sponge gardens consisting of sponges, gorgonians and crinoids; the larger passages between islands may also feature this bottom type. Other hard bottoms include igneous boulders, monolithic igneous reefs and limestone shoals. The igneous boulders in the intertidal zones are often populated by barnacles and oysters, but monolithic reefs in deeper waters attract relatively sparse invertebrate growth. Limestone shoals are composed of accumulations of sand and gravel from the breakdown of both coral reefs and

limestone rocks and their tops are often colonised by corals.

Soft bottoms are generally composed of either sand or silty sand. The former are prominent off the exposed sides of the outer islands, whereas the latter occur within passages and around the more inshore islands. Sandy intertidal flats usually have a high mud content, especially when fronting mangroves in protected embayments. Subtidal soft bottoms tend to be rather bare, but support a more diverse biota where emergent limestone pavements are also present.

Diving survey methodology

The major aim of the survey of the Dampier Archipelago is to document the species diversity of its marine biota. Two different methodologies were adopted for the diving surveys. The first involved SCUBA diving, plus some snorkelling, to collect and record the biota in subtidal regions, whereas the second was based on intertidal shore collecting during periods of extreme low water. The former was used extensively to survey the different habitats that surround the islands of the study area, whereas the latter was employed opportunistically when suitable conditions were present (mostly in the early morning or late afternoon).

SCUBA diving

The goal of this work was to discover the species inhabiting each of the selected stations. Although efforts were made to maximise species lists during the one hour dive period, part of the time was devoted to sampling and video taping along a pre-determined transect for later analysis (description below). Each of the subtidal stations (DA1/98 24 stations, DA3/99 26 stations) usually represented several different habitat types (e.g. limestone slope with coral reef, fronted by bare limestone pavement with sandy patches). Where possible, all were visited and the inhabitants either recorded on underwater slates (where identifications were considered unequivocal) or collected (some difficult to identify groups require extensive sampling). Much of the latter material was photographed, often underwater before collection, but also after removal to the support vessel; it was then processed and stored in preservative for the return trip to Perth.

Video recorded transects

Subtidal sampling stations were surveyed during 1998 and 1999 diving expeditions (DA1/98 and DA3/99). Video recordings of each of 45 subtidal stations (19 by DA1/98; 26 in triplicate by DA3/99) were acquired by movement of a housed Sony CCD Handycam Video 8 camera along a 25.0 m transect (Carleton and Done, 1995). Each transect was marked by lying a 25.0 m measuring tape along the substrate of relatively uniform depth. A diver maintained a constant speed of 0.2m/sec. and the video was kept approximately 0.5 m above the surface of the biota. This captured a bandwidth of around 0.6 m and a total area of 15.0 m^2 per transect. During the first diving expedition (DA1/98), replicate transects were not undertaken but replicate transects were undertaken during the second diving expedition (DA3/99).

Video recording was captured electronically, saved to file and then stored on compact disc. The Sinclair Knight Merz Pty. Ltd. Video Transect Analysis System then retrieved the electronically recorded transect for analysis. The program randomly selected 200 frames, each allocated with one randomly placed spot. Benthic categories were assigned to the substrate type beneath the respective spots. Since much of the benthic fauna present along the transects was cryptic or had not been described taxonomically, the benthos was identified to functional group level. The benthic categories were comprised of the following:

- three abiotic categories (sand, rubble and rock);
- macroalgae;
- three soft coral categories (alcyoniids, nephtheids and gorgonians);
- eight coral categories (branching *Acropora*, corymbose *Acropora*, digitate *Acropora*, encrusting non-*Acropora*, massive non-*Acropora* and mushroom coral); and
- six additional categories (sponge, anemone, mollusc, echinoderm, ascidian and other).

Once benthic categories were assigned and the respective frame completed, the program advanced along the transect to the next randomly selected frame and this process was repeated until the 200 frames were completed. Upon completion, the program computed percentage cover of the habitat by each benthic category.

Shore collecting

Expedition members were ferried ashore by dinghy just prior to low water (DA1/98 13 occasions, DA3/99 nine occasions). After landing, members searched the surrounding area for material relevant to their particular animal or marine plant group. Rock and rock pools that were normally submerged during mid and high water were especially targeted (many animals hide under rocks or gather in pools as the tide drops). Exposed tidal flats and the mangroves behind them were also investigated for burrowing animals. Much of this material was photographed *in situ*. The time spent at a shore station was generally two hours, after which the team returned to the support vessel to process and preserve the collections. Preserved specimens were identified by taxonomic specialists in Australia and other countries for identification to species level.

Station data

A list of the sampling stations, their location, the method and depth of collection data, and a brief description of the habitats at each site are presented in Tables 1 and 2.

Dredging Expedition DA2/99

Areas surveyed by dredging expedition

A total of 100 stations was sampled in shallow water between depths of 07–43 m. Extensive sampling of a variety of habitats was made throughout and seaward of the islands of the Dampier Archipelago. Less extensive sampling was made in and seaward of Nickol Bay, Delambre, Haüy and Legendre Islands (Figure 3; Table 3).

Dredging survey methodology

The dredging survey was designed to obtain samples of fauna that could be identified to species. The dredge type was a rake box dredge, mouth area 1200 cm x 330 cm, with a 1.0 cm mesh. Except when interrupted by snagging, the dredge was towed at 2–3 knots for 10 mins duration. For some stations (i.e. DA2/99/2a, 44, 80, 86, 92–96 and 100), a sleeve of flyscreen was inserted into a shovel box dredge to recover smaller fauna. Ninety-seven stations were sampled by dredging and three stations (DA2/99/11, 14 and 97) were sampled with a benthic grab for infaunal and sediment analysis. Rake box dredge samples were obtained from depths between 7.0–43.0 m, shovel box dredge samples from 5.0–39.0 m and benthic grab samples from 9.5–38.0 m.

Dredging samples, including sediment, sponges, rock, etc., were washed through sieves and specimens were sorted at sea into major taxonomic groups (e.g. sponges, molluscs, sea fans, etc.). Preserved specimens were identified by taxonomic specialists in Australia and other countries for identification to species level.

Station data

A list of the sampling stations, their location, the method and depth of collection data and a brief description of the habitats at each site are presented in Table 3.

GIS Spatial Datasets

Video-transects and GPS co-ordinates of sampling stations ensure that collected base-line data are permanent temporal records. Metadata and GIS spatial datasets were formalised from these data, including species lists of all faunal and floral taxa collected, by professional collaboration between the Western Australian Museum, Woodside Energy Ltd., the Western Australian Department of Fisheries, the North West Shelf Joint Environmental Management Study, (Western Australian Department of Environmental Protection), the Marine Conservation Branch, Western Australian Department of Conservation and Land Management and Sinclair Knight Merz Pty. Ltd.. Seventy eight video transects, which correspond to locations within the DA1/98/DA3/99 diving location dataset, accompany the GIS spatial datasets. These data are essential for future industrial and port development and conservation and management of biodiversity in the Dampier Archipelago. Metadata and GIS spatial datasets are available on request from the Western Australian Museum, Perth.

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Station map and lists for the diving expeditions (DA1 and DA3)

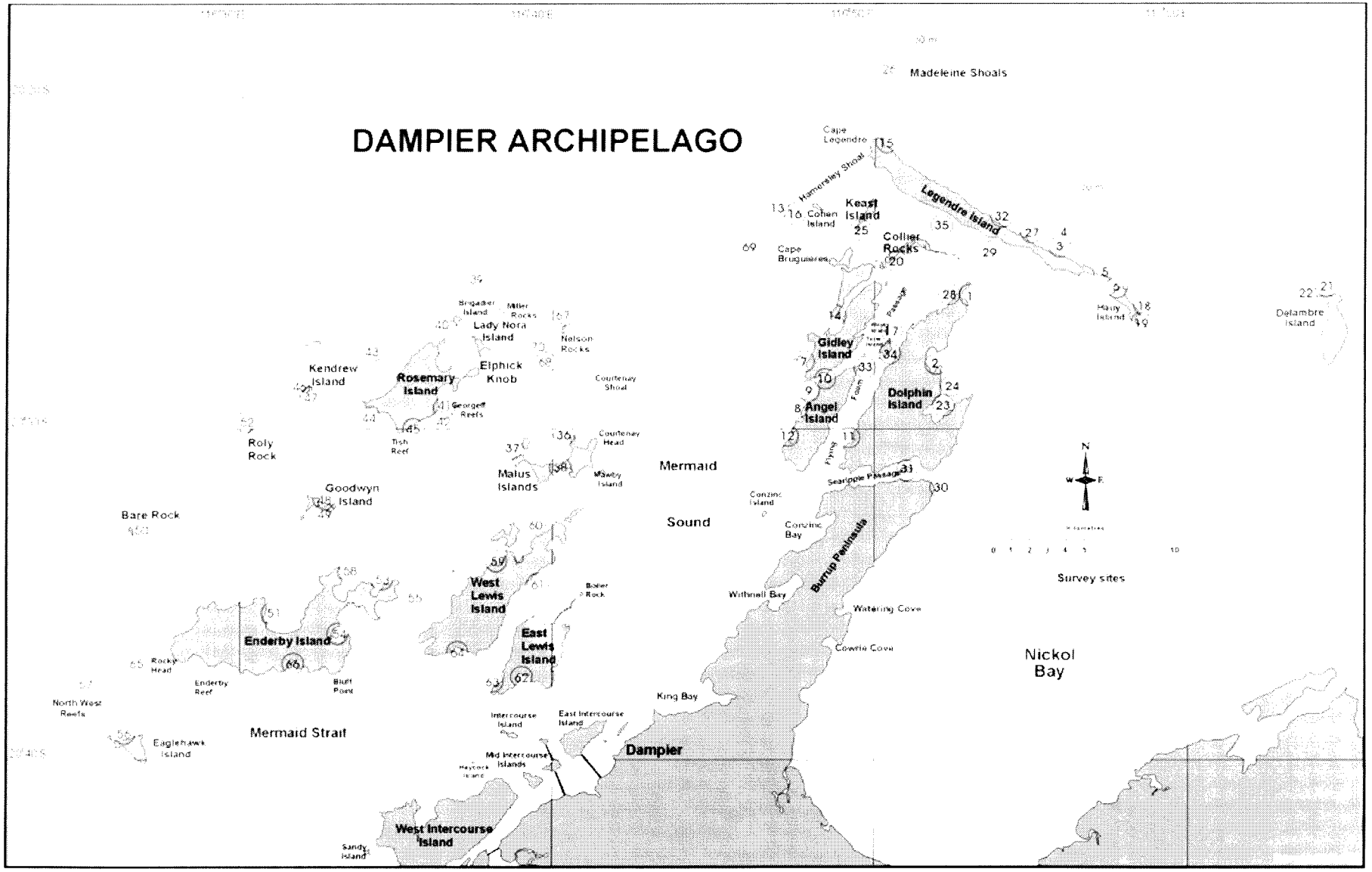

Figure 1 Locality map for sampling stations of the Dampier Archipelago diving expeditions DA1/98 and DA3/99.

Table 1 Sampling station data for the Dampier Archipelago diving expeditions DA1/98 and DA3/99 (see Figure 1).

	Location	Lat. and Long.	Method	Depth (m)	Habitat	Date
DA1/98/01	Dolphin Island	20°25.852'S, 116°52.953'E	Dive	3.0–6.5	Shallow coral reef, fronted by limestone pavement with thin veneer of silty sand; brown algae present, cover increasing shorewards.	17.10.98
DA1/98/02	Dolphin Island	20°28.090'S, 116°51.910'E	Shore	Intertidal	Large mudflat fronting mangroves, with igneous boulders along foreshore of headland; oyster zone on rocks.	17.10.98
DA1/98/03	Legendre Island	20°24.320'S, 116°56.108'E	Dive	2.0–15.0	Spur and groove reef front, dissected reef flat behind; moderately diverse coral fauna on top of and in front of spurs; limeston bottom at 15 m mostly bare with few invertebrates, gently sloping seawards.	18.10.98
DA1/98/04	Legendre Island	20°24.320'S, 116°56.108'E	Dive	12.0–18.0	Limestone bottom sloping seawards with scattered corals; more sandy at 18 m with numerous algae on emergent limestone rocks, some sea whips.	18.10.98
DA1/98/05	Legendre Island	20°25.380'S, 116°57.510'E	Shore	Intertidal	Reef flat with oyster dominated shoreline (vertical limestone walls); coral bommies abundant on reef edge, few sponges in pools.	18.10.98
DA1/98/06	Haüy Island	20°25.725'S, 116°57.580'E	Dive	0.5–2.0	Flat limestone pavement criss-crossed by shallow channels and occasional depressions; some stunted corals and algae; oyster zone on vertical limestone shoreline, forming stacks at southern end.	19.10.98
DA1/98/07	Gidley Island	20°28.010'S, 116°47.720'E	Shore, dive	0.0–2.0	Low headlands of igneous boulders separated by sandy beaches; pools with algae and stunted corals.	19.10.98
DA1/98/08	Angel Island	20°29.180'S, 116°47.711'E	Dive	2.0–8.0	Spur and groove reef slope, tops of spurs with corals; igneous boulders shorewards; limestone pavement and sand in deeper areas.	20.10.98
DA1/98/09	Angel Island	20°28.692'S, 116°47.950'E	Dive	2.0–3.0	Fragmented limestone pavement surrounded by sand; rocks colonised with brown algae, including *Sargassum*; few sponges, but numerous holothurians.	20.10.98
DA1/98/10	Angel Island	20°28.410'S, 116°48.480'E	Shore, dive	0.0–2.0	Narrow passage between islands with extensive sand spit to south; stunted corals and algae on bottom; hard and soft corals better developed in shallows behind mouth; side of passage with limestone pavement and fringing mangroves.	20.10.98
DA1/98/11	Dolphin Island	20°30.249'S, 116°49.335'E	Shore	Intertidal	Reef flat lined with igneous boulders fronting mangal; stunted corals, sponges and ascidians; flowing creek exiting mangroves, with several pools in muddy bottom.	21.10.98
DA1/98/12	Angel Island	20°30.200'S, 116°47.250'E	Dive	2.0–7.0	Limestone reef with corals, extending well into shallow bay; no spur and groove system; some large areas of dead coral.	21.10.98
DA1/98/13	Hamersley Shoal	20°23.203'S, 116°46.691'E	Dive	1.0–16.0	Limestone reef with low spur and groove system, sloping gently into deeper water; reef crest with dense concentrations of corals, but becoming sparser with increasing depth.	21.10.98

DA1/98/14	Unnamed Island	20°26.581'S, 116°48.790'E	Shore	Intertidal	Passage between Gidley Island and southern end of Unnamed Island; large pool separating islands with extensive sand bar at southern end; foreshore of Unnamed Island a combination of limestone pavement and eroded vertical walls with igneous boulders; small rock pools near southwest point; fringing mangroves on eastern side of island.	22.10.98
DA1/98/15	Legendre Island	20°21.142'S, 116°50.579'E	Dive	5.0–29.0	Massive limestone reefs with vertical drop-offs, tops covered mostly with soft corals and some hard corals; numerous ledges and caves; bottom at 29 m mostly barren and silty; nearshore rocky channels with smooth sides and bottoms, latter often with large elliptical to circular depressions.	22.10.98
DA1/98/16	Hamersley Shoal	20°23.240'S, 116°47.080'E	Dive	2.0–4.0	Coral rubble, with scattered live coral and algae; algae more concentrated towards reef crest to the west.	22.10.98
DA1/98/17	Wilcox Island	20°27.090'S, 116°50.438'E	Shore	Intertidal	Channel between Wilcox and Tozer Islands; sides of island with igneous boulders; bottom limestone pavement with patches of silty sand; numerous colonies of the coral *Lobophyllia hemprichii* on north side of island.	23.10.98
DA1/98/18	Haüy Island	20°26.400'S, 116°58.634'E	Dive	3.0–10.0	Limestone reef, sloping gently seawards; no obvious spur and groove system but shallow surge channels near shoreline. Area of diverse corals at 5 m, becoming more scattered with sandy inter-spaces as depth increased; numerous *Porites* bommies.	23.10.98
DA1/98/19	Haüy Island	20°26.620'S, 116°58.390'E	Dive	1.5–2.5	Bay with sandy beach; algae prominent near shoreline, but changing to mixture of tabulate and staghorn *Acropora* corals in centre of bay; numerous sandy inter-spaces.	23.10.98
DA1/98/20	Collier Rocks	20°24.812'S, 116°50.678'E	Shore	Intertidal	Fore-shore of second island; wide reef flat covered with close-packed corals, mostly *Fungia* near seaward side, and various taxa inshore, including *Porites*, *Acropora* and *Pavona*; shoreline with silt-covered igneous boulders, and a sandy beach behind.	24.10.98
DA1/98/21	Delambre Island	20°25.700'S, 117°04.220'E	Dive	2.0–19.0	Massive limestone reefs, with prominent spurs and deep narrow channels; tops of spurs covered with *Acropora*, mostly tabulate; coral rubble and boulders in channels; to seaward of spurs some large *Porites* bommies and large colonies of soft corals; bottom near shoreline smooth rock, with prominent oyster zone; large smooth-walled caves under headland.	24.10.98
DA1/98/22	Delambre Island	20°25.915'S, 117°03.655'E	Dive	2.0–4.0	Dominated by tabulate and staghorn *Acropora*; numerous large *Porites* bommies; many areas of coral rubble and some sandy inter-spaces.	24.10.98
DA1/98/23	Dolphin Island	20°29.100'S, 116°52.220'E	Shore	Intertidal	Silty intertidal flat, with scattered live and dead corals; rocks covered with filamentous brown algae; edge of bay to north with extensive colonies of live coral.	25.10.98

Table 1 (cont.)

	Location	Lat. and Long.	Method	Depth (m)	Habitat	Date
DA1/98/24	Dolphin Island	20°28.870'S, 116°52.380'E	Dive	2.0–7.0	Extensive coral cover, colonies closely packed in many areas, most covered with fine silt; some large *Porites* bommies; bottom gently sloping seaward, reef replaced by limestone pavement covered with silty sand in deeper areas.	25.10.98
DA1/98/25	Keast Island	20°23.975'S, 116°49.520'E	Shore	Intertidal	Flat coral rubble zone adjacent to sand spit, abruptly changing to extensive area of live corals, mainly low tabulate *Acropora*; rocks with brown algae on edge of channel.	26.10.98
DA1/98/26	Madeleine Shoals	20°19.343'S, 116°50.455'E	Dive	15.0–30.0	Massive igneous monolith, sloping steeply on all sides; shallower areas with some hard coral, but mostly soft corals and gorgonians; in deeper areas, bottom siltier with many sea whips.	26.10.98
DA1/98/27	Legendre Island	20°24.044'S, 116°55.042'E	Dive	1.0–8.0	Extensive dissected reef flat, with many channels and deep pools, latter with good coral cover; several small areas of seagrass on sandy bottom; offshore from edge of reef flat, bottom consisting of gently sloping limestone pavement covered with silty sand, supporting numerous gorgonians, sponges, and a few scattered hard corals.	26.10.98
DA1/98/28	Dolphin Island	20°25.771'S, 116°52.680'E	Shore, dive	Intertidal	Shoreline ranging from sandy beach over limestone platform to igneous boulders, with thin mangrove fringe; near shore bottom silty sand with small scattered sponges, corals, and algae, number and size of latter two increasing further offshore.	27.10.98
DA1/98/29	Legendre Island	20°24.566'S, 116°53.714'E	Dive	2.0–7.0	Extensive coral cover, some parts dead, but most alive, mainly staghorn *Acropora* and *Pavona*, but also numerous massives; some sandy interspaces.	27.10.98
DA1/98/30	Burrup Peninsula	20°31.586'S, 116°51.088'E	Dive	1.0–10.0	Flat silty bottom with widely scattered soft corals and sponges; very large igneous boulders on shoreline (fallen from cliff above), with sparse cover of hard and soft corals; an oyster zone in intertidal region.	27.10.98
DA1/98/31	Searipple Passage	20°31.230'S, 116°51.182'E	Shore	Intertidal	Island surrounded by reef and silt flats, dominated by algae, with some small sponges and corals; extensive mangrove area to the west; foreshore with igneous boulders covered with oysters.	28.10.98
DA1/98/32	Legendre Island	20°23.520'S, 116°54.110'E	Dive	5.0–17.0	Limestone reef with prominent spur and groove system, and large bommies seawards; tops of spurs with small *Acropora* heads; deeper bommies with soft corals and gorgonians; bottom in deeper areas sandy, very granular, with sea whips on emergent limestone pavement.	28.10.98
DA1/98/33	Angel Island	20°27.965'S, 116°49.692'E	Dive	1.0–8.0	Bottom of channel silty with numerous soft corals, gorgonians, sea whips and sponges; side of channel consists of a limestone slope with numerous corals rising to flat rocky pavement covered with reddish brown algae; closer to shore, another area of diverse corals forming a deep coral pool.	29.10.98

DA1/98/34	Tozer Island	20°27.684'S, 116°50.486'E	Shore	Intertidal	Island surrounded by silty flats, including an extensive fringing mangrove; much coral rubble and some oyster-covered rocks on flats.	29.10.98
DA1/98/35	Legendre Island	20°23.620'S, 116°51.960'E	Dive	0.0–1.0	Flat silty area of shallow corals, mostly live rounded heads of brain corals (flattened on top), but also some *Porites* coral; algae growing on dead corals; many sandy inter-spaces, often occupied by coral rubble.	29.10.98
DA3/99/36	Malus Islands	20°30.050'S, 116°40.594'E	Dive	6.0–14.0	Branching and tabular *Acropora* and *Turbinaria* corals with occasional *Porites* colonies on low limestone ridges interspersed with fine sandy bottom.	27.08.99
DA3/99/37	Malus Islands	20°30.632'S, 116°38.788'E	Dive	2.0–3.5	Flat sand/coral-rubble bottom covered with brown macroalgae, predominantly *Sargassum*. Scattered small coral heads and occasional large colonies of *Turbinaria*.	27.08.99
DA3/99/38	Malus Islands	20°30.632'S, 116°38.788'E	Shore	Intertidal	Extensive intertidal flat composed of coarse sand with scattered coral rubble and slabs. Becoming progressively more rocky (limestone boulders) towards shoreline. Algal turf-covered platform reef with channels and pools to west.	27.08.99
DA3/99/39	Brigadier Island	20°25.411'S, 116°37.578'E	Dive	15.0–27.0	Rock spur projecting across 30m depth contour. Comprised of high, smooth, angular igneous boulders with very few encrusting organisms. Few hard corals, encrusting scattered soft corals and abundant stinging hydroids. Fish abundant mid-water but diversity low.	28.08.99
DA3/99/40	Brigadier Island	20°26.657'S, 116°36.507'E	Dive	6.0–14.0	Limestone reef dissected by deep gullies with sandy floors. Flat reef top predominantly covered by large soft coral colonies interspersed with hard corals. *Turbinaria* and other hard corals dominant on walls of gullies.	28.08.99
DA3/99/41	Georgeff Reefs	20°29.339'S, 116°36.798'E	Dive	1.0–4.0	Gently sloping bottom of coarse coralline sand with occasional limestone slabs and dead coral supporting small live coral colonies. Inshore reefs consist of large *Porites* bommies and *Acropora* heads.	28–29.08.99
DA3/99/42	Georgeff Reef	20°29.339'S, 116°36.798'E	Shore	Intertidal	Extension of station DA3/99/41 with numerous *Porites* and *Acropora* colonies growing on limestone boulders.	28.08.99
DA3/99/43	Sailfish Reef	20°27.757'S, 116°34.193'E	Dive	10.0–16.0	Gently sloping limestone pavement with occasional scattered boulders and small colonies of *Porites* and robust tabular corals; occasional scattered soft corals; at 13 m, area of shallow to moderate gutters with larger coral bommies and many fish; subject to very high wave/current energy.	29.08.99
DA3/99/44	Rosemary Island	20°29.629'S, 116°34.425'E	Dive	2.5–6.0	Dominated by large *Porites* bommies with extensive caves and undercuts and interspersed with sand and rubble. Tabular and plate *Acropora* progressively more abundant inshore.	29.08.99
DA3/99/45	Rosemary Island	20°29.671'S, 116°35.894'E	Shore	Intertidal	Mainly flat, loose, igneous rocks overlaying calcareous sand. Rocks covered by brown macroalgae. *Syringodium* and *Halophila* in some pools.	30.08.99

Table 1 (cont.)

	Location	Lat. and Long.	Method	Depth (m)	Habitat	Date
DA3/99/46	Kendrew Island	20°29.671'S, 116°35.894'E	Dive	3.0–11.0	Spur and groove in limestone reef, grading into series of deep parallel gullies. Mainly robust branching *Acropora*, *Pocillopora* and encrusting corals; occasional scattered soft corals; areas of cyclone damage.	30.08.99
DA3/99/47	Kendrew Island	20°28.936'S, 116°32.519'E	Dive	4–5	Macroalgae (mainly browns but also *Caulerpa* spp) on limestone pavement with a thin veneer of coral sand. Some sand-filled depressions. Scattered coral colonies, *Turbinaria*, *Pocillopora* and robust *Acropora* predominant.	30.08.99
DA3/99/48	Goodwyn Island	20°32.000'S, 116°32.420'E	Shore	Intertidal	Gently sloping limestone pavement with scattered loose limestone slabs and occasional water-retaining depressions with numerous *Tridacna maxima*. Covering of short algal turf (mainly *Bornitella* spp) and *Caulerpa* spp. Large depressions 30 cm deep adjacent to beach with remnants of large 'relict' *Porites* colonies – alive at margins, tops dead and planed flat.	31.08.99
DA3/99/49	Goodwyn Island	20°32.397'S, 116°32.606'E	Dive	3.0–9.0	Sheltered reef with *Porites* bommies interspersed with extensive and diverse coral cover, mainly staghorn and digitate *Acropora* spp and foliaceous corals; some sandy interspaces and adjacent to silty channel at 9 m. Evidence of past storm damage.	31.08.99
DA3/99/50	Bare Rock	20°32.841'S, 116°26.733'E	Dive	10.0–20.0	Steeply sloping bottom from 15–20 m with scattered branching and encrusting corals on silty dissected limestone reef. At 20 m, sandy bottom gently sloping out to sea. Between 10 and 15 m, bottom dominated by small termitarium-like *Porites* colonies with some very large colonies closer to shore undercut with crevices and caves.	31.08.99
DA3/99/51	Enderby Island	20°35.196'S, 116°30.914'E	Shore	Intertidal	Extensive, very bare, silty sand flats in front of mangroves (*Avicennia*). West side of bay has algae-encrusted limestone boulders along shore. Area of limestone platform with numerous pools, bottoms covered with algae and flat rocks.	01.09.99
DA3/99/52	Roly Rock	20°29.696'S, 116°30.166'E	Dive	9.0–26.0	Rocky bottom rising steeply from 25–15 m, then gradually towards shore. Steep slope with abundant soft corals and gorgonians; mainly scattered tabular and encrusting hard corals on gradual slope. Fronted by gently sloping sandy bottom with some gorgonian-covered emergent rocks.	01.09.99
DA3/99/53	Enderby Island	20°34.528'S, 116°34.575'E	Dive	3.0–7.0	Moderately protected situation at entrance to bay. Gently sloping silty/rubble bottom with large *Porites* bommies with caves and crevices. Good diversity of *Acropora* spp and other encrusting and foliaceous hard corals. Many *Diadema*. Area of macroalgae inshore.	01.09.99
DA3/99/54	Enderby Island	20°36.222'S, 116°33.063'E	Shore	Intertidal	Enclosed bay with extensive tidal mud flat flanked by (igneous) rocky shore backed by mangroves. Flat largely devoid of any rocks/slabs to shelter animals, although some shallow holes present in NW portion close to shore; only whelks and holothurians conspicuous.	02.09.99

DA3/99/55	Enderby Island	20°35.152'S, 116°35.631'E	Dive	17.0	Flat sandy/silty bottom of channel between islands, subject to strong currents. High diversity and abundance of sponges with scattered nephtheids and gorgonians. Feather stars conspicuous in elevated situations. Few fishes, but numerous burrows of jawfish (*Opistognathus*) in bottom.	02.09.99
DA3/99/56	Eaglehawk Island	20°38.985'S, 116°26.210'E	Dive	2.0–11.0	Gently sloping coarse sand bottom, interspersed with limestone pavement with abundant and diverse sponges and sparse, scattered soft and hard corals. Sand with fair degree of bioturbation; bivalves, holothurians and gobies abundant. Coral growth most obvious at 7 m and shallower, mostly stunted *Acropora*.	03.09.99
DA3/99/57	North West Reefs	20°37.702'S, 116°25.089'E	Dive	11.0–13.0	Igneous outcrops with deep jointing and smooth, angular surfaces. Most animals in crevices. A few scattered colonies of encrusting hard corals and occasional soft corals. Coarse mobile sandy bottom between outcrops.	03.09.99
DA3/99/58	Enderby Island	20°34.398'S, 116°33.443'E	Dive	2.5–4.0	Protected bay situation with sand/rubble bottom sloping gently towards rich and diverse coral reef, reaching best development (100% cover) in 2.5 m (at low tide).	03.09.99
DA3/99/59	West Lewis Island	20°33.947'S, 116°38.334'E	Shore	Intertidal	Bay bordered by narrow band of mangroves (predominantly *Avicennia*). Substrate at head of bay comprised of small, angular, igneous rubble embedded in silty sand, becoming sandier with scattered rocks towards the entrance of the bay. Numerous shallow pools with little invertebrate or plant life.	04.09.99
DA3/99/60	West Lewis Island	20°32.878'S, 116°39.518'E	Dive	1.5–7.0	Rich and diverse coral reef spanning mouth of large bay with a shallow sandy lagoon between it and shore. Dominated by *Pavona*, but with faviids and fungiids conspicuous; branching *Acropora* predominating towards lagoon. Lagoon with large areas of recently dead staghorn coral.	04.09.99
DA3/99/61	West Lewis Island	20°34.693'S, 116°39.698'E	Dive	3.0–5.0	Flat, sand/rubble bottom with dense covering of brown macroalgae. Small colonies of massive and encrusting corals, and also sponges growing on scattered coral slabs. One large area of inter-connected *Porites* colonies, forming tunnels and caves.	04.09.99
DA3/99/62	East Lewis Island	20°37.499'S, 116°39.182'E	Shore	Intertidal	Bay fringed by mangroves (4 spp) with rocky (igneous) foreshore. Extensive sandy/muddy flat, consolidated by *Halophila*.	05.09.99
DA3/99/63	East Lewis Island	20°37.469'S, 116°38.246'E	Dive	0.0–5.0	Fringing reef in bay rising steeply from silty bottom and dominated by massive corals, including some very large *Porites* colonies; encrusting corals and fungiids conspicuous. Inshore, algal covered igneous rocks.	05.09.99
DA3/99/64	West Lewis Island	20°36.658'S, 116°36.956'E	Dive	2.0–5.0	Outside bay containing extensive mangroves. Flat, sandy bottom with scattered, but diverse hard corals (branching, foliose, encrusting and massive) as well as sparse soft corals and sponges. Inshore, more algal covered rocks and little coral.	06.09.99

Table 1 (cont.)

	Location	Lat. and Long.	Method	Depth (m)	Habitat	Date
DA3/99/65	Enderby Island	20°37.111'S, 116°26.780'E	Dive	13.0–15.0	Gently sloping limestone pavement, with only a thin veneer of sand and accumulations of sand in depressions. Dominated by sponges, including very large, fan-like species, gorgonians (particularly whips) and scattered hard and soft corals.	06.09.99
DA3/99/66	Enderby Island	20°36.700'S, 116°31.293'E	Shore	Intertidal	This narrow mangrove-lined (4 spp) creek cuts through limestone for several hundred metres and probably once completely dissected Enderby Island in a north/south direction. There are extensive middens of *Terebralia* shells along its west side. The bottom is mainly mud and rubble, supporting a depauperate benthic reef flat fauna with small coral colonies e.g. *Galaxia* and molluscs e.g. *Tridacna maxima*. Because of its depth there is movement of marine organisms (skates, sharks, turtles etc.) in and out with the tides.	06.09.99
DA3/99/67	Nelson Rocks	20°26.511'S, 116°40.256'E	Dive	6.0–24.0	Gently sloping limestone pavement with undulations and ridges topped with *Acropora* and soft corals. Scattered large *Porites* bommies and small encrusting coral colonies.	07.09.99
DA3/99/68	Nelson Rocks	20°27.998'S, 116°39.707'E	Dive	6.5	Flat bottom of coarse sand with scattered rubble and chunks of dead coral providing attachment for brown macroalgae and occasional small coral colonies and sponges. *Caulerpa* growing on sand.	07.09.99
DA3/99/69	Pipe-line	20°24.484'S, 116°46.310'E	Dive	15.0–18.0	Pile of igneous rocks to 4 m high covering pipe-line, thus forming a linear artificial reef across a flat sandy bottom. Little benthic growth on reef, comprised mainly of encrusting coral colonies and small isolated colonies of *Turbinaria* and robust *Acropora*. Fish life conspicuously concentrated on side of the reef exposed to the current; some very large schools of lutjanids and pomacentrids.	08.09.99
DA3/99/70	Nelson Rocks	20°27.441'S, 116°39.588'E	Dive	5.0–7.0	Limestone pavement with veneer of sand covered by brown macroalgae (mainly *Dictyopteris*), but also *Caulerpa* spp. Scattered hard and soft coral colonies.	08.09.99

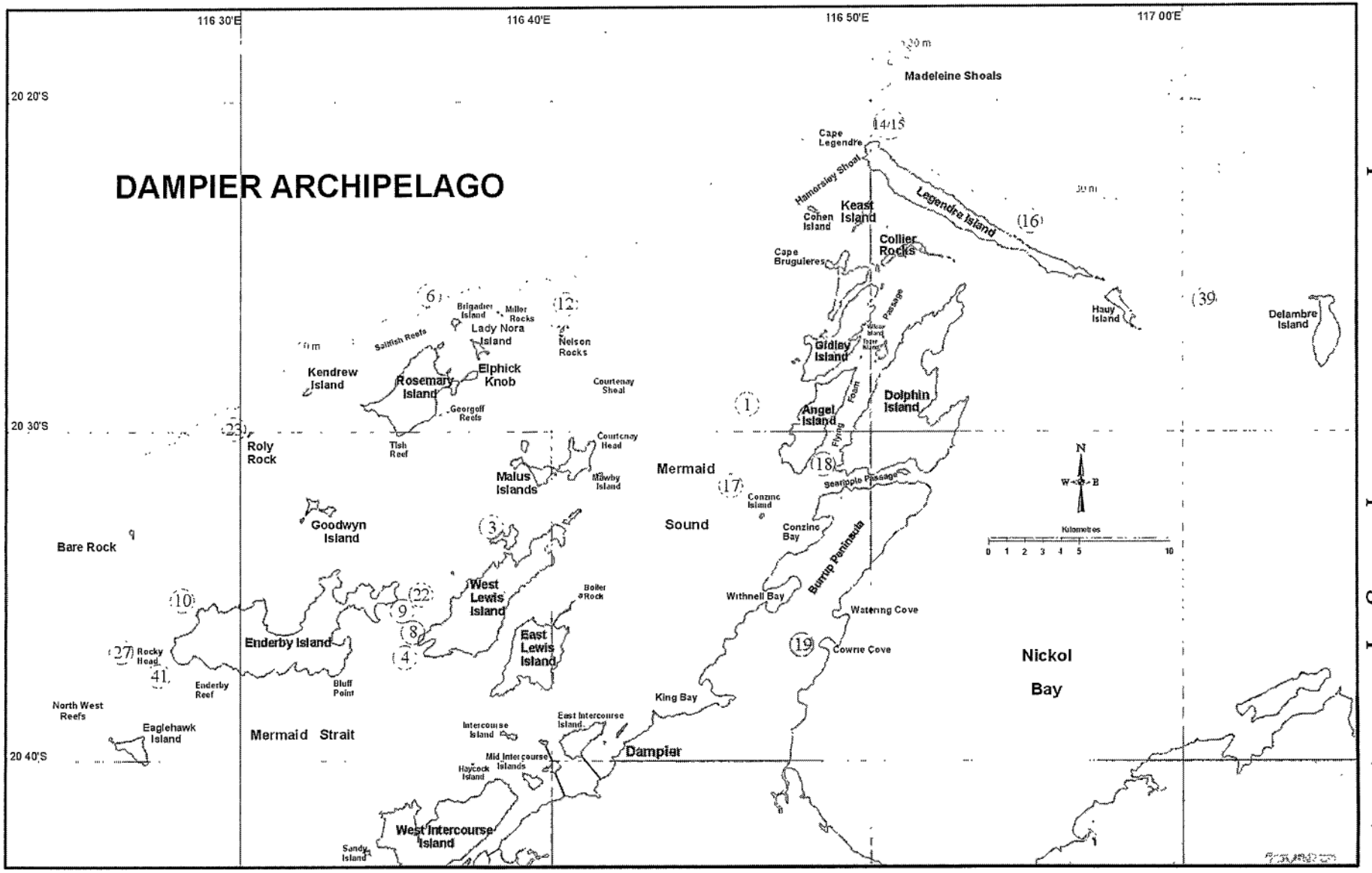

Figure 2 Locality map for sampling stations of the Dampier Archipelago Workshop diving expedition DA4/00.

Station map and list for the workshop diving expedition (DA4)

Table 2 Selected sampling station data for the Dampier Archipelago diving expedition DA4/00 (see Figure 2).

	Location	Lat. and Long.	Method	Depth (m)	Habitat	Date
DA4/00/01	W side Angel Island	20°29.050'S, 116°47.830'E	Dive	2.0-7.0	Spur and groove reef system with sandy interspaces; sponge and soft corals evident.	25.07.00
DA4/00/03	NW West Lewis Island	20°33.52'S, 116°38.21'E	Shore	Intertidal	Igneous boulder headlands with sandy beach between. Boulders small near waterline – thin encrusting sponges under submerged boulders with oyster and mangrove above.	
DA4/00/04	SW tip West Lewis Island	20°36.167'S, 116°35.741'S	Dive	5.0-6.0	Porites bommies near shoreline, surrounded by sand. Small colonies of plate and branching (*Acropora*) corals, some *Pavona decussata.*	26.07.00
DA4/00/06	SW tip West Lewis Island	20°26.25'S, 116°35.71'E	Dive	8.6	Fine sand with fine algal mat cover in places, some bioturbation, occasional outcrops of red gelatinous algae, sponges, ascidians, coelenterates. Grading into more sandy-gravel substratum with more outcrops of sponge and ascidian.	27.07.00
DA4/00/08	SW tip West Lewis Island	20°36.310'S, 116°35.696'E	Dive	1.0-10.0	Sandy rubble bottom with feathery type hydroids; nearshore corals. Many sponges, sea whips, crinoids, good cover. Inshore some *Porites* bommies, many *Acropora*, *Pocillopora* and *Pavona decussata.*	27.07.00
DA4/00/09	Between Enderby and West Lewis Islands	20°35.115'S, 116°35.629'E	Dive	16.0-17.7	Sponge garden on silty bottom. Some rock outcrops with sponge, soft corals, sea whips, gorgonians and many bryozoans.	28.07.00
DA4/00/10	W side Enderby Island, near Rocky Head	20°35.385'S, 116°28.572'E	Dive	5.0-11.2	Rugged dissected limestone reef; some soft and hard corals, sandy in deeper areas. Gravely sediment with low outcrops at deeper depths, grading to shallow, large rock outcrops, sediment coated with small patches of *Acropora* and *Goniopora*. Many hydroids and encrusting sponges in underhangs; many *Diadema* and some crown of thorns sea stars.	28.07.00
DA4/00/12	Nelson Rocks	20°26.506'S, 116°40.261'E	Dive	19.0-20.1	Limestone reef with ledges and crevices; some hard and soft corals. Flat pavement at 18-20 m with fine silt cover. Many soft and some small massive corals; sponges few, low diversity.	29.07.00
DA4/00/13	Pipe-line	20°24.448'S, 116°46.298'E	Dive	14.0-17.0	Pile of igneous rocks covering pipe-line (see DA3/99/69).	29.07.00
DA4/00/14	NW end Legendre Island	20°21.206'S, 116°50.439'E	Dive	8.0-30.0	Massive limestone reefs with vertical drop-offs (see DA1/98/15). Soft coral dominated, with few large sponges.	30.07.00
DA4/00/15	NW end Legendre Island	20°21.206'S, 116°50.439'E	Dive	4.0-18.0	Same location as DA4/00/14. Less soft coral and more sponge.	30.07.00
DA4/00/16	Mid N shore Legendre Island	20°24.025'S, 116°55.079'E	Dive	10.0-16.0	Sloping limestone pavement with long sandy channels running inshore, fading into low reef covered with soft corals.	31.07.00
DA4/00/17	NW corner Conzinc Island	20°31.902'S, 116°46.486'E	Dive	6.0-11.6	Sandy bottom, sloping shoreward with areas of emergent limestone; numerous patches of sponge garden bottom. Very silty; diverse attached invertebrates on limestone.	31.07.00

DA4/00/18	SW Dolphin Island in Searipple Passage	20°31.0'S, 116°48.95'E	Shore	Intertidal	Very silty, burrowing sponges and sponges on small rocky outcrops. Sand dollars and worm tubes covered in ascidians.	31.07.00
DA4/00/19	Hearson Cove	20°37.62'S, 116°48.15'E	Shore	Intertidal	Wide bay with extensive mudflat. No sessile attached invertebrates, some crabs.	01.08.00
DA4/00/21	Brigadier Island	20°26.657'S, 116°36.507'E	Dive	7.0-20.0	Limestone reef dissected by deep gullies (see DA3/99/40).	01.08.00
DA4/00/22	Between Enderby and West Lewis Islands	20°35.11'S, 116°35.62'E	Dive	19.0	Sponge garden. Silty with outcrops with many invertebrates, sponges, gorgonians, sea whips.	02.08.00
DA4/00/23	NW corner, Roly Rock	20°29.880'S, 116°30.050'E	Dive	8.6-10.0	Coral reef with low spur and groove sections. Extensive ledge formed by interlocked staghorn with small plate *Acropora* and *Pocillopora* dropping onto a sand covered broken pavement area.	03.08.00
DA4/00/27	W of Rocky Head, Enderby Island	20°37.096'S, 116°26.721'E	Dive	15.0-16.0	Sponge garden bottom (see DA3/99/65).	04.08.00
DA4/00/32	Angel Island	20°29.765'S, 116°47.480'E	Dive	5.0-8.0	*Spur and groove reef system (see DA4/00/01).*	04.08.00
DA4/00/33	Legendre Island	*20°21.401'S, 116°49.779'E*	*Dive*	*5.0-15.0*	*Flat limestone reef dropping steeply to 15 m; some moderate smooth-sided channels running shoreward; top of reef covered in areas with soft corals and some scattered encrusting hard corals.*	04.08.00
DA4/00/37	Legendre Island	20°21.270'S, 116°50.557'E	Dive	15.0-20.0	Massive limestone reefs with vertical drop-offs (same location as DA4/00/14).	06.08.00
DA4/00/38	Legendre Island	20°23.354'S, 116°53.802'E	Dive	8.0-15 .0	Moderate limestone reef with long spurs extending seaward, interspaces sandy; some spurs with moderate cover of hard and soft corals. Sandy bottom seaward with concentrations of coral rubble, obviously affected by wave action.	06.08.00
DA4/00/39	NE corner Delambre Island	20°25.705'S, 116°05.109'E	Shore and dive	Intertidal and 11.0-14.0	Low limestone reef with sandy interspaces, with patches of hard and soft corals; some shallow channels.	07.08.00
DA4/00/40	Delambre Island	20°25.936'S, 116°04.017'E	Dive	5.0-6.0	Sandy bottom with lots of emergent limestone pavement; some large *Porites* bommies; large area of coral rubble inshore.	07.08.00
DA4/00/41	SSW Rocky Head, Enderby Island	20°37.301'S, 116°27.381'E	Dive	10.0-13.0	Sponge gardens with some areas of low emergent reef (see DA3/99/65).	08.08.00
DA4/00/42	Enderby Island	20°36.349'S, 116°27.788'E	Snorkel	5.0-8.0	Moderately rugged limestone reef just off shoreline, prominent spur and groove; top of reef covered with hard and soft corals.	08.08.00
DA4/00/43	Enderby Island	20°35.119'S, 116°28.908'E	Dive	5.0-13.0	Sandy bottom with scattered bommies inshore, becoming more rugged offshore (without spur and groove); large *Porites* bommies; coral cover in some areas poor, but more diverse along western edge.	09.08.00
DA4/00/44	Enderby Island	20°37.370'S, 116°32.623'E	Dive	3.0-4.0	Sandy bottom with dense patches of coral, especially staghorns; corals covered with silt.	09.08.00

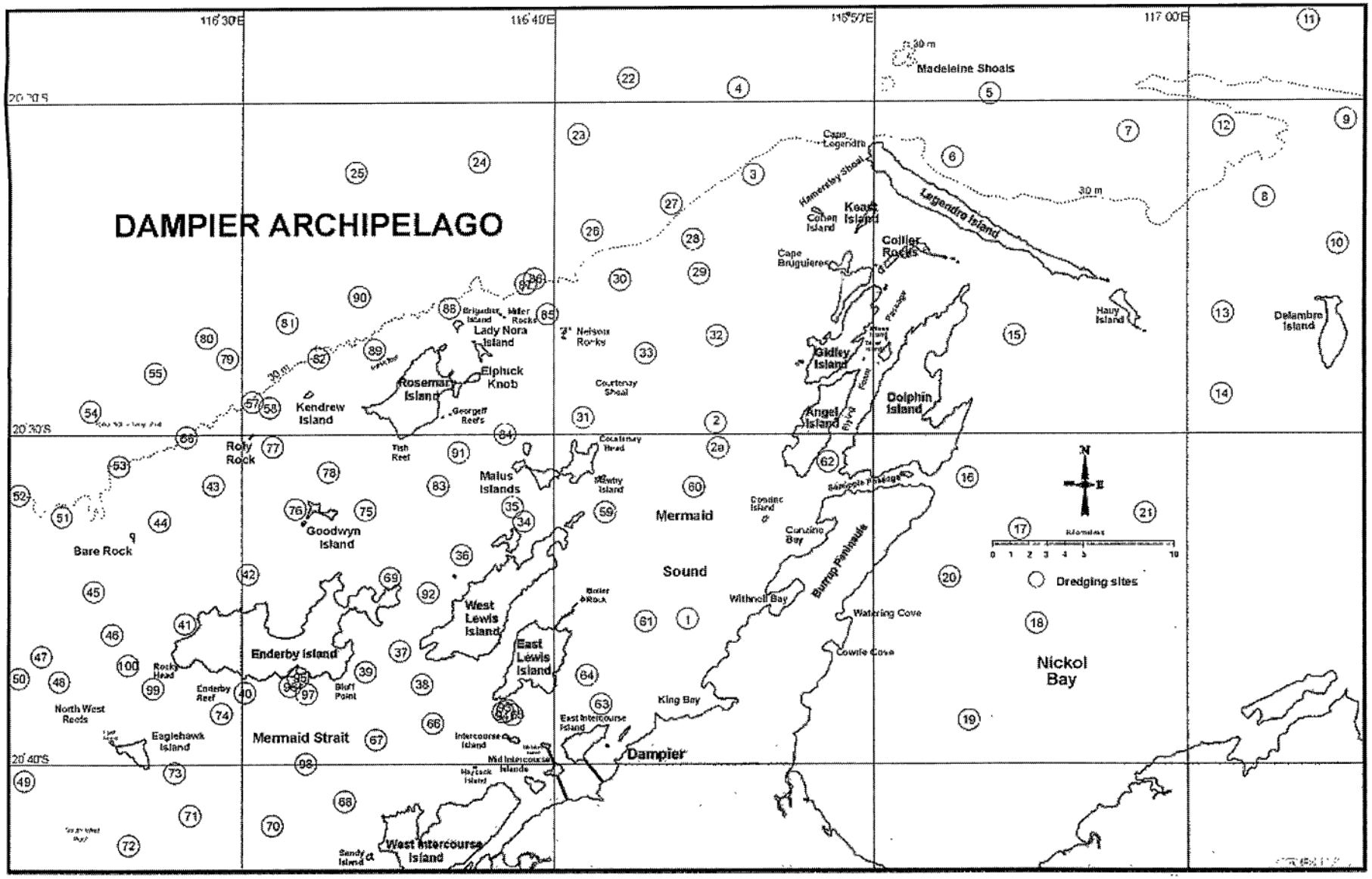

Figure 3 Locality map for sampling stations of the Dampier Archipelago dredging expedition DA2/99.

Station map and list for the dredging expedition (DA2)

Table 3 Sampling station data for the Dampier Archipelago dredging expedition DA2/99 (see Figure 3).

	Location	Lat. and Long.	Method	Depth (m)	Habitat	Date
DA2/99/01	Mermaid Sound, ~ 2.5 n. mls N of Phillip Point, Burrup Peninsula	20°35.32'S, 116°43.88'E to 20°35.32'S, 116°44.17'E	Rake box dredge	10.0	Rock, coarse sand; little material – frondose red algae and *Halophila.*	14.07.99
DA2/99/02	Mermaid Sound, ~ 3.5 n. mls E of Courtenay Head Light, Malus Island	20°29.84'S, 116°45.04'E to 20°30.13'S, 116°45.27'E	Rake box dredge	18.0	Rock, grey muddy sand; very little material – sponges, hydroids and soft corals.	14.07.99
DA2/99/02a	Mermaid Sound, ~ 2.3 n. mls W of Angel Island	20°30.34'S, 116°45.10'E to 20°30.62'S, 116°44.73'E	Scoop box dredge	18.0	Grey muddy sand; very little material – drift sponges.	14.07.99
DA2/99/03	Mermaid Sound, ~ 2 n. mls E of Cohen Island	20°22.14'S, 116°46.13'E to 20°22.43'S, 116°46.34'E	Rake box dredge	32.0–35.0	Muddy sand; coralline red algae and *Halophila*, free-living solitary corals.	14.07.99
DA2/99/04	4 n. mls NNW of Cohen Island	20°19.64'S, 116°45.75'E to 20°19.82'S, 116°45.98'E	Rake box dredge	42.0–43.0	Muddy shelly sand, rubble and limestone rocks; sponges and gorgonians.	14.07.99
DA2/99/05	~ 3.5 n. mls NE of Cape Legendre	20°19.79'S, 116°53.85'E to 20°19.81'S, 116°53.39'E	Rake box dredge	38.0	Rock, muddy sand and rock; sponges, soft corals, gorgonians.	14.07.99
DA2/99/06	~ 2.7 n. mls ESE of Cape Legendre	20°21.69'S, 116°52.40'E to 20°21.23'S, 116°52.36'E	Rake box dredge	33.0–36.0	Coarse muddy sand and limestone rocks; sponges, gorgonians.	14.07.99
DA2/99/07	~ 6.5 n. mls almost E of Cape Legendre	20°20.90'S, 116°57.04'E to 20°20.98'S, 116°56.79'E	Rake box dredge	37.0	Coarse sand and shell on rock; hydroids, few sponges.	15.07.99
DA2/99/08	~ 3.6 n. mls NNE of NW point of Delambre Island	20°22.76'S, 117°02.23'E to 20°23.12'S, 117°02.14'E	Rake box dredge	30.0–31.0	Fine sand, shelly gravel and limestone rocks; sponges, gorgonians, soft corals and tunicates.	15.07.99
DA2/99/09	~ 5.5 n. mls N of NE corner of Delambre Island	20°20.38'S, 117°05.22'E to 20°20.68'S, 117°05.63'E	Rake box dredge	31.0–34.5	Coarse sand and limestone rocks; sponges, gorgonians, soft corals and tunicates.	15.07.99
DA2/99/10	1.9 n. mls N of NE point of Delambre Island	20°23.97'S, 117°04.82'E to 20°23.72'S, 117°04.70'E	Rake box dredge	29.0	Coarse shelly sand and limestone rocks; sponges, gorgonians and soft corals.	15.07.99
DA2/99/11	~ 5.9 n. mls NNW of NW point of Delambre Island	20°17.12'S, 117°03.97'E; to 20°20.19'S, 117°01.18'E	Grab samples (10 within small area)	38.0	Rock, muddy sand; gorgonians.	15.07.99
DA2/99/12	~ 5.9 n. mls NNW of NW point of Delambre Island	20°20.75'S, 117°01.16'E to 20°20.19'S, 117°01.18'E	Rake box dredge	32.0–34.0	Coarse shelly sand and rocks; sponges, gorgonians and corals.	15.07.99
DA2/99/13	~ 2.25 n. mls off Haüy Island	20°26.52'S, 117°00.50'E to 20°26.27'S, 117°00.56'E	Rake box dredge	19.5	Rock; frondose red algae, many sponges, corals and gorgonians.	16.07.99
DA2/99/14	~ 3.1 n. mls SW of S point of Haüy Island	20°28.50'S, 117°01.10'E	Grab sample	18.5	Muddy sand.	16.07.99

DA2/99/15	~ 3.3 n. mls SW of S point of Legendre Island	20°27.27'S, 116°54.20'E to 20°27.91'S, 116°54.48'E	Rake box dredge	9.5	Muddy sand; small catch – crinoids and fish.	16.07.99
DA2/99/16	~ 1 n. ml E of Sloping Point, Burrup Peninsula	20°31.41'S, 116°52.83'E to 20°31.00'S, 116°53.50'E	Rake box dredge	11.5	Fine grey silty sand, shells and rocks; hydroids, gorgonians (calcareous flakes ?*Halimeda*).	16.07.99
DA2/99/17	~ 3. n. mls ESE of Sloping Point, Burrup Peninsula	20°32.99S, 116°54.71'E to 20°33.47'S, 116°54.97'E	Rake box dredge	16.5–17.0	Sticky grey mud, little gravel; hydroids.	16.07.99
DA2/99/18	~ 5 n. mls SE of Sloping Point, Burrup Peninsula	20°35.67'S, 116°54.97'E to 20°36.12'S, 116°55.09'E	Rake box dredge	10.0–10.5	Rock, grey muddy sand; hydroids, gorgonians.	16.07.99
DA2/99/19	~ 4.8 n. mls E of Hearson Cove, Burrup Peninsula	20°38.41'S, 116°52.86'E to 20°38.62'S, 116°52.56'E	Rake box dredge	10.0–10.2	Sticky grey mud with little sand and gravel; small haul – hydroids and echinoderms.	16.07.99
DA2/99/20	~ 2.7 n. mls S of Sloping Point, Burrup Peninsula	20°34.30'S, 116°52.20'E to 20°34.75'S, 116°52.26'E	Rake box dredge	11.0	Sticky grey mud; very few sipunculids, many holothurians.	16.07.99
DA2/99/21	~ 6.2 n. mls E of Sloping Point, Burrup Peninsula	20°32.25'S, 116°58.48'E to 20°31.76'S, 116°58.71'E	Rake box dredge	16.4–18.0	Sand; solitary corals, tunicates, echinoderms.	16.07.99
DA2/99/22	~ 7.1 n. mls WNW of Cape Legendre	20°19.43'S, 116°42.61'E to 20°19.69'S, 116°42.22'E	Rake box dredge	37.0–38.0	Sand, few rocks; hydroids.	17.07.99
DA2/99/23	~ 8.9 n. mls W of Cape Legendre	20°21.00'S, 116°40.39'E to 20°21.35'S, 116°40.19'E	Rake box dredge	37.0	Rock, sand; frondose red algae.	17.07.99
DA2/99/24	~ 5.5 n. mls N of Lady Nora Island	20°21.79'S, 116°38.05'E to 20°22.00'S, 116°37.81'E	Rake box dredge	38.5	Rock, sand; hydroids.	17.07.99
DA2/99/25	~ 5.2 n. mls N of Rosemary Island	20°22.29'S, 116°35.56'E to 20°22.62'S, 116°35.44'E	Rake box dredge	39.0	Muddy sand; echinoderms (echinoids, asteroids, holothurians, crinoids, ophiuroids).	17.07.99
DA2/99/26	~ 5.8 n. mls NE of Rosemary Island	20°24.01'S, 116°41.28'E to 20°24.16'S, 116°40.83'E	Rake box dredge	34.0	Rock, muddy sand; frondose red algae, hydroids.	17.07.99
DA2/99/27	~ 6.2 n. mls WSW of Cape Legendre	20°23.29'S, 116°43.64'E to 20°23.54'S, 116°43.32'E	Rake box dredge	33.5–34.0	Rock, muddy sand; very small catch – hydroids, soft corals.	17.07.99
DA2/99/28	~ 4.5 n. mls WNW of Cape Bruguieres	20°24.07'S, 116°43.90'E to 20°24.26'S, 116°43.67'E	Rake box dredge	30.0–30.5	Rock, muddy fine sand; frondose red algae, hydroids.	17.07.99
DA2/99/29	~ 4.35 n. mls W of Cape Bruguieres	20°24.64'S, 116°44.05'E to 20°24.76'S, 116°43.65'E	Rake box dredge	27.0–28.0	Rock, muddy sand; frondose red and brown algae, gorgonians.	17.07.99
DA2/99/30	~ 6.35 n. mls W of Cape Bruguieres	20°25.20'S, 116°41.74'E to 20°25.01'S, 116°42.28'E	Rake box dredge	29.0–30.0	Rock, muddy sand; frondose red algae, hydroids.	17.07.99
DA2/99/31	~ 1.2 n. mls NW of Courtenay Head Light, Malus Island	20°29.49'S, 116°40.61'E to 20°29.66'S, 116°41.01'E	Rake box dredge	11.5	Rock, fine muddy sand; brown algae, sponges, gorgonians.	18.07.99

Table 3 (cont.)

	Location	Lat. and Long.	Method	Depth (m)	Habitat	Date
DA2/99/32	~ 4.8 n. mls NE of Courtenay Head Light, Malus Island	20° 26.95'S, 116°44.86'E to 20°27.39S, 116°44.28'E	Rake box dredge	15.0–16.0	Rock, coarse sand, rubble; frondose red and brown algae, many sponges, hydroids, gorgonians.	18.07.99
DA2/99/33	3.3 n. mls NNE of Courtenay Head Light, Malus Island	20°27.41'S, 116°42.57'E to 20°27.33'S, 116°43.05'E	Rake box dredge	18.0–21.0	Coarse sand, rubble and shell; rhodoliths and frondose green and red algae, corals, soft corals, gorgonians.	18.07.99
DA2/99/34	3.3 n. mls NE of Courtenay Head Light, Malus Island	20°32.65'S, 116°39.14'E to 20°32.72'S, 116°39.59'E	Rake box dredge	9.0–13.0	Muddy sand, little gravel; little *Halophila*, hydroids, tunicates.	19.07.99
DA2/99/35	1.9 n. mls W of High Point, on island NE of West Lewis Island	20°32.15'S; 116°38.86'E to 20°32.14'S, 116°38.16'E	Rake box dredge	13.0–15.0	Shelly mud and rocks; frondose coralline algae, hydroids, gorgonians.	19.07.99
DA2/99/36	~ 4 n. mls WSW of High Point, on island NE of West Lewis Island	20°33.58'S, 116°36.87'E to 20°33.88'S, 116°36.25'E	Rake box dredge	13.0	Rock, shelly mud; red and brown algae, hydroids, gorgonians.	19.07.99
DA2/99/37	2.5 n. mls WNW of Marks Point, West Lewis Island	20°36.54'S, 116°34.98'E to 20°36.11'S, 116°35.02'E	Rake box dredge	14.0–15.0	Rock, shelly mud; brown algae, many sponges, hydroids, gorgonians.	19.07.99
DA2/99/38	~ 2.1 n. mls WSW of Marks Point, West Lewis Island	20°37.47'S, 116°35.37'E to 20°36.91'S, 116°35.33'E	Rake box dredge	11.0–13.0	Rock, sandy mud; frondose algae, little *Halophila*, hydroids, gorgonians, tunicates.	19.07.99
DA2/99/39	1 n. ml. ENE of Bluff Point, Enderby Island	20°37.05'S, 116°33.86'E to 20°37.56'S, 116°33.45'E	Rake box dredge	13.0–14 0	Rock, sandy mud; few rhodoliths, frondose brown algae, many sponges, tunicates.	19.07.99
DA2/99/40	~ 1.65 n. mls WSW of Bluff Point, Enderby Island	20°37.74'S, 116°31.05'E to 20°37.71'S, 116°31.57'E	Rake box dredge	10.5–11.0	Rock, sand; little frondose algae, little *Halophila*; hydroids, tunicates.	19.07.99
DA2/99/41	~ 1.3 n. mls N of Rocky Head, Enderby Island	20°35.63S, 116°28.07'E to 20°35.09'S, 116°27.81'E	Rake box dredge	16.0–17.4	Rock, fine sand; red algae, sponges, gorgonians, tunicates.	20.07.99
DA2/99/42	~ 2.4 n. mls SW of SW point of Goodwyn Island	20°34.16'S, 116°30.11'E to 20°33.67'S, 116°30.01'E	Rake box dredge	14.0–16 0	Rock, fine sand; frondose algae, tunicates, echinoderms.	20.07.99
DA2/99/43	~ 2.9 n. mls WNW of SW point of Goodwyn Island	20°31.60'S, 116°29.03'E to 20°32.02'S, 116°29.18'E	Rake box dredge	21.0–22.0	Very fine sand, little gravel; hydroids.	20.07.99
DA2/99/44	~ 4.2 n. mls W of SW point of Goodwyn Island	20°32.71'S, 116°27.57'E to 20°32.55'S, 116°28.00'E	Scoop box dredge	22.0–23.0	Rock, fine sand; hydroids, gorgonians.	20.07.99
DA2/99/45	~ 6.6 n. mls WSW of SW point of Goodwyn Island	20°34.35'S, 116°25.27'E to 20°33.95'S, 116°25.17'E	Rake box dredge	22.0–27.0	Very fine sand, little gravel; hydroids.	20.07.99

DA2/99/46	~ 2.4 n. mls WNW of Rocky Head, Enderby Island	20°35.90'S 116°25.60'E to 20°35.48'S, 116°25.52'E	Rake box dredge	17.5–18.0	Rock, fine sand, rhodoliths; tunicates, echinoderms.	20.07.99
DA2/99/47	~ 3.9 n. mls just N of W of Rocky Head, Enderby Island	20°36.58'S, 116°23.66'E to 20°36.58'S, 116°24.26'E	Rake box dredge	20.0–22.5	Rock, fine sand; brown algae, gorgonians, tunicates.	20.07.99
DA2/99/48	~ 3.6 n. mls just S of W of Rocky Head, Enderby Island	20°37.43'S, 116°24.08'E to 20°36.98'S, 116°24.22'E	Rake box dredge	20.5–21.0	Rock, fine sand; brown algae.	20.07.99
DA2/99/49	3.3 n. mls just S of W of W point of Eaglehawk Island	20°40.30'S, 116°22.59'E to 20°39'81'S, 116°22.60'E	Rake box dredge	15.5–16.0	Rock, coarse sand; green and brown frondose algae, sponges, tunicates.	20.07.99
DA2/99/50	~ 6.5 n. mls W of Rocky Head, Enderby Island	20°37.10'S, 116°20.99'E to 20°37.28'S, 116°21.08'E	Rake box dredge	24.0–25.0	Rock, shell fragments; algae, sponges, gorgonians, hydroids, coral.	20.07.99
DA2/99/51	~ 7.4 n. mls W of SW point of Goodwyn Island	20°32.40'S, 116°24.19'E to 20°32.59'S, 116°24.48'E	Rake box dredge	31.4–31.5	Rock sandy mud; algae, gorgonians.	21.07.99
DA2/99/52	~ 10 n. mls W of SW point of Goodwyn Island	20°31.85'S, 116°21.48'E to 20°31.97'S, 116°21.99'E	Rake box dredge	31.2–32.3	Rock, coarse sand; algae, hydroids, tunicates.	21.07.99
DA2/99/53	~ 5.8 n. mls WNW point of Goodwyn Island	20°30.90'S, 116°26.05'E to 20°30.62'S, 116°25.72'E	Rake box dredge	32.0–34.0	Rock, sandy mud; small catch; hydroids, gorgonians.	21.07.99
DA2/99/54	~ 7 n. mls WNW of NW point of Goodwyn Island	20°29.31'S, 116°25.18'E to 20°29.62'S, 116°25.44'E	Rake box dredge	36.0–37.0	Muddy sand, rubble, rocks; small-moderate haul; gorgonians and echinoderms.	21.07.99
DA2/99/55	~ 3.2 n. mls NW of Roly Rock	20°28.45'S, 116°27.43'E to 20°27.98'E, 116°27.54'E	Rake box dredge	37.5–38.0	Mud, sand, rubble rocks; brown algae, hydroids, gorgonians.	21.07.99
DA2/99/56	~ 2 n. mls W of Roly Rock	20°30.10'S, 116°28.27'E to 20°29.88'S, 116°27.93'E	Rake box dredge	33.0–34.5	Muddy coarse sand, rock; rhodoliths, hydroids, gorgonians.	21.07.99
DA2/99/57	~ 1.05 n. mls N of Roly Rock	20°29.03'S, 116°30.45'E to 20°29.18'S, 116°30.06'E	Rake box dredge	32.0–33.0	Coarse sand, gravel, rocks; frondose red and brown algae, tunicates.	21.07.99
DA2/99/58	~ 1 n. ml. NNE of Roly Rock	20°29.11'S, 116°30.78'E to 20°29.35'S, 116°30.55'E	Rake box dredge	25.0–25.5	Coarse shelly gravel, rock; frondose red and brown algae, hydroids.	21.07.99
DA2/99/59	1.8 n. mls S of Courtenay Head Light, Malus Island	20°32.23'S, 116°41.63'E to 20°32.09'S, 116°41.16'E	Rake box dredge	17.0–19.0	Shelly mud, rocks; frondose algae, many sponges, gorgonians.	22.07.99
DA2/99/60	~ 2.9 n. mls ESE of Courtenay Head Light, Malus Island	20°31.38'S, 116°44.24'E to 20°31.72'S, 116°43.80'E	Rake box dredge	16.0–17.0	Mud, rock; frondose algae, sponges, hydroids, gorgonians.	22.07.99
DA2/99/61	~ 2.85 n. mls NW of Phillip Point, Burrup Peninsula	20°35.33'S, 116°42.78'E to 20°34.83'S, 116°42.91'E	Rake box dredge	11.0	Mud, rock; red algae, few echinoids and holothurians.	22.07.99

Table 3 (cont.)

	Location	Lat. and Long.	Method	Depth (m)	Habitat	Date
DA2/99/62	Flying Foam Passage, 0.9 n. mls NE of S point of Angel Island	20°30.69'S, 116°48.58'E to 20°31.17'S, 116°48.33'E	Rake box dredge	7.0–9.0	Fine shell, rocks, rhodoliths; frondose algae, sponges, gorgonians.	22.07.99
DA2/99/63	~ 1.1 n. mls NNE of light on East Intercourse Island	20°38.35'S, 116°41.23'E to 20°38.23'S, 116°41.44'E	Rake box dredge	11.5–12.0	Mud, gravel and shell (dredge spoil); very few sponges.	23.07.99
DA2/99/64	~ 2 n. mls N of light on East Intercourse Island	20°37.43'S, 116°40.77'E to 20°37.79'S, 116°40.76'E	Rake box dredge	12.0–14.0	Mud and rubble; sparse crustaceans and dead shells.	23.07.99
DA2/99/65	~ 2.4 n. mls NW of light on East Intercourse Island	20°38.31'S, 116°38.46'E to 20°38.77'S, 116°38.54'E	Rake box dredge	10.0–15.0	Shelly mud and rocks; algae, many sponges, hydroids, corals, gorgonians.	23.07.99
DA2/99/66	~ 2.75 n. mls ESE of Bluff Point, Enderby Island	20°38.40'S, 116°35.66'E to 20°38.30'S, 116°36.01'E	Rake box dredge	7.2–7.5	Muddy coarse sand; algae, few gorgonians, stalked tunicates.	23.07.99
DA2/99/67	~ 2 n. mls SSE of Bluff Point, Enderby Island	20°39.11'S, 116°33.98'E to 20°38.93'S, 116°34.46'E	Rake box dredge	10.5	Muddy gravel; algae, stalked tunicates, sponges.	23.07.99
DA2/99/68	~ 3.6 n. mls S of Bluff Point, Enderby Island	20°40.93'S, 116°33.21'E to 20°40.63'S, 116°33.36'E	Rake box dredge	9.0–9.2	Sandy mud; *Halophila*, many sponges, stalked tunicates.	23.07.99
DA2/99/69	~ 2.5 n. mls SE of SE point of Goodwyn Island	20°34.34'S, 116°34.67'E to 20°34.29'S, 116°35.06'E	Rake box dredge	11.5–14.0	Muddy sand; sponges, gorgonians, stalked tunicates.	24.07.99
DA2/99/70	~ 4.6 n. mls SSW of Bluff Point, Enderby Island	20°41.45'S, 116°30.78'E to 20°41.27'S, 116°30.92'E	Rake box dredge	10.0	Coarse gravel and rocks; gorgonians, stalked tunicates, corals.	24.07.99
DA2/99/71	~ 4.6 n. mls S of Rocky Head, Enderby Island	20°41.49'S, 116°28.05'E to 20°41.55'S, 116°28.36'E	Rake box dredge	10.5	Coarse sand and rock; soft corals, gorgonians, stalked tunicates.	24.07.99
DA2/99/72	~ 5.5 n. mls SSW of Rocky Head, Enderby Island	20°42.13'S, 116°26.22'E to 20°42.12'S, 116°26.52'E	Rake box dredge	10.0	Rocky bottom with rhodoliths; frondose algae, gorgonians.	24.07.99
DA2/99/73	3.25 n. mls S of Rocky Head, Enderby Island	20°40.14'S, 116°27.69'E to 20°39.93'S, 116°27.96'E	Rake box dredge	12.5	Coarse sand and rocks; sponges, free living corals.	24.07.99
DA2/99/74	~ 1.95 n. mls SE of Rocky Head, Enderby Island	20°38.34'S, 116°29.18'E to 20°38.83'S, 116°28.85'E	Rake box dredge	10.5–11.5	Sand; little *Halophila*, diverse fish and echinoderms.	24.07.99
DA2/99/75	~ 0.75 n. mls E of NE point of Goodwyn Island	20°32.16'S, 116°33.70'E to 20°31.70'S, 116°33.20'E	Rake box dredge	14.0–19.0	Muddy sand and rock; brown algae, many sponges, gorgonians, soft corals.	25.07.99
DA2/99/76	~ 0.4 n. mls W of NW point of Goodwyn Island	20°32.11'S, 116°31.55'E to 20°32.40'S, 116°31.22'E	Rake box dredge	13.0–15.0	Coarse shelly sand and coralline algae; various algae, hydroids, solitary corals, stalked tunicates.	25.07.99
DA2/99/77	~ 1.8 n. mls NW of NW point of Goodwyn Island	20°30.57'S, 116°30.89'E to 20°30.49'S, 116°30.91'E	Rake box dredge	13.0–14.0	Rock bottom; various algae, gorgonians, attached tunicates.	25.07.99

DA2/99/78	~ 1.3 n. mls NE of NW point of Goodwyn Island	20°31.09'S, 116°33.04'E to 20°31.17'S, 116°33.40'E	Rake box dredge	14.0–15.0	Sand and rocks; very rough bottom (only 2 minutes of dredging but duration of 10 minutes recorded by skipper); brown algae, attached tunicates.	25.07.99
DA2/99/79	~ 2.6 n. mls WNW of W point of Kendrew Island	20°27.64'S, 116°29.54'E to 20°27.25'S, 116°29.33'E	Rake box dredge	38.0	Shelly mud and rocks; algae, stalked tunicates.	25.07.99
DA2/99/80	~ 3.1 n. mls WNW of W point of Kendrew Island	20°27.34'S, 116°29.14'E to 20°27.41'S, 116°29.19'E	Scoop box dredge with fine mesh fitted	38.0–39.0	Muddy sand.	25.07.99
DA2/99/81	~ 2.35 n. mls N of W point of Kendrew Island	20°26.51'S, 116°31.57'E to 20°26.37'S, 116°31.73'E	Rake box dredge	38.0	Muddy shell, gravel and rocks; diverse echinoderms.	25.07.99
DA2/99/82	1.2 n. mls N of N point of Kendrew Island	20°27.57'S, 116°32.35'E to 20°27.18'S, 116°32.29'E	Rake box dredge	32.0–36.0	Muddy sand and rocks; algae, sponges, soft corals, attached tunicates.	25.07.99
DA2/99/83	3.15 n. mls ENE of NE point of Goodwyn Island	20°31.60'S, 116°36.19'E to 20°31.37'S, 116°35.76'E	Rake box dredge	11.5–11.7	Fine sand and rocks; little algae, few sponges and gorgonians, attached tunicates.	26.07.99
DA2/99/84	2.9 n. mls E of Tish Point, Rosemary Island	20°29.94'S, 116°38.11'E to 20°29.84'S, 116°38.64'E	Rake box dredge	12.5–15.0	Hard bottom; algae, sponges, gorgonians, hard corals.	26.07.99
DA2/99/85	~ 2.6 n. mls E of E point of Brigadier Island	20°26.38'S, 116°39.76'E to 20°26.09'S, 116°40.10'E	Rake box dredge	28.0–29.0	Coarse sand and rocks; algae, attached tunicates.	26.07.99
DA2/99/86	~ 2.4 n. mls ENE of E point of Brigadier Island	20°25.35'S, 116°39.17'E to 20°25.42'S, 116°39.12'E	Fine mesh on scoop box dredge	33.0	Very fine sand; extremely small catch (aborted dredging) – fish only.	26.07.99
DA2/99/87	~ 2.2 n. mls ENE of E point of Brigadier Island	20°25.48'S, 116°39.07'E to 20°25.23'S, 116°39.32'E	Rake box dredge	33.0–33.5	Fine sand; very small catch – diverse echinoderms.	26.07.99
DA2/99/88	0.7 n. mls N of W of Brigadier Island	20°26.04'S, 116°36.77'E to 20°25.63'S, 116°36.85'E	Rake box dredge	33.5–38.5	Coarse sand, gravel, small rocks; brown algae, few hydroids and gorgonians.	26.07.99
DA2/99/89	~ 1.85 n. mls N of Gordon Point, Rosemary Island	20°27.33'S, 116°34.39'E to 20°27.17'S, 116°34.72'E	Rake box dredge	27.0–28.0	Coarse shell and rubble; extremely small catch (problems with dredging) – mainly echinoids and fish.	26.07.99
DA2/99/90	3.5 n. mls N of Gordon Point, Rosemary Island	20°25.68'S, 116°33.96'E to 20°25.62'S, 116°34.38'E	Rake box dredge	38.0	Sandy mud and rocks; very small catch – brown algae and hydroids.	26.07.99
DA2/99/91	~ 1.4 n. mls ESE of Tish Point, Rosemary Island	20°30.48'S, 116°36.53'E to 20°30.27'S, 116°36.86'E	Rake box dredge	9.0–10.0	Sandy mud, shell and rhodoliths; various algae, gorgonians and attached tunicates.	26.07.99
DA2/99/92	~ 3.9 n. mls NE of Bluff Point, Enderby Island	20°34.64'S, 116°35.74'E to 20°34.72'S, 116°35.65'E	Fine mesh in scoop box dredge	17.0	Shelly mud; very few living organisms – mainly sponges and crustaceans.	27.07.99
DA2/99/93	~ 0.45 n. mls SE of King Point, East Lewis Island	20°38.29'S, 116°38.39'E to 20°38.32'S, 116°38.53'E	Fine mesh in scoop box dredge	12.0–13.0	Shelly mud; mainly molluscs.	27.07.99

Table 3 (cont.)

	Location	Lat. and Long.	Method	Depth (m)	Habitat	Date
DA2/99/94	0.6 n. mls SE of King Point, East Lewis Island	20°38.37'S, 116°38.41'E to 20°38.39'S, 116°38.52'E	Fine mesh scoop box	14.5–16.0	Dredge; shelly mud and rocks; gorgonians, soft corals.	27.07.99
DA2/99/95	~ 1.1 n. mls W of Bluff Point, Enderby Island	20°37.37'S, 116°31.69'E to 20°37.45'S, 116°31.58'E	Fine mesh in scoop box dredge	5.0–7.0	Rock, corals; sponges, gorgonians, soft corals, attached tunicates.	27.07.99
DA2/99/96	1.3 n. mls W of Bluff Point, Enderby Island	20°37.50'S, 116°31.56'E to 20°37.57'S, 116°31.61'E	Fine mesh in scoop box dredge	9.0	Muddy coarse sand; little *Halophila* and *Caulerpa*, echinoderms and tunicates.	27.07.99
DA2/99/97	~ 0.9 n. mls WSW of Bluff Point, Enderby Island	20°37.65'S, 116°31.94'E	Grab samples (10)	9.5	Start 0721 hrs; water 20.4°C.	28.07.99
DA2/99/98	~ 2.55 n. mls SSW of Bluff Point, Enderby Island	20°39.81'S, 116°31.92'E to 20°39.34'S, 116°32.12'E	Rake box dredge	10.5–11.0	Sponges.	28.07.99
DA2/99/99	~ 1.05 n. mls WSW of Rocky Head, Enderby Island	20°37.36'S, 116°26.85'E to 20°37.02'S, 116°26.44'E	Rake box dredge	17.0–19.0	Rocks; many sponges, hard corals, gorgonians, hydroids.	28.07.99
DA2/99/100	~ 1.5 n. mls W of Rocky Head, Enderby Island	20°36.98'S, 116°26.25'E to 20°36.99'S, 116°26.36'E	Scoop box dredge fitted with fine mesh	18.0–19.0	Sand; no specimens.	28.07.99