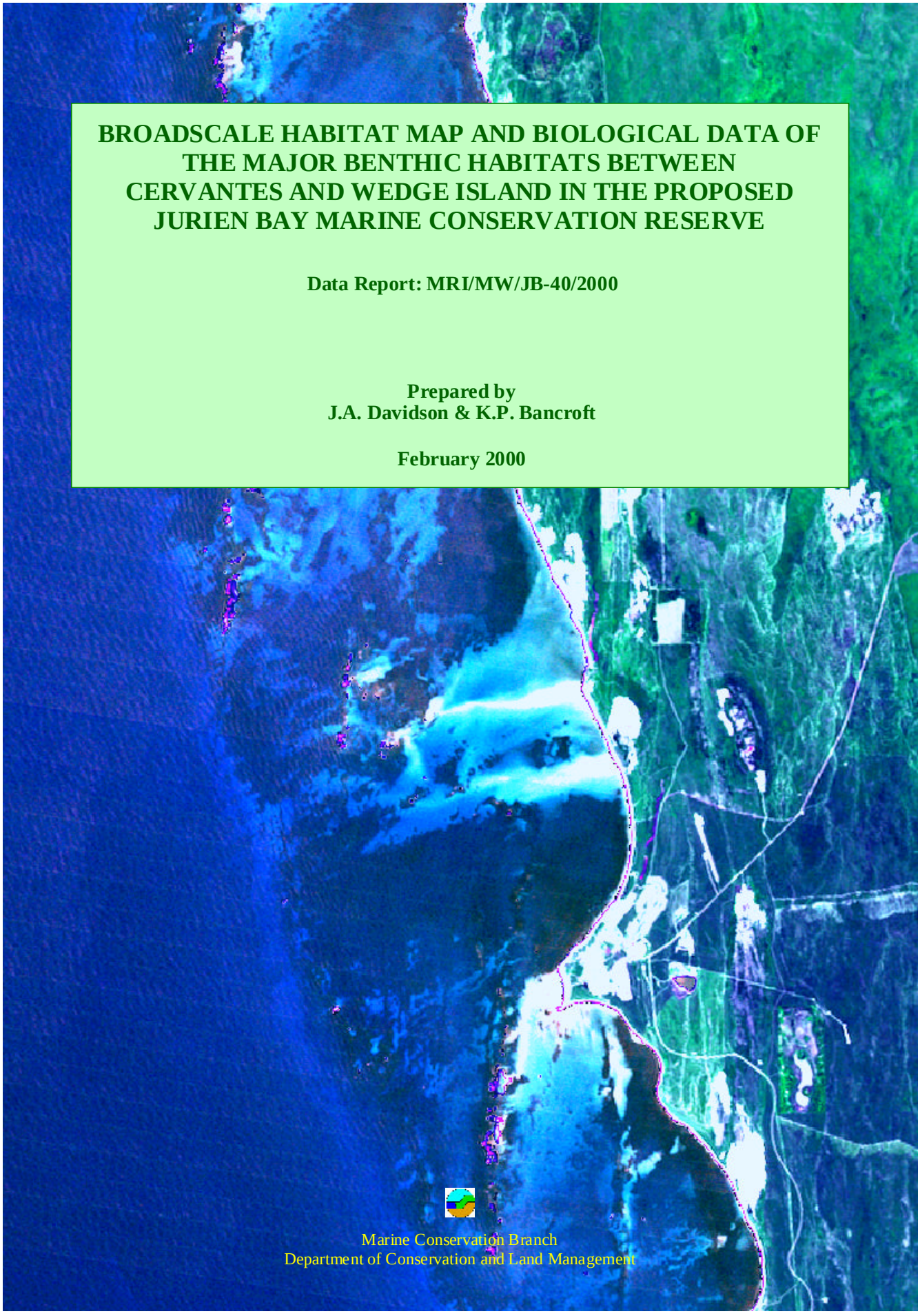

BROADSCALE HABITAT MAP AND BIOLOGICAL DATA OF THE MAJOR BENTHIC HABITATS BETWEEN CERVANTES AND WEDGE ISLAND IN THE PROPOSED JURIEN BAY MARINE CONSERVATION RESERVE

Data Report: MRI/MW/JB-40/2000

Prepared by
J.A. Davidson & K.P. Bancroft

February 2000

Marine Conservation Branch
Department of Conservation and Land Management

MARINE RESERVE IMPLEMENTATION:
MIDWEST

BROADSCALE HABITAT MAP AND BIOLOGICAL DATA OF THE MAJOR BENTHIC HABITATS BETWEEN CERVANTES AND WEDGE ISLAND IN THE PROPOSED JURIEN BAY MARINE CONSERVATION RESERVE

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A collaborative project between
CALM's Marine Conservation Branch and Midwest Regional Office

A project funded by CALM

Prepared by
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February 2000

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Cover. Cervantes (Landsat Thematic Mapper satellite image *courtesy* Department of Land Administration)

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Copies of this report may be obtained from:

Marine Conservation Branch
Department of Conservation and Land Management
47 Henry Street, Fremantle, Western Australia, 6160
Ph: 61-8-9432 5100 Fax: 61-8-9430 5408

SUMMARY

This data report presents the results of the first field survey of the major benthic habitats of the waters south of Jurien Bay, from Cervantes to Wedge Island. This section of coastline is included in the proposed Jurien Bay marine conservation reserve. The survey was conducted during 15th to 19th March 1998 and coordinated by CALM's Marine Conservation Branch in collaboration with CALM's Midwest Regional Office.

The objective of this field survey was to ground-truth the major benthic habitats of the area between Cervantes and Wedge Island and from this data produce a broadscale habitat map of the area south of the proposed Jurien Bay marine conservation reserve.

The objective was achieved.

The data acquired during this survey and the resulting habitat map have been important in the determination of the relative conservation values of the respective major habitats of the southern section of the proposed Jurien Bay marine conservation reserve. It has also contributed to the information base required for the marine reserve planning process, during which marine reserve boundaries and zones for multiple-use will be considered for the area. This data will also be of use for ongoing management purposes.

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LIST OF TABLES

In view of the WA Government priority for the proposed Jurien Bay marine conservation reserve and the importance of the southern boundary extension highlighted by the Jurien Bay Marine Reserve Advisory Committee, CALM provided the financial and logistical resources required for the project.

The data acquired during this survey (Appendix I) was important in the determination of the relative conservation values of the respective major habitats of the southern section of the proposed Jurien Bay marine conservation reserve. It also contributed to the information base required for the marine reserve planning process, during which marine reserve boundaries and zones for multiple-use were considered for the area. This data will also be of used for ongoing management purposes.

This survey was part of the Biological Inventory portfolio of the Marine Reserve Implementation function of CALM's Marine Conservation Branch (MCB). The survey was coordinated by the MCB and conducted in collaboration with CALM's Midwest Regional Office.

The information gathered during this survey has complemented that from other recent studies which have been performed in the Jurien Bay area (Burt, 1996; Burt, 1997; Burt & Anderson, 1997; Burt, *et al*., 1997; D' Adamo, 1997a, 1997b, 1997c; D'Adamo & Monty, 1997; Hunt & D' Adamo, 1998).

1.2. OBJECTIVE

The objective of this field survey was to ground-truth the major benthic habitats of the study area and from this data produce a broadscale habitat map of the nearshore waters from Cervantes to Wedge Island in the proposed Jurien Bay marine conservation reserve.

2. METHODS

2.1. SURVEY AREA

The area for this survey was from Cervantes (30º S) to Wedge Island (30º S), and extends seaward to the Limit of State Territorial Waters, described as 3 nm from the Territorial Sea Baseline (Figure 1).

2.2. SITE SELECTION

The 125 sites were preselected using Landsat Thermatic Mapper satellite imagery and aerial photography, so that a representative of the major benthic habitats of the study area was covered. The latitudes and longitudes for the sites sampled can be found in Appendix I.

2.3. FIELD METHODS

Video footage of the major benthic community types (e.g. seagrass meadow, limestone platform etc.) were filmed using a manually deployed, underwater digital drop-down video camera system.

The video camera was lowered over the side of the field survey vessel and 2-5 minutes of video footage of the seabed was recorded at each of the study sites. Sites number, date, time, water depth, and GPS coordinates were recorded for each section of video footage (Appendix I).

The dominant flora and fauna as well as substrate type and habitat classification were recorded from the video footage once on land (Appendix II). This provided broadscale representation of the visually dominant flora and fauna, substrate type and depth, hence habitat classification of the southern section of the proposed Jurien Bay marine conservation reserve.

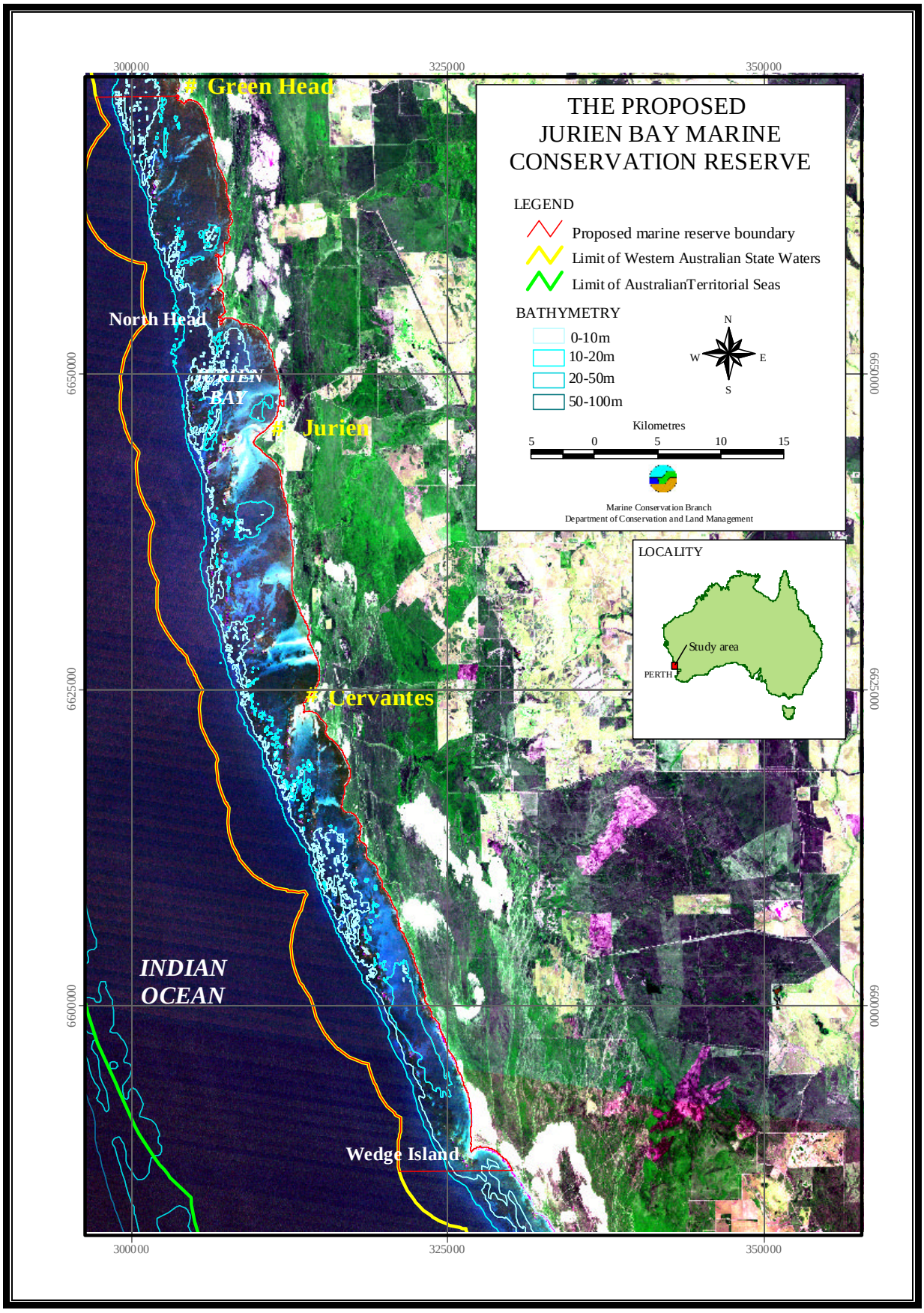

Figure 1. The proposed Jurien Bay marine conservation reserve

2.4. HABITAT CLASSIFICATION

Habitats were classified as per the draft classification scheme presented in Table 1. However the habitat classification "Seagrass meadows", was split into 2 sub categories:

1. ***Dense seagrass***, is typically continuous seagrass coverage (>1 ha) with greater than 30% cover. Usually on sand or subtidal reef platform.

2. ***Sparse seagrass***, is typically continuous seagrass coverage (>1 ha) with 10-30% cover. Usually on sand or subtidal reef platform.

3. RESULTS

3.1. SITE AND HABITAT DATA

A total of 125 sites were ground-truthed in the field (Figures 2). Site information, location, habitat classification and biological assemblage data was collected (Appendix II). This data was used in conjunction with Landsat Thematic Mapper satellite imagery and aerial photographs to produce a revised broad-scale map of the major marine habitat types for the study area (Figure 2).

There were six habitat classifications used:

1. Dense seagrass;
2. Sparse seagrass;
3. Macroalgal meadow;
4. Macroalgae dominated limestone reef;
5. Reef platform, and;
6. Sand.

These categories are defined in Table 1 and Section 2.4.

Table 1. Draft habitat classification scheme

HABITAT CLASSIFICATION	TIDAL RANGE	SUBSTRATE TYPE	TROPICAL	TEMPERATE	RELIEF	MACROBIOLOGY	COMMENTS
1. Rocky shore	Intertidal	igneous metamorphic sedimentary	✓	✓	high & low	bare	• continuous rocky shore • cliff, boulders, pavement • around HWM
2. Beach	Intertidal	sand	✓	✓	low	bare	• continuous intertidal sand
3. Shoreline reef platform	Intertidal	igneous metamorphic sedimentary	✓	✓	low	bare algal turf	• continuous reef platform along the shoreline
4. Intertidal reef	Intertidal	igneous metamorphic sedimentary	✓	✓	low	coralline algae, macroalgae	• offshore
5. Mangal	Intertidal	N/A	✓	✓	N/A	mangroves	• continuous mangrove cover (<1 ha)
6. Mudflat	Intertidal	mud silts	✓	✓	N/A	bare algal mats	• continuous intertidal mudflat • includes flats behind mangals
7. Salt marsh	Intertidal	mud silt	✓	✓	N/A	samphire	• continuous salt marsh cover (>1 ha) • on protected or low energy coastline
8. Coral reef	Intertidal & Subtidal	N/A	✓		high & low	hard & soft corals	• typical coral reef community • seaward reef slope, reef crest, back reef, reef flat and individual bommies
9. Rubble	Subtidal	dead coral	✓		low	sparse live coral sparse vegetation	• lagoonal areas • mainly unconsolidated coral rubble

HABITAT CLASSIFICATION	TIDAL RANGE	SUBSTRATE TYPE	TROPICAL	TEMPERATE	RELIEF	MACROBIOLOGY	COMMENTS
10. Reef platform	Subtidal	igneous metamorphic sedimentary	✓	✓	low	diverse algae sessile invertebrates (including sponges, sea-whips, sea-pens)	• includes limestone pavement or low relief reef
11. Macroalgae dominated limestone reef	Subtidal	sedimentary		✓	high & low	macroalgae	• typically covered in macroalgae (>10%) with diverse invertebrate life in overhangs & caves
12. Macroalgae dominated granite reef	Subtidal	igneous metamorphic	✓	✓	high & low	macroalgae	• typically covered in macroalgae (>10%) with diverse invertebrate life in overhangs & caves
13. Macroalgal beds	Subtidal	sand pavement	✓	✓	low	macroalgae	• continuous macroalgal cover (>1 ha) • seasonal macroalgae % coverage allowance (min 10%)
14. Seagrass meadows	Subtidal	sand pavement	✓	✓	low	seagrasses	• continuous (>10%) seagrass coverage (>1 ha) • perennials/ephemerals
15. Sand	Subtidal	Sand (generally white)	✓	✓	low	bare	• little or no vegetation
16. Silt	Subtidal	muds silts	✓	✓	low	bare	• marine and/or terrigenous muds & silts • little or no vegetation

4. DATA MANAGEMENT

4.1. DATA REPORT

Hard copies of the Data Report will be held at three locations:

1. Marine Conservation Branch, Department of Conservation and Land Management, 47 Henry St., Fremantle Western Australia, 6160. Ph. (08) 9432 5100 Fax. (08) 9430 5408.

2. Woodvale Library, Science and Information Division, Ocean Reef Rd., Woodvale, Western Australia, 6026. Ph. (08) 9405 5100 Fax. (08) 9306 1641.

3. Archives, Woodvale Library, Science and Information Division, Ocean Reef Rd., Woodvale, Western Australia, 6026. Ph. (08) 9405 5100 Fax. (08) 9306 1641.

The Marine Conservation Branch will hold digital copies of the Data Report at three locations:

1. The Marine Conservation Branch Server:
mcb on StreetTalk\User Data@CALM.FREM@CALM [T:/Reports/MRI/MRI_4000]

2. MCB Server full backup DAT tape [T:/Reports/MRI/MRI_4000]

3. CD-ROM [MRI_4000]

4.2. GIS DATA

Data presented in the form of GIS layers will be stored digitally at three locations:

1. The Marine Conservation Branch Server:
GIS Data@FREM.SHARED@CALM on StreetTalk [L:/GIS/MCB/MW/JB/]

2. MCB Server full backup DAT tape [L:/GIS/MCB/MW/JB/]

3. On GIS Information Coordinator's Computer. [H:/MCB/MW/JB/]

4.3. VIDEO RECORDS

One VHS digital tape was used to record habitat data. Tape number was:

MRI/MW/JB/DD#1-03/1998

Video footage will be held at two locations:

1. Digital masters to be archived at the CALM's Information Management Branch, Como.

2. VHS copies to be stored at CALM's Marine Conservation Branch, Fremantle.

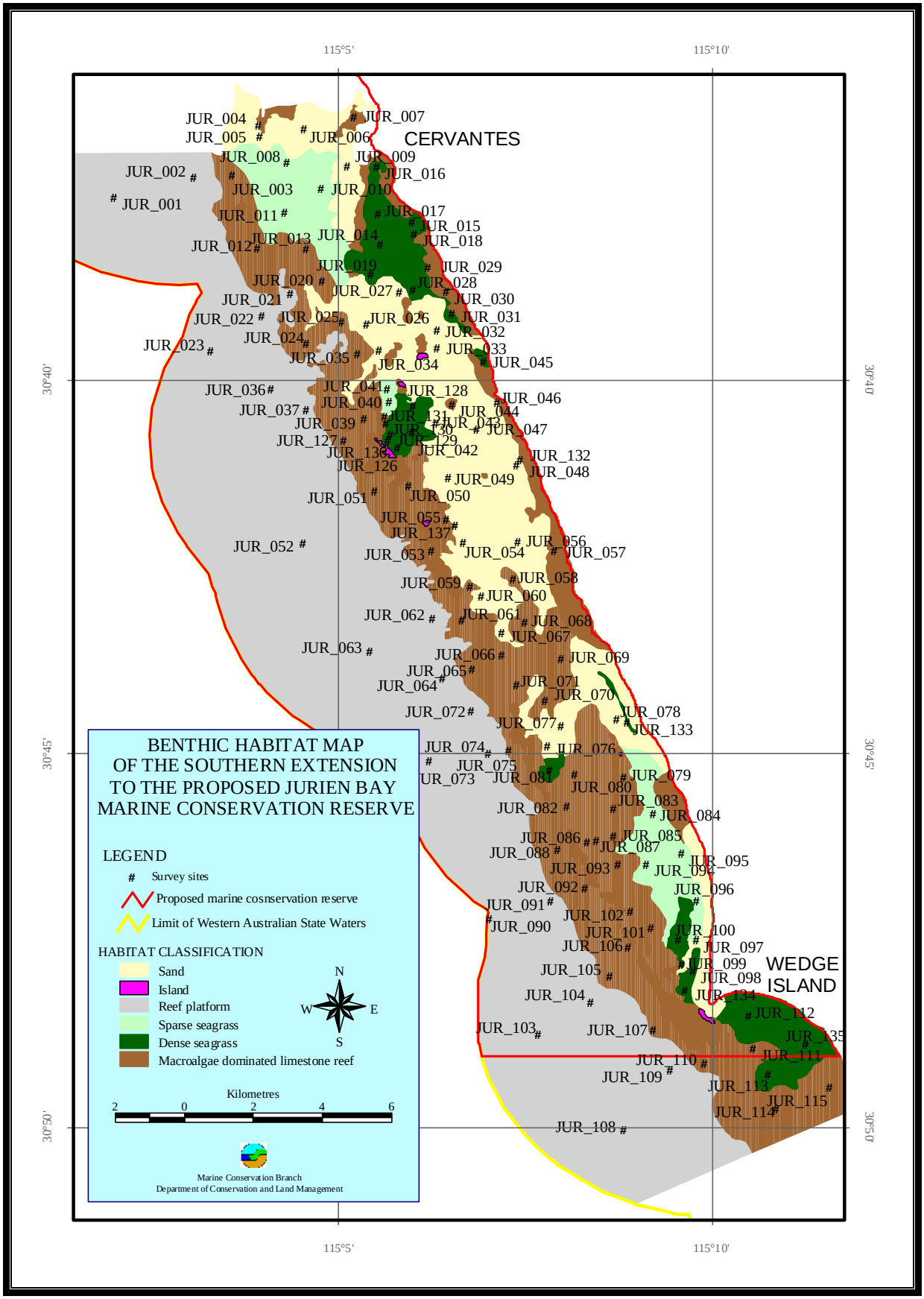

Figure 2. Habitat map of the southern extension (Cervantes to Wedge Island) of the proposed Jurien Bay marine conservation reserve

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6. APPENDICES

APPENDIX I. LATITUDE AND LONGITUDES OF SITES SAMPLED IN THE SOUTHERN EXTENSION OF THE PROPOSED JURIEN BAY MARINE CONSERVATION RESERVE

Site No	Location	Latitude	Longitude	Time	Date	GPS type	Datum
JUR_001	Cervantes Islands	-30.61668	115.03338	1604	19/03/98	DGPS	AGD66
JUR_002	Cervantes Islands	-30.61132	115.05405	1619	19/03/98	DGPS	AGD66
JUR_003	Cervantes Islands	-30.61091	115.06425	1622	19/03/98	DGPS	AGD66
JUR_004	Cervantes Islands	-30.59788	115.07103	1225	19/03/98	DGPS	AGD66
JUR_005	Cervantes Islands	-30.6009	115.0712	1236	19/03/98	DGPS	AGD66
JUR_006	Cervantes	-30.59882	115.08278	1249	17/03/98	DGPS	AGD66
JUR_007	Cervantes	-30.59563	115.09603	1300	17/03/98	DGPS	AGD66
JUR_008	Cervantes Islands	-30.60753	115.07828	1322	15/03/98	DGPS	AGD66
JUR_009	Cervantes	-30.60855	115.09422	0706	18/03/98	DGPS	AGD66
JUR_010	Cervantes	-30.61436	115.08742	1326	17/03/98	DGPS	AGD66
JUR_011	Cervantes Islands	-30.6207	115.07782	1339	17/03/98	DGPS	AGD66
JUR_012	Cervantes Islands	-30.62977	115.07068	1348	15/03/98	DGPS	AGD66
JUR_013	Cervantes Islands	-30.63005	115.08355	1355	17/03/98	DGPS	AGD66
JUR_014	Kangaroo Point	-30.62882	115.10267	0733	18/03/98	DGPS	AGD66
JUR_015	Cervantes	-30.6209	115.10211	0726	18/03/98	DGPS	AGD66
JUR_016	Cervantes	-30.6088	115.10185	0720	18/03/98	DGPS	AGD66
JUR_017	Cervantes	-30.62305	115.11092	0740	18/03/98	DGPS	AGD66
JUR_018	Kangaroo Point	-30.62623	115.11158	0742	18/03/98	DGPS	AGD66
JUR_019	Kangaroo Point	-30.6367	115.10037	0802	18/03/98	DGPS	AGD66
JUR_020	Cervantes Islands	-30.63848	115.08772	0800	17/03/98	DGPS	AGD66
JUR_021	Cervantes Islands	-30.64177	115.07922	0740	19/03/98	DGPS	AGD66
JUR_022	Cervantes Islands	-30.6477	115.07182	0744	19/03/98	DGPS	AGD66
JUR_023	Cervantes Islands	-30.65665	115.05857	1550	19/03/98	DGPS	AGD66
JUR_024	Boomers	-30.65463	115.08333	0750	19/03/98	DGPS	AGD66
JUR_025	Kangaroo Point	-30.64917	115.0926	1109	19/03/98	DGPS	AGD66
JUR_026	Kangaroo Point	-30.64962	115.0991	1415	19/03/98	DGPS	AGD66
JUR_027	Kangaroo Point	-30.64135	115.10767	0757	19/03/98	DGPS	AGD66
JUR_028	Kangaroo Point	-30.64072	115.11127	0755	19/03/98	DGPS	AGD66
JUR_029	Kangaroo Point	-30.63478	115.11523	0750	19/03/98	DGPS	AGD66
JUR_030	Kangaroo Point	-30.64115	115.11988		19/03/98	DGPS	AGD66
JUR_031	Kangaroo Point	-30.64692	115.12147	0824	19/03/98	DGPS	AGD66
JUR_032	Kangaroo Point	-30.65098	115.11753	0834	19/03/98	DGPS	AGD66
JUR_033	Kangaroo Point	-30.6559	115.11743	0838	19/03/98	DGPS	AGD66
JUR_034	Kangaroo Point	-30.6564	115.10235	1421	17/03/98	DGPS	AGD66
JUR_035	Kangaroo Point	-30.65745	115.09683	0755	19/03/98	DGPS	AGD66
JUR_036	Boomers	-30.66653	115.0742	0802	19/03/98	DGPS	AGD66
JUR_037	Boomers	-30.67173	115.08345	0807	19/03/98	DGPS	AGD66
JUR_039	Boomers	-30.67432	115.09843	0813	19/03/98	DGPS	AGD66
JUR_040	Kangaroo Point	-30.66985	115.10493	1433	19/03/98	DGPS	AGD66
JUR_041	Kangaroo Point	-30.66648	115.10457	1430	19/03/98	DGPS	AGD66
JUR_042	Boomers	-30.6778	115.11088	0828	19/03/98	DGPS	AGD66
JUR_043	Francis Reef	-30.67533	115.11717	0911	19/03/98	DGPS	AGD66
JUR_044	Kangaroo Point	-30.67062	115.12123	0906	19/03/98	DGPS	AGD66
JUR_045	Kangaroo Point	-30.6595	115.12963	0858	19/03/98	DGPS	AGD66
JUR_046	Francis Reef	-30.6702	115.13308	0850	19/03/98	DGPS	AGD66
JUR_047	Francis Reef	-30.67682	115.12798	0915	19/03/98	DGPS	AGD66
JUR_048	Francis Reef	-30.68647	115.13827	0932	19/03/98	DGPS	AGD66
JUR_049	Francis Reef	-30.6895	115.12058	0925	19/03/98	DGPS	AGD66
JUR_050	Boomers	-30.69177	115.11003	0853	19/03/98	DGPS	AGD66
JUR_051	Boomers	-30.69317	115.10115	0859	19/03/98	DGPS	AGD66
JUR_052	Boomers	-30.7069	115.08245	1055	19/03/98	DGPS	AGD66
JUR_053	Boomers	-30.70843	115.11615	0909	19/03/98	DGPS	AGD66
JUR_054	Francis Reef	-30.7066	115.12432	0920	19/03/98	DGPS	AGD66

Site No	Location	Latitude	Longitude	Time	Date	GPS type	Datum
JUR_055	Francis Reef	-30.70057	115.1198	0914	19/03/98	DGPS	AGD66
JUR_056	Grey	-30.70617	115.1385	0945	19/03/98	DGPS	AGD66
JUR_057	Grey	-30.70847	115.14815	0949	19/03/98	DGPS	AGD66
JUR_058	Grey	-30.71605	115.13732	0955	19/03/98	DGPS	AGD66
JUR_059	Green Island	-30.71802	115.12608	0926	19/03/98	DGPS	AGD66
JUR_060	Green Island	-30.72048	115.12892	0930	19/03/98	DGPS	AGD66
JUR_061	Green Island	-30.72675	115.12397	0935	19/03/98	DGPS	AGD66
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JUR_068	Grey	-30.72732	115.14037	1018	19/03/98	DGPS	AGD66
JUR_069	Grey	-30.73667	115.14993	1030	19/03/98	DGPS	AGD66
JUR_070	Green Island	-30.74776	115.14572	1043	19/03/98	DGPS	AGD66
JUR_071	Green Island	-30.74347	115.13817	1037	19/03/98	DGPS	AGD66
JUR_072	Green Island	-30.7502	115.12647	1015	19/03/98	DGPS	AGD66
JUR_073	Green Island	-30.76335	115.11545	1031	19/03/98	DGPS	AGD66
JUR_074	Green Island	-30.76137	115.13073	1025	19/03/98	DGPS	AGD66
JUR_075	Green Island	-30.76078	115.13627	1022	19/03/98	DGPS	AGD66
JUR_076	Green Island	-30.75963	115.14633	1509	19/03/98	DGPS	AGD66
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JUR_078	Flat Rock	-30.75245	115.16442	1052	19/03/98	DGPS	AGD66
JUR_079	Flat Rock	-30.76743	115.16602	1103	19/03/98	DGPS	AGD66
JUR_080	Flat Rock	-30.76695	115.15337	1503	19/03/98	DGPS	AGD66
JUR_081	Green Island	-30.76578	115.14692	1506	19/03/98	DGPS	AGD66
JUR_082	Flat Rock	-30.77512	115.15138	1459	19/03/98	DGPS	AGD66
JUR_083	Flat Rock	-30.77565	115.16338	1106	19/03/98	DGPS	AGD66
JUR_084	Flat Rock	-30.77702	115.1739	1112	19/03/98	DGPS	AGD66
JUR_085	Flat Rock	-30.78295	115.16355	1453	19/03/98	DGPS	AGD66
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JUR_097	Wedge Island	-30.80982	115.18513	1139	19/03/98	DGPS	AGD66
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JUR_099	Wedge Island	-30.81635	115.18123	1152	19/03/98	DGPS	AGD66
JUR_100	Wedge Island	-30.80998	115.18025	1142	19/03/98	DGPS	AGD66
JUR_101	Wedge Island	-30.80698	115.17308	1403	19/03/98	DGPS	AGD66
JUR_102	Wedge Island	-30.80235	115.16772	1400	19/03/98	DGPS	AGD66
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JUR_104	Wedge Island	-30.82628	115.15753	1348	19/03/98	DGPS	AGD66
JUR_105	Wedge Island	-30.81927	115.16255	1352	19/03/98	DGPS	AGD66
JUR_106	Wedge Island	-30.81182	115.16713	1359	19/03/98	DGPS	AGD66
JUR_107	Wedge Island	-30.83318	115.17378	1227	19/03/98	DGPS	AGD66
JUR_108	Wedge Island	-30.85942	115.16593	1330	19/03/98	DGPS	AGD66
JUR_109	Wedge Island	-30.8439	115.1782	1232	19/03/98	DGPS	AGD66
JUR_110	Wedge Island	-30.8421	115.18703	1237	19/03/98	DGPS	AGD66
JUR_111	Wedge Island	-30.83833	115.19992	1252	19/03/98	DGPS	AGD66
JUR_112	Wedge Island	-30.82982	115.19875	1247	19/03/98	DGPS	AGD66
JUR_113	Wedge Island	-30.84515	115.2038	1305	19/03/98	DGPS	AGD66
JUR_114	Wedge Island	-30.8541	115.20565	1317	19/03/98	DGPS	AGD66
JUR_115	Wedge Island	-30.84843	115.21972	1310	19/03/98	DGPS	AGD66
JUR_126	Boomers	-30.68198	115.10725	1442	19/03/98	DGPS	AGD66
JUR_127	Boomers	-30.67993	115.09323	1447	19/03/98	DGPS	AGD66
JUR_128	Kangaroo Point	-30.67108	115.1112	0820	19/03/98	DGPS	AGD66

Site No	Location	Latitude	Longitude	Time	Date	GPS type	Datum
JUR_129	Boomers	-30.67828	115.10532	1456	19/03/98	DGPS	AGD66
JUR_130	Boomers	-30.67533	115.10412	1456	19/03/98	DGPS	AGD66
JUR_131	Boomers	-30.67367	115.10397	0926	19/03/98	DGPS	AGD66
JUR_132	Francis Reef	-30.68473	115.13922	0926	19/03/98	DGPS	AGD66
JUR_133	Flat Rock	-30.75322	115.1669		19/03/98	DGPS	AGD66
JUR_134	Wedge Island	-30.8232	115.1821	1157	19/03/98	DGPS	AGD66
JUR_135	Wedge Island	-30.83718	115.2136	1259	19/03/98	DGPS	AGD66
JUR_136	Boomers	-30.67982	115.10473	0834	19/03/98	DGPS	AGD66
JUR_137	Francis Reef	-30.70217	115.12212		19/03/98	DGPS	AGD66

APPENDIX II. HABITAT DATA FOR THE SOUTHERN EXTENSION TO PROPOSED JURIEN BAY MARINE CONSERVATION RESERVE

Site No	Location	Habitat type	Substrate	Latitude	Longitude	Depth	Time	Biological assemblage	Recorder	Observation	Video tape No	Date	GPS type	Datum
JUR_001	Cervantes Islands	Sand	Sand	-30.61668	115.03338	-30	1604	Offshore limestone pavement interspersed with sand. Very sparse macroalgae.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_002	Cervantes Islands	Sparse seagrass	Sand/ Limestone	-30.61132	115.05405	-23.5	1619	Offshore limestone pavement covered with sand, interspersed with sparse seagrass and some macroalgae.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_003	Cervantes Islands	Macroalgae dominated limestone reef	Limestone	-30.61091	115.06425	-10.5	1622	Macroalgal dominated patchy reef, some Ecklonia radiata.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_004	Cervantes Islands	Macroalgal beds	Sand	-30.59788	115.07103	-9.1	1225	Predominately sandy bottom with rock outcrops. Macroalgae, some Ecklonia sp. and banded sweep (school).	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_005	Cervantes Islands	Macroalgal beds	Sand	-30.6009	115.0712	-10.9	1236	Initially sandy bottom, then macroalgae meadow (patchy).	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_006	Cervantes	Sand	Sand	-30.59882	115.08278	-10	1249	Sandy bottom with wrack. (video unclear or not recorded)	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	17/03/98	DGPS	AGD66
JUR_007	Cervantes	Macroalgae dominated limestone reef	Limestone	-30.59563	115.09603	-4.2	1300	Macroalgal dominated subtidal reef. (video unclear)	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	17/03/98	DGPS	AGD66
JUR_008	Cervantes Islands	Sparse seagrass	Limestone	-30.60753	115.07828	-13	1322	Sparse seagrass, predominately Amphibolis antarctica, some patchy macroalgae (brown)	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	15/03/98	DGPS	AGD66
JUR_009	Cervantes	Macroalgal beds	Limestone	-30.60855	115.09422	-4.5	0706	Sparse macroalgae on subtidal reef	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	18/03/98	DGPS	AGD66
JUR_010	Cervantes	Sand	Sand	-30.61436	115.08742	-4.5	1326	Predominately sand; then sparse seagrass of Amphibolis antarctica and some macroalgae.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	17/03/98	DGPS	AGD66

Site No	Location	Habitat type	Substrate	Latitude	Longitude	Depth	Time	Biological assemblage	Recorder	Observation	Video tape No	Date	GPS type	Datum
JUR_011	Cervantes Islands	Sparse seagrass	Sand	-30.6207	115.07782	-13.5	1339	Sparse seagrass (Amphibolis antarctica) and some patchy macroalgae	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	17/03/98	DGPS	AGD66
JUR_012	Cervantes Islands	Macroalgae dominated limestone reef	Limestone	-30.62977	115.07068	-11.6	1348	Macroalgal dominated limestone reef (cliffs and drop-offs) some species include, Ecklonia and Sargassum.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	15/03/98	DGPS	AGD66
JUR_013	Cervantes Islands	Reef platform	Limestone	-30.63005	115.08355	-12.2	1355	Subtidal reef. No video footage	MLA			17/03/98	DGPS	AGD66
JUR_014	Kangaroo Point	Dense seagrass	Sand	-30.62882	115.10267	-9.5	0733	Seagrass meadow, of predominately Amphibolis griffithii and some epiphytic algae. Some sandy patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	18/03/98	DGPS	AGD66
JUR_015	Cervantes	Dense seagrass	Sand	-30.6209	115.10211	-6.5	0726	Seagrass medow of predominately Amphibolis griffithii (dense).	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	18/03/98	DGPS	AGD66
JUR_016	Cervantes	Sand	Sand	-30.6088	115.10185	-8	0720	Sand with either macroalgae (Ecklonia radiata) or seagrass. Very poor visibility.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	18/03/98	DGPS	AGD66
JUR_017	Cervantes	Dense seagrass	Sand	-30.62305	115.110917	-4.8	0740	Seagrass meadow (dense) with predominatley Amphibolis antarctica and A. griffithii, some epiphytic algae as well.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	18/03/98	DGPS	AGD66
JUR_018	Kangaroo Point	Dense seagrass	Sand	-30.62623	115.11158	-3.8	0742	Seagrass meadow (dense) with predominately Amphibolis antarctica and some A. griffithii.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	18/03/98	DGPS	AGD66
JUR_019	Kangaroo Point	Macroalgae dominated limestone reef	Limestone	-30.6367	115.10037	-9	0802	Macroalgal dominated limestone (subtidal reef), some sand patches.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	18/03/98	DGPS	AGD66
JUR_020	Cervantes Islands	Macroalgae dominated limestone reef	Limestone	-30.63848	115.08772	-12.6	0800	Macroalgaal dominated limestone reef, many browns eg. Sargassum.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	17/03/98	DGPS	AGD66
JUR_021	Cervantes Islands	Sand	Sand	-30.64177	115.07922	-10.2	0740	Sand only.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_022	Cervantes Islands	Sand	Sand	-30.6477	115.07182	-16	0744	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66

Site No	Location	Habitat type	Substrate	Latitude	Longitude	Depth	Time	Biological assemblage	Recorder	Observation	Video tape No	Date	GPS type	Datum
JUR_023	Cervantes Islands	Sparse seagrass	Limestone	-30.65665	115.05857	-30	1550	Sparse seagrass of predominately Posidonia Australis, some patchy macroalgae. Offshore limestone platform covered in sand.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_024	Boomers	Macroalgae dominated limestone reef	Limestone	-30.65463	115.08333	-7.5	0750	Macroalgae dominated limestone reef, cliffs and hangovers, some Ecklonia radiata.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_025	Kangaroo Point	Sparse seagrass	Limestone	-30.64917	115.0926	-13.5	1109	Sparse seagrass, Amphibolis antarctica, some macroalgae and sandy patches and rubble	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_026	Kangaroo Point	Sand	Sand	-30.64962	115.0991		1415	Sandy bottom and some drift macroalgae.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_027	Kangaroo Point	Sand	Sand	-30.64135	115.10767	-8.4	0757	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_028	Kangaroo Point	Dense seagrass	Sand	-30.64072	115.11127	-8.8	0755	Sandy bottom with patches of seagrass, Amphibolis griffithii and A. antarctica patches surrounded by sand.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_029	Kangaroo Point	Macroalgae dominated limestone reef	Limestone	-30.63478	115.11523	-2	0750	Macroalgal dominated limestone reef, lots of rocky outcrops.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_030	Kangaroo Point	Dense seagrass	Sand	-30.64115	115.11988	-3.6		Dense seagrass meadow with predominately Amphibolis griffithii and some A. antarctica	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_031	Kangaroo Point	Dense seagrass	Sand	-30.64692	115.12147	-4.5	0824	Seagrass meadow with predominately Amphibolis antarctica and some macroalgae, Ecklonia.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_032	Kangaroo Point	Sand	Sand	-30.65098	115.11753	-9.4	0834	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_033	Kangaroo Point	Sand	Sand	-30.6559	115.11743	-6.4	0838	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_034	Kangaroo Point	Sand	Sand	-30.6564	115.10235	-10	1421	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	17/03/98	DGPS	AGD66
JUR_035	Kangaroo Point	Macroalgal beds	Limestone	-30.65745	115.09683	-10.8	0755	Macroalgal meadow on limestone pavement	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66

Site No	Location	Habitat type	Substrate	Latitude	Longitude	Depth	Time	Biological assemblage	Recorder	Observation	Video tape No	Date	GPS type	Datum
JUR_036	Boomers	Macroalgal beds	Limestone	-30.6665333	115.0742	-11.6	0802	Offshore limestone platform with macroalgal cover and sandy patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_037	Boomers	Sand	Sand	-30.67173	115.08345	-19	0807	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_039	Boomers	Macroalgae dominated limestone reef	Limestone	-30.67432	115.09843	-12.2	0813	Macroalgae dominated limestone reef, dense cover, some Ecklonia radiata.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_040	Kangaroo Point	Sparse seagrass	Sand	-30.66985	115.10493	-10.5	1433	Sandy bottom, and V. sparse Halophila.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_041	Kangaroo Point	Sparse seagrass	Sand	-30.66648	115.10457	-11.3	1430	Sparse seagrass predominately Amphibolis antarctica and some macroalgae. Sandy substrate and some brocken limestone	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_042	Boomers	Dense seagrass	Sand	-30.6778	115.11088	-6.2	0828	Very dense seagrass meadow of predominately Posidonia sinuosa.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_043	Francis Reef	Sand	Sand	-30.67533	115.11717	-6.9	0911	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_044	Kangaroo Point	Macroalgae dominated limestone reef	Limestone	-30.67062	115.12123	-3	0906	Macroalgal dominated limestone reef, many caves and drop offs. No large macroalgae, mostly short browns, coralline and turf algae. Some sponges and ascidians. Footage up to intertidal reef.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_045	Kangaroo Point	Dense seagrass	Sand	-30.6595	115.12963	-2.6	0858	Seagrass meadow (dense) with predominately Amphibolis griffithii and some A. antarctica.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_046	Francis Reef	Sand	Sand	-30.6702	115.13308	-5	0850	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_047	Francis Reef	Sand	Sand	-30.67682	115.12798	-8.6	0915	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_048	Francis Reef	Sand	Sand	-30.68647	115.13827	-7.8	0932	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_049	Francis Reef	Sand	Sand	-30.6895	115.12058	-9.8	0925	Sand and some Halophila	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_050	Boomers	Macroalgae dominated limestone reef	Limestone	-30.69177	115.11003		0853	Macroalgae dominated limestone platform, some ecklonia	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66

Site No	Location	Habitat type	Substrate	Latitude	Longitude	Depth	Time	Biological assemblage	Recorder	Observation	Video tape No	Date	GPS type	Datum
JUR_051	Boomers	Macroalgae dominated limestone reef	Limestone	-30.69317	115.10115	-17	0859	Macroalgae dominated limestone reef, cliffs and drop-offs, some Ecklonia radiata and Sargassum and some reef fish (wrasse?)	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_052	Boomers	Macroalgal beds	Limestone	-30.7069	115.08245	-28.8	1055	Macroalgal meadow on offshore limestone platform and some seagrass.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_053	Boomers	Macroalgae dominated limestone reef	Limestone	-30.70843	115.11615	-5.5	0909	Macroalgal dominated limestone reef, some Ecklonis radiata	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_054	Francis Reef	Sand	Sand	-30.7066	115.12432	-11	0920	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_055	Francis Reef	Macroalgal beds	Limestone	-30.70057	115.1198	-11	0914	Macroalgal meadow (dense) on limestone pavement, lots of Ecklonis radiata	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_056	Grey	Sand	Sand	-30.70617	115.1385	-14.9	0945	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_057	Grey	Macroalgal dominated limestone reef	Limestone	-30.70847	115.14815	-3.6	0949	Macroalgal dominated reef of many short species of macroalgae, coralline algae and sponges. Some sand patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_058	Grey	Macroalgal beds	Sand	-30.71605	115.13732	-15.5	0955	Macroalgal meadow over sandy bottom, many sandy patches I.e. medium density	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_059	Green Island	Macroalgal beds	Limestone	-30.71802	115.12608	-14	0926	Macroalgal meadow and some sandy patches, some Platythalia.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_060	Green Island	Sand	Sand	-30.72048	115.12892	-12.5	0930	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_061	Green Island	Macroalgal beds	Limestone	-30.72675	115.12397	-10	0935	Macroalgal meadow with some sandy patches, on limestone platform	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_062	Green Island	Sand	Sand	-30.72633	115.11622	-17.5	0935	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_063	Green Island	Macroalgal beds	Limestone/ sand	-30.73484	115.1	-17.5	1043	Offshore limestone pavement with macroalgae and some seagrass, lots of sandy areas	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66

Site No	Location	Habitat type	Substrate	Latitude	Longitude	Depth	Time	Biological assemblage	Recorder	Observation	Video tape No	Date	GPS type	Datum
JUR_064	Green Island	Macroalgal beds	Limestone	-30.74187	115.11913	-22	1949	Offshore limestone pavement with macroalgae, some Platythalia and a school of skippy.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_065	Green Island	Macroalgae dominated limestone reef	Limestone	-30.73947	115.12677	-22	1008	Macroalgae dominated limestone reef, with cliffs, caves and drop-offs. Lots of Ecklonia radiata	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_066	Green Island	Macroalgal beds	Limestone	-30.73578	115.13438	-15	0827	Macroalgal meadow, some sand patches.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_067	Green Island	Sand	Sand	-30.72989	115.1343	-12.6	1021	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_068	Grey	Macroalgal beds	Limestone	-30.72732	115.14037	-19.8	1018	Macroalgal meadow and some sand patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_069	Grey	Macroalgae dominated limestone reef	Limestone	-30.73667	115.14993	-17.5	1030	Macroalgae dominated limestone reef, lots of caves and cliffs, some fish	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_070	Green Island	Macroalgae dominated limestone reef	Limestone	-30.74776	115.14572	-15.4	1043	Macroalgae dominated limestone reef, some Ecklonia radiata	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_071	Green Island	Macroalgal beds	Limestone	-30.74347	115.13817	-16	1037	Macroalgal meadow on limestone platform and patches of sand, some Ecklonia. Also some seagrass (strap)	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_072	Green Island	Sand	Sand	-30.7502	115.12647	-16.5	1015	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_073	Green Island	Macroalgal beds	Limestone	-30.76335	115.11545	-27.5	1031	Macroalgal Meadow (dense) on offshore limestone pavement, some sand patches and some Posidonia australis.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_074	Green Island	Sand	Sand	-30.76137	115.13073	-22	1025	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_075	Green Island	Reef platform	Limestone	-30.76078	115.13627	-17	1022	Reef platform, of limestone pavement and sand, with macroalgae	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_076	Green Island	Sparse seagrass	Sand	-30.75963	115.14633	-13	1509	Sparse seagrass, of predominately Halophila and some Heterozostera, sandy bottom	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_077	Green Island	Sand	Sand	-30.7541	115.1498	-12.6	1047	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66

Site No	Location	Habitat type	Substrate	Latitude	Longitude	Depth	Time	Biological assemblage	Recorder	Observation	Video tape No	Date	GPS type	Datum
JUR_078	Flat Rock	Sand	Sand	-30.75245	115.16442	-10.5	1052	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_079	Flat Rock	Macroalgae dominated limestone reef	Limestone	-30.76743	115.16602	-6	1103	Macroalgae dominated limestone reef (dense), some Ecklonia radiata	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_080	Flat Rock	Sand	Sand	-30.76695	115.15337	-14.5	1503	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_081	Green Island	Sparse seagrass	Sand	-30.76578	115.14692	-13.8	1506	Sparse seagrass of predominately Posidonia, lots of macroalgae and some sand patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_082	Flat Rock	Macroalgal beds	Limestone	-30.77512	115.15138	-11	1459	Macroalgal meadow, limestone pavement	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_083	Flat Rock	Macroalgal beds	Sand	-30.77565	115.16338	-15	1106	Macroalgal meadow with predominately sandy bottom.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_084	Flat Rock	Sand	Sand	-30.77702	115.1739	-14	1112	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_085	Flat Rock	Macroalgal beds	Limestone	-30.78295	115.16355	-13.5	1453	Macroalgal meadow on limestone pavement, some Platythalia, some sand patches.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_086	Flat Rock	Macroalgal beds	Limestone	-30.78433	115.1566	-6	1446	Macroalgal meadow (dense) on limestone pavement	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_087	Flat Rock	Macroalgal beds	Limestone	-30.78413	115.15907	-10.5	1449	Macroalgal meadow (dense) on limestone pavement, V. little sand	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_088	Flat Rock	Macroalgal beds	Limestone	-30.78645	115.14887	-11.2	1441	Macroalgal meadow on limestone pavement, some Ecklonia raditata	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_090	Flat Rock	Macroalgal beds	Limestone	-30.80443	115.13117	-29	1430	Offshore limestone pavement with macroalgal meadow, some sand patches and some Posidonia australis	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_091	Flat Rock	Sand	Sand	-30.79968	115.14718	-18.5	1423	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_092	Flat Rock	Macroalgal beds	Limestone	-30.79657	115.15613	-9.3	1417	Macroalgal meadow on limestone pavement and some broken limestone	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_093	Flat Rock	Macroalgal beds	Limestone	-30.79027	115.16453	-9.6	1411	Macroalgal meadow on limestone pavement, some sand patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_094	Wedge Island	Sparse seagrass	Sand	-30.79027	115.172	-12.2	1129	Sparse seagrass on sand substrate, Heterozostera	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66

Site No	Location	Habitat type	Substrate	Latitude	Longitude	Depth	Time	Biological assemblage	Recorder	Observation	Video tape No	Date	GPS type	Datum
JUR_095	Wedge Island	Sand	Sand	-30.78748	115.18111	-10	1119	Sand and some very sparse Heterozostera. Poor visibility	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_096	Wedge Island	Dense seagrass	Sand	-30.79985	115.18508	-8.3	1123	Seagrass meadow, Amphibolis griffithii, some sand patches, some limestone patch reefs (with macroalgae) in between meadow.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_097	Wedge Island	Sparse seagrass	Sand	-30.80982	115.18513	-6.6	1139	Sparse seagrass of Posidonia australis, some epiphytic macroalgae, and sand	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_098	Wedge Island	Dense seagrass	Sand	-30.8181	115.18427	-6.9	1149	Seagrass meadow of Amphibolis griffithii, some sand patches, lots of macroalgae (drift and epiphytic) in some patches.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_099	Wedge Island	Dense seagrass	Sand	-30.81635	115.18123	-3	1152	Seagrass meadow (dense) of Amphibolis griffithii	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_100	Wedge Island	Dense seagrass	Sand	-30.80998	115.18025	-7.3	1142	Seagrass meadow of predominately Amphibolis antarctica and Posidonia australis, and some A. griffithii, few sand patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_101	Wedge Island	Macroalgae dominated limestone reef	Limestone	-30.80698	115.17308	-6.5	1403	Macroalgae dominated limestone, caves and overhangs.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_102	Wedge Island	Macroalgae dominated granite reef	Limestone	-30.80235	115.16772	-7.2	1400	Macroalgae dominated limestone, lots of overhangs, cliffs and caves. Some poccilopora coral.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_103	Wedge Island	Macroalgal beds	Limestone	-30.83447	115.14387	-29.5	1342	Offshore limestone platforms with macroalgal meadow, some sand patches and some Posidonia australis	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_104	Wedge Island	Sand	Sand	-30.82628	115.15753	-23.5	1348	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_105	Wedge Island	Macroalgae dominated limestone reef	Limestone	-30.81927	115.16255	-8.8	1352	Macroalgae dominated limestone, some Ecklonia radiata and Sargassum.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_106	Wedge Island	Macroalgae dominated limestone reef	Limestone	-30.81182	115.16713	-4.5	1359	Macroalgae dominated limestone reef, some Sargassum and Ecklonia radiata	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66

Site No	Location	Habitat type	Substrate	Latitude	Longitude	Depth	Time	Biological assemblage	Recorder	Observation	Video tape No	Date	GPS type	Datum
JUR_107	Wedge Island	Macroalgal beds	Limestone	-30.83318	115.17378	-10	1227	Macroalgal meadow on limestone pavement, lots of Ecklonia, some sand patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_108	Wedge Island	Macroalgal beds	Limestone	-30.85942	115.16593	-28	1330	Macroalgal meadow on sand covered pavement (offshore limestone pavement), some Posidonia australis.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_109	Wedge Island	Macroalgal beds	Limestone	-30.8439	115.1782	-19.5	1232	Offshore limeatone platform, macroalgal meadow, sand patches, some very sparse Posidonia australis	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_110	Wedge Island	Macroalgae dominated limestone reef	Limestone	-30.8421	115.18703	-9.5	1237	Macroalgae dominated limestone reef, lots of broken limestone and sandy bottom.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_111	Wedge Island	Macroalgae dominated limestone reef	Limestone	-30.83833	115.19992	-13	1252	Macroalgae dominated limestone reef, cliffs and drop-offs, mostly short macroalgae and turf algae, some Ecklonia	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_112	Wedge Island	Sand	Sand	-30.82982	115.19875	-8.1	1247	Sandy bottom, macroalgae (drift) and some seagrass. Poor visibility.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_113	Wedge Island	Sparse seagrass	Sand	-30.84515	115.2038	-14.5	1305	Sparse seagrass predominately Amphibolis antarctica and macroalgae, many sand patches and some Heterozostera.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_114	Wedge Island	Sand	Sand	-30.8541	115.20565	-14.5	1317	Sandy bottom, some macroalgae (mostly short browns)	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_115	Wedge Island	Macroalgal beds	Limestone	-30.84843	115.21972	-10.3	1310	Macroalgal meadow, some posidonia sinuosa and lots of sand	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_126	Boomers	Dense seagrass	Sand	-30.68198	115.10725	-3.5	1442	Seagrass meadow, predominately Posidonia sinuosa, some epiphytic growth of encrusting coralline algae	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_127	Boomers	Sparse seagrass	Sand	-30.67993	115.09323	-8.2	1447	Sparse seagrass predominately Halophila and Heterozostera, and a very small amount of Posidonia sp.	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66

Site No	Location	Habitat type	Substrate	Latitude	Longitude	Depth	Time	Biological assemblage	Recorder	Observation	Video tape No	Date	GPS type	Datum
JUR_128	Kangaroo Point	Dense seagrass	Sand	-30.67108	115.1112	-8	0820	Seagrass meadow predominately Amphibolis griffithii and some Posidonia, some macroalgae and sand patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_129	Boomers	Dense seagrass	Sand	-30.67828	115.10532	-6.2	1456	Seagrass meadow predominately Amphibolis griffithii and some Heterozostera, also some epiphytic and drift macroalgae	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_130	Boomers	Sand	Sand	-30.67533	115.10412	-7.5	1456	Sand only	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_131	Boomers	Macroalgal beds	Limestone	-30.67367	115.10397	-9.2	0926	Macroalgal meadow (50-75%) mostly browns, Ecklonia radiata and some Sargassum, some sand patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_132	Francis Reef	Macroalgae dominated limestone reef	Limestone	-30.68473	115.13922	-3.6	0926	Macroalgal dominated limestone reef, many drop-offs and crevices, mostly short macroalgae and turf algae	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_133	Flat Rock	Macroalgal beds	Limestone	-30.75322	115.1669	-6		Macroalgal meadow and some Amphibolis antarctica, a few sand patches	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_134	Wedge Island	Dense seagrass	Sand	-30.8232	115.1821	-5	1157	Seagrass meadow (dense) predominately Amphibolis antarctica, also A. griffithii, some sand patches and macroalgae	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_135	Wedge Island	Dense seagrass	Sand	-30.83718	115.2136	-6	1259	Seagrass meadow predominately Amphibolis antarctica and some Posidonia, also some short brown macroalgae	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_136	Boomers	Dense seagrass	Sand	-30.67982	115.10473	-3.2	0834	Seagrass meadow (dense) of Amphibolis griffithii, some epiphytic macroalgae	MLA	Drop down video	MRI/MW/JB/DD#1-03/1998	19/03/98	DGPS	AGD66
JUR_137	Francis Reef	Macroalgae dominated limestone reef	Limestone	-30.70217	115.12212	-2.8		Bommie south of Green Island, 2.8m top of bommie, 11m bottom of bommie. No footage.	MLA			19/03/98	DGPS	AGD66