MARINE MANAGEMENT SUPPORT:
SHARK BAY

FIELD SURVEY OF MARINE ECOLOGICAL COMMUNITIES IN SHARK BAY MARINE PARK AND HAMELIN POOL MARINE NATURE RESERVE (18 – 29 March 2002)

Field Programme Report: MMS/SBY/SBA,HPO - 56/2002

Prepared by
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Marine Conservation Branch
Department of Conservation and Land Management
47 Henry St
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ACKNOWLEDGEMENTS

Direction

- Dr Chris Simpson - Manager, Marine Conservation Branch (MCB), Nature Conservation Division.

Department of Conservation and Land Management Collaboration

- Kevin Bancroft - Marine Ecologist, Marine Conservation Branch (Project Leader).
- Judith Davidson - Marine Conservation Officer, Marine Conservation Branch.
- David Rose - Manager, Shark Bay District.
- Kevin Crane – Marine Operations Officer, Shark Bay District.
- Richard Hall – Marine Reserves Officer, Shark Bay District.
- David Holley – Marine Zoologist, Marine Conservation Branch.
- Nick D'Adamo – Senior Oceanographer, Marine Conservation Branch.

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Copies of this report may be obtained from:

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

SUMMARY

This report presents the details of a marine ecological communities survey to be undertaken from 18 to 29 March 2002, in Shark Bay Marine Park and Hamelin Pool Marine Nature Reserve. This survey is being undertaken to improve the knowledge base of the Shark Bay marine reserves marine ecological communities map, which is currently being developed by the Marine Conservation Branch (MCB) of the Department of Conservation and Land Management.

This project is being coordinated by the MCB in collaboration with the Department's Shark Bay District.

The primary objectives of this survey are to:

i) improve the knowledge base of the Shark Bay marine reserves marine ecological communities map by obtaining more ground-truthing data of the areas not yet mapped and by verifying the biological and spatial accuracy of the areas that are already mapped, and;

ii) obtain more marine benthic habitat ground-truth data for the MCB's Shark Bay dugong tracking project titled: "*Movements and Community Based Conservation of Dugongs*".

The secondary objective of this survey is to:

i) opportunistically collect video footage and stills of the marine and coastal habitats of the Shark Bay marine reserves for educational purposes.

The data acquired during this survey will contribute to the broadscale marine ecological communities map of the Shark Bay marine reserves, required by the Department to implement management strategies highlighted in the Shark Bay Marine Reserves Management Plan 1996-2006 (Department of Conservation and Land Management, 1996). It will also contribute to the information base required for the long-term management of this internationally significant area.

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1 INTRODUCTION

1.1 GENERAL BACKGROUND

This report presents the details of a marine ecological communities survey to be undertaken from 18 to 29 March 2002, in Shark Bay Marine Park and Hamelin Pool Marine Nature Reserve. This survey is being undertaken to improve the knowledge base of the Shark Bay marine reserves marine ecological communities map, which is currently being developed by the Marine Conservation Branch (MCB) of the Department of Conservation and Land Management.

At present the marine ecological communities map for the Shark Bay marine reserves contains the majority of perennial seagrass meadows, very little information on ephemeral seagrasses and mangals, and no information on other important habitats such as coral reef communities, stromatolites, subtidal reef platforms, beaches, rocky shores and intertidal reefs. This project, which is being coordinated by the MCB in collaboration with the Department's Shark Bay District, aims to help rectify the informational deficiencies by verifying and making additions to the current broadscale marine ecological communities map.

The data acquired during this survey will contribute to the broadscale marine ecological communities map of the Shark Bay marine reserves, required by the Department to implement management strategies highlighted in the Shark Bay Marine Reserves Management Plan 1996-2006 (Department of Conservation and Land Management, 1996). It will also contribute to the information base required for the long-term management of this internationally significant area.

1.2 OBJECTIVES

The primary objectives of this survey are to:

i) improve the knowledge base of the Shark Bay marine reserves marine ecological communities map by obtaining more ground-truthing data of the areas not yet mapped and by verifying the biological and spatial accuracy of the areas that are already mapped, and;

ii) obtain more marine benthic habitat ground-truth data for the MCB's Shark Bay dugong tracking project titled: "*Movements and Community Based Conservation of Dugongs*".

The secondary objective of this survey is to:

i) opportunistically collect video footage and stills of the marine and coastal habitats of the Shark Bay marine reserves for educational purposes.

2 METHODS

2.1 SURVEY AREA

The study area for this field survey lies within Shark Bay Marine Park and Hamelin Pool Marine Nature Reserve, which includes the eastern and western gulfs of Shark Bay and extends north along the coast to Carnarvon (Figure 1).

2.2 SITE SELECTION

The sites selected for this field survey are located within Shark Bay Marine Park and Hamelin Pool Marine Nature Reserve particularly where the existing habitat map is lacking information or needs verification. These areas have been chosen in an attempt to rectify the informational deficiencies of the current habitat map. The pre-selected field verification sites with latitudes and longitudes are presented in Appendix I.

Sites in Freycinet Bay and North East of Faure Island were selected in collaboration with the MCB's Shark Bay dugong tracking project.

The general areas selected for ground-truthing are:

- Red Cliff Bay.
- Peron Flats.
- Lharidon Bight.
- Hopeless Reach.
- Hamelin Pool Marine Nature Reserve.
- Freycinet Reach.
- Disappointment Reach.

2.3 SAMPLING METHODS

At each site a visual observation of the seabed will be made using either a bathyscope placed over the side of the field survey vessel or a drop-down camera will be lowered over the side of the vessel and 30 seconds of video footage of the seabed will be recorded. Operating instructions for the digital drop-down camera and video system are included as Appendix II.

Opportunistic collection of video footage for educational purposes will be taken using the hand-held video camera whilst snorkelling. Operating instructions for the Canon MV1 hand held video camera are included as Appendix III.

Site number, date, time, water depth, GPS coordinates and habitat description will be recorded on proforma habitat data sheets (Appendix IV) for each site.

Note that the daily program will be determined with consideration to weather and tide conditions. Tide predictions for Denham and Monkey Mia during the survey period are included as Appendix V.

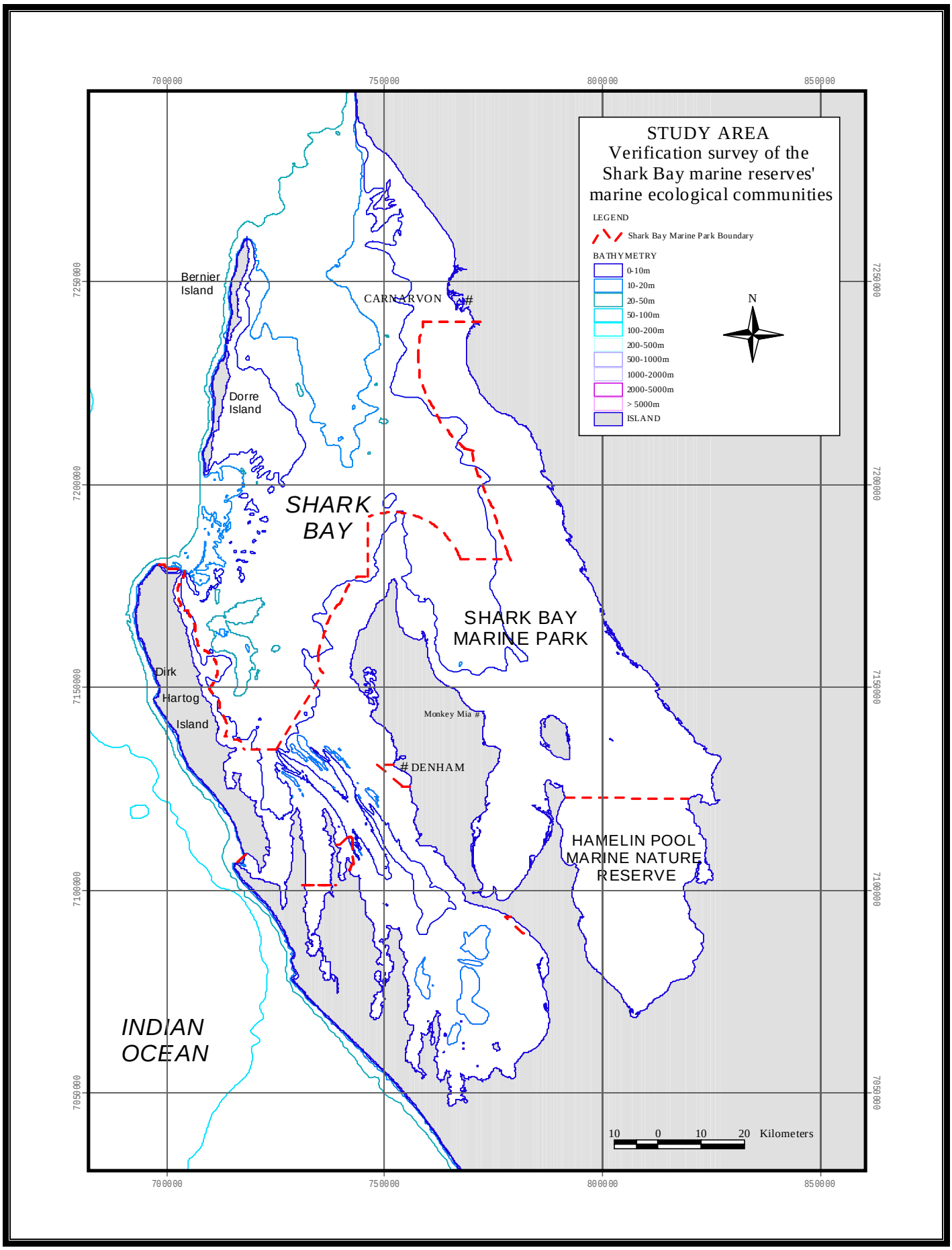

Figure 1: Study area: Shark Bay Marine Park and Hamelin Pool Marine Nature Reserve

3 PROJECT MANAGEMENT

3.1 SURVEY TEAM

The survey team will be comprised of three Department of Conservation and Land Management personnel (two from the Marine Conservation Branch and one of two from the Shark Bay District).

3.1.1 Marine Conservation Branch personnel

Kevin Bancroft	Project Leader	Ph (w):	(08) 9432 5102
	Marine Ecologist	Mob:	0417 401 200
		Fax:	(08) 9430 5408
		Ph (h):	(08) 9448 8192
Judith Davidson	Team member	Ph (w):	(08) 9432 5117
	Marine Conservation Officer	Fax:	(08) 9430 5408
		Ph (h):	(08) 9354 3567

3.1.2 Shark Bay District personnel

Kevin Crane	Vessel Master	Ph (w):	(08) 9948 1208
	Marine Operations Officer	Fax:	(08) 9948 1024
		Ph (h):	(08) 9948 3009
Richard Hall	Vessel Master	Ph (w):	(08) 9948 1208
	Marine Reserves Officer	Fax:	(08) 9948 1024
		Ph (h):	(08) 9948 3330

3.2 PROJECT COLLABORATION

This survey is being coordinated and supported by the MCB under the project titled: "Shark Bay Marine Park Habitat Mapping". The assistance and logistical support provided for this project by other collaborators is outlined below.

3.2.1 Other MCB projects

Support in the form of the use of an inflatable rubber boat from 25th to 28th March is being provided by the MCB Shark Bay dugong tracking project titled*:* "*Movements and community based conservation of Dugongs*".

- Upon completion of the survey David Holley (Field Team Leader for the Shark Bay dugong tracking project) will be briefed on the results of the program.

3.2.2 Shark Bay District

The Shark Bay District supports this project by the provisioning of assistance in the form of up to two marine reserve personnel and a vessel. Other assistance will be provided in the form of administrative support with access to phones and office equipment.

- Prior to the commencement of the field program, contact will be made with the district through Kevin Crane to outline the proposed activities and to seek advice and confirmation of the districts involvement.
- Upon arrival at Shark Bay the field survey team will meet to discuss the field program.
- During the field program Kevin Crane and or Richard Hall (depending on availability) will have the role of vessel master.
- Upon completion of the survey the district will be briefed on the results of the program and a MCB Data Report will be distributed to all survey team members, the Shark Bay District and the Gascoyne District.

3.3 FLIGHT ITINERARY

Flight details are as follows:

Name:	Kevin Bancroft
Booking reference:	LZ3PV6
Name:	Judith Davidson
Booking reference:	LZ3VX8
Airline:	Skywest

Perth to Denham

Departure flight:	AN7683
Departure date	18 March 2002
Departure time:	1155
Arrival time:	1450

Denham to Perth

Departure flight:	AN7683
Departure date	29 March 2002
Departure time	1210
Arrival time:	1455

3.4 FIELD ITINERARY

Table 1: Field itinerary for the survey of marine benthic habitats in Shark Bay Marine Park and Hamelin Pool Marine Nature Reserve.

Date	Activity
18 March 2002	• Depart from Perth 1155hrs • Arrive Denham 1450hrs • Aerial survey 1500-1700hrs (if conditions permit) • Book into Denham Villas • Preparation for field work
19-24 March 2002	• Undertake field programme in deeper waters using Sirenia II (Shark Bay District vessel) • Survey area determined with consideration to weather conditions

Date	Activity
25-28 March 2002	• Undertake field programme in shallow waters using MCB's Inflatable Rubber Boat (IRB) • Survey area determined with consideration to weather conditions
29 March 2002	• Book out of Denham Villas • Pack field equipment • Depart Denham for Perth 1210hrs • Arrive Perth 1455hrs

3.5 SAFETY

3.5.1 General

Field operations shall be carried out in accordance with departmental procedures and protocols. Overall responsibility for field procedures during this field trip and the personal safety of all team members rests with the Project Leader.

3.5.2 Boating

All boating operations shall be carried out in accordance with Department of Transport regulations and also conform to the Department of Conservation and Land Management's draft procedure for safe marine operations, "*Draft procedure guideline statement safe marine operations in CALM"* (Department of Conservation and Land Management, in prep.).

Alterations to the itinerary based on safety aspects related to weather conditions and sea-state are the responsibility of the Vessel Master in consultation with the Project Leader.

Prior to departure each day the Project Leader will log on with the Shark Bay District office, detailing the proposed activities for the day. Upon return the Project Leader will log off with the Shark Bay District office. An intermediate contact will be made with the Shark Bay District at approximately 1200 hrs every day.

3.5.3 Snorkelling

All snorkelling operations shall be carried out in accordance with the Department of Conservation and Land Management's dive code, "*A code of practice: safe work in CALM scientific diving*" (Department of Conservation and Land Management, 1998).

3.6 COMMUNICATIONS AND EMERGENCY CONTACTS

3.6.1 General

- The survey team will contact the Shark Bay District office at 1200 hrs everyday to collect any messages.
- A hand-held Department of Conservation and Land Management VHF radio will be carried on board the field vessel.
- The vehicle is equipped with a Department of Conservation and Land Management VHF radio.
- The survey team will carry a satellite phone (0404 856 708) in case of an emergency.

- The survey team will also have mobile phones but coverage may be intermittent in places.

The method of communication with the survey team is as follows:
- Before 0700 hrs ring the accommodation (Denham Villas ph. 9948 1264) or mobile (0417 401 200).
- Between 0700 hrs and 1200 hrs contact the Shark Bay District office and leave a message.
- The survey team will contact the Shark Bay District office at approximately 1200 hrs everyday.
- After 1200 hrs leave a message at the accommodation or mobile.

3.6.2 Department of Conservation and Land Management offices

Marine Conservation Branch, Fremantle:
Ph: (08) 9432 5100
Fax: (08) 9430 5408

Shark Bay District, Denham:
Ph: (08) 9948 1208
Fax: (08) 9948 1024
Department VHF channels 70 (north of Nanga) and 72 (south of Nanga)
Eastern Gulf marine VHF channel: 72 (Monkey Mia Ranger Station)
Western Gulf marine VHF channel: 16 (Denham radio)
Satellite Phone: 0404 856 708

Monkey Mia Visitors Centre:
Ph: (08) 9948 1366
Fax: (08) 9948 1512

3.6.3 Volunteer Marine Rescue

Denham Volunteer Marine Rescue
Paul Low (President)
Ph: 0409 117 093
VHF channel 16

3.6.4 Other emergency contacts

Silver Chain Bush Nursing Post, Denham – (08) 9948 1213
Department of Fisheries, Denham – (08) 9948 1154
Police, Denham – (08) 9948 1201

3.7 ACCOMMODATION

Name: Denham Villas
Address: 4 Durlacher St, Denham
Ph: (08) 9948 1264
Fax: (08) 9948 1870

3.8 BUDGET

The budget breakdown is given in Table 2.

Table 2: Budget breakdown for the survey of marine ecological communities in Shark Bay Marine Park and Hamelin Pool Marine Nature Reserve.

Budget Item			CALM in kind costs ($)	CALM District costs ($)	MCB costs ($)	Total costs ($)
Travel						
Airfares	2 return airfares @ $686		0	0	1372	1372
Vehicle	District 4WD – 2000 km @ $0.60/km		0	1200	0	1200
Accommodation	Denham – 11 days		0	0	1300	1300
Provisions	11 days @ $100		0	0	1100	1100
Taxi fare	4 @ $40		0	0	160	160
		Sub-total	0	1200	3932	5132
Staff						
K. Bancroft	12 days @ $ 273		0	0	3276	3276
J. Davidson	12 days @ $ 170		0	0	2040	2040
K. Crane	11 days @ $ 251		0	2761	0	2761
R. Hall	11 days @ $ 188		0	2068	0	2068
		Sub-total	0	4829	5316	10145
Vessel & other equipment						
Shark Bay District vessel	10 days @ $500		0	5000	0	5000
Wildlife IRB	4 days @ $200		800	0	0	800
IRB fuel	4 days @ $100/day		0	0	400	400
GPS unit	12 days @ $35		420	0	0	420
Drop-down camera equipment (plus spares)	12 days @ $150		1800	0	0	1800
Hand-held video camera and u/water housing	12 days @ $100		1200	0	0	1200
Laptop Computer	12 days @ $50/day		600	0	0	600
Freight					200	200
Aerial survey	2 hrs @ $400/hr		0	0	800	800
		Sub-total	4820	5000	1400	11220
Consumables						
Stationary and sundries			0	0	300	300
Video tapes	10 x DVM, 3 x VHS		0	0	280	280
Slide film	2 x Fuji Sensia 200 & processing @ $35		0	0	70	70
		Sub-total	0	0	650	650
		TOTAL	**$ 4,420**	**$ 11,029**	**$11,298**	**$ 27,147**

3.9 EQUIPMENT

3.9.1 Marine Conservation Branch

Boating
- 5.4m inflatable rubber boat with rigid hull and trailer

Video camera
- Canon MV1 digital video camcorder, with batteries (6), battery charger (4 x 12 Volt), remote control and accessories
- Amphibico Explorer MV1 housing
- 10 x 60 min digital video tapes
- 3 x VHS tapes
- Drop down digital camera kit
- Drop down camera (spare)
- 12 Volt TV TEAC

Still photography
- Canon EOS land camera and lens
- 2 x rolls of 36 exposure slide film - Fuji Sensia
- Kit of camera spares

Communications
- Hand held VHF radio

Information
- Marine Charts
- Field identification guides for tropical water fishes, macro-algae, seagrass, benthic invertebrates
- CALM GIS habitat maps
- Aerial photographs of coastline
- Laptop computer and accessories
- High density discs

Position fixing
- 1 x Garmin hand held GPS
- Batteries

Data recording
- Habitat data sheets
- Pencils
- Chalk
- Clapper board

Snorkelling
- Personal snorkeling equipment
- Torch

3.9.2 Shark Bay District

Vehicle
- 4WD vehicle (fitted with CALM VHF)
- Off road safety gear (if necessary)

Boating
- Sirenia II (7m twin hull Leisure Cat) and trailer
- Fuel tanks (spare)
- Boating safety gear

Safety
- Comprehensive first aid kit
- Satellite phone (0404 856 708)
- Emergency response flow-sheet
- Emergency contact flow chart
- Patient information log
- Log sheets for accidents
- Dive flag
- Sunscreen

Other
- Digital still camera
- Esky
- Water bottle

4 DATA MANAGEMENT

4.1 FIELD PROGRAMME REPORT

Hard copies of this Field Programme Report will be held at five 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, Department of Conservation and Land Management, Ocean Reef Rd., Woodvale, Western Australia, 6026. Ph (08) 9405 5100 Fax (08) 9306 1641.

3. Archived with CD ROM, Woodvale Library, Science and Information Division, Department of Conservation and Land Management, Ocean Reef Rd., Woodvale, Western Australia, 6026. Ph (08) 9405 5100 Fax (08) 9306 1641.

4. Shark Bay District, Department of Conservation and Land Management, 67 Knight St., Denham, Western Australia, 6537. Ph (08) 9948 1208 Fax (08) 9948 1024.

5. Mid West Region, Department of Conservation and Land Management, PO Box 72, Geraldton, Western Australia, 6531. Ph (08) 9921 5955 Fax (08) 9921 5713.

Digital copies of this field programme report will be held at the following:

1. The Marine Conservation Branch server:
   Shareddata on 'Calm-frem-1'
   [T:\144-Marine Conservation Branch\Shared Data\Current_MCB_reports\MMS\mms_5602]

2. The Marine Conservation Branch server full backup DAT tape:
   Shareddata on 'Calm-frem-1'
   [T:\144-Marine Conservation Branch\Shared Data\Current_MCB_reports\MMS\mms_5602]

3. CD ROM held at Marine Conservation Branch and Woodvale Library: CD-ROM [mms_5602]

4.2 DATA

Collected raw data will be:

1. entered into the habitats database:
   Shareddata on 'Calm-frem-1'
   [T:\144-Marine Conservation Branch\Shared Data\Databases\Biological inventory\Habitats]

2. written into a data report and copies will be held at the same locations as the field programme report (see 4.1).

4.3 VIDEO RECORDS

Collected mini digital video (MDV) footage will be held at two locations:

1. Video masters (MDV) to be archived at the Information Management Branch, Department of Conservation and Land Management, 50 Hayman Road, Como, Western Australia.

2. MDV copies to be stored at the Marine Conservation Branch, Department of Conservation and Land Management, 47 Henry Street, Fremantle, Western Australia.

4.4 SLIDE RECORDS

All photographic slides to be stored at the Marine Conservation Branch, Department of Conservation and Land Management, 47 Henry Street, Fremantle, Western Australia. Selected slides will be entered into the MCB image library.

5 REPORT DISTRIBUTION LIST

Copies of this report will be distributed to:

- Chris Simpson, Manger, Marine Conservation Branch.
- Kelly Gillen, Manager, Midwest Region.
- David Rose, Manager, Shark Bay District.
- All survey team members (4)

6 PUBLICITY/EDUCATION

6.1 PUBLIC RELATIONS OPPORTUNITIES

An article will be presented in the MCB newsletter, *Marine Conservation Matters.*

A media statement will be released prior to the field trip (Appendix VI).

6.2 EDUCATION OPPORTUNITIES

No education opportunities have been identified.

7 REFERENCES

Department of Conservation and Land Management, (in prep.). Draft procedure guideline statement safe marine operations in CALM. Marine Conservation Branch, Department of Conservation and Land Management, Perth, Western Australia. (Unpublished report).

Department of Conservation and Land Management, (1998). A code of practice: Safe work in CALM scientific diving. September 1998. Department of Conservation and Land Management. Perth, Western Australia. (Unpublished report)

Department of Conservation and Land Management, (1996). Shark Bay marine reserves management plan 1996-2006. Management Plan No. 34. A report prepared for the National Parks and Nature Conservation Authority, Department of Conservation and Land Management, Perth, Western Australia.

APPENDICES

APPENDIX I: PRE-SECLECTED FIELD VERIFICATION SITES

AREA	SITE NO	Long (ddeg)	Lat (ddeg)	Long (deg)	long (dmin)	Lat (deg)	Lat (dmin)
Red Cliff Bay	r1	113.7225	-25.7985	113	43.350	-25	-47.910
Red Cliff Bay	r2	113.7232	-25.7895	113	43.392	-25	-47.370
Red Cliff Bay	r3	113.7157	-25.7924	113	42.942	-25	-47.544
Red Cliff Bay	r4	113.6866	-25.7842	113	41.196	-25	-47.052
Red Cliff Bay	r5	113.7007	-25.7786	113	42.042	-25	-46.716
Red Cliff Bay	r6	113.6644	-25.7508	113	39.864	-25	-45.048
Red Cliff Bay	r7	113.6924	-25.7496	113	41.544	-25	-44.976
Red Cliff Bay	r8	113.7220	-25.7525	113	43.320	-25	-45.150
Red Cliff Bay	r9	113.7486	-25.8038	113	44.916	-25	-48.228
Red Cliff Bay	r10	113.7384	-25.7813	113	44.304	-25	-46.878
Red Cliff Bay	r11	113.7818	-25.8011	113	46.908	-25	-48.066
Red Cliff Bay	r12	113.7655	-25.7765	113	45.930	-25	-46.590
Red Cliff Bay	r13	113.7416	-25.7530	113	44.496	-25	-45.180
Red Cliff Bay	r14	113.7602	-25.7518	113	45.612	-25	-45.108
Red Cliff Bay	r15	113.7803	-25.7525	113	46.818	-25	-45.150
Red Cliff Bay	r16	113.7924	-25.7513	113	47.544	-25	-45.078
Red Cliff Bay	r17	113.8156	-25.7622	113	48.936	-25	-45.732
Red Cliff Bay	r18	113.8362	-25.7631	113	50.172	-25	-45.786
Red Cliff Bay	r19	113.8331	-25.7464	113	49.986	-25	-44.784
Red Cliff Bay	r20	113.8294	-25.7295	113	49.764	-25	-43.770
Red Cliff Bay	r21	113.8031	-25.7179	113	48.186	-25	-43.074
Red Cliff Bay	r22	113.7534	-25.7205	113	45.204	-25	-43.230
Red Cliff Bay	r23	113.7246	-25.7237	113	43.476	-25	-43.422
Red Cliff Bay	r24	113.6772	-25.7280	113	40.632	-25	-43.680

AREA	SITE NO	Long (ddeg)	Lat (ddeg)	Long (deg)	long (dmin)	Lat (deg)	Lat (dmin)
Peron Flats	p1	113.5409	-25.5809	113	32.454	-25	-34.854
Peron Flats	p2	113.5680	-25.5753	113	34.080	-25	-34.518
Peron Flats	p3	113.5269	-25.5501	113	31.614	-25	-33.006
Peron Flats	p4	113.5160	-25.5739	113	30.960	-25	-34.434
Peron Flats	p5	113.5482	-25.5528	113	32.892	-25	-33.168
Peron Flats	p6	113.5622	-25.5436	113	33.732	-25	-32.616
Peron Flats	p7	113.5719	-25.5511	113	34.314	-25	-33.066
Peron Flats	p8	113.5731	-25.5119	113	34.386	-25	-30.714
Peron Flats	p9	113.5387	-25.5121	113	32.322	-25	-30.726
Peron Flats	p10	113.5286	-25.5133	113	31.716	-25	-30.798
Peron Flats	p11	113.5107	-25.4916	113	30.642	-25	-29.496
Peron Flats	p12	113.5458	-25.4838	113	32.748	-25	-29.028
Peron Flats	p13	113.5542	-25.4838	113	33.252	-25	-29.028
Peron Flats	p14	113.6026	-25.4744	113	36.156	-25	-28.464
Peron Flats	p15	113.6508	-25.4751	113	39.048	-25	-28.506
Peron Flats	p16	113.6242	-25.4526	113	37.452	-25	-27.156
Peron Flats	p17	113.5649	-25.4536	113	33.894	-25	-27.216
Peron Flats	p18	113.6055	-25.4049	113	36.330	-25	-24.294
Peron Flats	p19	113.5501	-25.4078	113	33.006	-25	-24.468
Peron Flats	p20	113.5678	-25.3737	113	34.068	-25	-22.422
Peron Flats	p21	113.5436	-25.3640	113	32.616	-25	-21.840
Peron Flats	p22	113.5201	-25.3708	113	31.206	-25	-22.248
Peron Flats	p23	113.4613	-25.3708	113	27.678	-25	-22.248
Peron Flats	p24	113.4804	-25.3923	113	28.824	-25	-23.538
Peron Flats	p25	113.4603	-25.4078	113	27.618	-25	-24.468
Peron Flats	p26	113.5145	-25.3986	113	30.870	-25	-23.916
Peron Flats	p27	113.5298	-25.4073	113	31.788	-25	-24.438
Peron Flats	p28	113.5225	-25.4291	113	31.350	-25	-25.746
Peron Flats	p29	113.5034	-25.4308	113	30.204	-25	-25.848
Peron Flats	p30	113.5097	-25.4463	113	30.582	-25	-26.778
Peron Flats	p31	113.5261	-25.4652	113	31.566	-25	-27.912
Peron Flats	p32	113.4901	-25.4734	113	29.406	-25	-28.404
Peron Flats	p33	113.4562	-25.4657	113	27.372	-25	-27.942
Peron Flats	p34	113.4639	-25.4572	113	27.834	-25	-27.432
Peron Flats	p35	113.4903	-25.4937	113	29.418	-25	-29.622
Peron Flats	p36	113.4990	-25.5121	113	29.940	-25	-30.726
Peron Flats	p37	113.4668	-25.5034	113	28.008	-25	-30.204
Peron Flats	p38	113.4632	-25.4945	113	27.792	-25	-29.670
Peron Flats	p39	113.4392	-25.5114	113	26.352	-25	-30.684
Peron Flats	p40	113.4351	-25.5172	113	26.106	-25	-31.032
Peron Flats	p41	113.4693	-25.5286	113	28.158	-25	-31.716
Peron Flats	p42	113.4342	-25.5540	113	26.052	-25	-33.240
Peron Flats	p43	113.4618	-25.5538	113	27.708	-25	-33.228
Peron Flats	p44	113.4722	-25.5581	113	28.332	-25	-33.486

AREA	SITE NO	Long (ddeg)	Lat (ddeg)	Long (deg)	long (dmin)	Lat (deg)	Lat (dmin)
Lharidon Bight	L1	113.7671	-25.8758	113	46.026	-25	-52.548
Lharidon Bight	L2	113.7399	-25.9400	113	44.394	-25	-56.400
Lharidon Bight	L3	113.7420	-25.9850	113	44.520	-25	-59.100
Lharidon Bight	L4	113.7371	-26.0088	113	44.226	-26	-0.528
Lharidon Bight	L5	113.7476	-26.0197	113	44.856	-26	-1.182
Lharidon Bight	L6	113.7336	-26.0285	113	44.016	-26	-1.710
Lharidon Bight	L7	113.7228	-26.0320	113	43.368	-26	-1.920
Lharidon Bight	L8	113.7493	-26.0312	113	44.958	-26	-1.872
Lharidon Bight	L9	113.7694	-26.0364	113	46.164	-26	-2.184
Lharidon Bight	L10	113.8044	-26.0397	113	48.264	-26	-2.382
Lharidon Bight	L11	113.8157	-26.0542	113	48.942	-26	-3.252
Lharidon Bight	L12	113.7806	-26.0625	113	46.836	-26	-3.750
Lharidon Bight	L13	113.7483	-26.066	113	44.898	-26	-3.960
Lharidon Bight	L14	113.7156	-26.0847	113	42.936	-26	-5.082
Lharidon Bight	L15	113.7502	-26.0867	113	45.012	-26	-5.202
Lharidon Bight	L16	113.7809	-26.0914	113	46.854	-26	-5.484
Lharidon Bight	L17	113.8173	-26.0913	113	49.038	-26	-5.478
Lharidon Bight	L18	113.8061	-26.1099	113	48.366	-26	-6.594
Lharidon Bight	L19	113.7686	-26.1232	113	46.116	-26	-7.392
Lharidon Bight	L20	113.7406	-26.1112	113	44.436	-26	-6.672
Lharidon Bight	L21	113.7279	-26.1295	113	43.674	-26	-7.770
Lharidon Bight	L22	113.7164	-26.1495	113	42.984	-26	-8.970
Lharidon Bight	L23	113.7229	-26.1474	113	43.374	-26	-8.844
Lharidon Bight	L24	113.7298	-26.1469	113	43.788	-26	-8.814
Lharidon Bight	L25	113.7703	-26.1497	113	46.218	-26	-8.982
Lharidon Bight	L26	113.7884	-26.1615	113	47.304	-26	-9.690
Lharidon Bight	L27	113.7612	-26.1673	113	45.672	-26	-10.038
Lharidon Bight	L28	113.7376	-26.1691	113	44.256	-26	-10.146
Lharidon Bight	L29	113.7805	-26.1824	113	46.830	-26	-10.944
Lharidon Bight	L30	113.7381	-26.1901	113	44.286	-26	-11.406
Lharidon Bight	L31	113.7682	-26.202	113	46.092	-26	-12.120
Lharidon Bight	L32	113.801	-26.185	113	48.060	-26	-11.100
Lharidon Bight	L33	113.8034	-26.1642	113	48.204	-26	-9.852
Lharidon Bight	L34	113.8017	-26.1406	113	48.102	-26	-8.436
Lharidon Bight	L35	113.8204	-26.1438	113	49.224	-26	-8.628
Lharidon Bight	L36	113.827	-26.1174	113	49.620	-26	-7.044
Lharidon Bight	L37	113.7969	-26.122	113	47.814	-26	-7.320
Lharidon Bight	L38	113.8538	-26.0962	113	51.228	-26	-5.772
Lharidon Bight	L39	113.8437	-26.1003	113	50.622	-26	-6.018
Lharidon Bight	L40	113.8341	-26.0926	113	50.046	-26	-5.556
Lharidon Bight	L41	113.8223	-26.0725	113	49.338	-26	-4.350
Lharidon Bight	L42	113.8418	-26.0646	113	50.508	-26	-3.876
Lharidon Bight	L43	113.8564	-26.0702	113	51.384	-26	-4.212
Lharidon Bight	L44	113.8541	-26.0502	113	51.246	-26	-3.012
Lharidon Bight	L45	113.8731	-26.038	113	52.386	-26	-2.280
Lharidon Bight	L46	113.8241	-25.9979	113	49.446	-25	-59.874

AREA	SITE NO	Long (ddeg)	Lat (ddeg)	Long (deg)	long (dmin)	Lat (deg)	Lat (dmin)
Lharidon Bight	L47	113.8433	-25.9919	113	50.598	-25	-59.514
Lharidon Bight	L48	113.8555	-26.0009	113	51.330	-26	-0.054
Lharidon Bight	L49	113.8606	-25.9702	113	51.636	-25	-58.212
Lharidon Bight	L50	113.8463	-25.9653	113	50.778	-25	-57.918
Lharidon Bight	L51	113.839	-25.9371	113	50.340	-25	-56.226
Lharidon Bight	L52	113.8669	-25.931	113	52.014	-25	-55.860
Lharidon Bight	L53	113.8545	-25.9004	113	51.270	-25	-54.024

AREA	SITE NO	Long (ddeg)	Lat (ddeg)	Long (deg)	long (dmin)	Lat (deg)	Lat (dmin)
Hopeless Reach	h1	113.6266	-25.7092	113	37.596	-25	-42.552
Hopeless Reach	h2	113.6629	-25.7099	113	39.774	-25	-42.594
Hopeless Reach	h3	113.691	-25.7135	113	41.460	-25	-42.810
Hopeless Reach	h4	113.7169	-25.7106	113	43.014	-25	-42.636
Hopeless Reach	h5	113.7367	-25.7007	113	44.202	-25	-42.042
Hopeless Reach	h6	113.7529	-25.7041	113	45.174	-25	-42.246
Hopeless Reach	h7	113.7503	-25.6951	113	45.018	-25	-41.706
Hopeless Reach	h8	113.7043	-25.7000	113	42.258	-25	-42.000
Hopeless Reach	h9	113.6651	-25.6910	113	39.906	-25	-41.460
Hopeless Reach	h10	113.6268	-25.6946	113	37.608	-25	-41.676
Hopeless Reach	h11	113.6109	-25.6743	113	36.654	-25	-40.458
Hopeless Reach	h12	113.6786	-25.6518	113	40.716	-25	-39.108
Hopeless Reach	h13	113.7312	-25.6503	113	43.872	-25	-39.018
Hopeless Reach	h14	113.7208	-25.6196	113	43.248	-25	-37.176
Hopeless Reach	h15	113.6699	-25.6198	113	40.194	-25	-37.188
Hopeless Reach	h16	113.6423	-25.6211	113	38.538	-25	-37.266
Hopeless Reach	h17	113.6067	-25.623	113	36.402	-25	-37.380
Hopeless Reach	h18	113.614	-25.6244	113	36.840	-25	-37.464
Hopeless Reach	h19	113.5772	-25.6119	113	34.632	-25	-36.714
Hopeless Reach	h20	113.6041	-25.5906	113	36.246	-25	-35.436
Hopeless Reach	h21	113.6106	-25.5889	113	36.636	-25	-35.334
Hopeless Reach	h22	113.651	-25.5891	113	39.060	-25	-35.346
Hopeless Reach	h23	113.6815	-25.5886	113	40.890	-25	-35.316
Hopeless Reach	h24	113.7234	-25.5893	113	43.404	-25	-35.358
Hopeless Reach	h25	113.7481	-25.5862	113	44.886	-25	-35.172
Hopeless Reach	h26	113.758	-25.563	113	45.480	-25	-33.780
Hopeless Reach	h27	113.7629	-25.517	113	45.774	-25	-31.020
Hopeless Reach	h28	113.7324	-25.5158	113	43.944	-25	-30.948
Hopeless Reach	h29	113.7198	-25.5155	113	43.188	-25	-30.930
Hopeless Reach	h30	113.7304	-25.547	113	43.824	-25	-32.820
Hopeless Reach	h31	113.6915	-25.5463	113	41.490	-25	-32.778
Hopeless Reach	h32	113.6871	-25.4949	113	41.226	-25	-29.694
Hopeless Reach	h33	113.6934	-25.4644	113	41.604	-25	-27.864
Hopeless Reach	h34	113.73	-25.4739	113	43.800	-25	-28.434
Hopeless Reach	h35	113.7476	-25.4787	113	44.856	-25	-28.722

AREA	SITE NO	Long (ddeg)	Lat (ddeg)	Long (deg)	long (dmin)	Lat (deg)	Lat (dmin)
Hamelin Pool MNR	ha1	113.9888	-25.9962	113	59.328	-25	-59.772
Hamelin Pool MNR	ha2	113.9664	-26.0074	113	57.984	-26	-0.444
Hamelin Pool MNR	ha3	113.9444	-25.9919	113	56.664	-25	-59.514
Hamelin Pool MNR	ha4	113.9116	-25.9982	113	54.696	-25	-59.892
Hamelin Pool MNR	ha5	113.8999	-26.0288	113	53.994	-26	-1.728
Hamelin Pool MNR	ha6	113.9308	-26.0163	113	55.848	-26	-0.978
Hamelin Pool MNR	ha7	113.9223	-26.0607	113	55.338	-26	-3.642
Hamelin Pool MNR	ha8	113.9404	-26.0577	113	56.424	-26	-3.462
Hamelin Pool MNR	ha9	113.9402	-26.0973	113	56.412	-26	-5.838
Hamelin Pool MNR	ha10	113.9221	-26.1002	113	55.326	-26	-6.012
Hamelin Pool MNR	ha11	113.9569	-26.1262	113	57.414	-26	-7.572
Hamelin Pool MNR	ha12	113.9875	-26.0763	113	59.250	-26	-4.578
Hamelin Pool MNR	ha13	114.0065	-26.1303	114	0.390	-26	-7.818
Hamelin Pool MNR	ha14	114.0223	-26.171	114	1.338	-26	-10.260
Hamelin Pool MNR	ha15	114.0006	-26.1684	114	0.036	-26	-10.104
Hamelin Pool MNR	ha16	113.9846	-26.1867	113	59.076	-26	-11.202
Hamelin Pool MNR	ha17	113.964	-26.183	113	57.840	-26	-10.980
Hamelin Pool MNR	ha18	113.9505	-26.19	113	57.030	-26	-11.400
Hamelin Pool MNR	ha19	113.9912	-26.223	113	59.472	-26	-13.380
Hamelin Pool MNR	ha20	114.0174	-26.2014	114	1.044	-26	-12.084
Hamelin Pool MNR	ha21	114.0499	-26.2038	114	2.994	-26	-12.228
Hamelin Pool MNR	ha22	114.0497	-26.2402	114	2.982	-26	-14.412
Hamelin Pool MNR	ha23	114.0523	-26.2736	114	3.138	-26	-16.416
Hamelin Pool MNR	ha24	114.0303	-26.3048	114	1.818	-26	-18.288
Hamelin Pool MNR	ha25	113.9997	-26.3106	113	59.982	-26	-18.636
Hamelin Pool MNR	ha26	113.9923	-26.3308	113	59.538	-26	-19.848
Hamelin Pool MNR	ha27	113.9783	-26.3398	113	58.698	-26	-20.388
Hamelin Pool MNR	ha28	114.0226	-26.382	114	1.356	-26	-22.920
Hamelin Pool MNR	ha29	114.0335	-26.3817	114	2.010	-26	-22.902
Hamelin Pool MNR	ha30	114.0584	-26.353	114	3.504	-26	-21.180
Hamelin Pool MNR	ha31	114.0899	-26.4026	114	5.394	-26	-24.156
Hamelin Pool MNR	ha32	114.096	-26.4204	114	5.760	-26	-25.224
Hamelin Pool MNR	ha33	114.0941	-26.4323	114	5.646	-26	-25.938
Hamelin Pool MNR	ha34	114.0926	-26.4421	114	5.556	-26	-26.526
Hamelin Pool MNR	ha35	114.1489	-26.3941	114	8.934	-26	-23.646
Hamelin Pool MNR	ha36	114.137	-26.3959	114	8.220	-26	-23.754
Hamelin Pool MNR	ha37	114.1306	-26.3915	114	7.836	-26	-23.490
Hamelin Pool MNR	ha38	114.1161	-26.3825	114	6.966	-26	-22.950
Hamelin Pool MNR	ha39	114.1184	-26.3383	114	7.104	-26	-20.298
Hamelin Pool MNR	ha40	114.1358	-26.3303	114	8.148	-26	-19.818
Hamelin Pool MNR	ha41	114.1514	-26.3381	114	9.084	-26	-20.286
Hamelin Pool MNR	ha42	114.1817	-26.3436	114	10.902	-26	-20.616
Hamelin Pool MNR	ha43	114.1917	-26.3552	114	11.502	-26	-21.312
Hamelin Pool MNR	ha44	114.1977	-26.3037	114	11.862	-26	-18.222

AREA	SITE NO	Long (ddeg)	Lat (ddeg)	Long (deg)	long (dmin)	Lat (deg)	Lat (dmin)
Hamelin Pool MNR	ha45	114.1648	-26.288	114	9.888	-26	-17.280
Hamelin Pool MNR	ha46	114.1025	-26.2781	114	6.150	-26	-16.686
Hamelin Pool MNR	ha47	114.1858	-26.2219	114	11.148	-26	-13.314
Hamelin Pool MNR	ha48	114.1143	-26.2075	114	6.858	-26	-12.450
Hamelin Pool MNR	ha49	114.1848	-26.1223	114	11.088	-26	-7.338
Hamelin Pool MNR	ha50	114.1258	-26.1041	114	7.548	-26	-6.246
Hamelin Pool MNR	ha51	114.0771	-26.0908	114	4.626	-26	-5.448
Hamelin Pool MNR	ha52	114.0631	-26.0557	114	3.786	-26	-3.342
Hamelin Pool MNR	ha53	114.0566	-26.025	114	3.396	-26	-1.500
Hamelin Pool MNR	ha54	114.0944	-26.0345	114	5.664	-26	-2.070
Hamelin Pool MNR	ha55	114.1253	-26.0441	114	7.518	-26	-2.646
Hamelin Pool MNR	ha56	114.1576	-26.0608	114	9.456	-26	-3.648
Hamelin Pool MNR	ha57	114.191	-26.057	114	11.460	-26	-3.420
Hamelin Pool MNR	ha58	114.2008	-26.0414	114	12.048	-26	-2.484
Hamelin Pool MNR	ha59	114.1905	-26.0165	114	11.430	-26	-0.990
Hamelin Pool MNR	ha60	114.1585	-25.9884	114	9.510	-25	-59.304
Hamelin Pool MNR	ha61	114.1581	-25.9736	114	9.486	-25	-58.416

AREA	SITE NO	Long (ddeg)	Lat (ddeg)	Long (deg)	long (dmin)	Lat (deg)	Lat (dmin)
Freycinet Reach	f1	113.2604	-25.899	113	15.624	-25	-53.940
Freycinet Reach	f2	113.2907	-25.9144	113	17.442	-25	-54.864
Freycinet Reach	f3	113.2903	-25.9196	113	17.418	-25	-55.176
Freycinet Reach	f4	113.2904	-25.9273	113	17.424	-25	-55.638
Freycinet Reach	f5	113.3426	-25.9516	113	20.556	-25	-57.096
Freycinet Reach	f6	113.3428	-25.9613	113	20.568	-25	-57.678
Freycinet Reach	f7	113.3419	-25.9747	113	20.514	-25	-58.482
Freycinet Reach	f8	113.3754	-26.0039	113	22.524	-26	-0.234
Freycinet Reach	f9	113.3958	-26.001	113	23.748	-26	-0.060
Freycinet Reach	f10	113.4071	-25.9973	113	24.426	-25	-59.838
Freycinet Reach	f11	113.4224	-25.9965	113	25.344	-25	-59.790
Freycinet Reach	f12	113.4406	-25.9957	113	26.436	-25	-59.742
Freycinet Reach	f13	113.4036	-26.0482	113	24.216	-26	-2.892
Freycinet Reach	f14	113.4235	-26.0468	113	25.410	-26	-2.808
Freycinet Reach	f15	113.4445	-26.0464	113	26.670	-26	-2.784
Freycinet Reach	f16	113.4802	-26.0402	113	28.812	-26	-2.412
Freycinet Reach	f17	113.4182	-26.0936	113	25.092	-26	-5.616
Freycinet Reach	f18	113.4302	-26.096	113	25.812	-26	-5.760
Freycinet Reach	f19	113.4574	-26.0924	113	27.444	-26	-5.544
Freycinet Reach	f20	113.4786	-26.0982	113	28.716	-26	-5.892
Freycinet Reach	f21	113.5086	-26.0941	113	30.516	-26	-5.646
Freycinet Reach	f22	113.528	-26.0979	113	31.680	-26	-5.874
Freycinet Reach	f23	113.5595	-26.1343	113	33.570	-26	-8.058
Freycinet Reach	f24	113.5466	-26.1397	113	32.796	-26	-8.382
Freycinet Reach	f25	113.5104	-26.149	113	30.624	-26	-8.940
Freycinet Reach	f26	113.4882	-26.152	113	29.292	-26	-9.120
Freycinet Reach	f27	113.5169	-26.19	113	31.014	-26	-11.400
Freycinet Reach	f28	113.5817	-26.1847	113	34.902	-26	-11.082
Freycinet Reach	f29	113.6113	-26.1837	113	36.678	-26	-11.022
Freycinet Reach	f30	113.6295	-26.1849	113	37.770	-26	-11.094
Freycinet Reach	f31	113.662	-26.2367	113	39.720	-26	-14.202
Freycinet Reach	f32	113.6397	-26.233	113	38.382	-26	-13.980
Freycinet Reach	f33	113.6271	-26.2317	113	37.626	-26	-13.902
Freycinet Reach	f34	113.6123	-26.2319	113	36.738	-26	-13.914
Freycinet Reach	f35	113.5885	-26.2344	113	35.310	-26	-14.064

AREA	SITE NO	Long (ddeg)	Lat (ddeg)	Long (deg)	long (dmin)	Lat (deg)	Lat (dmin)
Disappointment Reach	d1	113.9001	-25.7641	113	54.006	-25	-45.846
Disappointment Reach	d2	113.9635	-25.7656	113	57.810	-25	-45.936
Disappointment Reach	d3	114.0047	-25.7375	114	0.282	-25	-44.250
Disappointment Reach	d4	113.9764	-25.7384	113	58.584	-25	-44.304
Disappointment Reach	d5	113.9444	-25.7418	113	56.664	-25	-44.508
Disappointment Reach	d6	113.9137	-25.743	113	54.822	-25	-44.580
Disappointment Reach	d7	113.8747	-25.7443	113	52.482	-25	-44.658
Disappointment Reach	d8	113.8541	-25.7259	113	51.246	-25	-43.554
Disappointment Reach	d9	113.8713	-25.7147	113	52.278	-25	-42.882
Disappointment Reach	d10	113.8948	-25.7135	113	53.688	-25	-42.810
Disappointment Reach	d11	113.9493	-25.7167	113	56.958	-25	-43.002
Disappointment Reach	d12	113.9902	-25.7155	113	59.412	-25	-42.930
Disappointment Reach	d13	114.0064	-25.6988	114	0.384	-25	-41.928
Disappointment Reach	d14	113.9563	-25.6944	113	57.378	-25	-41.664
Disappointment Reach	d15	113.8846	-25.6946	113	53.076	-25	-41.676
Disappointment Reach	d16	113.8534	-25.6917	113	51.204	-25	-41.502
Disappointment Reach	d17	113.8156	-25.6859	113	48.936	-25	-41.154
Disappointment Reach	d18	113.8275	-25.6661	113	49.650	-25	-39.966
Disappointment Reach	d19	113.8108	-25.6622	113	48.648	-25	-39.732
Disappointment Reach	d20	113.8026	-25.6702	113	48.156	-25	-40.212
Disappointment Reach	d21	113.7914	-25.6595	113	47.484	-25	-39.570
Disappointment Reach	d22	113.7924	-25.677	113	47.544	-25	-40.620
Disappointment Reach	d23	113.7752	-25.66	113	46.512	-25	-39.600
Disappointment Reach	d24	113.7851	-25.6917	113	47.106	-25	-41.502
Disappointment Reach	d25	113.7675	-25.7019	113	46.050	-25	-42.114
Disappointment Reach	d26	113.7651	-25.6772	113	45.906	-25	-40.632
Disappointment Reach	d27	113.7566	-25.6607	113	45.396	-25	-39.642

APPENDIX II: DROPDOWN CAMERA AND VIDEO INSTRUCTIONS

Setup

1. Connect camera power and video to VDU and power pack.
2. Ensure drop line attached to camera cable is weight bearing.
3. If required attach weight to drop line.
4. Choose power source on POWER SWITCH i.e. built in 12 Volt batteries or external 12 Volt source. It is important to have the right power switch on.
5. Turn isolator switch on.
6. Ready for operation.

Operation

1. Write site number, date and location on the clapper board.
2. Place clapper board in front of camera and record for about 5 seconds then press pause.
3. Lower the camera to the bottom and press pause to recommence recording.
4. Record 30 seconds of benthic habitat footage.
5. Fill out habitat data sheet (ensure GPS location and datum are recorded).
6. Switch video and camera power off.
7. Retrieve camera.
8. Check footage regularly to ensure correct operation.

Equipment Care

1. Don't allow twists or knots in the cable. Figure eight the cable on the deck or in a nally bin.
2. Don't step on the cable.
3. Clean and silicon grease camera connection plug daily.
4. Do not use CRC, WD40 or similar on electrical connections.
5. Don't attach weighted or other objects to camera or cable (only to dropline).
6. Beware of the boat propeller.
7. Don't allow camera to hit the side of the boat when deploying or retrieving.
8. Don't allow camera to hit or drag along the bottom.
9. Always keep remote control in a sealed plastic bag (a wet hand will destroy it).
10. 240 volt power supply is not to be used on boats. Use only 12 volt power supply
11. Disconnect power to camera when not in use.
12. Wash down camera and cable after use (ensure connections are not exposed to water).

APPENDIX III: CANON MV1 DIGITAL VIDEO CAMERA AND UNDERWATER HOUSING INSTRUCTIONS

PREPARATION OF UNDERWATER HOUSING AND VIDEO CAMCORDER

Where possible, store and prepare the equipment at room temperature to prevent condensation on the lenses of the camcorder and housing. Carry out these preparations in a dry, dust and spray-free environment.

The following is to be used as a general guide only. Users should refer to the relevant instruction manual for full details on settings, care and use.

Housing

Check the inside of the housing for any dust or other particulate matter, and clean out using a lens cloth and blower brush if necessary. Check the inside of the lens and clean using blower brush, lens tissues and lens cleaning fluid if necessary.

Remove the O-ring from the housing, clean it with lens tissues and check for any cracks or scratches. If there is any damage to the O-ring, discard and replace with a new one. Apply a small amount of silicone grease (2-3 mm) between thumb and index finger and run the O-ring through several times to spread this evenly. **Ensure that you do not use too much grease as this could cause the seal to leak!** Remember that the grease is there to keep the O-ring supple and not to actually form a seal.

Clean out the O-ring groove with a cotton bud, and carefully replace the clean and greased O-ring back into the groove without twisting it. Ensure that there is no particulate matter sticking to the O-ring. The housing is now ready for the camcorder to be inserted.

Camera setup

Set the OPERATE switch to CAMERA
Set the STANDBY LEVER (front right) to MOVIE
Press MENU button
Use the small joy stick controller, on the left hand side of the camera, to move around the menu
Set movie mode to PRO SCAN
Set the PROGRAM SELECT switch to AUTO ("A" inside a square)

POST-DIVE PROCEDURE

After every dive immerse the housing in fresh water for about 10-15 minutes. Occasionally operate the external controls to ensure they are well rinsed.

Wipe the housing with a clean, dry towel and leave in a clean, dry, airy and salt-free environment to dry completely.

Wipe carefully around the rear seal of the housing before opening so that no water gets onto the camcorder. Open the housing and remove the camera. **Do not open the housing where salt spray is present.**

Rewind the tape using either the controls on the back of the camcorder or the remote commander. Connect the camcorder to the TV monitor (refer to camcorder instruction manual) and view the footage. Transcribe the system settings and time code information onto the main Video Transect Data Sheet. Label the tape clearly (using a permanent marker pen) with the designated tape number, the site number and the date of recording as described below.

APPENDIX IV: HABITAT DATA SHEETS

MARINE CONSERVATION BRANCH

HABITAT MAPPING DATA SHEET

SITE N^{O}.	SBMR	**LOCATION NAME**	
LAT	……..…..°……..’S	**LONG**	……..…..°……..’E
DGPS/GPS		**DATUM**	
DEPTH (M)		**TIDAL RANGE**	
DATE		**TIME**	
RECORDER		**OBSERVAT^{n} METHOD**	
MPRSWG	SBA, HP0	**IMCRA BIOREGION**	SBY
SUBSTRATE TYPE		**RELIEF**	
VIDEO TAPE N^{O}	MMS/SBY/SBA,HPO/….#……-……/2002 (MCB function) (IMCRA region) (MPRSWG) (DD or HH camera) (number) (MM/YYYY)		
VISUALLY DOMINANT ORGANISM			
DESCRIPTION……			
……			
……			
……			
……			
……			
……			
HABITAT TYPE			

SITE N^{O}.	SBMR	**LOCATION NAME**	
LAT	……..…..°……..’S	**LONG**	……..…..°……..’E
DGPS/GPS		**DATUM**	
DEPTH (M)		**TIDAL RANGE**	
DATE		**TIME**	
RECORDER		**OBSERVAT^{n} METHOD**	
MPRSWG	SBMP, HP0	**IMCRA BIOREGION**	SBY
SUBSTRATE TYPE		**RELIEF**	
VIDEO TAPE N^{O}	MMS/SBY/SBA,HPO/….#……-……/2002 (MCB function) (IMCRA region) (MPRSWG) (DD or HH camera) (number) (MM/YYYY)		
VISUALLY DOMINANT ORGANISM			
DESCRIPTION……			
……			
……			
……			
……			
……			
……			
HABITAT TYPE			

APPENDIX V: TIDE PREDICTIONS FOR DENHAM AND MONKEY MIA

The following times and heights of high and low waters at Denham and Monkey Mia, Western Australia were obtained from the Department for Planning and Infrastructure's web site:

www.coastaldata.transport.wa.gov.au/tides/predictions

DENHAM	MONKEY MIA
Monday 18th Mar 2002	**Monday 18th Mar 2002**
1.05m @ 3:07 am	1.96m @ 3:20 am
0.68m @ 8:46 am	0.99m @ 9:07 am
1.32m @ 3:26 pm	2.14m @ 3:18 pm
0.64m @ 10:51 pm	0.91m @ 9:47 pm
Tuesday 19th Mar 2002	**Tuesday 19th Mar 2002**
1.00m @ 3:44 am	1.91m @ 3:50 am
0.74m @ 8:53 am	1.07m @ 9:27 am
1.37m @ 3:45 pm	2.16m @ 3:38 pm
0.62m @ 11:35 pm	0.90m @ 10:23 pm
Wednesday 20th Mar 2002	**Wednesday 20th Mar 2002**
0.94m @ 4:26 am	1.83m @ 4:23 am
0.79m @ 8:49 am	1.15m @ 9:50 am
1.41m @ 4:05 pm	2.17m @ 4:00 pm
	0.91m @ 11:00 pm
Thursday 21st Mar 2002	**Thursday 21st Mar 2002**
0.60m @ 12:24 am	1.73m @ 5:02 am
0.88m @ 5:18 am	1.23m @ 10:10 am
0.82m @ 8:40 am	2.16m @ 4:27 pm
1.45m @ 4:31 pm	0.95m @ 11:45 pm
Friday 22nd Mar 2002	**Friday 22nd Mar 2002**
First Quarter	First Quarter
0.58m @ 1:19 am	1.60m @ 5:55 am
0.83m @ 6:48 am	1.31m @ 10:32 am
0.83m @ 7:43 am	2.13m @ 5:08 pm
1.48m @ 5:08 pm	
Saturday 23rd Mar 2002	**Saturday 23rd Mar 2002**
0.57m @ 2:30 am	0.99m @ 12:45 am
1.48m @ 5:56 pm	1.49m @ 7:15 am
	1.39m @ 10:53 am
	2.06m @ 6:05 pm

DENHAM	**MONKEY MIA**
Sunday 24th Mar 2002 0.55m @ 3:58 am 1.46m @ 6:58 pm	**Sunday 24th Mar 2002** 1.02m @ 2:17 am 2.00m @ 7:28 pm
Monday 25th Mar 2002 0.52m @ 5:12 am 1.42m @ 8:18 pm	**Monday 25th Mar 2002** 0.96m @ 4:12 am 1.58m @ 11:38 am 1.53m @ 2:48 pm 1.98m @ 9:12 pm
Tuesday 26th Mar 2002 0.50m @ 6:06 am 1.38m @ 9:58 pm	**Tuesday 26th Mar 2002** 0.87m @ 5:15 am 1.71m @ 12:02 pm 1.40m @ 4:50 pm 2.02m @ 10:50 pm
Wednesday 27th Mar 2002 0.52m @ 6:48 am 1.12m @ 12:59 pm 0.98m @ 5:20 pm 1.35m @ 11:22 pm	**Wednesday 27th Mar 2002** 0.80m @ 6:02 am 1.86m @ 12:32 pm 1.22m @ 5:55 pm
Thursday 28th Mar 2002 0.56m @ 7:21 am 1.22m @ 1:10 pm 0.86m @ 6:45 pm	**Thursday 28th Mar 2002** 2.09m @ 12:05 am 0.78m @ 6:43 am 2.02m @ 1:03 pm 1.05m @ 6:47 pm
Friday 29th Mar 2002 Full Moon 1.31m @ 12:29 am 0.63m @ 7:44 am 1.32m @ 1:36 pm 0.74m @ 8:08 pm	**Friday 29th Mar 2002** Full Moon 2.14m @ 1:00 am 0.79m @ 7:18 am 2.17m @ 1:35 pm 0.90m @ 7:39 pm

APPENDIX VI: MEDIA RELEASE

Shark Bay Habitat Survey

A team of four Department of Conservation and Land Management staff will undertake a marine habitat survey within Shark Bay Marine Park and Hamelin Pool Marine Nature Reserve later this month.

The Department's Marine Conservation Branch in collaboration with the Shark Bay District is co-ordinating the survey, which is being carried out to make improvements to the existing Shark Bay marine reserves habitat map that is being developed by the Department.

The team will be lead by Marine Ecologist, Kevin Bancroft, who said that ground-truthing data would be gathered from areas where the current map was lacking information or needed verification.

"The current map contains very little or no information on ephemeral seagrasses, mangals (mangrove areas), coral reef communities, stromatolites, subtidal reef platforms, beaches, rocky shores and intertidal reefs," Mr Bancroft said.

"Our data collection during this survey will be concentrated mainly in the deeper waters of the Shark Bay marine reserves".

"The habitat data we collect will be included into the Department's Habitats Database, Shark Bay marine reserves marine ecological communities map and the Shark Bay Dugong Tracking Project".

"Video footage and still photographs of the marine and coastal habitats of Shark Bay will also be collected for educational purposes."

The habitat data will be collected using underwater video cameras lowered from the side of a boat and visually by using a glass bottom bucket or snorkelling.

Mr Bancroft said that the data would be important for the long-term management of the marine reserves and its wildlife such as dugongs.

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