

FIELD PROGRAM REPORT

Biological classification of marine benthic habitats in waters of proposed marine parks and reserves in the Pilbara region

(including Great Sandy Island Nature Reserve, Cowrie Beach and Spit Point to Cape Keraudren including Bedout, North Turtle and Little Turtle islands)

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EXECUTIVE SUMMARY

The Department of Environment and Conservation (DEC) is coordinating a field survey of the major marine benthic habitats in several study areas in the Pilbara region to contribute to the development of habitat maps in these areas. The field program is being conducted as part of the broader project to expand the marine parks and reserves system in Pilbara and Eighty Mile Beach (PEMB) regions, which is being coordinated by the Marine Policy and Planning Branch (MPPB) in liaison with the Pilbara Region and West Kimberley District of DEC.

The primary objective of the field survey is to verify the marine benthic habitats at pre-selected sites in several study areas to contribute to the development of a marine benthic habitat map in the area. A secondary objective is to opportunistically collate video footage and still photographs of the ecological and socio-economic values of the study areas for use in educational material.

This field program report outlines the objectives, methods, project management and safety requirements of the field survey. The survey is being coordinated by the MPPB with in-kind support provided by DEC's Marine Science Program.

This report may be cited as:

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CONTENTS

Executive Summary	i
Contents.....	ii
List of figures.....	ii
1 Introduction	1
1.1 Background	1
1.2 Objectives.....	2
2 Methods	2
2.1 Study areas	2
2.2 Site selection	2
2.3 Field methodology	7
2.3.1 Marine benthic communities and species.....	7
3 Project Management.....	9
3.1 Survey team	9
3.2 Field itinerary	10
3.3 Communications and emergency contacts.....	11
3.4 Safety	12
3.5 Budget	12
3.6 Equipment list.....	14
4 Data Management	15
4.1 Field program report.....	15
4.2 Data, video and photography	15
5 References.....	15
Appendix I: Pre-selected Sampling Sites	16
Appendix II: Habitat Data Sheets	32
Appendix III: Instructions for the Towed Video Unit	34
Appendix IV: Instructions for the Drop-down Video Unit	35
Appendix V: Habitat Classification Scheme	36
Appendix VI: Job Safety Analysis	39
Appendix VII: Snorkel Plan	45

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LIST OF FIGURES

FIGURE 1: STUDY AREAS FOR THE FIELD SURVEY.....	3
FIGURE 2: PRE-SELECTED SURVEY SITES IN THE GREAT SANDY ISLAND NATURE RESERVE	4
FIGURE 3: PRE-SELECTED SURVEY SITES AT COWRIE BEACH	5
FIGURE 4: PRE-SELECTED SURVEY SITES AT DE GREY (INCLUDING OFFSHORE ISLANDS)	6

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1 INTRODUCTION

This field program report outlines the objectives, methods, project management and safety requirements of a field survey to be undertaken in the Pilbara region from 2-12 and 23-31 October 2008. The field program is being coordinated by the Marine Policy and Planning Branch (MPPB) of the Department of Environment and Conservation (DEC) in coordination with Marine Science Program and in liaison with the Pilbara Region.

The field program is being conducted as part of the broader project to expand the marine parks and reserves system in Pilbara and Eighty Mile Beach (PEMB) regions, which is being coordinated by MPPB in liaison with the Pilbara Region and West Kimberley District of DEC. The data obtained during the field program will be used to develop a benthic habitat map for use in planning proposed marine parks and reserves in the region.

The primary objective of the field survey is to verify the marine benthic habitats at pre-selected sites in several study areas to contribute to the development of a marine benthic habitat map in the area. A secondary objective is to opportunistically collate video footage and still photographs of the ecological and socio-economic values of the study areas for use in educational material.

1.1 BACKGROUND

On 12 December 2006, the WA Government announced its commitment to the expansion of the terrestrial and marine reserves system in the PEMB regions, subject to established planning and approvals processes under the *Conservation and Land Management Act 1984* (CALM Act). These new reserves are intended to improve protection for the marine biodiversity and provide additional protection for marine turtles (in particular flatback turtles) to the maximum extent possible. This Government decision was part of the consideration of environmental mitigation and offset measures associated with the proposed Gorgon Gas Development on Barrow Island Nature Reserve.

DEC has undertaken a rapid resource assessment of the ecological and socio-economic values in the region including the collation of as much habitat data as possible for the study areas. This included obtaining the broad scale ecosystem mapping data which resulted from the North West Joint Environmental Management Study (Lyne *et. al.*, 2006), as well as existing ground truth data from various sources. In addition, DEC undertook an aerial survey over the study area at Great Sandy Island Nature Reserve in December 2007 which provided valuable 'ground truth' photographs of the islands and shallow reef systems of the study area. Data has also been retrieved for Eighty Mile Beach from the 'Long Mud Study' (Piersma *et. al.*, 2005).

Knowledge of the distribution of benthic marine habitats in some areas does not exist at a level that adequately supports management zoning. As such, DEC is proposing to collect habitat ground truth data at pre-selected sites to contribute to the development of an appropriate habitat map that will be one of the key data layers for use in the marine planning process.

1.2 OBJECTIVES

The objectives (in order of priority) of the field survey are to:

1. biologically classify the marine benthic habitat at pre-selected sites to contribute to the development of a broad scale habitat map of the study area; and
2. opportunistically collect video and still photographs of the major ecological and socio-economic (where appropriate) values of the study area for educational purposes.

2 METHODS

2.1 STUDY AREAS

There are three study areas identified for this field survey (Figures 1-4):

- waters of the Great Sandy Island Nature Reserve (Cane River to Fortescue River);
- State waters of Cowrie Beach (Cape Thouin to Ronsard Island)
- State waters of the De Grey River mouth (Spit Point to Cape Keraudren and including the offshore islands, Bedout, North Turtle and Little Turtle islands).

Due to availability of a vessel and the large distances between survey areas, the field program will be split into two parts. The first part will be undertaken from 2-12 October which will focus on the study areas at Cowrie Beach and Spit Point to Cape Keraudren (including Bedout, North Turtle and Little Turtle islands), while the second part will be undertaken from 23-31 October and will focus on the Great Sandy Island Nature Reserve study area.

2.2 SITE SELECTION

Prior to identifying sites, DEC undertook a project to create 'amalgamated' Landsat imagery using 15 years of Landsat images of the study areas and identifying persistent features. This imagery allowed sites to be located in areas that overlapped persistent benthic features.

Sampling sites were pre-selected by identifying gaps in existing data and identifying habitat changes from Landsat imagery, aerial photographs, orthophotographs and google earth (where available). A total of 788 sites were selected within and outside of these features. However, field conditions (weather, tides etc) may require alternative sites being selected and other additional sites may also be opportunistically selected when obvious transitions between ecological communities are observed. More information regarding the sampling sites is detailed in Appendix I.

Sample sites were placed a minimum distance of 50m where possible from each feature boundary to allow for errors in mapping. High water turbidity in some nearshore waters as well as deep water prevented the identification of benthic features, as such pre-selected sites have been placed randomly in these areas to ensure adequate coverage.

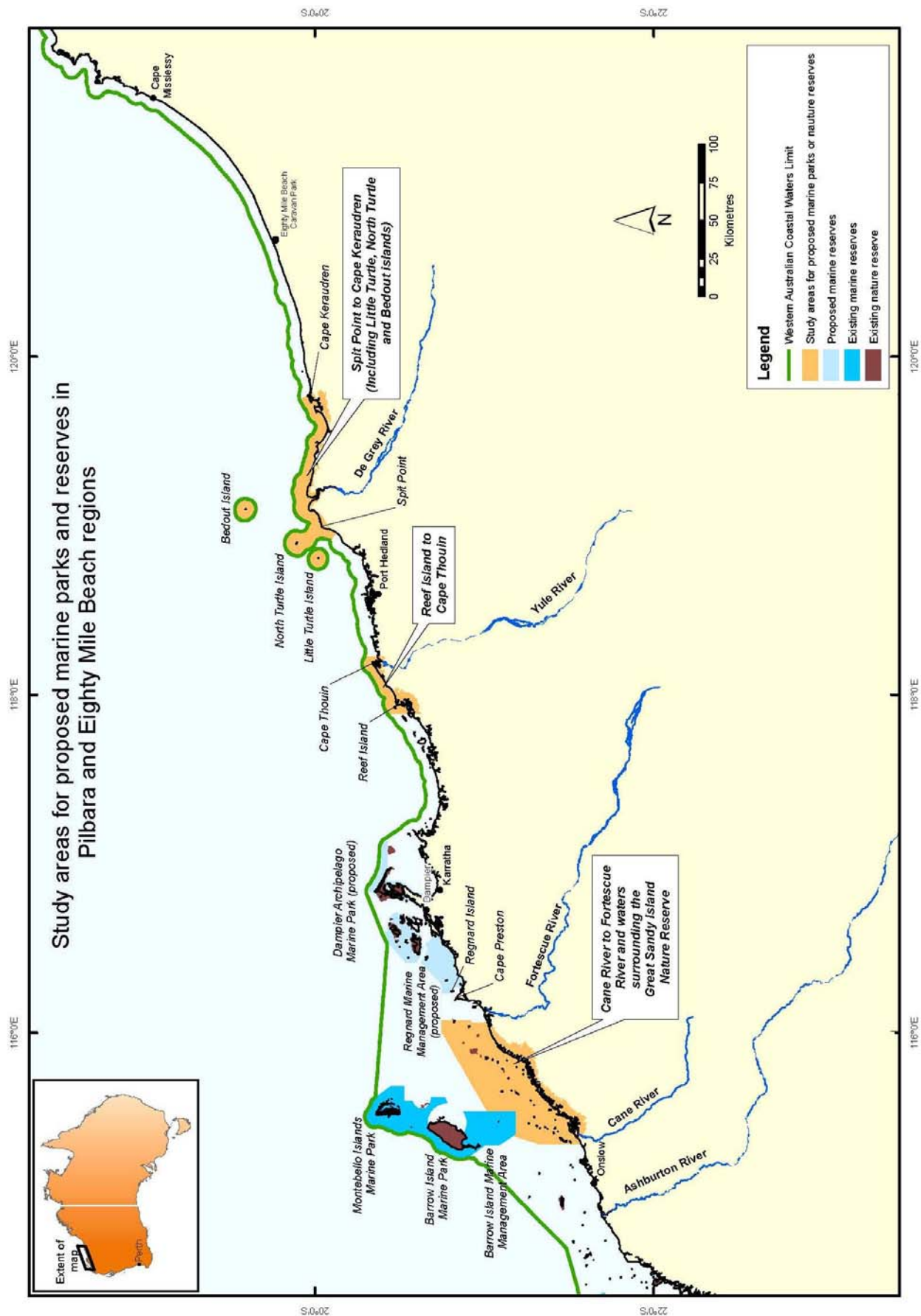


Figure 1: Study areas for the field survey

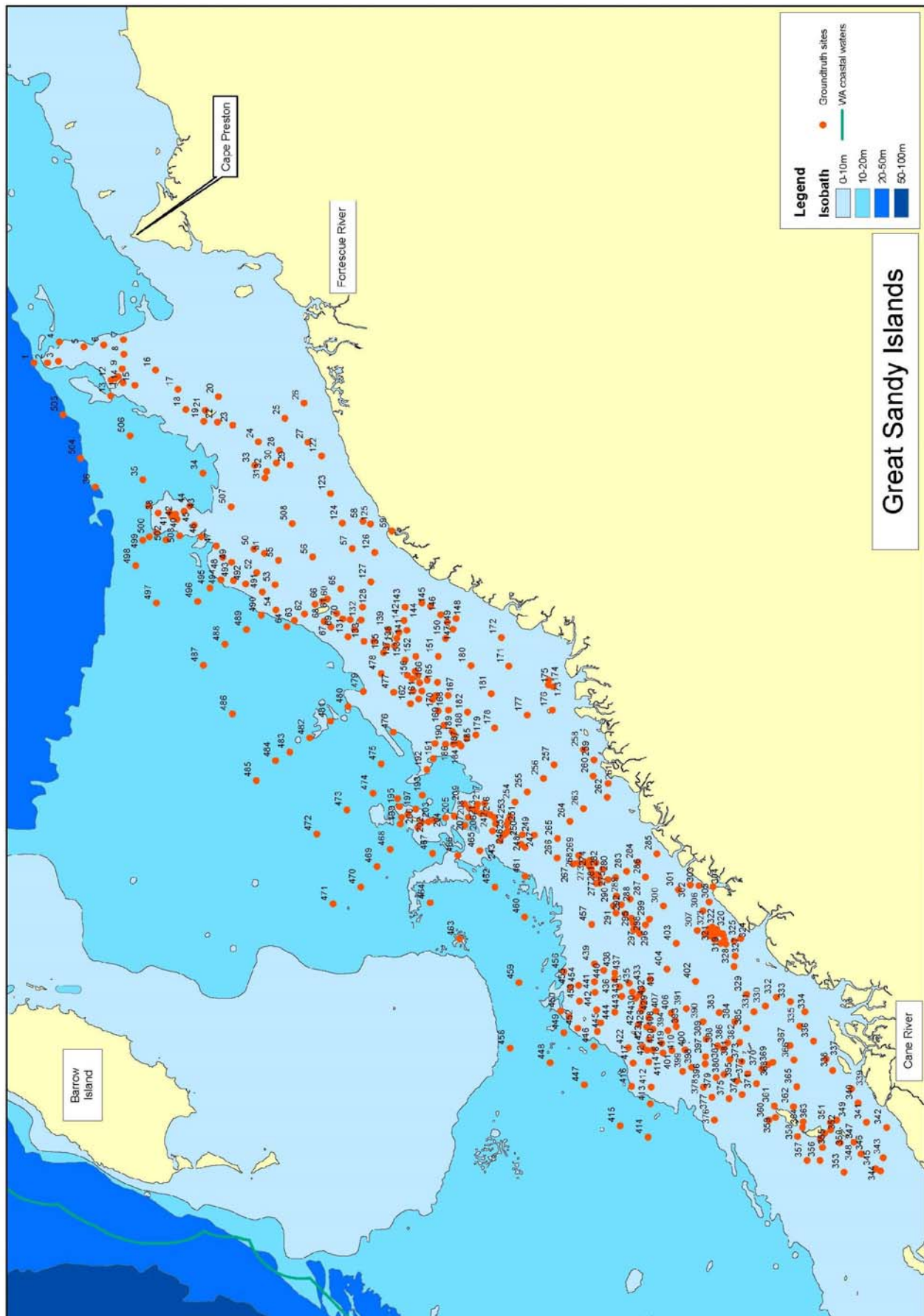


Figure 2: Pre-selected survey sites in the Great Sandy Island Nature Reserve

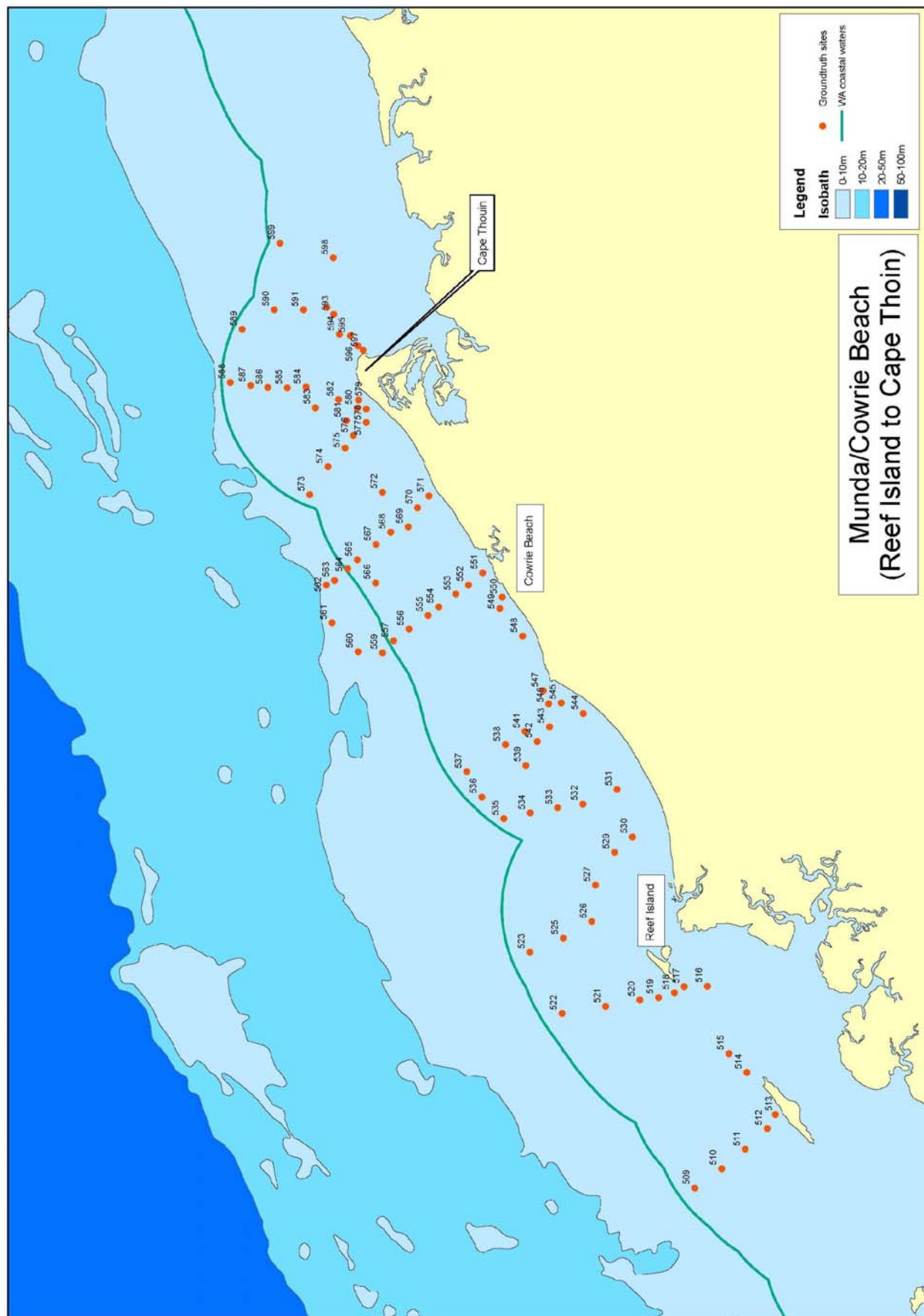


Figure 3: Pre-selected survey sites at Cowrie Beach

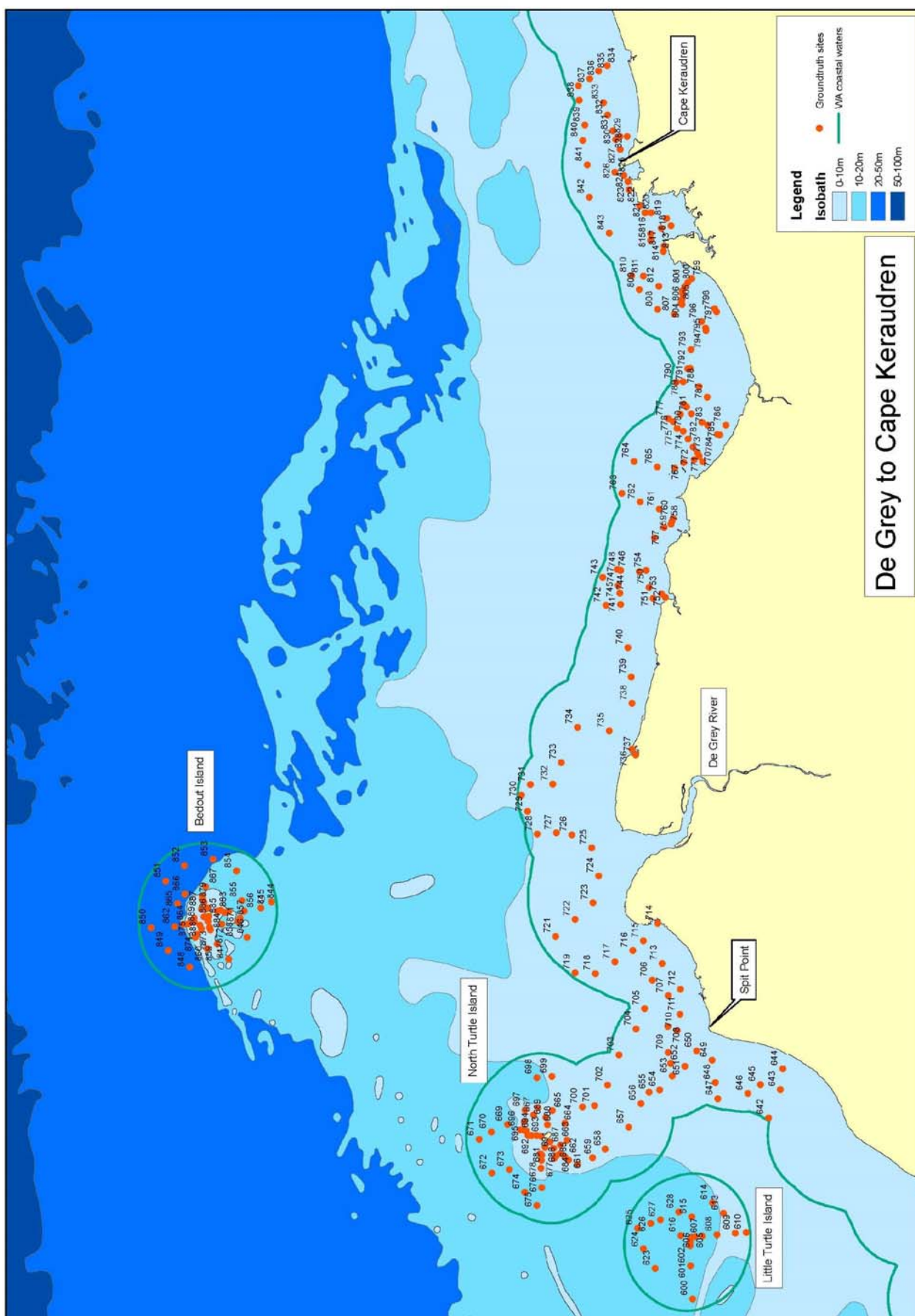


Figure 4: Pre-selected survey sites at De Grey (including offshore islands)

2.3 FIELD METHODOLOGY

Two field teams will be used to ensure maximum coverage of sites during the survey time. Each team will comprise a skipper responsible for maneuvering the vessel, a marine ecologist responsible for recording all habitat information and a spatial information officer who will be responsible for navigation, operating the GPS and video unit. One team will work from the tender and the other team will work from the Walcott.

At each site, a visual observation of the marine biological community will be made using either a bathyscope placed over the side of the vessel, drop-down video camera, towed video camera or direct observations by snorkeling using a hand-held underwater video camera. The bathyscope will be used at sites with less than 5m depth or at sites with greater than 5m depth with good water visibility (where possible video footage will be taken through the bathyscope or over the side of the vessel). The drop-down video camera will be used primarily at sites with depths greater than 5m or at sites where the water visibility is poor (lowered over the side of the vessel to record a minimum of 30 seconds of video footage of the seabed). The towed video camera will be used primarily at sites where it has been pre-determined that a transition in habitat should be recorded. The towed video camera will also be used as a drop-down camera. At shallow water sites of less than 3m depth, in-water observations will be made by snorkelers using a Sony digital camera in an underwater housing and towing a short-tethered float with a Garmin GPS X76S recording the track (Datum WGS 84). The digital imagery will be geo-referenced to the GPS route using RoboGEO version 5.3.7 software (Pretek Inc).

At each site the zone, relief, substrate and the visually dominant flora and fauna (where appropriate an estimate of sparse, medium and dense cover) will be recorded (see Section 2.3.1) on hard copy waterproof habitat forms (Appendix II). The site number, date, time, water depth and GPS coordinates will also be recorded. The GPS coordinates will be recorded at the end of the camera deployment or in the case of the towed video or strong currents at the beginning and end of the deployment. Operating instructions for the towed and drop-down video cameras are at Appendix III and IV.

2.3.1 Marine benthic communities and species

The major benthic communities and species will be recorded according to the following hierarchy:

1. **Zone:**
Reef slope, reef front, reef flat, lagoon, back reef, channel
2. **Substrate type:**
Silt/mud
Sand
Course sand/gravel
Rubble
Coral rubble (old dead hard coral)
Reef
3. **Relief:**

Flat (no relief)
Ripples (<20cm)
Mega ripples (>20cm)
Low relief (structure <1m)
High relief (structure >1m)

4. **Biological community & species:**

Mangrove (*Rhizophora*, *Avicinnia*, *Ceriops*, *Aegiceris*, *Buigiera*, *Osbornia*)
Seagrass (*Cymodocea*, *Syringodium*, *Halophila*, *Thalassia*, *Thalassodendron*,
Enhalus, *Halodule*)
Macroalgae (coralline, turf, fleshy) (Phaeophyta: *Sargassum*, *Padina*,
Dictyopteris, *Turbinaria*) (Chlorophyta: *Halimeda*, *Codium*) (Rhodophyta:
Laurencia, *Gracilaria*)
Sponges/filter feeders (porifera, sea whips, gorgonians)
Live hard coral (Acroporidae, Pocilloporidae, Dendrophyllidae, Faviidae,
Poritidae, Fungiidae and mixed corals)
Live soft coral (Alcyoniidae, Nephtheidae)
Dead coral

5. **Other species and notes:**

Fish
Molluscs
Crustaceans
Echinoderms
Burrowing invertebrates
Drupella
Crown-of-thorns
Bleached coral

Relative coverage for each biological community will be recorded as bare (0-10%), sparse (10-40%), medium (40-70%) and dense (>70%) and the 'visually dominant organism' will also be recorded to assist with determining habitat type. No quantitative assessment will be made against presence/absence, density or abundance.

The habitat classification scheme that will be used to determine broad habitat types from the information collected during the survey for mapping is at Appendix V.

3 PROJECT MANAGEMENT

3.1 SURVEY TEAM

Due to availability of a vessel and the large distances between survey areas, the field program will be split into two parts:

- Part 1 from 2 to 12 October will commence from Dampier and will focus on sites at Cowrie Beach and the coast from Spit Point to Cape Keraudren (including Bedout, North Turtle and Little Turtle islands);
- Part 2 from 23 to 31 October will commence from Dampier and will focus on sites within the Great Sandy Islands Nature Reserve study area.

The survey team for each part, their roles and contact details are outlined in Table 1.

Table 1: Names, roles and contact details for the survey team

Personnel	Role whilst in field	Contact details
PART 1: 2 to 12 October 2008		
DEC		
Ray Lawrie	Team Leader. GPS & camera operator (Category D diver for snorkel purposes only)– team 1	Ph: 93360109 Mob: 0438 008 851
Leanne Thompson	Marine ecologist (Category B diver for snorkel purposes only) – team 1	Ph: 93360107
Kevin Bancroft	Marine ecologist (Category B diver for snorkel purposes only) – team 2	Ph: 9219792 Mob: 0429360102
Ewan Buckley	GPS & camera operator (Category D diver for snorkel purposes only)– team 2	Ph: 93360110
DoF		
Andy Passmore	Senior Fisheries and Marine Officer Master of Walcott	Ph: 0419049379 Vessel Sat ph: 0011 881 621 465 125 Vessel fax: 0015 872 600 352 370
N/A	Fisheries & Marine Officer Skipper/Coxswain – team 1	Via Andy Passmore
N/A	Fisheries & Marine Officer Skipper/Coxswain – team 2	Via Andy Passmore
PART 2: 23 to 31 October 2008		
DEC		
Ray Lawrie	Team Leader GPS & camera operator (Category D diver for snorkel purposes only)– team 1	As above
Judy Davidson	Marine ecologist (Category C diver for snorkel purposes only) – team 1	Ph: 93360118
Leanne Thompson	Marine ecologist (Category B diver for snorkel purposes only) – team 2	As above
Ewan Buckley	GPS & camera operator(Category D diver for snorkel purposes only) – team 2	As above
DoF		
Andy Passmore	Senior Fisheries and Marine Officer Master of Walcott	As above
N/A	Fisheries & Marine Officer Skipper/Coxswain – team 1	Via Andy Passmore
N/A	Fisheries & Marine Officer Skipper/Coxswain – team 2	Via Andy Passmore

3.2 FIELD ITINERARY

It may be difficult to maintain planned activities during the field survey due to the reliance on sea and weather sea conditions. The Master of the Walcott and the Team Leader will determine the daily survey activities. Table 2 outlines the planned itinerary.

Table 2: Planned itinerary for the field survey

Date	Activity
PART 1: 2 to 12 October	
Thursday, 02/10/08	Fly Perth to Karratha (7:50am-9:50am) Pick up gear from DEC office and load the Walcott. Depart Dampier in early afternoon.
Friday, 03/10/08	Survey sites at Cowrie Beach
Saturday, 04/10/08	Survey sites at Cowrie Beach Steam to Bedout Island
Sunday, 05/10/08	Survey sites at Bedout Steam to North Turtle Island
Monday, 06/10/08	Survey sites at North Turtle Steam to Little Turtle Island
Tuesday, 07/10/08	Survey sites at Little Turtle Island
Wednesday, 08/10/08	Steam to De Grey Survey sites at De Grey
Thursday, 09/10/08	Survey Sites at De Grey
Friday, 10/10/08	Survey sites at Cape Keraudren
Saturday, 11/10/08	Survey sites at Cape Keraudren
Sunday, 12/10/08	Steam to Dampier arrive by noon Clean gear and vessels Drop equipment at DEC office Fly Karratha to Perth (6:30pm-8:30pm)
PART 2: 23 to 31 October	
Wednesday, 22/10/08	Fly Perth to Karratha (10:45am-12:45pm) Pick up gear from DEC office. Board vessel.
Thursday, 23/10/08	Depart Dampier and steam to first area Survey sites at Great Sandy Island Nature Reserve
Friday, 24/10/08	Survey sites at Great Sandy Island Nature Reserve
Saturday, 25/10/08	Survey sites at Great Sandy Island Nature Reserve
Sunday 26/10/08	Survey sites at Great Sandy Island Nature Reserve
Monday, 27/10/08	Survey sites at Great Sandy Island Nature Reserve
Tuesday, 28/10/08	Survey sites at Great Sandy Island Nature Reserve
Wednesday, 29/10/08	Survey sites at Great Sandy Island Nature Reserve
Thursday, 30/10/08	Survey sites at Great Sandy Island Nature Reserve Steam back to Dampier (arrive by noon) Clean gear and vessels.
Friday, 31/10/08	Drop equipment at transport depo or DEC office Fly Karratha to Perth (9:30am-11:30am)

3.3 COMMUNICATIONS AND EMERGENCY CONTACTS

Communication with the survey team should be firstly via the Team Leader's mobile phone 0438 008 851. If out of range the team can be contacted on the vessel's satellite phone 0011 881 621 465 125 or fax machine 0015 872 600 352 370.

Each tender vessel will be equipped with a marine VHF radio and the team will log calls with the mother vessel at agreed times each day.

A list of important phone numbers is listed below.

DEC offices

Pilbara Regional Office

Ph: 91822000
Lot 3 Anderson Rd.
Karratha Industrial Estate
Karratha WA 6714

MPPB

Ph: 93360100
Suite 3, Level 3, Queensgate Building
10 William St.
Fremantle WA 6160

Marine Science Program

Ph: 93340140
17 Dick Perry Ave
Technology Park, Western Precinct
Kensington WA 6151

DoF office

Karratha District Office

Ph: 91444337 or After hr: 0418937214
Unit1/17, 19 Crane Circle
Karratha WA 6714

Volunteer Sea Rescue Groups

Port Walcott

Ph: 91871803
9 Mulga Way
Wickham WA 6720

West Pilbara

Ph: 91831327
The Esplanade
Dampier WA 6713

Port Hedland

Ph: 0407476096
10 McKay St.
Port Hedland WA 6721

Local hospitals

Nickol Bay (Karratha)

Ph: 91432333
Millstream Rd.
Karratha WA 6714

Onslow

Ph: 91843211
Second Ave.
Onslow WA 6710

Port Hedland Ph: 91851666
 Kingsmill St.
 Port Hedland WA 6721

Roebourne Ph: 91820200
 Hampton St.
 Roebourne WA 6718

Wickham Ph: 91873200
 Mulga Way
 Wickham WA 6720

Royal Flying Doctor Service

Ph: 1800625800

3.4 SAFETY

Field operations shall be carried out in accordance with departmental procedures and protocols. Overall responsibility of field procedures during this survey and the personal safety of all team members rests with the Team Leader under direction of the Principal Marine Planner and Branch Manager. A Job Safety Analysis has been prepared in consultation with all team members (Appendix VI)

Alterations to survey procedures based on safety aspects related to weather conditions and sea state are the responsibility of the Team Leader in consultation with the Master of the Walcott and boat Skippers.

All boating operations shall be carried out in accordance with Department for Planning and Infrastructure regulations and also conform to DEC's Draft Departmental Boating Policy (CALM, 2002). All safety aspects relating to navigation and sea conditions are the responsibility of the designated Skippers of the vessels.

All snorkeling activity shall be carried out in accordance with DEC's Diving Code of Practice (CALM, 2005). A snorkel plan has been submitted and approved by the A/Departmental Dive Officer (Appendix VII). All safety aspects relating to sea conditions are the responsibility of the designated Skippers of the vessels.

3.5 BUDGET

This field program is funded by the project to expand the marine parks and reserves system in the Pilbara and Eighty Mile Beach region which was commenced in July 2007, with support in kind being provided by DEC's Marine Science Program. The budget breakdown is outlined in Table 3.

Table 3: Operational budget breakdown for the field program

Item	Description	Cost (\$)
Travel MPPB/MSP staff		
Airfares	4 people, 2 return flights each @ ~\$750	\$6,000
Travel Broome staff		
	2 people from Broome to Karratha (4 trips)	
Accommodation	4 nights @ \$250pp (may not be needed)	\$2,000
Airfares	1 person, 4 flights (plus one extra) @ \$600	\$3,000
Food (additional)		
	(may not be necessary)	
Dinner Karratha	4 people, 4 meals each @ \$50	\$800
Vessel & fuel		
Vessel – fuel, DoF staff x 3	Walcott – 18 days @ \$5,320+GST /day	\$95,760
Food for DEC staff	Maximum \$34/day/pers for 18 days for 4 people	\$2,448
Fuel for Walcott tender	100L/day for 18 days @ ~\$1.85/L	\$3,330
Fuel for second vessel	100L/day for 8 days @ ~\$1.85/L	\$1,480
Underwater camera & GPS equipment		
Drop-down camera unit x2	Borrow from MSP	NA
Towed video unit x2	Borrow from MEB	NA
GPS x2	MPPB (need to purchase another one)	NA
Back-up GPS	Borrow from MEB	NA
Educational camera & video equipment		
Camera and accessories	MPPB	NA
Video and accessories	MPPB	NA
Maps/charts/aerials/film		
DigiGlobe		\$30,000
Aerial photos/prints/ink		\$1,000
Charts, habitat maps		NA
Safety/Communications		
Satellite phone x2	Borrow from Radio Communication Branch	NA
Other equipment		
Bathyscope, esky, clapper boards x2, clip boards x4		\$100
Consumables		
Stationary	Digital video tapes, batteries, fuses	\$800
Courier/extra baggage		\$800
Taxi fares	4 people x 2 fares @ \$30/fare	\$240
Total		\$147,758

3.6 EQUIPMENT LIST

Boating & navigational

GPS units x3

Computers

Laptops x2, case, charger, mouse, USB

Pre-established database for data entry

Drop down and towed video cameras

Drop down video unit x2

Towed video unit x2

Batteries and chargers

Crates for units in tenders x2

Other associated equipment and maintenance gear

Educational camera and video

Camera x2, underwater housing, case, charger, memory card

Video x2, underwater housing, case, charger, tapes

Maps/charts/field guide/forms

Pre-selected site maps (multiple scales)

Digiglobe

Depth charts

Habitat maps

Stack of habitat data forms on water proof paper

Field guides?

Clip boards x3

Clapper boards x3

Pens, pencils, erasers, string

Safety & electrical tool box

Satellite phone x2

First aid kit

Dive flag x2

Sun cream

Wet weather gear

Tool box with fuses

Torch x2

Esky, water cooler

Bathyscope

Miscellaneous

Ropes of various sizes

Duct tape

Cable ties

Extra dive weights

Tissue paper (for salt wipes)

Personal gear

Warm weather gear

Hat, sunglasses, bathers, towel

Snorkel gear

Personal clothes and toiletries

4 DATA MANAGEMENT

4.1 FIELD PROGRAM REPORT

Hard copies of this field program report will be held at DEC's MPPB and Karratha Regional Office. Digital copies will be located on the MPPB server and full backup tape.

4.2 DATA, VIDEO AND PHOTOGRAPHY

The habitat data on hard copy forms will be entered into Marine Science Program's habitat database and used by Marine Policy and Planning Branch to develop a more comprehensive habitat map for use in the marine parks and reserves planning processes. Hard copy forms will be filed on departmental files.

Video footage will be stored at Marine Science Program. Still photography will be stored at Marine Policy & Planning Branch server and backed up to CD.

5 REFERENCES

CALM (2005) CALM diving code of practice. Version 8. Department of Conservation and Land Management, Perth Western Australia.

CALM (2002) Safe marine operations in CALM. Draft Procedure Guideline Statement. Department of Conservation and Land Management.

Lyne, V., Fuller, M., Last, P., Butler, A., Martin, M. & Scott, R. (2006) Ecosystem characterization of Australia's North West Shelf. North West Shelf Joint Environmental Management Study Technical Report No.12. CSIRO and Department of Environment.

Piersma, T., Pearson, G.B., Hickey, R. and Lavaleye, M. (2005) The Long Mud: Benthos and shorebirds of the foreshore of Eighty-mile Beach, Western Australia. Report on the 'Anna Plains benthic invertebrate and bird mapping 1999'. Royal Netherlands Institute for Sea Research (NIOZ), Texel, Netherlands.

APPENDIX I: PRE-SELECTED SAMPLING SITES

ID	Reg.	Location	Lat_DMS	Long_DMS	Lat_DDM	Long_DDM
1	PIN	GSI	20° 44' 30.98" S	116° 5' 5.32" E	20° 44.516' S	116° 5.089' E
2	PIN	GSI	20° 45' 15.98" S	116° 5' 6.61" E	20° 45.266' S	116° 5.110' E
3	PIN	GSI	20° 45' 54.11" S	116° 5' 11.65" E	20° 45.902' S	116° 5.194' E
4	PIN	GSI	20° 45' 55.44" S	116° 6' 16.34" E	20° 45.924' S	116° 6.272' E
5	PIN	GSI	20° 47' 18.96" S	116° 5' 59.53" E	20° 47.316' S	116° 5.992' E
6	PIN	GSI	20° 48' 27.76" S	116° 6' 6.48" E	20° 48.463' S	116° 6.108' E
7	PIN	GSI	20° 49' 34.10" S	116° 6' 25.06" E	20° 49.568' S	116° 6.418' E
8	PIN	GSI	20° 49' 35.33" S	116° 5' 34.51" E	20° 49.589' S	116° 5.575' E
9	PIN	GSI	20° 49' 30.29" S	116° 4' 45.26" E	20° 49.505' S	116° 4.754' E
10	PIN	GSI	20° 49' 15.60" S	116° 4' 19.09" E	20° 49.260' S	116° 4.318' E
11	PIN	GSI	20° 49' 8.08" S	116° 4' 12.11" E	20° 49.135' S	116° 4.202' E
12	PIN	GSI	20° 48' 53.06" S	116° 4' 6.74" E	20° 48.884' S	116° 4.112' E
13	PIN	GSI	20° 48' 51.91" S	116° 3' 13.18" E	20° 48.865' S	116° 3.220' E
14	PIN	GSI	20° 49' 33.35" S	116° 3' 57.67" E	20° 49.556' S	116° 3.961' E
15	PIN	GSI	20° 50' 13.45" S	116° 3' 49.50" E	20° 50.224' S	116° 3.825' E
16	PIN	GSI	20° 51' 24.05" S	116° 4' 39.94" E	20° 51.401' S	116° 4.666' E
17	PIN	GSI	20° 52' 40.40" S	116° 3' 34.96" E	20° 52.673' S	116° 3.583' E
18	PIN	GSI	20° 53' 7.15" S	116° 2' 25.80" E	20° 53.119' S	116° 2.430' E
19	PIN	GSI	20° 54' 7.45" S	116° 1' 45.88" E	20° 54.124' S	116° 1.765' E
20	PIN	GSI	20° 54' 57.46" S	116° 3' 10.01" E	20° 54.958' S	116° 3.167' E
21	PIN	GSI	20° 54' 13.07" S	116° 2' 23.06" E	20° 54.218' S	116° 2.384' E
22	PIN	GSI	20° 54' 54.90" S	116° 1' 43.18" E	20° 54.915' S	116° 1.720' E
23	PIN	GSI	20° 55' 47.24" S	116° 1' 33.31" E	20° 55.787' S	116° 1.555' E
24	PIN	GSI	20° 57' 13.75" S	116° 0' 36.97" E	20° 57.229' S	116° 0.616' E
25	PIN	GSI	20° 58' 44.54" S	116° 1' 57.11" E	20° 58.742' S	116° 1.952' E
26	PIN	GSI	20° 59' 49.63" S	116° 2' 48.08" E	20° 59.827' S	116° 2.801' E
27	PIN	GSI	21° 0' 3.49" S	116° 0' 35.68" E	21° 0.058' S	116° 0.595' E
28	PIN	GSI	20° 58' 26.65" S	116° 0' 7.88" E	20° 58.444' S	116° 0.131' E
29	PIN	GSI	20° 59' 2.22" S	115° 59' 17.74" E	20° 59.037' S	115° 59.296' E
30	PIN	GSI	20° 58' 14.70" S	115° 59' 24.65" E	20° 58.245' S	115° 59.411' E
31	PIN	GSI	20° 57' 35.78" S	115° 58' 33.53" E	20° 57.596' S	115° 58.559' E
32	PIN	GSI	20° 57' 41.44" S	115° 58' 54.77" E	20° 57.691' S	115° 58.913' E
33	PIN	GSI	20° 57' 1.58" S	115° 59' 15.61" E	20° 57.026' S	115° 59.260' E
34	PIN	GSI	20° 54' 4.93" S	115° 58' 49.66" E	20° 54.082' S	115° 58.828' E
35	PIN	GSI	20° 50' 41.35" S	115° 58' 27.66" E	20° 50.689' S	115° 58.461' E
36	PIN	GSI	20° 47' 58.09" S	115° 58' 1.92" E	20° 47.968' S	115° 58.032' E
37	PIN	GSI	20° 51' 0.22" S	115° 56' 58.70" E	20° 51.004' S	115° 56.978' E
38	PIN	GSI	20° 51' 32.72" S	115° 56' 32.57" E	20° 51.545' S	115° 56.543' E
39	PIN	GSI	20° 52' 10.92" S	115° 56' 34.62" E	20° 52.182' S	115° 56.577' E
40	PIN	GSI	20° 52' 32.45" S	115° 56' 29.54" E	20° 52.541' S	115° 56.492' E
41	PIN	GSI	20° 52' 20.10" S	115° 56' 21.44" E	20° 52.335' S	115° 56.357' E
42	PIN	GSI	20° 52' 37.74" S	115° 56' 12.70" E	20° 52.629' S	115° 56.212' E
43	PIN	GSI	20° 53' 1.39" S	115° 56' 37.97" E	20° 53.023' S	115° 56.633' E
44	PIN	GSI	20° 53' 20.40" S	115° 56' 56.69" E	20° 53.340' S	115° 56.945' E
45	PIN	GSI	20° 53' 35.81" S	115° 55' 51.38" E	20° 53.597' S	115° 55.856' E
46	PIN	GSI	20° 53' 59.82" S	115° 55' 12.29" E	20° 53.997' S	115° 55.205' E
47	PIN	GSI	20° 54' 51.08" S	115° 54' 40.86" E	20° 54.851' S	115° 54.681' E
48	PIN	GSI	20° 55' 12.65" S	115° 54' 2.16" E	20° 55.211' S	115° 54.036' E
49	PIN	GSI	20° 55' 42.31" S	115° 53' 44.84" E	20° 55.705' S	115° 53.747' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
50	PIN	GSI	20° 56' 59.42" S	115° 54' 31.82" E	20° 56.990' S	115° 54.530' E
51	PIN	GSI	20° 57' 35.06" S	115° 54' 15.70" E	20° 57.584' S	115° 54.262' E
52	PIN	GSI	20° 57' 8.42" S	115° 53' 9.96" E	20° 57.140' S	115° 53.166' E
53	PIN	GSI	20° 58' 11.28" S	115° 52' 28.31" E	20° 58.188' S	115° 52.472' E
54	PIN	GSI	20° 58' 14.27" S	115° 51' 2.66" E	20° 58.238' S	115° 51.044' E
55	PIN	GSI	20° 58' 22.33" S	115° 53' 51.32" E	20° 58.372' S	115° 53.855' E
56	PIN	GSI	21° 0' 18.29" S	115° 54' 2.81" E	21° 0.305' S	115° 54.047' E
57	PIN	GSI	21° 2' 33.72" S	115° 54' 32.00" E	21° 2.562' S	115° 54.533' E
58	PIN	GSI	21° 3' 10.04" S	115° 56' 5.32" E	21° 3.167' S	115° 56.089' E
59	PIN	GSI	21° 4' 48.14" S	115° 55' 31.37" E	21° 4.802' S	115° 55.523' E
60	PIN	GSI	21° 1' 9.62" S	115° 51' 40.39" E	21° 1.160' S	115° 51.673' E
61	PIN	GSI	21° 0' 27.65" S	115° 51' 22.54" E	21° 0.461' S	115° 51.376' E
62	PIN	GSI	20° 59' 51.07" S	115° 50' 49.42" E	20° 59.851' S	115° 50.824' E
63	PIN	GSI	20° 59' 15.94" S	115° 50' 25.80" E	20° 59.266' S	115° 50.430' E
64	PIN	GSI	20° 58' 51.13" S	115° 50' 5.46" E	20° 58.852' S	115° 50.091' E
65	PIN	GSI	21° 1' 54.73" S	115° 52' 15.49" E	21° 1.912' S	115° 52.258' E
66	PIN	GSI	21° 0' 52.38" S	115° 51' 32.87" E	21° 0.873' S	115° 51.548' E
67	PIN	GSI	21° 1' 21.83" S	115° 50' 4.78" E	21° 1.364' S	115° 50.080' E
68	PIN	GSI	21° 0' 56.84" S	115° 50' 23.10" E	21° 0.947' S	115° 50.385' E
69	PIN	GSI	21° 1' 40.51" S	115° 50' 50.46" E	21° 1.675' S	115° 50.841' E
70	PIN	GSI	21° 2' 2.36" S	115° 50' 32.64" E	21° 2.039' S	115° 50.544' E
122	PIN	GSI	21° 0' 49.28" S	115° 59' 48.34" E	21° 0.821' S	115° 59.806' E
123	PIN	GSI	21° 1' 20.10" S	115° 57' 39.78" E	21° 1.335' S	115° 57.663' E
124	PIN	GSI	21° 1' 59.88" S	115° 55' 58.51" E	21° 1.998' S	115° 55.975' E
125	PIN	GSI	21° 3' 36.14" S	115° 55' 55.49" E	21° 3.602' S	115° 55.925' E
126	PIN	GSI	21° 3' 49.97" S	115° 54' 18.58" E	21° 3.833' S	115° 54.310' E
127	PIN	GSI	21° 3' 37.58" S	115° 52' 38.42" E	21° 3.626' S	115° 52.640' E
128	PIN	GSI	21° 3' 7.60" S	115° 51' 12.02" E	21° 3.127' S	115° 51.200' E
129	PIN	GSI	21° 2' 26.16" S	115° 50' 28.50" E	21° 2.436' S	115° 50.475' E
130	PIN	GSI	21° 2' 41.60" S	115° 49' 56.03" E	21° 2.693' S	115° 49.934' E
131	PIN	GSI	21° 2' 19.86" S	115° 49' 31.15" E	21° 2.331' S	115° 49.519' E
132	PIN	GSI	21° 3' 4.36" S	115° 50' 28.21" E	21° 3.073' S	115° 50.470' E
133	PIN	GSI	21° 3' 13.64" S	115° 49' 15.10" E	21° 3.227' S	115° 49.252' E
134	PIN	GSI	21° 3' 47.95" S	115° 49' 15.85" E	21° 3.799' S	115° 49.264' E
135	PIN	GSI	21° 4' 20.03" S	115° 48' 36.97" E	21° 4.334' S	115° 48.616' E
136	PIN	GSI	21° 4' 31.94" S	115° 48' 58.79" E	21° 4.532' S	115° 48.980' E
137	PIN	GSI	21° 4' 58.40" S	115° 49' 0.70" E	21° 4.973' S	115° 49.012' E
138	PIN	GSI	21° 5' 4.45" S	115° 49' 24.64" E	21° 5.074' S	115° 49.411' E
139	PIN	GSI	21° 4' 37.24" S	115° 49' 56.17" E	21° 4.621' S	115° 49.936' E
140	PIN	GSI	21° 5' 14.39" S	115° 49' 46.49" E	21° 5.240' S	115° 49.775' E
141	PIN	GSI	21° 5' 39.91" S	115° 49' 52.57" E	21° 5.665' S	115° 49.876' E
142	PIN	GSI	21° 5' 30.34" S	115° 50' 26.05" E	21° 5.506' S	115° 50.434' E
143	PIN	GSI	21° 5' 34.58" S	115° 51' 11.95" E	21° 5.576' S	115° 51.199' E
144	PIN	GSI	21° 6' 30.53" S	115° 51' 26.14" E	21° 6.509' S	115° 51.436' E
145	PIN	GSI	21° 7' 0.80" S	115° 51' 15.48" E	21° 7.013' S	115° 51.258' E
146	PIN	GSI	21° 7' 35.90" S	115° 50' 45.96" E	21° 7.598' S	115° 50.766' E
147	PIN	GSI	21° 7' 58.26" S	115° 50' 20.72" E	21° 7.971' S	115° 50.345' E
148	PIN	GSI	21° 8' 28.72" S	115° 50' 33.00" E	21° 8.479' S	115° 50.550' E
149	PIN	GSI	21° 8' 17.70" S	115° 49' 57.58" E	21° 8.295' S	115° 49.960' E
150	PIN	GSI	21° 7' 52.00" S	115° 49' 24.38" E	21° 7.867' S	115° 49.406' E
151	PIN	GSI	21° 7' 27.08" S	115° 48' 24.01" E	21° 7.451' S	115° 48.400' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
152	PIN	GSI	21° 6' 10.66" S	115° 48' 24.62" E	21° 6.178' S	115° 48.410' E
153	PIN	GSI	21° 5' 34.30" S	115° 48' 11.34" E	21° 5.572' S	115° 48.189' E
154	PIN	GSI	21° 6' 7.34" S	115° 47' 32.42" E	21° 6.122' S	115° 47.540' E
155	PIN	GSI	21° 5' 41.78" S	115° 47' 20.11" E	21° 5.696' S	115° 47.335' E
156	PIN	GSI	21° 5' 57.37" S	115° 47' 7.44" E	21° 5.956' S	115° 47.124' E
157	PIN	GSI	21° 6' 18.18" S	115° 47' 19.18" E	21° 6.303' S	115° 47.320' E
158	PIN	GSI	21° 6' 22.90" S	115° 46' 53.44" E	21° 6.382' S	115° 46.891' E
159	PIN	GSI	21° 6' 30.64" S	115° 46' 26.36" E	21° 6.511' S	115° 46.439' E
160	PIN	GSI	21° 6' 1.33" S	115° 46' 25.61" E	21° 6.022' S	115° 46.427' E
161	PIN	GSI	21° 6' 19.44" S	115° 45' 57.82" E	21° 6.324' S	115° 45.964' E
162	PIN	GSI	21° 5' 51.54" S	115° 45' 42.77" E	21° 5.859' S	115° 45.713' E
163	PIN	GSI	21° 7' 6.74" S	115° 45' 57.10" E	21° 7.112' S	115° 45.952' E
164	PIN	GSI	21° 7' 18.26" S	115° 46' 11.32" E	21° 7.304' S	115° 46.189' E
165	PIN	GSI	21° 7' 24.28" S	115° 46' 54.66" E	21° 7.405' S	115° 46.911' E
166	PIN	GSI	21° 6' 48.92" S	115° 47' 2.76" E	21° 6.815' S	115° 47.046' E
167	PIN	GSI	21° 7' 59.38" S	115° 46' 10.99" E	21° 7.990' S	115° 46.183' E
168	PIN	GSI	21° 8' 1.28" S	115° 45' 21.20" E	21° 8.021' S	115° 45.353' E
169	PIN	GSI	21° 7' 45.73" S	115° 44' 29.44" E	21° 7.762' S	115° 44.491' E
170	PIN	GSI	21° 7' 26.00" S	115° 45' 18.18" E	21° 7.433' S	115° 45.303' E
171	PIN	GSI	21° 11' 27.02" S	115° 47' 50.14" E	21° 11.450' S	115° 47.836' E
172	PIN	GSI	21° 11' 2.22" S	115° 49' 28.70" E	21° 11.037' S	115° 49.478' E
173	PIN	GSI	21° 13' 43.86" S	115° 47' 3.84" E	21° 13.731' S	115° 47.064' E
174	PIN	GSI	21° 13' 41.56" S	115° 46' 45.91" E	21° 13.693' S	115° 46.765' E
175	PIN	GSI	21° 13' 58.91" S	115° 46' 41.74" E	21° 13.982' S	115° 46.696' E
176	PIN	GSI	21° 13' 56.68" S	115° 45' 20.70" E	21° 13.945' S	115° 45.345' E
177	PIN	GSI	21° 12' 30.28" S	115° 45' 4.07" E	21° 12.505' S	115° 45.068' E
178	PIN	GSI	21° 10' 39.18" S	115° 44' 19.28" E	21° 10.653' S	115° 44.321' E
179	PIN	GSI	21° 9' 35.53" S	115° 43' 56.10" E	21° 9.592' S	115° 43.935' E
180	PIN	GSI	21° 9' 18.25" S	115° 47' 51.76" E	21° 9.304' S	115° 47.863' E
181	PIN	GSI	21° 10' 27.05" S	115° 46' 16.28" E	21° 10.451' S	115° 46.271' E
182	PIN	GSI	21° 9' 6.77" S	115° 45' 13.28" E	21° 9.113' S	115° 45.221' E
183	PIN	GSI	21° 9' 3.92" S	115° 43' 43.64" E	21° 9.065' S	115° 43.727' E
184	PIN	GSI	21° 8' 45.28" S	115° 43' 17.76" E	21° 8.755' S	115° 43.296' E
185	PIN	GSI	21° 8' 35.59" S	115° 43' 26.51" E	21° 8.593' S	115° 43.442' E
186	PIN	GSI	21° 8' 18.20" S	115° 43' 23.77" E	21° 8.303' S	115° 43.396' E
187	PIN	GSI	21° 7' 52.14" S	115° 43' 23.99" E	21° 7.869' S	115° 43.400' E
188	PIN	GSI	21° 8' 14.78" S	115° 44' 7.94" E	21° 8.246' S	115° 44.132' E
189	PIN	GSI	21° 8' 18.92" S	115° 43' 58.40" E	21° 8.315' S	115° 43.973' E
190	PIN	GSI	21° 7' 15.24" S	115° 43' 25.97" E	21° 7.254' S	115° 43.433' E
191	PIN	GSI	21° 7' 10.67" S	115° 42' 35.17" E	21° 7.178' S	115° 42.586' E
192	PIN	GSI	21° 6' 47.84" S	115° 41' 57.95" E	21° 6.797' S	115° 41.966' E
193	PIN	GSI	21° 6' 32.47" S	115° 40' 30.36" E	21° 6.541' S	115° 40.506' E
194	PIN	GSI	21° 5' 7.98" S	115° 40' 19.92" E	21° 5.133' S	115° 40.332' E
195	PIN	GSI	21° 5' 14.57" S	115° 39' 51.37" E	21° 5.243' S	115° 39.856' E
196	PIN	GSI	21° 5' 43.22" S	115° 39' 26.53" E	21° 5.720' S	115° 39.442' E
197	PIN	GSI	21° 6' 10.62" S	115° 39' 43.63" E	21° 6.177' S	115° 39.727' E
198	PIN	GSI	21° 5' 22.16" S	115° 39' 15.55" E	21° 5.369' S	115° 39.259' E
199	PIN	GSI	21° 5' 17.23" S	115° 38' 51.58" E	21° 5.287' S	115° 38.860' E
200	PIN	GSI	21° 6' 17.82" S	115° 38' 41.17" E	21° 6.297' S	115° 38.686' E
201	PIN	GSI	21° 6' 29.84" S	115° 38' 58.92" E	21° 6.497' S	115° 38.982' E
202	PIN	GSI	21° 6' 52.92" S	115° 39' 0.22" E	21° 6.882' S	115° 39.004' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
203	PIN	GSI	21° 7' 13.22" S	115° 39' 3.74" E	21° 7.220' S	115° 39.062' E
204	PIN	GSI	21° 7' 51.89" S	115° 39' 14.26" E	21° 7.865' S	115° 39.238' E
205	PIN	GSI	21° 8' 20.94" S	115° 39' 20.20" E	21° 8.349' S	115° 39.337' E
206	PIN	GSI	21° 8' 57.30" S	115° 38' 48.44" E	21° 8.955' S	115° 38.807' E
207	PIN	GSI	21° 9' 10.01" S	115° 39' 16.42" E	21° 9.167' S	115° 39.274' E
208	PIN	GSI	21° 9' 12.92" S	115° 39' 45.43" E	21° 9.215' S	115° 39.757' E
209	PIN	GSI	21° 8' 55.64" S	115° 40' 1.27" E	21° 8.927' S	115° 40.021' E
210	PIN	GSI	21° 9' 39.82" S	115° 39' 59.94" E	21° 9.664' S	115° 39.999' E
211	PIN	GSI	21° 9' 36.61" S	115° 39' 47.59" E	21° 9.610' S	115° 39.793' E
212	PIN	GSI	21° 9' 30.28" S	115° 39' 39.06" E	21° 9.505' S	115° 39.651' E
213	PIN	GSI	21° 9' 51.19" S	115° 39' 27.94" E	21° 9.853' S	115° 39.466' E
214	PIN	GSI	21° 10' 4.58" S	115° 39' 29.74" E	21° 10.076' S	115° 39.496' E
215	PIN	GSI	21° 10' 11.71" S	115° 39' 27.76" E	21° 10.195' S	115° 39.463' E
216	PIN	GSI	21° 10' 24.17" S	115° 39' 24.30" E	21° 10.403' S	115° 39.405' E
217	PIN	GSI	21° 10' 5.74" S	115° 40' 2.57" E	21° 10.096' S	115° 40.043' E
240	PIN	GSI	21° 10' 37.24" S	115° 39' 15.30" E	21° 10.621' S	115° 39.255' E
241	PIN	GSI	21° 10' 42.49" S	115° 38' 54.10" E	21° 10.708' S	115° 38.902' E
242	PIN	GSI	21° 10' 31.91" S	115° 38' 29.18" E	21° 10.532' S	115° 38.486' E
243	PIN	GSI	21° 10' 58.69" S	115° 37' 54.30" E	21° 10.978' S	115° 37.905' E
244	PIN	GSI	21° 11' 8.77" S	115° 38' 13.92" E	21° 11.146' S	115° 38.232' E
245	PIN	GSI	21° 11' 15.14" S	115° 38' 20.62" E	21° 11.252' S	115° 38.344' E
246	PIN	GSI	21° 11' 24.22" S	115° 38' 27.74" E	21° 11.404' S	115° 38.462' E
247	PIN	GSI	21° 12' 9.43" S	115° 37' 43.07" E	21° 12.157' S	115° 37.718' E
248	PIN	GSI	21° 12' 22.90" S	115° 37' 32.84" E	21° 12.382' S	115° 37.547' E
249	PIN	GSI	21° 12' 53.89" S	115° 38' 14.39" E	21° 12.898' S	115° 38.240' E
250	PIN	GSI	21° 12' 13.32" S	115° 38' 15.76" E	21° 12.222' S	115° 38.263' E
251	PIN	GSI	21° 11' 22.16" S	115° 38' 51.79" E	21° 11.369' S	115° 38.863' E
252	PIN	GSI	21° 11' 26.34" S	115° 39' 5.22" E	21° 11.439' S	115° 39.087' E
253	PIN	GSI	21° 11' 31.85" S	115° 39' 17.68" E	21° 11.531' S	115° 39.295' E
254	PIN	GSI	21° 11' 47.58" S	115° 40' 7.10" E	21° 11.793' S	115° 40.118' E
255	PIN	GSI	21° 12' 29.99" S	115° 40' 42.42" E	21° 12.500' S	115° 40.707' E
256	PIN	GSI	21° 13' 25.61" S	115° 41' 27.24" E	21° 13.427' S	115° 41.454' E
257	PIN	GSI	21° 14' 2.51" S	115° 42' 14.98" E	21° 14.042' S	115° 42.250' E
258	PIN	GSI	21° 15' 42.37" S	115° 43' 5.81" E	21° 15.706' S	115° 43.097' E
259	PIN	GSI	21° 16' 16.97" S	115° 42' 31.93" E	21° 16.283' S	115° 42.532' E
260	PIN	GSI	21° 16' 15.67" S	115° 41' 34.80" E	21° 16.261' S	115° 41.580' E
261	PIN	GSI	21° 17' 5.64" S	115° 41' 10.79" E	21° 17.094' S	115° 41.180' E
262	PIN	GSI	21° 17' 2.72" S	115° 40' 23.63" E	21° 17.045' S	115° 40.394' E
263	PIN	GSI	21° 15' 42.52" S	115° 39' 44.46" E	21° 15.709' S	115° 39.741' E
264	PIN	GSI	21° 14' 56.26" S	115° 39' 2.27" E	21° 14.938' S	115° 39.038' E
265	PIN	GSI	21° 14' 13.27" S	115° 38' 2.80" E	21° 14.221' S	115° 38.047' E
266	PIN	GSI	21° 14' 11.04" S	115° 36' 55.73" E	21° 14.184' S	115° 36.929' E
267	PIN	GSI	21° 15' 7.02" S	115° 36' 35.28" E	21° 15.117' S	115° 36.588' E
268	PIN	GSI	21° 15' 21.46" S	115° 36' 38.45" E	21° 15.358' S	115° 36.641' E
269	PIN	GSI	21° 15' 25.42" S	115° 37' 4.04" E	21° 15.424' S	115° 37.067' E
270	PIN	GSI	21° 15' 44.10" S	115° 36' 41.18" E	21° 15.735' S	115° 36.686' E
271	PIN	GSI	21° 16' 2.35" S	115° 36' 47.95" E	21° 16.039' S	115° 36.799' E
272	PIN	GSI	21° 16' 23.92" S	115° 36' 40.43" E	21° 16.399' S	115° 36.674' E
273	PIN	GSI	21° 16' 0.48" S	115° 36' 28.94" E	21° 16.008' S	115° 36.482' E
274	PIN	GSI	21° 16' 8.29" S	115° 36' 18.25" E	21° 16.138' S	115° 36.304' E
275	PIN	GSI	21° 16' 14.30" S	115° 35' 58.06" E	21° 16.238' S	115° 35.968' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
276	PIN	GSI	21° 16' 24.71" S	115° 35' 30.88" E	21° 16.412' S	115° 35.515' E
277	PIN	GSI	21° 16' 38.06" S	115° 35' 30.73" E	21° 16.634' S	115° 35.512' E
278	PIN	GSI	21° 17' 5.64" S	115° 35' 43.30" E	21° 17.094' S	115° 35.722' E
279	PIN	GSI	21° 17' 31.42" S	115° 35' 49.63" E	21° 17.524' S	115° 35.827' E
280	PIN	GSI	21° 16' 26.65" S	115° 36' 0.86" E	21° 16.444' S	115° 36.014' E
281	PIN	GSI	21° 16' 36.19" S	115° 35' 51.25" E	21° 16.603' S	115° 35.854' E
282	PIN	GSI	21° 16' 46.70" S	115° 36' 17.53" E	21° 16.778' S	115° 36.292' E
283	PIN	GSI	21° 18' 9.32" S	115° 36' 10.51" E	21° 18.155' S	115° 36.175' E
284	PIN	GSI	21° 18' 48.35" S	115° 36' 42.73" E	21° 18.806' S	115° 36.712' E
285	PIN	GSI	21° 19' 52.39" S	115° 37' 10.70" E	21° 19.873' S	115° 37.178' E
286	PIN	GSI	21° 19' 12.97" S	115° 35' 51.25" E	21° 19.216' S	115° 35.854' E
287	PIN	GSI	21° 18' 20.56" S	115° 34' 36.34" E	21° 18.343' S	115° 34.606' E
288	PIN	GSI	21° 17' 50.53" S	115° 34' 16.82" E	21° 17.842' S	115° 34.280' E
289	PIN	GSI	21° 17' 33.97" S	115° 34' 47.75" E	21° 17.566' S	115° 34.796' E
290	PIN	GSI	21° 17' 22.70" S	115° 34' 13.08" E	21° 17.378' S	115° 34.218' E
291	PIN	GSI	21° 17' 33.14" S	115° 33' 48.82" E	21° 17.552' S	115° 33.814' E
292	PIN	GSI	21° 18' 3.31" S	115° 33' 46.33" E	21° 18.055' S	115° 33.772' E
293	PIN	GSI	21° 18' 24.12" S	115° 33' 31.50" E	21° 18.402' S	115° 33.525' E
294	PIN	GSI	21° 18' 30.82" S	115° 33' 12.38" E	21° 18.514' S	115° 33.206' E
295	PIN	GSI	21° 18' 33.05" S	115° 32' 51.50" E	21° 18.551' S	115° 32.858' E
296	PIN	GSI	21° 18' 40.93" S	115° 32' 53.23" E	21° 18.682' S	115° 32.887' E
297	PIN	GSI	21° 18' 53.14" S	115° 32' 37.39" E	21° 18.886' S	115° 32.623' E
298	PIN	GSI	21° 19' 12.29" S	115° 33' 8.68" E	21° 19.205' S	115° 33.145' E
299	PIN	GSI	21° 19' 26.87" S	115° 33' 27.22" E	21° 19.448' S	115° 33.454' E
300	PIN	GSI	21° 20' 13.88" S	115° 34' 11.78" E	21° 20.231' S	115° 34.196' E
301	PIN	GSI	21° 21' 4.46" S	115° 35' 8.81" E	21° 21.074' S	115° 35.147' E
302	PIN	GSI	21° 21' 45.50" S	115° 35' 24.90" E	21° 21.758' S	115° 35.415' E
303	PIN	GSI	21° 22' 15.38" S	115° 35' 21.98" E	21° 22.256' S	115° 35.366' E
304	PIN	GSI	21° 23' 3.52" S	115° 35' 17.63" E	21° 23.059' S	115° 35.294' E
305	PIN	GSI	21° 22' 49.08" S	115° 34' 26.98" E	21° 22.818' S	115° 34.450' E
306	PIN	GSI	21° 22' 29.28" S	115° 33' 55.26" E	21° 22.488' S	115° 33.921' E
307	PIN	GSI	21° 22' 9.80" S	115° 32' 49.67" E	21° 22.163' S	115° 32.828' E
308	PIN	GSI	21° 22' 33.49" S	115° 32' 36.42" E	21° 22.558' S	115° 32.607' E
309	PIN	GSI	21° 22' 46.45" S	115° 32' 44.84" E	21° 22.774' S	115° 32.747' E
310	PIN	GSI	21° 22' 51.71" S	115° 32' 31.09" E	21° 22.862' S	115° 32.518' E
311	PIN	GSI	21° 23' 6.76" S	115° 32' 27.82" E	21° 23.113' S	115° 32.464' E
312	PIN	GSI	21° 23' 3.88" S	115° 32' 32.68" E	21° 23.065' S	115° 32.545' E
313	PIN	GSI	21° 23' 6.68" S	115° 32' 17.27" E	21° 23.111' S	115° 32.288' E
314	PIN	GSI	21° 23' 28.14" S	115° 32' 5.28" E	21° 23.469' S	115° 32.088' E
315	PIN	GSI	21° 23' 45.89" S	115° 32' 1.75" E	21° 23.765' S	115° 32.029' E
316	PIN	GSI	21° 23' 41.75" S	115° 32' 17.63" E	21° 23.696' S	115° 32.294' E
317	PIN	GSI	21° 23' 37.82" S	115° 32' 32.10" E	21° 23.630' S	115° 32.535' E
318	PIN	GSI	21° 23' 34.94" S	115° 32' 38.11" E	21° 23.582' S	115° 32.635' E
319	PIN	GSI	21° 23' 25.76" S	115° 32' 39.16" E	21° 23.429' S	115° 32.653' E
320	PIN	GSI	21° 23' 15.76" S	115° 32' 52.94" E	21° 23.263' S	115° 32.882' E
321	PIN	GSI	21° 23' 4.49" S	115° 32' 50.17" E	21° 23.075' S	115° 32.836' E
322	PIN	GSI	21° 23' 0.53" S	115° 33' 0.79" E	21° 23.009' S	115° 33.013' E
323	PIN	GSI	21° 22' 49.69" S	115° 32' 54.64" E	21° 22.828' S	115° 32.911' E
324	PIN	GSI	21° 24' 14.54" S	115° 32' 13.13" E	21° 24.242' S	115° 32.219' E
325	PIN	GSI	21° 24' 37.26" S	115° 32' 20.72" E	21° 24.621' S	115° 32.345' E
327	PIN	GSI	21° 24' 17.82" S	115° 31' 21.58" E	21° 24.297' S	115° 31.360' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
328	PIN	GSI	21° 24' 13.97" S	115° 30' 45.50" E	21° 24.233' S	115° 30.758' E
329	PIN	GSI	21° 24' 56.70" S	115° 29' 11.08" E	21° 24.945' S	115° 29.185' E
330	PIN	GSI	21° 26' 0.89" S	115° 28' 31.58" E	21° 26.015' S	115° 28.526' E
331	PIN	GSI	21° 25' 21.90" S	115° 28' 11.46" E	21° 25.365' S	115° 28.191' E
332	PIN	GSI	21° 26' 38.40" S	115° 29' 0.49" E	21° 26.640' S	115° 29.008' E
333	PIN	GSI	21° 27' 26.64" S	115° 28' 46.16" E	21° 27.444' S	115° 28.769' E
334	PIN	GSI	21° 28' 16.46" S	115° 28' 10.56" E	21° 28.274' S	115° 28.176' E
335	PIN	GSI	21° 27' 57.85" S	115° 27' 22.75" E	21° 27.964' S	115° 27.379' E
336	PIN	GSI	21° 28' 44.94" S	115° 26' 31.45" E	21° 28.749' S	115° 26.524' E
337	PIN	GSI	21° 29' 28.43" S	115° 25' 30.07" E	21° 29.474' S	115° 25.501' E
338	PIN	GSI	21° 29' 49.67" S	115° 24' 51.05" E	21° 29.828' S	115° 24.851' E
339	PIN	GSI	21° 30' 54.72" S	115° 23' 48.48" E	21° 30.912' S	115° 23.808' E
340	PIN	GSI	21° 31' 16.75" S	115° 23' 0.20" E	21° 31.279' S	115° 23.003' E
341	PIN	GSI	21° 31' 45.48" S	115° 21' 54.32" E	21° 31.758' S	115° 21.905' E
342	PIN	GSI	21° 32' 54.17" S	115° 21' 36.00" E	21° 32.903' S	115° 21.600' E
343	PIN	GSI	21° 32' 43.66" S	115° 19' 54.52" E	21° 32.728' S	115° 19.909' E
344	PIN	GSI	21° 32' 32.82" S	115° 19' 8.47" E	21° 32.547' S	115° 19.141' E
345	PIN	GSI	21° 32' 16.48" S	115° 19' 16.03" E	21° 32.275' S	115° 19.267' E
346	PIN	GSI	21° 31' 27.73" S	115° 20' 7.40" E	21° 31.462' S	115° 20.123' E
347	PIN	GSI	21° 31' 3.07" S	115° 20' 47.36" E	21° 31.051' S	115° 20.789' E
348	PIN	GSI	21° 30' 15.52" S	115° 20' 43.30" E	21° 30.259' S	115° 20.722' E
349	PIN	GSI	21° 30' 4.18" S	115° 22' 0.98" E	21° 30.070' S	115° 22.016' E
350	PIN	GSI	21° 29' 43.12" S	115° 21' 29.84" E	21° 29.719' S	115° 21.497' E
351	PIN	GSI	21° 29' 41.64" S	115° 21' 52.92" E	21° 29.694' S	115° 21.882' E
352	PIN	GSI	21° 29' 22.27" S	115° 21' 17.14" E	21° 29.371' S	115° 21.286' E
353	PIN	GSI	21° 30' 29.20" S	115° 19' 4.33" E	21° 30.487' S	115° 19.072' E
354	PIN	GSI	21° 29' 9.10" S	115° 20' 56.04" E	21° 29.152' S	115° 20.934' E
355	PIN	GSI	21° 29' 15.72" S	115° 20' 28.28" E	21° 29.262' S	115° 20.471' E
356	PIN	GSI	21° 29' 7.51" S	115° 19' 44.98" E	21° 29.125' S	115° 19.750' E
357	PIN	GSI	21° 28' 22.58" S	115° 19' 43.64" E	21° 28.376' S	115° 19.727' E
358	PIN	GSI	21° 27' 51.41" S	115° 21' 6.16" E	21° 27.857' S	115° 21.103' E
359	PIN	GSI	21° 26' 36.02" S	115° 22' 11.60" E	21° 26.600' S	115° 22.193' E
360	PIN	GSI	21° 26' 13.45" S	115° 22' 0.80" E	21° 26.224' S	115° 22.013' E
361	PIN	GSI	21° 26' 31.20" S	115° 22' 50.45" E	21° 26.520' S	115° 22.841' E
362	PIN	GSI	21° 27' 37.73" S	115° 22' 47.86" E	21° 27.629' S	115° 22.798' E
363	PIN	GSI	21° 28' 10.92" S	115° 21' 55.80" E	21° 28.182' S	115° 21.930' E
364	PIN	GSI	21° 28' 7.28" S	115° 21' 36.43" E	21° 28.121' S	115° 21.607' E
365	PIN	GSI	21° 27' 48.74" S	115° 23' 55.14" E	21° 27.812' S	115° 23.919' E
366	PIN	GSI	21° 27' 38.38" S	115° 25' 27.55" E	21° 27.640' S	115° 25.459' E
367	PIN	GSI	21° 27' 24.16" S	115° 26' 15.72" E	21° 27.403' S	115° 26.262' E
368	PIN	GSI	21° 26' 25.69" S	115° 25' 18.19" E	21° 26.428' S	115° 25.303' E
369	PIN	GSI	21° 26' 10.10" S	115° 25' 11.89" E	21° 26.168' S	115° 25.198' E
370	PIN	GSI	21° 25' 48.36" S	115° 24' 57.35" E	21° 25.806' S	115° 24.956' E
371	PIN	GSI	21° 25' 30.58" S	115° 24' 5.87" E	21° 25.510' S	115° 24.098' E
372	PIN	GSI	21° 25' 0.66" S	115° 24' 40.32" E	21° 25.011' S	115° 24.672' E
373	PIN	GSI	21° 24' 40.32" S	115° 25' 21.18" E	21° 24.672' S	115° 25.353' E
374	PIN	GSI	21° 24' 41.83" S	115° 23' 29.47" E	21° 24.697' S	115° 23.491' E
375	PIN	GSI	21° 23' 57.62" S	115° 23' 15.22" E	21° 23.960' S	115° 23.254' E
376	PIN	GSI	21° 23' 7.66" S	115° 22' 1.02" E	21° 23.128' S	115° 22.017' E
377	PIN	GSI	21° 22' 59.77" S	115° 23' 19.54" E	21° 22.996' S	115° 23.326' E
378	PIN	GSI	21° 22' 29.86" S	115° 23' 53.99" E	21° 22.498' S	115° 23.900' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
379	PIN	GSI	21° 23' 13.38" S	115° 24' 27.65" E	21° 23.223' S	115° 24.461' E
380	PIN	GSI	21° 23' 41.14" S	115° 24' 36.58" E	21° 23.686' S	115° 24.610' E
381	PIN	GSI	21° 23' 59.75" S	115° 25' 28.99" E	21° 23.996' S	115° 25.483' E
382	PIN	GSI	21° 24' 33.16" S	115° 26' 26.77" E	21° 24.553' S	115° 26.446' E
383	PIN	GSI	21° 23' 23.21" S	115° 28' 8.08" E	21° 23.387' S	115° 28.135' E
384	PIN	GSI	21° 24' 16.52" S	115° 27' 37.08" E	21° 24.275' S	115° 27.618' E
385	PIN	GSI	21° 24' 56.95" S	115° 27' 16.34" E	21° 24.949' S	115° 27.272' E
386	PIN	GSI	21° 23' 51.65" S	115° 26' 25.37" E	21° 23.861' S	115° 26.423' E
387	PIN	GSI	21° 23' 37.64" S	115° 26' 5.21" E	21° 23.627' S	115° 26.087' E
388	PIN	GSI	21° 23' 18.71" S	115° 26' 14.64" E	21° 23.312' S	115° 26.244' E
389	PIN	GSI	21° 22' 39.18" S	115° 26' 38.11" E	21° 22.653' S	115° 26.635' E
390	PIN	GSI	21° 22' 28.49" S	115° 27' 38.20" E	21° 22.475' S	115° 27.637' E
391	PIN	GSI	21° 21' 31.86" S	115° 28' 22.15" E	21° 21.531' S	115° 28.369' E
392	PIN	GSI	21° 20' 53.45" S	115° 27' 40.10" E	21° 20.891' S	115° 27.668' E
393	PIN	GSI	21° 20' 56.72" S	115° 27' 20.70" E	21° 20.945' S	115° 27.345' E
394	PIN	GSI	21° 20' 28.97" S	115° 27' 7.16" E	21° 20.483' S	115° 27.119' E
395	PIN	GSI	21° 24' 24.12" S	115° 24' 14.90" E	21° 24.402' S	115° 24.248' E
396	PIN	GSI	21° 22' 34.93" S	115° 25' 14.20" E	21° 22.582' S	115° 25.237' E
397	PIN	GSI	21° 22' 36.01" S	115° 25' 38.17" E	21° 22.600' S	115° 25.636' E
398	PIN	GSI	21° 21' 49.90" S	115° 25' 2.68" E	21° 21.832' S	115° 25.045' E
399	PIN	GSI	21° 21' 18.65" S	115° 24' 48.28" E	21° 21.311' S	115° 24.805' E
400	PIN	GSI	21° 21' 27.11" S	115° 26' 1.97" E	21° 21.452' S	115° 26.033' E
401	PIN	GSI	21° 20' 42.14" S	115° 25' 58.76" E	21° 20.702' S	115° 25.979' E
402	PIN	GSI	21° 22' 2.57" S	115° 29' 55.21" E	21° 22.043' S	115° 29.920' E
403	PIN	GSI	21° 20' 56.11" S	115° 32' 3.80" E	21° 20.935' S	115° 32.063' E
404	PIN	GSI	21° 20' 26.16" S	115° 30' 37.19" E	21° 20.436' S	115° 30.620' E
405	PIN	GSI	21° 19' 30.54" S	115° 30' 1.69" E	21° 19.509' S	115° 30.028' E
406	PIN	GSI	21° 20' 39.88" S	115° 28' 6.89" E	21° 20.665' S	115° 28.115' E
407	PIN	GSI	21° 19' 49.01" S	115° 28' 13.55" E	21° 19.817' S	115° 28.226' E
408	PIN	GSI	21° 19' 38.82" S	115° 27' 11.05" E	21° 19.647' S	115° 27.184' E
409	PIN	GSI	21° 20' 9.13" S	115° 26' 24.58" E	21° 20.152' S	115° 26.410' E
410	PIN	GSI	21° 20' 12.66" S	115° 25' 50.66" E	21° 20.211' S	115° 25.844' E
411	PIN	GSI	21° 19' 24.31" S	115° 25' 20.39" E	21° 19.405' S	115° 25.340' E
412	PIN	GSI	21° 19' 32.16" S	115° 23' 54.13" E	21° 19.536' S	115° 23.902' E
413	PIO	GSI	21° 19' 29.68" S	115° 22' 56.71" E	21° 19.495' S	115° 22.945' E
414	PIO	GSI	21° 19' 20.89" S	115° 21' 2.92" E	21° 19.348' S	115° 21.049' E
415	PIO	GSI	21° 17' 46.10" S	115° 21' 42.95" E	21° 17.768' S	115° 21.716' E
416	PIO	GSI	21° 18' 25.85" S	115° 23' 56.90" E	21° 18.431' S	115° 23.948' E
417	PIN	GSI	21° 18' 31.39" S	115° 25' 15.85" E	21° 18.523' S	115° 25.264' E
418	PIN	GSI	21° 19' 17.98" S	115° 26' 1.50" E	21° 19.300' S	115° 26.025' E
419	PIN	GSI	21° 19' 38.17" S	115° 26' 2.33" E	21° 19.636' S	115° 26.039' E
420	PIN	GSI	21° 19' 3.65" S	115° 26' 10.90" E	21° 19.061' S	115° 26.182' E
421	PIN	GSI	21° 19' 25.03" S	115° 26' 36.31" E	21° 19.417' S	115° 26.605' E
422	PIN	GSI	21° 18' 13.64" S	115° 26' 9.38" E	21° 18.227' S	115° 26.156' E
423	PIN	GSI	21° 19' 16.79" S	115° 27' 19.51" E	21° 19.280' S	115° 27.325' E
424	PIN	GSI	21° 18' 48.96" S	115° 27' 28.01" E	21° 18.816' S	115° 27.467' E
425	PIN	GSI	21° 18' 59.69" S	115° 28' 16.64" E	21° 18.995' S	115° 28.277' E
426	PIN	GSI	21° 19' 24.46" S	115° 27' 50.47" E	21° 19.408' S	115° 27.841' E
427	PIN	GSI	21° 19' 1.99" S	115° 28' 30.76" E	21° 19.033' S	115° 28.513' E
428	PIN	GSI	21° 19' 5.09" S	115° 28' 44.83" E	21° 19.085' S	115° 28.747' E
429	PIN	GSI	21° 18' 40.21" S	115° 28' 58.44" E	21° 18.670' S	115° 28.974' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
430	PIN	GSI	21° 18' 54.29" S	115° 29' 10.86" E	21° 18.905' S	115° 29.181' E
431	PIN	GSI	21° 19' 2.50" S	115° 29' 25.69" E	21° 19.042' S	115° 29.428' E
432	PIN	GSI	21° 18' 27.90" S	115° 29' 19.75" E	21° 18.465' S	115° 29.329' E
433	PIN	GSI	21° 18' 17.86" S	115° 29' 48.12" E	21° 18.298' S	115° 29.802' E
434	PIN	GSI	21° 17' 53.16" S	115° 29' 3.62" E	21° 17.886' S	115° 29.060' E
435	PIN	GSI	21° 17' 43.15" S	115° 29' 36.71" E	21° 17.719' S	115° 29.612' E
436	PIN	GSI	21° 17' 26.48" S	115° 30' 1.98" E	21° 17.441' S	115° 30.033' E
437	PIN	GSI	21° 17' 28.86" S	115° 30' 23.15" E	21° 17.481' S	115° 30.386' E
438	PIN	GSI	21° 16' 50.70" S	115° 30' 32.94" E	21° 16.845' S	115° 30.549' E
439	PIN	GSI	21° 16' 19.27" S	115° 30' 54.47" E	21° 16.321' S	115° 30.908' E
440	PIN	GSI	21° 16' 19.45" S	115° 29' 53.27" E	21° 16.324' S	115° 29.888' E
441	PIN	GSI	21° 16' 20.60" S	115° 29' 17.92" E	21° 16.343' S	115° 29.299' E
442	PIN	GSI	21° 16' 25.97" S	115° 28' 18.23" E	21° 16.433' S	115° 28.304' E
443	PIN	GSI	21° 17' 28.39" S	115° 28' 9.73" E	21° 17.473' S	115° 28.162' E
444	PIN	GSI	21° 16' 40.26" S	115° 27' 33.37" E	21° 16.671' S	115° 27.556' E
445	PIN	GSI	21° 16' 28.96" S	115° 27' 3.67" E	21° 16.483' S	115° 27.061' E
446	PIO	GSI	21° 16' 17.47" S	115° 26' 13.56" E	21° 16.291' S	115° 26.226' E
447	PIO	GSI	21° 15' 44.60" S	115° 24' 2.09" E	21° 15.743' S	115° 24.035' E
448	PIO	GSI	21° 13' 47.64" S	115° 25' 17.87" E	21° 13.794' S	115° 25.298' E
449	PIO	GSI	21° 14' 35.20" S	115° 27' 0.14" E	21° 14.587' S	115° 27.002' E
450	PIN	GSI	21° 14' 23.21" S	115° 28' 13.94" E	21° 14.387' S	115° 28.232' E
451	PIN	GSI	21° 14' 53.41" S	115° 27' 55.12" E	21° 14.890' S	115° 27.919' E
452	PIN	GSI	21° 15' 22.68" S	115° 27' 15.08" E	21° 15.378' S	115° 27.251' E
453	PIN	GSI	21° 15' 28.58" S	115° 28' 47.60" E	21° 15.476' S	115° 28.793' E
454	PIN	GSI	21° 15' 25.45" S	115° 29' 41.64" E	21° 15.424' S	115° 29.694' E
455	PIN	GSI	21° 14' 56.87" S	115° 29' 36.13" E	21° 14.948' S	115° 29.602' E
456	PIN	GSI	21° 14' 35.27" S	115° 30' 28.44" E	21° 14.588' S	115° 30.474' E
457	PIN	GSI	21° 16' 9.34" S	115° 33' 10.04" E	21° 16.156' S	115° 33.167' E
458	PIO	GSI	21° 11' 32.28" S	115° 26' 7.15" E	21° 11.538' S	115° 26.119' E
459	PIN	GSI	21° 12' 1.84" S	115° 29' 51.18" E	21° 12.031' S	115° 29.853' E
460	PIN	GSI	21° 12' 21.49" S	115° 33' 35.32" E	21° 12.358' S	115° 33.589' E
461	PIN	GSI	21° 12' 22.64" S	115° 35' 53.70" E	21° 12.377' S	115° 35.895' E
462	PIN	GSI	21° 10' 40.12" S	115° 35' 16.94" E	21° 10.669' S	115° 35.282' E
463	PIN	GSI	21° 8' 38.65" S	115° 32' 19.93" E	21° 8.644' S	115° 32.332' E
464	PIN	GSI	21° 6' 59.44" S	115° 34' 24.53" E	21° 6.991' S	115° 34.409' E
465	PIN	GSI	21° 9' 48.02" S	115° 37' 21.11" E	21° 9.800' S	115° 37.352' E
466	PIN	GSI	21° 8' 33.18" S	115° 37' 5.02" E	21° 8.553' S	115° 37.084' E
467	PIN	GSI	21° 7' 6.74" S	115° 37' 12.11" E	21° 7.112' S	115° 37.202' E
468	PIN	GSI	21° 4' 43.32" S	115° 37' 26.00" E	21° 4.722' S	115° 37.433' E
469	PIN	GSI	21° 3' 57.60" S	115° 36' 27.79" E	21° 3.960' S	115° 36.463' E
470	PIO	GSI	21° 3' 1.98" S	115° 35' 17.09" E	21° 3.033' S	115° 35.285' E
471	PIO	GSI	21° 1' 29.06" S	115° 34' 19.31" E	21° 1.484' S	115° 34.322' E
472	PIO	GSI	21° 0' 32.04" S	115° 38' 18.56" E	21° 0.534' S	115° 38.309' E
473	PIN	GSI	21° 2' 14.96" S	115° 39' 41.40" E	21° 2.249' S	115° 39.690' E
474	PIN	GSI	21° 3' 43.88" S	115° 40' 37.16" E	21° 3.731' S	115° 40.619' E
475	PIN	GSI	21° 4' 12.18" S	115° 42' 17.50" E	21° 4.203' S	115° 42.292' E
476	PIN	GSI	21° 4' 54.30" S	115° 44' 6.07" E	21° 4.905' S	115° 44.101' E
477	PIN	GSI	21° 4' 55.27" S	115° 46' 22.22" E	21° 4.921' S	115° 46.370' E
478	PIN	GSI	21° 4' 12.47" S	115° 47' 25.44" E	21° 4.208' S	115° 47.424' E
479	PIN	GSI	21° 3' 11.09" S	115° 46' 25.18" E	21° 3.185' S	115° 46.420' E
480	PIN	GSI	21° 2' 19.57" S	115° 45' 33.26" E	21° 2.326' S	115° 45.554' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
481	PIN	GSI	21° 1' 20.24" S	115° 44' 43.48" E	21° 1.337' S	115° 44.725' E
482	PIN	GSI	21° 0' 9.00" S	115° 43' 45.44" E	21° 0.150' S	115° 43.757' E
483	PIN	GSI	20° 59' 1.79" S	115° 42' 57.85" E	20° 59.030' S	115° 42.964' E
484	PIO	GSI	20° 58' 12.43" S	115° 42' 28.98" E	20° 58.207' S	115° 42.483' E
485	PIO	GSI	20° 57' 7.02" S	115° 41' 20.44" E	20° 57.117' S	115° 41.341' E
486	PIO	GSI	20° 55' 45.30" S	115° 45' 8.17" E	20° 55.755' S	115° 45.136' E
487	PIO	GSI	20° 54' 6.48" S	115° 47' 53.41" E	20° 54.108' S	115° 47.890' E
488	PIN	GSI	20° 55' 19.70" S	115° 49' 5.38" E	20° 55.328' S	115° 49.090' E
489	PIN	GSI	20° 56' 33.14" S	115° 49' 56.50" E	20° 56.552' S	115° 49.942' E
490	PIN	GSI	20° 57' 23.83" S	115° 50' 44.16" E	20° 57.397' S	115° 50.736' E
491	PIN	GSI	20° 57' 27.83" S	115° 52' 3.65" E	20° 57.464' S	115° 52.061' E
492	PIN	GSI	20° 56' 30.73" S	115° 52' 31.80" E	20° 56.512' S	115° 52.530' E
493	PIN	GSI	20° 55' 49.12" S	115° 52' 43.21" E	20° 55.819' S	115° 52.720' E
494	PIN	GSI	20° 55' 5.70" S	115° 52' 45.41" E	20° 55.095' S	115° 52.757' E
495	PIN	GSI	20° 54' 29.05" S	115° 52' 17.94" E	20° 54.484' S	115° 52.299' E
496	PIN	GSI	20° 53' 47.04" S	115° 51' 32.04" E	20° 53.784' S	115° 51.534' E
497	PIN	GSI	20° 51' 26.32" S	115° 51' 25.70" E	20° 51.439' S	115° 51.428' E
498	PIN	GSI	20° 50' 15.97" S	115° 53' 33.72" E	20° 50.266' S	115° 53.562' E
499	PIN	GSI	20° 50' 40.81" S	115° 55' 0.37" E	20° 50.680' S	115° 55.006' E
500	PIN	GSI	20° 51' 3.71" S	115° 55' 11.86" E	20° 51.062' S	115° 55.198' E
501	PIN	GSI	20° 51' 27.40" S	115° 55' 26.15" E	20° 51.457' S	115° 55.436' E
502	PIN	GSI	20° 52' 0.26" S	115° 55' 1.42" E	20° 52.004' S	115° 55.024' E
503	PIN	GSI	20° 52' 46.38" S	115° 55' 16.14" E	20° 52.773' S	115° 55.269' E
504	PIN	GSI	20° 47' 7.94" S	115° 59' 41.32" E	20° 47.132' S	115° 59.689' E
505	PIN	GSI	20° 46' 8.90" S	116° 2' 8.52" E	20° 46.148' S	116° 2.142' E
506	PIN	GSI	20° 49' 57.04" S	116° 0' 56.88" E	20° 49.951' S	116° 0.948' E
507	PIN	GSI	20° 55' 40.22" S	115° 56' 54.02" E	20° 55.670' S	115° 56.900' E
508	PIN	GSI	20° 59' 10.03" S	115° 55' 56.60" E	20° 59.167' S	115° 55.943' E
509	PIN	Munda	20° 29' 9.64" S	117° 49' 31.44" E	20° 29.161' S	117° 49.524' E
510	PIN	Munda	20° 29' 52.87" S	117° 50' 2.83" E	20° 29.881' S	117° 50.047' E
511	PIN	Munda	20° 30' 30.78" S	117° 50' 33.50" E	20° 30.513' S	117° 50.558' E
512	PIN	Munda	20° 31' 6.02" S	117° 51' 6.30" E	20° 31.100' S	117° 51.105' E
513	PIN	Munda	20° 31' 19.27" S	117° 51' 29.05" E	20° 31.321' S	117° 51.484' E
514	PIN	Munda	20° 30' 32.87" S	117° 52' 36.12" E	20° 30.548' S	117° 52.602' E
515	PIN	Munda	20° 30' 4.64" S	117° 53' 6.43" E	20° 30.077' S	117° 53.107' E
516	PIN	Munda	20° 29' 30.05" S	117° 54' 54.65" E	20° 29.501' S	117° 54.911' E
517	PIN	Munda	20° 28' 53.33" S	117° 54' 53.71" E	20° 28.889' S	117° 54.895' E
518	PIN	Munda	20° 28' 37.38" S	117° 54' 43.70" E	20° 28.623' S	117° 54.728' E
519	PIN	Munda	20° 28' 12.04" S	117° 54' 36.47" E	20° 28.201' S	117° 54.608' E
520	PIN	Munda	20° 27' 42.66" S	117° 54' 32.76" E	20° 27.711' S	117° 54.546' E
521	PIN	Munda	20° 26' 47.98" S	117° 54' 21.82" E	20° 26.800' S	117° 54.364' E
522	PIN	Munda	20° 25' 37.96" S	117° 54' 10.76" E	20° 25.633' S	117° 54.179' E
523	PIN	Munda	20° 24' 46.19" S	117° 55' 48.94" E	20° 24.770' S	117° 55.816' E
525	PIN	Munda	20° 25' 40.01" S	117° 56' 11.54" E	20° 25.667' S	117° 56.192' E
526	PIN	Munda	20° 26' 25.37" S	117° 56' 37.82" E	20° 26.423' S	117° 56.630' E
527	PIN	Munda	20° 26' 31.34" S	117° 57' 36.58" E	20° 26.522' S	117° 57.610' E
529	PIN	Munda	20° 27' 1.87" S	117° 58' 28.78" E	20° 27.031' S	117° 58.480' E
530	PIN	Munda	20° 27' 30.46" S	117° 58' 53.47" E	20° 27.508' S	117° 58.891' E
531	PIN	Munda	20° 27' 5.51" S	118° 0' 9.83" E	20° 27.092' S	118° 0.164' E
532	PIN	Munda	20° 26' 11.00" S	117° 59' 46.46" E	20° 26.183' S	117° 59.774' E
533	PIN	Munda	20° 25' 31.12" S	117° 59' 40.24" E	20° 25.519' S	117° 59.671' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
534	PIN	Munda	20° 24' 47.05" S	117° 59' 31.81" E	20° 24.784' S	117° 59.530' E
535	PIN	Munda	20° 24' 5.08" S	117° 59' 22.63" E	20° 24.085' S	117° 59.377' E
536	PIN	Munda	20° 23' 29.87" S	117° 59' 57.30" E	20° 23.498' S	117° 59.955' E
537	PIN	Munda	20° 23' 5.82" S	118° 0' 37.98" E	20° 23.097' S	118° 0.633' E
538	PIN	Munda	20° 24' 7.63" S	118° 1' 20.89" E	20° 24.127' S	118° 1.348' E
539	PIN	Munda	20° 24' 40.21" S	118° 0' 48.10" E	20° 24.670' S	118° 0.802' E
541	PIN	Munda	20° 24' 39.02" S	118° 1' 42.17" E	20° 24.650' S	118° 1.703' E
542	PIN	Munda	20° 24' 58.57" S	118° 1' 26.26" E	20° 24.976' S	118° 1.438' E
543	PIN	Munda	20° 25' 17.87" S	118° 1' 49.76" E	20° 25.298' S	118° 1.829' E
544	PIN	Munda	20° 26' 11.72" S	118° 2' 11.18" E	20° 26.195' S	118° 2.186' E
545	PIN	Munda	20° 25' 36.66" S	118° 2' 27.89" E	20° 25.611' S	118° 2.465' E
546	PIN	Munda	20° 25' 16.36" S	118° 2' 26.41" E	20° 25.273' S	118° 2.440' E
547	PIN	Munda	20° 25' 8.00" S	118° 2' 47.40" E	20° 25.133' S	118° 2.790' E
548	PIN	Munda	20° 24' 35.10" S	118° 4' 14.70" E	20° 24.585' S	118° 4.245' E
549	PIN	Munda	20° 23' 58.13" S	118° 4' 59.30" E	20° 23.969' S	118° 4.988' E
550	PIN	Munda	20° 24' 2.59" S	118° 5' 16.98" E	20° 24.043' S	118° 5.283' E
551	PIN	Munda	20° 23' 30.88" S	118° 5' 56.26" E	20° 23.515' S	118° 5.938' E
552	PIN	Munda	20° 23' 8.05" S	118° 5' 37.14" E	20° 23.134' S	118° 5.619' E
553	PIN	Munda	20° 22' 48.29" S	118° 5' 22.42" E	20° 22.805' S	118° 5.374' E
554	PIN	Munda	20° 22' 21.14" S	118° 5' 1.97" E	20° 22.352' S	118° 5.033' E
555	PIN	Munda	20° 22' 4.12" S	118° 4' 48.04" E	20° 22.069' S	118° 4.801' E
556	PIN	Munda	20° 21' 33.16" S	118° 4' 26.22" E	20° 21.553' S	118° 4.437' E
557	PIN	Munda	20° 21' 8.32" S	118° 4' 7.39" E	20° 21.139' S	118° 4.123' E
559	PIN	Munda	20° 20' 50.93" S	118° 3' 48.17" E	20° 20.849' S	118° 3.803' E
560	PIN	Munda	20° 20' 11.47" S	118° 3' 50.08" E	20° 20.191' S	118° 3.835' E
561	PIN	Munda	20° 19' 30.40" S	118° 4' 36.26" E	20° 19.507' S	118° 4.604' E
562	PIN	Munda	20° 19' 20.86" S	118° 5' 36.71" E	20° 19.348' S	118° 5.612' E
563	PIN	Munda	20° 19' 34.39" S	118° 5' 44.02" E	20° 19.573' S	118° 5.734' E
564	PIN	Munda	20° 19' 55.02" S	118° 6' 2.92" E	20° 19.917' S	118° 6.049' E
565	PIN	Munda	20° 20' 10.21" S	118° 6' 16.70" E	20° 20.170' S	118° 6.278' E
566	PIN	Munda	20° 20' 39.70" S	118° 5' 40.16" E	20° 20.662' S	118° 5.669' E
567	PIN	Munda	20° 20' 40.31" S	118° 6' 41.80" E	20° 20.672' S	118° 6.697' E
568	PIN	Munda	20° 21' 4.00" S	118° 7' 1.06" E	20° 21.067' S	118° 7.018' E
569	PIN	Munda	20° 21' 31.79" S	118° 7' 9.91" E	20° 21.530' S	118° 7.165' E
570	PIN	Munda	20° 21' 46.91" S	118° 7' 40.66" E	20° 21.782' S	118° 7.678' E
571	PIN	Munda	20° 22' 5.48" S	118° 7' 59.52" E	20° 22.091' S	118° 7.992' E
572	PIN	Munda	20° 20' 50.75" S	118° 8' 5.14" E	20° 20.846' S	118° 8.086' E
573	PIN	Munda	20° 18' 54.36" S	118° 8' 1.50" E	20° 18.906' S	118° 8.025' E
574	PIN	Munda	20° 19' 23.84" S	118° 8' 46.25" E	20° 19.397' S	118° 8.771' E
575	PIN	Munda	20° 19' 50.77" S	118° 9' 16.16" E	20° 19.846' S	118° 9.269' E
576	PIN	Munda	20° 20' 3.77" S	118° 9' 36.65" E	20° 20.063' S	118° 9.611' E
577	PIN	Munda	20° 20' 24.65" S	118° 9' 57.24" E	20° 20.411' S	118° 9.954' E
578	PIN	Munda	20° 20' 24.50" S	118° 10' 18.80" E	20° 20.408' S	118° 10.313' E
579	PIN	Munda	20° 20' 12.59" S	118° 10' 32.70" E	20° 20.210' S	118° 10.545' E
580	PIN	Munda	20° 20' 10.36" S	118° 10' 19.74" E	20° 20.173' S	118° 10.329' E
581	PIN	Munda	20° 19' 53.04" S	118° 9' 59.62" E	20° 19.884' S	118° 9.994' E
582	PIN	Munda	20° 19' 40.58" S	118° 10' 33.20" E	20° 19.676' S	118° 10.553' E
583	PIN	Munda	20° 19' 3.32" S	118° 10' 20.53" E	20° 19.055' S	118° 10.342' E
584	PIN	Munda	20° 18' 48.53" S	118° 10' 53.26" E	20° 18.809' S	118° 10.888' E
585	PIN	Munda	20° 18' 18.29" S	118° 10' 52.25" E	20° 18.305' S	118° 10.871' E
586	PIN	Munda	20° 17' 47.65" S	118° 10' 52.79" E	20° 17.794' S	118° 10.880' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
587	PIN	Munda	20° 17' 19.57" S	118° 10' 56.06" E	20° 17.326' S	118° 10.934' E
588	PIN	Munda	20° 16' 47.10" S	118° 11' 0.85" E	20° 16.785' S	118° 11.014' E
589	PIN	Munda	20° 17' 6.22" S	118° 12' 25.60" E	20° 17.104' S	118° 12.427' E
590	PIN	Munda	20° 17' 57.37" S	118° 12' 57.64" E	20° 17.956' S	118° 12.961' E
591	PIN	Munda	20° 18' 44.78" S	118° 12' 56.88" E	20° 18.746' S	118° 12.948' E
592	PIN	Munda	20° 19' 21.54" S	118° 13' 1.42" E	20° 19.359' S	118° 13.024' E
593	PIN	Munda	20° 19' 32.92" S	118° 12' 50.29" E	20° 19.549' S	118° 12.838' E
594	PIN	Munda	20° 19' 41.56" S	118° 12' 18.22" E	20° 19.693' S	118° 12.304' E
595	PIN	Munda	20° 19' 59.45" S	118° 12' 15.84" E	20° 19.991' S	118° 12.264' E
596	PIN	Munda	20° 20' 11.36" S	118° 11' 59.53" E	20° 20.189' S	118° 11.992' E
597	PIN	Munda	20° 20' 19.90" S	118° 11' 52.87" E	20° 20.332' S	118° 11.881' E
598	PIN	Munda	20° 19' 32.20" S	118° 14' 20.36" E	20° 19.537' S	118° 14.339' E
599	PIN	Munda	20° 18' 6.62" S	118° 14' 43.87" E	20° 18.110' S	118° 14.731' E
600	PIO	LTIs	20° 1' 12.25" S	118° 45' 12.20" E	20° 1.204' S	118° 45.203' E
601	PIO	LTIs	20° 1' 5.95" S	118° 46' 59.20" E	20° 1.099' S	118° 46.987' E
602	PIO	LTIs	20° 1' 5.09" S	118° 48' 3.53" E	20° 1.085' S	118° 48.059' E
603	PIO	LTIs	20° 1' 4.40" S	118° 48' 12.53" E	20° 1.073' S	118° 48.209' E
604	PIO	LTIs	20° 1' 4.30" S	118° 48' 22.32" E	20° 1.072' S	118° 48.372' E
605	PIO	LTIs	20° 1' 7.86" S	118° 48' 30.02" E	20° 1.131' S	118° 48.500' E
606	PIO	LTIs	20° 1' 19.70" S	118° 48' 32.90" E	20° 1.328' S	118° 48.548' E
607	PIO	LTIs	20° 1' 43.28" S	118° 48' 34.70" E	20° 1.721' S	118° 48.578' E
608	PIO	LTIs	20° 2' 30.95" S	118° 48' 38.81" E	20° 2.516' S	118° 48.647' E
609	PIO	LTIs	20° 3' 29.70" S	118° 48' 44.06" E	20° 3.495' S	118° 48.734' E
610	PIO	LTIs	20° 4' 5.34" S	118° 48' 46.51" E	20° 4.089' S	118° 48.775' E
613	PIO	LTIs	20° 2' 51.83" S	118° 49' 48.43" E	20° 2.864' S	118° 49.807' E
614	PIO	LTIs	20° 2' 16.73" S	118° 50' 22.42" E	20° 2.279' S	118° 50.374' E
615	PIO	LTIs	20° 1' 10.49" S	118° 49' 35.98" E	20° 1.175' S	118° 49.600' E
616	PIO	LTIs	20° 0' 34.13" S	118° 48' 36.25" E	20° 0.569' S	118° 48.604' E
623	PIO	LTIs	19° 59' 12.77" S	118° 46' 50.38" E	19° 59.213' S	118° 46.840' E
624	PIO	LTIs	19° 58' 34.00" S	118° 47' 55.18" E	19° 58.567' S	118° 47.920' E
625	PIO	LTIs	19° 58' 15.42" S	118° 49' 0.77" E	19° 58.257' S	118° 49.013' E
626	PIO	LTIs	19° 58' 58.40" S	118° 49' 15.49" E	19° 58.973' S	118° 49.258' E
627	PIO	LTIs	19° 59' 30.26" S	118° 49' 27.12" E	19° 59.504' S	118° 49.452' E
628	PIO	LTIs	20° 0' 27.18" S	118° 49' 52.68" E	20° 0.453' S	118° 49.878' E
642	PIN	De Grey	20° 5' 17.16" S	118° 54' 55.98" E	20° 5.286' S	118° 54.933' E
643	PIN	De Grey	20° 5' 55.97" S	118° 56' 26.81" E	20° 5.933' S	118° 56.447' E
644	PIN	De Grey	20° 6' 2.48" S	118° 57' 33.48" E	20° 6.041' S	118° 57.558' E
645	PIN	De Grey	20° 4' 50.70" S	118° 56' 42.83" E	20° 4.845' S	118° 56.714' E
646	PIN	De Grey	20° 4' 11.21" S	118° 56' 14.03" E	20° 4.187' S	118° 56.234' E
647	PIN	De Grey	20° 2' 33.04" S	118° 55' 57.50" E	20° 2.551' S	118° 55.958' E
648	PIN	De Grey	20° 2' 25.22" S	118° 56' 48.70" E	20° 2.420' S	118° 56.812' E
649	PIN	De Grey	20° 2' 15.76" S	118° 58' 1.27" E	20° 2.263' S	118° 58.021' E
650	PIN	De Grey	20° 1' 24.78" S	118° 58' 32.05" E	20° 1.413' S	118° 58.534' E
651	PIN	De Grey	20° 0' 47.70" S	118° 57' 42.59" E	20° 0.795' S	118° 57.710' E
652	PIN	De Grey	20° 0' 1.33" S	118° 57' 51.19" E	20° 0.022' S	118° 57.853' E
653	PIN	De Grey	20° 0' 6.84" S	118° 57' 9.94" E	20° 0.114' S	118° 57.166' E
654	PIN	De Grey	19° 59' 26.09" S	118° 56' 26.59" E	19° 59.435' S	118° 56.443' E
655	PIN	De Grey	19° 58' 53.62" S	118° 56' 18.53" E	19° 58.894' S	118° 56.309' E
656	PIN	De Grey	19° 58' 25.79" S	118° 55' 42.24" E	19° 58.430' S	118° 55.704' E
657	PIN	NTIs	19° 57' 47.56" S	118° 54' 25.27" E	19° 57.793' S	118° 54.421' E
658	PIO	NTIs	19° 56' 31.63" S	118° 53' 15.50" E	19° 56.527' S	118° 53.258' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
659	PIO	NTIs	19° 55' 50.70" S	118° 52' 47.50" E	19° 55.845' S	118° 52.792' E
660	PIO	NTIs	19° 55' 3.18" S	118° 52' 27.05" E	19° 55.053' S	118° 52.451' E
661	PIO	NTIs	19° 54' 34.09" S	118° 52' 40.48" E	19° 54.568' S	118° 52.675' E
662	PIO	NTIs	19° 54' 21.67" S	118° 52' 51.02" E	19° 54.361' S	118° 52.850' E
663	PIO	NTIs	19° 54' 29.09" S	118° 53' 43.87" E	19° 54.485' S	118° 53.731' E
664	PIO	NTIs	19° 54' 22.00" S	118° 54' 38.09" E	19° 54.367' S	118° 54.635' E
665	PIO	NTIs	19° 53' 41.75" S	118° 55' 18.91" E	19° 53.696' S	118° 55.315' E
666	PIO	NTIs	19° 52' 53.90" S	118° 55' 29.03" E	19° 52.898' S	118° 55.484' E
667	PIO	NTIs	19° 52' 40.44" S	118° 55' 4.40" E	19° 52.674' S	118° 55.073' E
668	PIO	NTIs	19° 52' 10.99" S	118° 54' 42.66" E	19° 52.183' S	118° 54.711' E
669	PIO	NTIs	19° 51' 17.57" S	118° 54' 34.34" E	19° 51.293' S	118° 54.572' E
670	PIO	NTIs	19° 50' 24.29" S	118° 54' 10.01" E	19° 50.405' S	118° 54.167' E
671	PIO	NTIs	19° 49' 44.76" S	118° 53' 46.61" E	19° 49.746' S	118° 53.777' E
672	PIO	NTIs	19° 50' 26.41" S	118° 51' 58.57" E	19° 50.440' S	118° 51.976' E
673	PIO	NTIs	19° 51' 22.00" S	118° 52' 9.91" E	19° 51.367' S	118° 52.165' E
674	PIO	NTIs	19° 52' 11.96" S	118° 50' 56.33" E	19° 52.199' S	118° 50.939' E
675	PIO	NTIs	19° 52' 52.18" S	118° 50' 13.20" E	19° 52.870' S	118° 50.220' E
676	PIO	NTIs	19° 53' 6.76" S	118° 51' 11.48" E	19° 53.113' S	118° 51.191' E
677	PIO	NTIs	19° 53' 3.95" S	118° 52' 13.40" E	19° 53.066' S	118° 52.223' E
678	PIO	NTIs	19° 53' 5.86" S	118° 52' 38.64" E	19° 53.098' S	118° 52.644' E
679	PIO	NTIs	19° 53' 6.40" S	118° 52' 55.81" E	19° 53.107' S	118° 52.930' E
680	PIO	NTIs	19° 53' 1.32" S	118° 53' 0.78" E	19° 53.022' S	118° 53.013' E
681	PIO	NTIs	19° 53' 17.56" S	118° 53' 21.66" E	19° 53.293' S	118° 53.361' E
682	PIO	NTIs	19° 53' 33.86" S	118° 53' 37.79" E	19° 53.564' S	118° 53.630' E
683	PIO	NTIs	19° 53' 44.70" S	118° 53' 16.94" E	19° 53.745' S	118° 53.282' E
684	PIO	NTIs	19° 53' 55.00" S	118° 52' 54.05" E	19° 53.917' S	118° 52.901' E
685	PIO	NTIs	19° 53' 48.12" S	118° 52' 46.27" E	19° 53.802' S	118° 52.771' E
686	PIO	NTIs	19° 54' 6.66" S	118° 53' 2.15" E	19° 54.111' S	118° 53.036' E
687	PIO	NTIs	19° 54' 7.24" S	118° 53' 27.24" E	19° 54.121' S	118° 53.454' E
688	PIO	NTIs	19° 53' 25.44" S	118° 54' 34.06" E	19° 53.424' S	118° 54.568' E
689	PIO	NTIs	19° 53' 20.76" S	118° 54' 56.16" E	19° 53.346' S	118° 54.936' E
690	PIO	NTIs	19° 53' 5.28" S	118° 53' 57.23" E	19° 53.088' S	118° 53.954' E
691	PIO	NTIs	19° 52' 50.20" S	118° 53' 59.10" E	19° 52.837' S	118° 53.985' E
692	PIO	NTIs	19° 52' 34.57" S	118° 53' 58.63" E	19° 52.576' S	118° 53.977' E
693	PIO	NTIs	19° 52' 23.38" S	118° 53' 59.96" E	19° 52.390' S	118° 53.999' E
694	PIO	NTIs	19° 52' 17.08" S	118° 54' 13.79" E	19° 52.285' S	118° 54.230' E
695	PIO	NTIs	19° 52' 8.40" S	118° 54' 16.92" E	19° 52.140' S	118° 54.282' E
696	PIO	NTIs	19° 51' 57.74" S	118° 54' 18.25" E	19° 51.962' S	118° 54.304' E
697	PIO	NTIs	19° 52' 13.19" S	118° 55' 20.93" E	19° 52.220' S	118° 55.349' E
698	PIO	NTIs	19° 52' 51.78" S	118° 57' 5.83" E	19° 52.863' S	118° 57.097' E
699	PIO	NTIs	19° 53' 39.91" S	118° 57' 9.07" E	19° 53.665' S	118° 57.151' E
700	PIO	NTIs	19° 55' 18.77" S	118° 55' 31.58" E	19° 55.313' S	118° 55.526' E
701	PIO	NTIs	19° 55' 57.47" S	118° 55' 35.18" E	19° 55.958' S	118° 55.586' E
702	PIN	NTIs	19° 56' 39.44" S	118° 56' 41.86" E	19° 56.657' S	118° 56.698' E
703	PIN	De Grey	19° 57' 15.23" S	118° 58' 18.34" E	19° 57.254' S	118° 58.306' E
704	PIN	De Grey	19° 58' 10.34" S	118° 59' 42.76" E	19° 58.172' S	118° 59.713' E
705	PIN	De Grey	19° 58' 38.46" S	119° 0' 47.88" E	19° 58.641' S	119° 0.798' E
706	PIN	De Grey	19° 59' 3.98" S	119° 2' 19.86" E	19° 59.066' S	119° 2.331' E
707	PIN	De Grey	19° 59' 54.28" S	119° 1' 29.17" E	19° 59.905' S	119° 1.486' E
708	PIN	De Grey	19° 59' 52.51" S	118° 59' 50.14" E	19° 59.875' S	118° 59.836' E
709	PIN	De Grey	19° 59' 54.60" S	118° 58' 25.82" E	19° 59.910' S	118° 58.430' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
710	PIN	De Grey	20° 0' 22.10" S	118° 59' 37.07" E	20° 0.368' S	118° 59.618' E
711	PIN	De Grey	20° 0' 31.90" S	119° 0' 29.77" E	20° 0.532' S	119° 0.496' E
712	PIN	De Grey	20° 0' 33.30" S	119° 1' 50.45" E	20° 0.555' S	119° 1.841' E
713	PIN	De Grey	19° 59' 34.58" S	119° 3' 13.43" E	19° 59.576' S	119° 3.224' E
714	PIN	De Grey	19° 59' 20.58" S	119° 5' 22.99" E	19° 59.343' S	119° 5.383' E
715	PIN	De Grey	19° 58' 34.57" S	119° 4' 26.00" E	19° 58.576' S	119° 4.433' E
716	PIN	De Grey	19° 58' 1.16" S	119° 3' 54.86" E	19° 58.019' S	119° 3.914' E
717	PIN	De Grey	19° 57' 1.94" S	119° 3' 18.40" E	19° 57.032' S	119° 3.307' E
718	PIN	De Grey	19° 55' 59.59" S	119° 2' 41.06" E	19° 55.993' S	119° 2.684' E
719	PIN	De Grey	19° 54' 54.40" S	119° 2' 43.55" E	19° 54.907' S	119° 2.726' E
721	PIN	De Grey	19° 53' 51.83" S	119° 4' 41.41" E	19° 53.864' S	119° 4.690' E
722	PIN	De Grey	19° 54' 53.96" S	119° 5' 35.34" E	19° 54.899' S	119° 5.589' E
723	PIN	De Grey	19° 55' 52.21" S	119° 6' 29.23" E	19° 55.870' S	119° 6.487' E
724	PIN	De Grey	19° 56' 10.79" S	119° 7' 55.78" E	19° 56.180' S	119° 7.930' E
725	PIN	De Grey	19° 55' 48.50" S	119° 9' 25.96" E	19° 55.808' S	119° 9.433' E
726	PIN	De Grey	19° 54' 43.63" S	119° 10' 8.22" E	19° 54.727' S	119° 10.137' E
727	PIN	De Grey	19° 53' 54.13" S	119° 10' 14.20" E	19° 53.902' S	119° 10.237' E
728	PIN	De Grey	19° 52' 52.93" S	119° 10' 10.02" E	19° 52.882' S	119° 10.167' E
729	PIN	De Grey	19° 52' 21.43" S	119° 11' 23.42" E	19° 52.357' S	119° 11.390' E
730	PIN	De Grey	19° 52' 1.96" S	119° 12' 16.27" E	19° 52.033' S	119° 12.271' E
731	PIN	De Grey	19° 52' 29.78" S	119° 12' 49.82" E	19° 52.496' S	119° 12.830' E
732	PIN	De Grey	19° 53' 42.76" S	119° 12' 51.70" E	19° 53.713' S	119° 12.862' E
733	PIN	De Grey	19° 54' 9.36" S	119° 14' 0.92" E	19° 54.156' S	119° 14.015' E
734	PIN	De Grey	19° 55' 2.06" S	119° 15' 54.50" E	19° 55.034' S	119° 15.908' E
735	PIN	De Grey	19° 56' 44.27" S	119° 15' 42.70" E	19° 56.738' S	119° 15.712' E
736	PIN	De Grey	19° 57' 58.43" S	119° 14' 44.48" E	19° 57.974' S	119° 14.741' E
737	PIN	De Grey	19° 58' 9.98" S	119° 14' 25.87" E	19° 58.166' S	119° 14.431' E
738	PIN	De Grey	19° 57' 57.60" S	119° 17' 11.54" E	19° 57.960' S	119° 17.192' E
739	PIN	De Grey	19° 57' 55.04" S	119° 18' 36.40" E	19° 57.917' S	119° 18.607' E
740	PIN	De Grey	19° 57' 44.14" S	119° 20' 11.40" E	19° 57.736' S	119° 20.190' E
741	PIN	De Grey	19° 57' 21.49" S	119° 22' 30.18" E	19° 57.358' S	119° 22.503' E
742	PIN	De Grey	19° 56' 34.62" S	119° 22' 26.40" E	19° 56.577' S	119° 22.440' E
743	PIN	De Grey	19° 56' 22.78" S	119° 23' 57.26" E	19° 56.380' S	119° 23.954' E
744	PIN	De Grey	19° 57' 18.11" S	119° 23' 6.43" E	19° 57.302' S	119° 23.107' E
745	PIN	De Grey	19° 57' 12.46" S	119° 23' 31.42" E	19° 57.208' S	119° 23.524' E
746	PIN	De Grey	19° 57' 10.76" S	119° 24' 23.54" E	19° 57.179' S	119° 24.392' E
747	PIN	De Grey	19° 57' 15.16" S	119° 24' 22.07" E	19° 57.253' S	119° 24.368' E
748	PIN	De Grey	19° 57' 20.48" S	119° 24' 20.63" E	19° 57.341' S	119° 24.344' E
749	PIN	De Grey	19° 58' 21.00" S	119° 24' 15.41" E	19° 58.350' S	119° 24.257' E
750	PIN	De Grey	19° 58' 52.68" S	119° 23' 25.48" E	19° 58.878' S	119° 23.425' E
751	PIN	De Grey	19° 59' 6.43" S	119° 22' 49.80" E	19° 59.107' S	119° 22.830' E
752	PIN	De Grey	19° 59' 45.85" S	119° 22' 52.64" E	19° 59.764' S	119° 22.877' E
753	PIN	De Grey	19° 59' 33.07" S	119° 23' 3.88" E	19° 59.551' S	119° 23.065' E
754	PIN	De Grey	19° 58' 43.93" S	119° 24' 19.80" E	19° 58.732' S	119° 24.330' E
756	PIN	De Grey	19° 59' 9.42" S	119° 26' 4.99" E	19° 59.157' S	119° 26.083' E
757	PIN	De Grey	19° 59' 41.32" S	119° 26' 38.22" E	19° 59.689' S	119° 26.637' E
758	PIN	De Grey	20° 0' 3.28" S	119° 26' 49.63" E	20° 0.055' S	119° 26.827' E
759	PIN	De Grey	20° 0' 5.22" S	119° 26' 57.70" E	20° 0.087' S	119° 26.962' E
760	PIN	De Grey	20° 0' 8.82" S	119° 27' 7.56" E	20° 0.147' S	119° 27.126' E
761	PIN	De Grey	19° 59' 25.76" S	119° 27' 37.51" E	19° 59.429' S	119° 27.625' E
762	PIN	De Grey	19° 58' 23.99" S	119° 28' 0.73" E	19° 58.400' S	119° 28.012' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
763	PIN	De Grey	19° 57' 24.98" S	119° 28' 29.28" E	19° 57.416' S	119° 28.488' E
764	PIN	De Grey	19° 58' 4.19" S	119° 30' 12.20" E	19° 58.070' S	119° 30.203' E
765	PIN	De Grey	19° 59' 19.64" S	119° 29' 53.52" E	19° 59.327' S	119° 29.892' E
766	PIN	De Grey	20° 0' 15.62" S	119° 29' 49.31" E	20° 0.260' S	119° 29.822' E
767	PIN	De Grey	20° 0' 42.73" S	119° 30' 8.82" E	20° 0.712' S	119° 30.147' E
768	PIN	De Grey	20° 1' 18.01" S	119° 30' 17.17" E	20° 1.300' S	119° 30.286' E
769	PIN	De Grey	20° 1' 44.83" S	119° 30' 11.23" E	20° 1.747' S	119° 30.187' E
770	PIN	De Grey	20° 1' 33.89" S	119° 30' 28.01" E	20° 1.565' S	119° 30.467' E
771	PIN	De Grey	20° 1' 27.73" S	119° 30' 38.52" E	20° 1.462' S	119° 30.642' E
772	PIN	De Grey	20° 1' 14.12" S	119° 30' 57.38" E	20° 1.235' S	119° 30.956' E
773	PIN	De Grey	20° 0' 58.36" S	119° 31' 24.67" E	20° 0.973' S	119° 31.411' E
774	PIN	De Grey	20° 0' 41.98" S	119° 31' 49.15" E	20° 0.700' S	119° 31.819' E
775	PIN	De Grey	20° 0' 22.50" S	119° 31' 57.32" E	20° 0.375' S	119° 31.955' E
776	PIN	De Grey	20° 0' 8.82" S	119° 32' 19.72" E	20° 0.147' S	119° 32.329' E
777	PIN	De Grey	19° 59' 54.67" S	119° 32' 28.68" E	19° 59.911' S	119° 32.478' E
778	PIN	De Grey	20° 0' 33.34" S	119° 32' 43.73" E	20° 0.556' S	119° 32.729' E
779	PIN	De Grey	20° 0' 43.81" S	119° 33' 15.88" E	20° 0.730' S	119° 33.265' E
780	PIN	De Grey	20° 0' 52.67" S	119° 33' 6.05" E	20° 0.878' S	119° 33.101' E
781	PIN	De Grey	20° 1' 8.47" S	119° 32' 44.27" E	20° 1.141' S	119° 32.738' E
782	PIN	De Grey	20° 1' 42.89" S	119° 32' 17.63" E	20° 1.715' S	119° 32.294' E
783	PIN	De Grey	20° 2' 0.78" S	119° 32' 7.91" E	20° 2.013' S	119° 32.132' E
784	PIN	De Grey	20° 2' 32.60" S	119° 31' 38.42" E	20° 2.543' S	119° 31.640' E
785	PIN	De Grey	20° 2' 39.80" S	119° 31' 36.95" E	20° 2.663' S	119° 31.616' E
786	PIN	De Grey	20° 3' 0.14" S	119° 32' 8.88" E	20° 3.002' S	119° 32.148' E
787	PIN	De Grey	20° 1' 59.09" S	119° 33' 39.10" E	20° 1.985' S	119° 33.652' E
788	PIN	De Grey	20° 1' 32.56" S	119° 34' 11.89" E	20° 1.543' S	119° 34.198' E
789	PIN	De Grey	20° 0' 42.01" S	119° 34' 28.67" E	20° 0.700' S	119° 34.478' E
790	PIN	De Grey	20° 0' 20.12" S	119° 34' 27.08" E	20° 0.335' S	119° 34.451' E
791	PIN	De Grey	20° 0' 57.28" S	119° 35' 10.10" E	20° 0.955' S	119° 35.168' E
792	PIN	De Grey	20° 1' 3.83" S	119° 35' 11.29" E	20° 1.064' S	119° 35.188' E
793	PIN	De Grey	20° 1' 6.96" S	119° 36' 11.59" E	20° 1.116' S	119° 36.193' E
794	PIN	De Grey	20° 1' 55.96" S	119° 37' 13.62" E	20° 1.933' S	119° 37.227' E
795	PIN	De Grey	20° 1' 54.73" S	119° 37' 21.32" E	20° 1.912' S	119° 37.355' E
796	PIN	De Grey	20° 1' 40.66" S	119° 37' 41.88" E	20° 1.678' S	119° 37.698' E
797	PIN	De Grey	20° 2' 29.29" S	119° 38' 13.56" E	20° 2.488' S	119° 38.226' E
798	PIN	De Grey	20° 2' 22.42" S	119° 38' 24.14" E	20° 2.374' S	119° 38.402' E
799	PIN	De Grey	20° 1' 10.13" S	119° 39' 59.80" E	20° 1.169' S	119° 39.997' E
800	PIN	De Grey	20° 0' 56.99" S	119° 39' 47.23" E	20° 0.950' S	119° 39.787' E
801	PIN	De Grey	20° 0' 47.77" S	119° 39' 34.16" E	20° 0.796' S	119° 39.569' E
802	PIN	De Grey	20° 0' 39.92" S	119° 39' 20.84" E	20° 0.665' S	119° 39.347' E
803	PIN	De Grey	20° 0' 40.36" S	119° 39' 10.01" E	20° 0.673' S	119° 39.167' E
804	PIN	De Grey	20° 0' 38.95" S	119° 38' 52.66" E	20° 0.649' S	119° 38.878' E
805	PIN	De Grey	20° 0' 35.24" S	119° 38' 41.75" E	20° 0.587' S	119° 38.696' E
806	PIN	De Grey	20° 0' 37.80" S	119° 38' 36.49" E	20° 0.630' S	119° 38.608' E
807	PIN	De Grey	20° 0' 13.86" S	119° 38' 5.57" E	20° 0.231' S	119° 38.093' E
808	PIN	De Grey	19° 59' 19.82" S	119° 38' 20.44" E	19° 59.330' S	119° 38.341' E
809	PIN	De Grey	19° 58' 21.68" S	119° 39' 24.95" E	19° 58.361' S	119° 39.416' E
810	PIN	De Grey	19° 57' 56.63" S	119° 40' 10.13" E	19° 57.944' S	119° 40.169' E
811	PIN	De Grey	19° 58' 35.08" S	119° 40' 8.80" E	19° 58.585' S	119° 40.147' E
812	PIN	De Grey	19° 59' 24.32" S	119° 39' 35.89" E	19° 59.405' S	119° 39.598' E
813	PIN	De Grey	19° 59' 38.22" S	119° 41' 28.07" E	19° 59.637' S	119° 41.468' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
814	PIN	De Grey	19° 59' 41.14" S	119° 41' 46.10" E	19° 59.686' S	119° 41.768' E
815	PIN	De Grey	19° 58' 58.30" S	119° 42' 3.67" E	19° 58.972' S	119° 42.061' E
816	PIN	De Grey	19° 58' 57.50" S	119° 42' 24.80" E	19° 58.958' S	119° 42.413' E
817	PIN	De Grey	19° 59' 32.82" S	119° 42' 42.19" E	19° 59.547' S	119° 42.703' E
818	PIN	De Grey	20° 0' 2.66" S	119° 42' 51.19" E	20° 0.044' S	119° 42.853' E
819	PIN	De Grey	19° 59' 48.91" S	119° 43' 13.91" E	19° 59.815' S	119° 43.232' E
820	PIN	De Grey	19° 58' 58.98" S	119° 43' 32.63" E	19° 58.983' S	119° 43.544' E
821	PIN	De Grey	19° 58' 39.40" S	119° 43' 33.13" E	19° 58.657' S	119° 43.552' E
822	PIN	De Grey	19° 58' 22.76" S	119° 43' 55.27" E	19° 58.379' S	119° 43.921' E
823	PIN	De Grey	19° 57' 49.03" S	119° 44' 47.26" E	19° 57.817' S	119° 44.788' E
824	PIN	De Grey	19° 57' 44.32" S	119° 45' 13.54" E	19° 57.739' S	119° 45.226' E
825	PIN	De Grey	19° 57' 31.82" S	119° 45' 32.44" E	19° 57.530' S	119° 45.541' E
826	PIN	De Grey	19° 57' 2.23" S	119° 45' 44.35" E	19° 57.037' S	119° 45.739' E
827	EMB	De Grey	19° 57' 19.58" S	119° 46' 57.11" E	19° 57.326' S	119° 46.952' E
828	EMB	De Grey	19° 57' 42.05" S	119° 47' 37.93" E	19° 57.701' S	119° 47.632' E
829	EMB	De Grey	19° 57' 18.94" S	119° 47' 38.44" E	19° 57.316' S	119° 47.641' E
830	EMB	De Grey	19° 57' 6.05" S	119° 47' 28.43" E	19° 57.101' S	119° 47.474' E
831	EMB	De Grey	19° 56' 56.36" S	119° 47' 57.12" E	19° 56.939' S	119° 47.952' E
832	EMB	De Grey	19° 56' 39.19" S	119° 48' 47.92" E	19° 56.653' S	119° 48.799' E
833	EMB	De Grey	19° 56' 25.94" S	119° 49' 27.70" E	19° 56.432' S	119° 49.462' E
834	EMB	De Grey	19° 56' 38.26" S	119° 51' 26.10" E	19° 56.638' S	119° 51.435' E
835	EMB	De Grey	19° 56' 10.39" S	119° 51' 9.29" E	19° 56.173' S	119° 51.155' E
836	EMB	De Grey	19° 55' 40.84" S	119° 50' 43.80" E	19° 55.681' S	119° 50.730' E
837	EMB	De Grey	19° 55' 4.87" S	119° 50' 22.06" E	19° 55.081' S	119° 50.368' E
838	EMB	De Grey	19° 55' 8.33" S	119° 49' 35.08" E	19° 55.139' S	119° 49.585' E
839	EMB	De Grey	19° 55' 25.97" S	119° 48' 14.76" E	19° 55.433' S	119° 48.246' E
840	EMB	De Grey	19° 55' 19.45" S	119° 47' 25.69" E	19° 55.324' S	119° 47.428' E
841	EMB	De Grey	19° 55' 33.38" S	119° 46' 7.25" E	19° 55.556' S	119° 46.121' E
842	PIN	De Grey	19° 55' 40.48" S	119° 44' 22.74" E	19° 55.675' S	119° 44.379' E
843	PIN	De Grey	19° 56' 43.98" S	119° 42' 26.71" E	19° 56.733' S	119° 42.445' E
844	PIO	Bedout	19° 38' 36.67" S	119° 6' 31.61" E	19° 38.611' S	119° 6.527' E
845	PIO	Bedout	19° 38' 2.83" S	119° 6' 13.21" E	19° 38.047' S	119° 6.220' E
846	PIO	Bedout	19° 37' 17.87" S	119° 4' 38.57" E	19° 37.298' S	119° 4.643' E
847	PIO	Bedout	19° 36' 19.58" S	119° 3' 27.00" E	19° 36.326' S	119° 3.450' E
848	PIO	Bedout	19° 34' 13.69" S	119° 3' 1.08" E	19° 34.228' S	119° 3.018' E
849	PIO	Bedout	19° 33' 3.96" S	119° 3' 55.15" E	19° 33.066' S	119° 3.919' E
850	PIO	Bedout	19° 32' 9.02" S	119° 5' 8.41" E	19° 32.150' S	119° 5.140' E
851	PIO	Bedout	19° 32' 57.34" S	119° 7' 39.04" E	19° 32.956' S	119° 7.651' E
852	PIO	Bedout	19° 33' 56.84" S	119° 8' 28.43" E	19° 33.947' S	119° 8.474' E
853	PIO	Bedout	19° 35' 27.74" S	119° 8' 48.66" E	19° 35.462' S	119° 8.811' E
854	PIO	Bedout	19° 36' 44.32" S	119° 8' 11.62" E	19° 36.739' S	119° 8.194' E
855	PIO	Bedout	19° 37' 0.44" S	119° 6' 36.72" E	19° 37.007' S	119° 6.612' E
856	PIO	Bedout	19° 37' 8.87" S	119° 6' 1.94" E	19° 37.148' S	119° 6.032' E
857	PIO	Bedout	19° 36' 55.12" S	119° 5' 39.55" E	19° 36.919' S	119° 5.659' E
858	PIO	Bedout	19° 36' 49.25" S	119° 5' 27.85" E	19° 36.821' S	119° 5.464' E
859	PIO	Bedout	19° 35' 42.97" S	119° 4' 16.21" E	19° 35.716' S	119° 4.270' E
860	PIO	Bedout	19° 35' 10.07" S	119° 4' 0.98" E	19° 35.168' S	119° 4.016' E
861	PIO	Bedout	19° 34' 32.59" S	119° 4' 37.49" E	19° 34.543' S	119° 4.625' E
862	PIO	Bedout	19° 33' 26.10" S	119° 5' 11.51" E	19° 33.435' S	119° 5.192' E
863	PIO	Bedout	19° 33' 53.06" S	119° 5' 20.29" E	19° 33.884' S	119° 5.338' E
864	PIO	Bedout	19° 34' 10.06" S	119° 5' 21.59" E	19° 34.168' S	119° 5.360' E

ID	Reg.	Location	Lat DMS	Long DMS	Lat DDM	Long DDM
865	PIO	Bedout	19° 33' 34.27" S	119° 6' 26.64" E	19° 33.571' S	119° 6.444' E
866	PIO	Bedout	19° 33' 57.96" S	119° 6' 56.52" E	19° 33.966' S	119° 6.942' E
867	PIO	Bedout	19° 35' 4.74" S	119° 7' 21.68" E	19° 35.079' S	119° 7.361' E
868	PIO	Bedout	19° 34' 54.08" S	119° 6' 51.98" E	19° 34.901' S	119° 6.866' E
869	PIO	Bedout	19° 36' 20.02" S	119° 6' 0.25" E	19° 36.334' S	119° 6.004' E
870	PIO	Bedout	19° 36' 6.16" S	119° 5' 58.20" E	19° 36.103' S	119° 5.970' E
871	PIO	Bedout	19° 35' 56.62" S	119° 5' 20.87" E	19° 35.944' S	119° 5.348' E
872	PIO	Bedout	19° 35' 20.87" S	119° 5' 1.61" E	19° 35.348' S	119° 5.027' E
873	PIO	Bedout	19° 35' 18.28" S	119° 5' 9.10" E	19° 35.305' S	119° 5.152' E
874	PIO	Bedout	19° 34' 37.56" S	119° 4' 47.53" E	19° 34.626' S	119° 4.792' E
875	PIO	Bedout	19° 34' 17.18" S	119° 5' 24.83" E	19° 34.286' S	119° 5.414' E
876	PIO	Bedout	19° 34' 28.56" S	119° 5' 27.24" E	19° 34.476' S	119° 5.454' E
877	PIO	Bedout	19° 34' 28.42" S	119° 5' 39.62" E	19° 34.474' S	119° 5.660' E
878	PIO	Bedout	19° 34' 54.41" S	119° 6' 40.46" E	19° 34.907' S	119° 6.674' E
879	PIO	Bedout	19° 34' 56.60" S	119° 6' 36.00" E	19° 34.943' S	119° 6.600' E
880	PIO	Bedout	19° 35' 0.56" S	119° 6' 31.18" E	19° 35.009' S	119° 6.520' E
881	PIO	Bedout	19° 35' 11.83" S	119° 6' 12.53" E	19° 35.197' S	119° 6.209' E
882	PIO	Bedout	19° 35' 42.58" S	119° 6' 2.38" E	19° 35.710' S	119° 6.040' E
883	PIO	Bedout	19° 35' 52.51" S	119° 6' 5.15" E	19° 35.875' S	119° 6.086' E
884	PIO	Bedout	19° 35' 13.06" S	119° 5' 28.93" E	19° 35.218' S	119° 5.482' E
885	PIO	Bedout	19° 35' 16.08" S	119° 5' 44.77" E	19° 35.268' S	119° 5.746' E
886	PIO	Bedout	19° 34' 58.98" S	119° 5' 44.16" E	19° 34.983' S	119° 5.736' E
887	PIO	Bedout	19° 34' 51.24" S	119° 6' 8.50" E	19° 34.854' S	119° 6.142' E
888	PIO	Bedout	19° 34' 51.96" S	119° 5' 4.99" E	19° 34.866' S	119° 5.083' E
889	PIO	Bedout	19° 34' 47.53" S	119° 5' 17.70" E	19° 34.792' S	119° 5.295' E

APPENDIX II: HABITAT DATA SHEETS

HABITAT DATA SHEET

Site ID	Site Name	Drop Tow Snorkel Direct Bathyscope
Recorder	Method	
Date	Time	
Video tape /DVD No.	Way Point	
In Lat (WGS 84)	In Long	° 'E
Out Lat	Out Long	° 'E
Depth	Zone	
Substrate Relief	Substrate type	Silt-mud/ Sand/ Course sand-gravel/ Rubble/ Coral rubble/ Reef
Biological community & species		Cover (sparse medium dense)
Other species & notes		
Dominant organism	Habitat type	

Site ID	Site Name	Drop Tow Snorkel Direct Bathyscope
Recorder	Method	
Date	Time	
Video tape /DVD No.	Way Point	
In Lat (WGS 84)	In Long	° 'E
Out Lat	Out Long	° 'E
Depth	Zone	
Substrate Relief	Substrate type	Silt-mud/ Sand/ Course sand-gravel/ Rubble/ Coral rubble/ Reef
Biological community & species		Cover (sparse medium dense)
Other species & notes		
Dominant organism	Habitat type	

APPENDIX III: INSTRUCTIONS FOR THE TOWED VIDEO UNIT

Instructions to use Sony DVDirect with Deep Blue Pro drop down camera

Plug camera, monitor, GPS (Garmin 450S), GeoStamp, splitter/amplifier and DVDirect into 12v power supply. Fuse must be plugged in when using or charging battery but unplug fuse when not in use.

Connect video output on camera lead (via double adaptor or splitter/amplifier) to video input on DVDirect and monitor.

Connect Garmin 450S to GeoStamp. Connect audio out on GeoStamp to audio in on DVDirect. Ensure the green power light is on.

Switch on DVDirect and the camera image should appear on the screen.

Insert disc. Note: Do not use DVD-R discs as for some reason they can't be read by our laptops. Use only DVD+R discs. The DVDirect will format disc.

Ensure that the top left of screen displays "Video -> DVD". If not, press return to enter the menu and scroll using the arrows until "DV Camcorder/Video->DVD" is highlighted and press "select" (button in the centre of the scroll arrows).

Press button with red dot to begin recording. Press the button with the grey square to stop.

To play back enter menu by pressing the return button. Scroll to "DVD Video Preview" and press select.

The bottom right of the screen will display the total number of chapters (segment of video recorded between each start/stop operation) and the chapter currently playing i.e. 4/7 is chapter 4 of 7.

Use scroll button to choose chapter to preview. Player will return to menu after last chapter.

Scroll back to "Video -> DVD mode" to record more clips. The time remaining on the disc will be displayed in the bottom right corner.

Note: do not use pause function when recording as this will interrupt the recording during the chapter. This will result in the length of the chapter no longer relating to the time elapsed between start and stop of the transect making it difficult to apply coordinates from the GPS to the footage.

When disc is full or at the end of each day the disc should be finalized. When eject button is pushed you will be asked if you want to finalize disc. Press yes.

To use the computer as a monitor the video to USB adapter must be used.

APPENDIX IV: INSTRUCTIONS FOR THE DROP-DOWN VIDEO UNIT

Setup

1. Connect sheathed coax cable to splitter box and camera
2. Ensure the sheath is tied to the camera in a way that prevents any load on the coax itself
3. Connect splitter box to TV/video unit via short lead (aerial in socket)
4. Connect TV/video unit to 12 volt power supply
5. Tune TV to channel 0
6. Connect camera power leads to 12 volt battery
7. Ensure that the polarity of the battery leads are correct or the 1 amp splitter box fuse will rupture

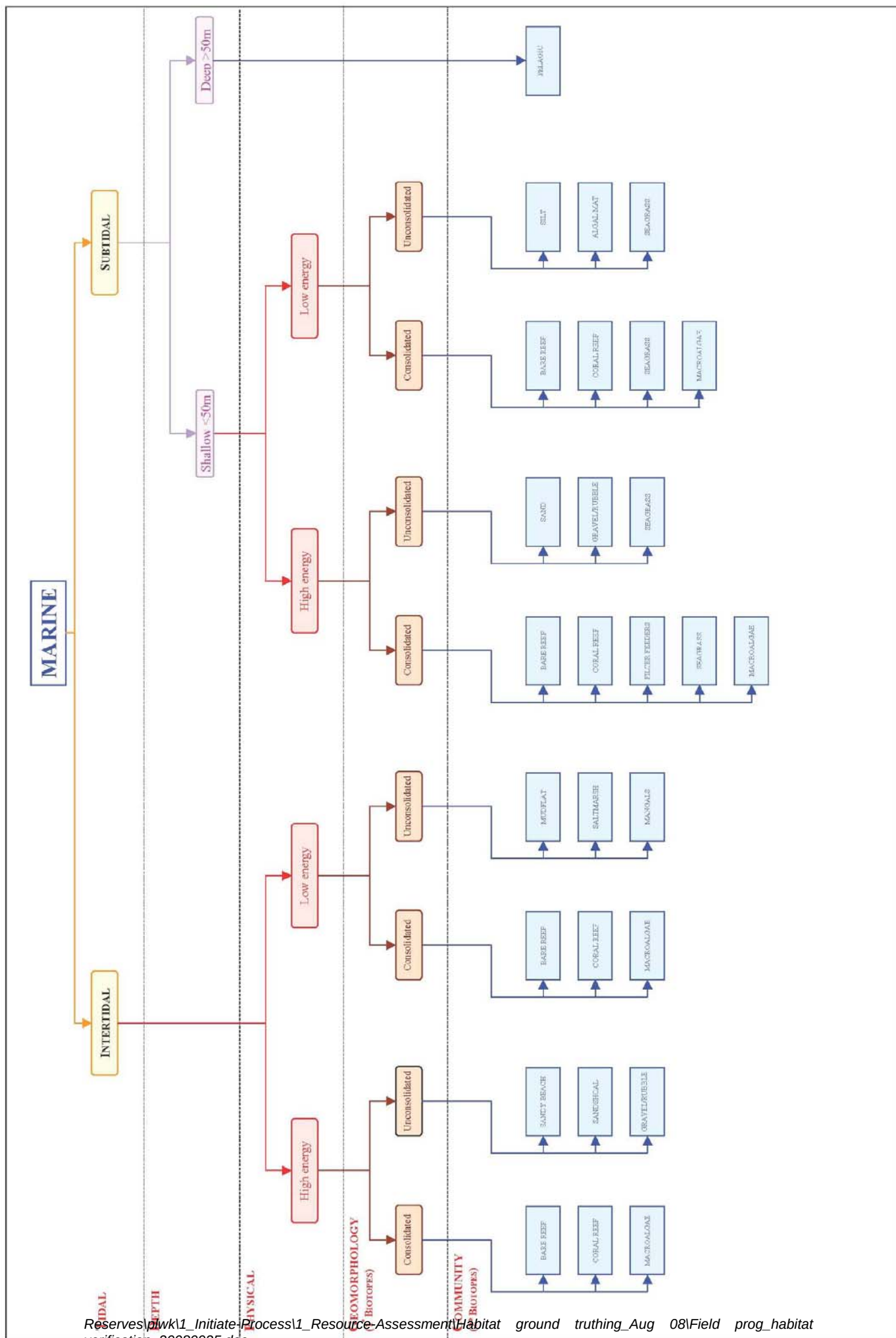
Operation

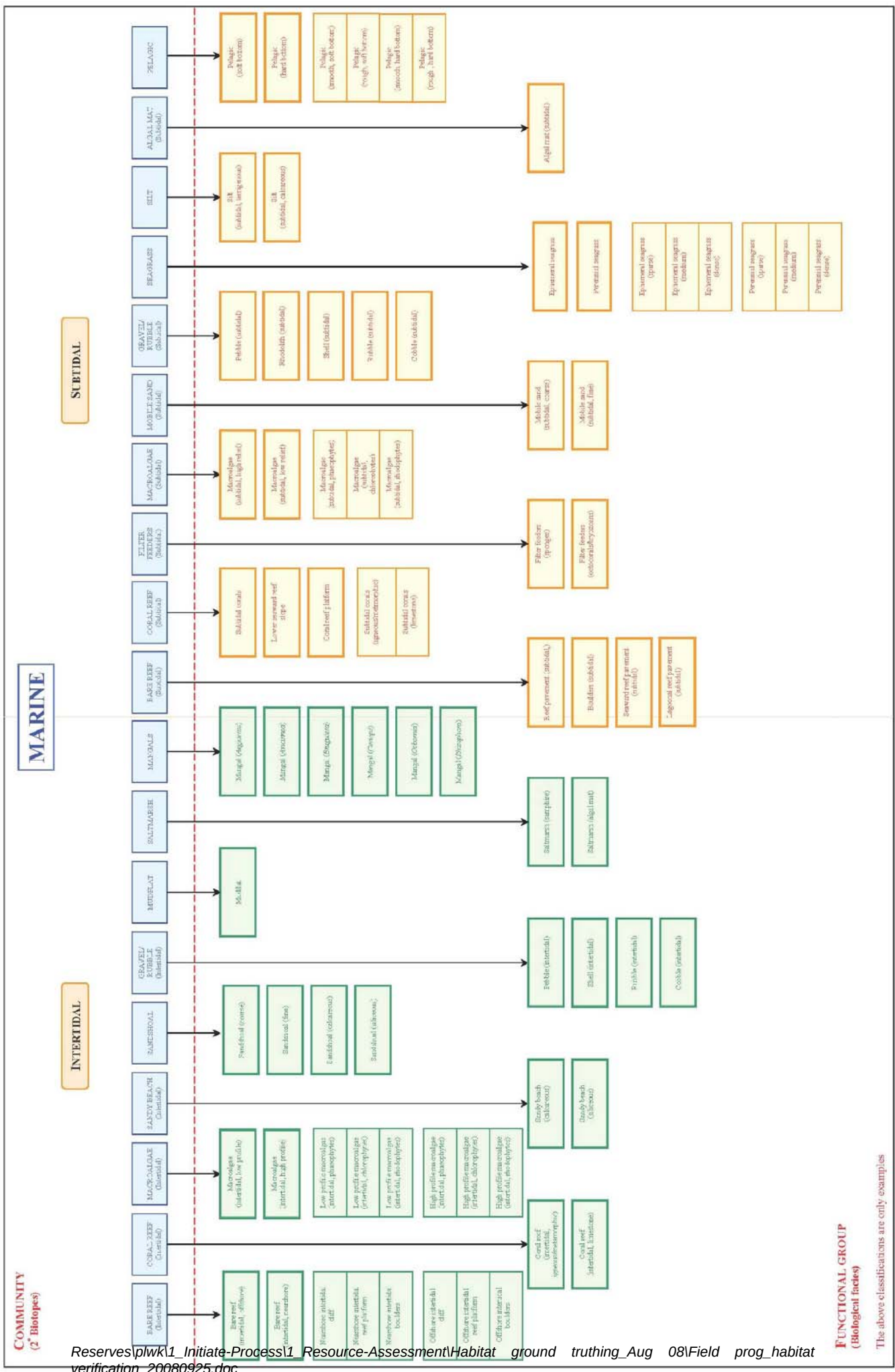
1. Write site number, date and location on the clapper board
2. Place clapper board in front of the camera and record for about 30 seconds then press pause
3. Lower camera to the bottom and press pause to recommence recording.
4. Record about 30 seconds of benthic habitat footage
5. Fill out habitat data sheet
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 weights or other objects to camera or cable
6. Beware of 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 bottom
9. Always keep remote control in sealed plastic bag (one drop from a wet hand will destroy it)
10. 240 volt power is not to be used on boats. Use only 12 volt power supply
11. Keep splitter box and batteries in a dry place
12. Disconnect power to camera when not in use

APPENDIX V: HABITAT CLASSIFICATION SCHEME





APPENDIX VI: JOB SAFETY ANALYSIS

APPENDIX VII: SNORKEL PLAN

