

**MARINE RESERVE IMPLEMENTATION:
MIDWEST**

**BIOLOGICAL SURVEY OF THE
SOUTHERN PORTION OF NINGALOO REEF**

Final Report: MRI/MW/NSE-29/1999

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

A project partially funded through the Natural Heritage Trust's
Coast and Clean Seas Marine Protected Area Programme
Project No: GO24/97

**Prepared by K P Bancroft
Marine Conservation Branch**

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Marine Conservation Branch
Department of Conservation and Land Management
47 Henry St
Fremantle, Western Australia, 6160

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SUMMARY

This report summarises the major activities and outcomes of a one-year project entitled “*Biological survey of the southern portion of Ningaloo Reef*” which was partially funded through the Natural Heritage Trust’s Coast and Clean Seas marine Protected Area Programme. The outcomes of specific action items detailed in the project specifications are reported on.

This project has highlighted the lack of biological and physical information for the proposed southern extension to Ningaloo Marine Park.

The most significant outcomes from this project are the broadscale benthic habitat map and collected biological information.

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1. INTRODUCTION

This report summarises the major activities and outcomes of a one-year project entitled “*Biological survey of the southern portion of Ningaloo Reef*”. The outcomes of specific action items detailed in the project specifications are reported on.

1.1. BACKGROUND

In recognition of the importance of conserving the State’s marine biodiversity, the Minister for the Environment established the Marine Parks and Reserves Selection Working Group (MPRSWG) in 1986. The main aim of the MPRS WG was to identify representative and unique areas of Western Australia’s marine waters for consideration as part of a statewide system of marine conservation reserves under the *Conservation and Land Management (CALM) Act* 1984. The MPRS WG’s report was released in June 1994 and identified over seventy such candidate areas throughout the coastal waters of Western Australia (CALM, 1994).

The State’s vesting body for marine conservation reserves is the Marine Parks and Reserves Authority (MPRA) which was established in 1997. The MPRA has prioritised the candidate areas for implementation as marine conservation reserves and the proposed southern extension of Ningaloo Marine Park (Figure 1) was one of the MPRA’s high priority candidate areas.

Under the State Government’s marine and conservation strategy detailed in *New Horizons - The way ahead in marine conservation and management* released by the Western Australian Government in 1998 (WA Government, undated), there is a requirement for:

“Extensive assessment, community consultation and management planning before a new marine conservation reserve is established.”

An essential component of this is that:

“A comprehensive assessment of the area’s biological and economic resources, and social values is carried out.”

In view of the high standing that the proposed southern extension to Ningaloo Marine Park has in the MPRA’s priority list for new marine conservation reserves, CALM applied to Environment Australia for funding to perform a biological survey in the area. Partial funding of \$22,000 (Grant No GO24/97) for the project has been obtained through Environment Australia’s Natural Heritage Trust, via the Coast and Clean Seas Marine Protected Area Programme. CALM contributed further resources to the project, valued at approximately \$44,000.

The data acquired during this project will be important in the determination of the relative conservation values of the respective major habitats of the proposed southern extension to the Ningaloo Marine Park. It will also contribute to the information base required for the marine reserve planning process, during which marine reserve boundaries and zones for multiple-use will be considered for the area.

This project was coordinated by CALM’s Marine Conservation Branch (MCB) and conducted in collaboration with the Midwest Regional Office.

1.2. OBJECTIVE

The objective of the project was to describe and classify the marine flora and fauna in representative habitats of the southern portion of Ningaloo Reef.

1.3. STUDY AREA

The area of interest for this project is the proposed southern extension to Ningaloo Marine Park (Figure 1). This area lies between Amherst Point (23° S) in the north to Red Bluff (24° 01.6' S) in the south, and extends to the Limit of State Territorial Waters, described as 3 nm from the Territorial Sea Baseline.

2. PROJECT TASKS

The project details are outlined in the Work Schedule (see Appendix A) and include three specific action items:

- Action 1.** Review and collate existing biological and physical data of the area;
- Action 2.** Map and auto-classify the major benthic habitats from satellite images, and;
- Action 3.** Undertake a survey of marine flora and fauna in the major habitat types identified in Action 2.

2.1.1. ACTION 1: Review and collate existing biological and physical data of the area

An extensive search and collation of existing biological and physical data, in the form of Geological Information (GIS) layers, has been undertaken.

This review highlighted that there has been no biological or physical data layers created for the proposed southern extension to the Ningaloo Marine Park. This may in part, be attributed to the inaccessibility to the area from the closure of gates at the Worroora/Gnaraloo stations fence-line and the northern paddocks of Gnaraloo Station. These gates have been permanently closed historically but were temporarily opened for the first time in April 1999 for period of six weeks.

2.1.2. ACTION 2. Map and auto-classify the major benthic habitats from aerial photographs and satellite images

A preliminary habitat map was produced using aerial photographs and Landsat Thematic Map imagery. An auto-classification algorithm was applied to the Landsat image and the resulting habitat map (Figures 2 & 3) highlighted the need for further ground-truth biological data.

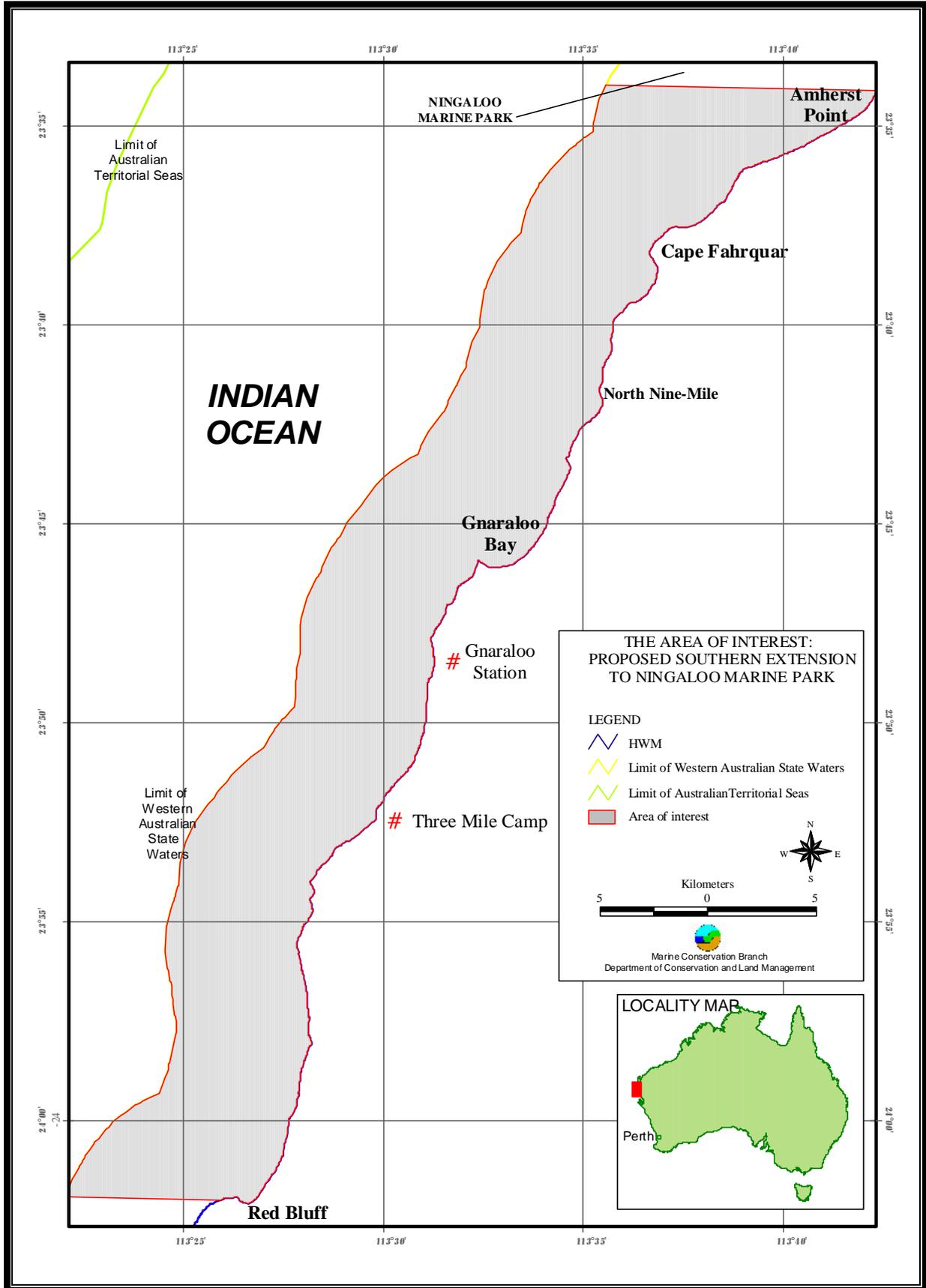


Figure 1. Study area: The proposed southern extension to Ningaloo Marine Park

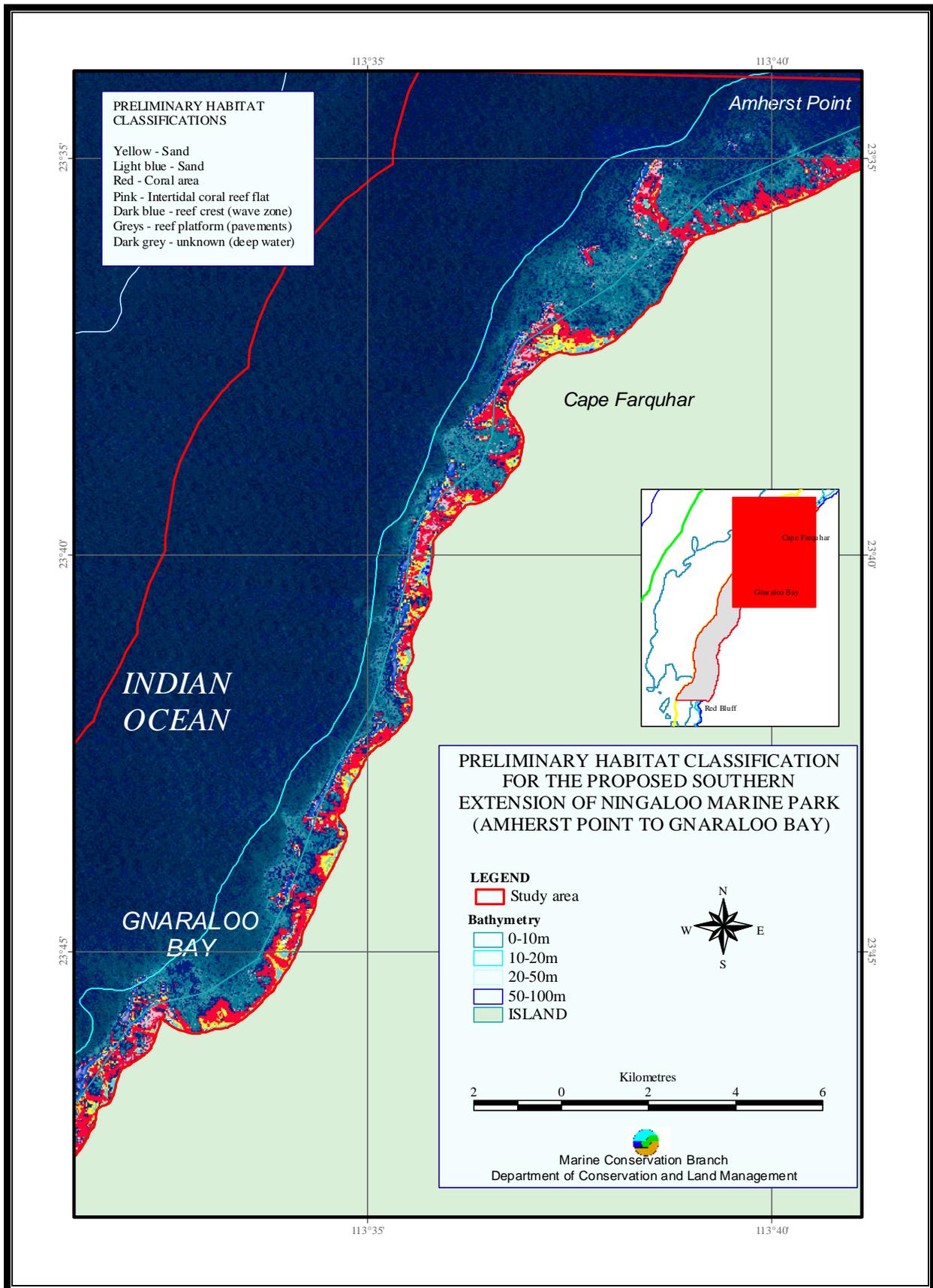


Figure 2. Preliminary habitat map of the proposed southern extension to Ningaloo Marine Park (Amherst Point to Gnaraloo Bay)

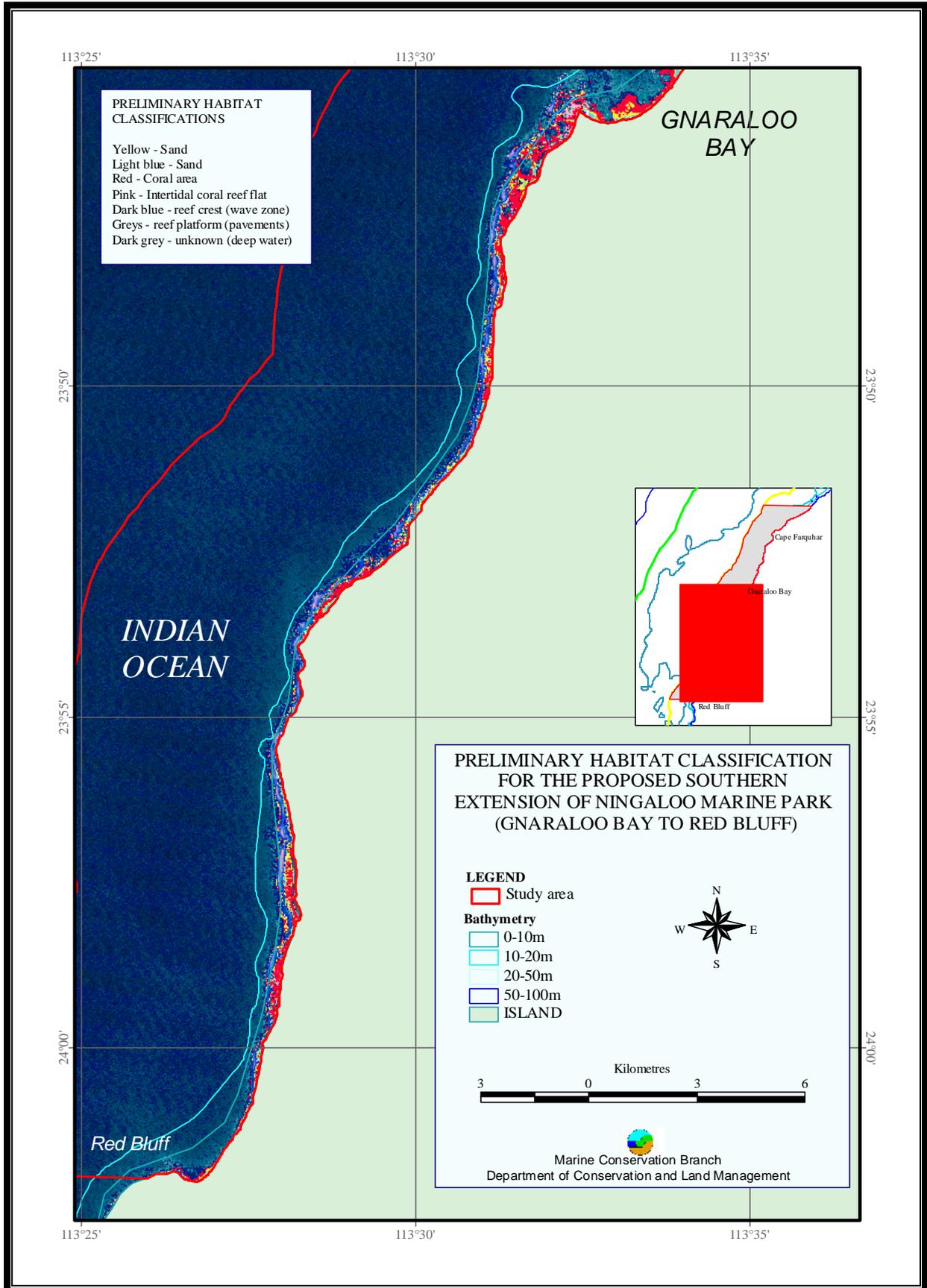


Figure 3. Preliminary habitat map of the proposed southern extension to Ningaloo Marine Park (Gnaraloo Bay to Red Bluff)

This map was utilised to preselect various sites for the biological verification field survey for the proposed southern extension of Ningaloo Marine Park (*see* Action 3; *see* Appendix B. CALM Field Programme Report: MRI/MW/NSE-24/1999; Bancroft & Lapwood, 1999).

2.1.3. ACTION 3: Undertake a ground truthing survey to verify the biological and spatial accuracy of the benthic habitat maps

A biological verification field survey was conducted in October 1999 (*see* Appendix B. CALM Field Programme Report: MRI/MW/NSE-24/1999; Bancroft & Lapwood, 1999).

The objectives of this field survey were as follows.

Primary objectives:

- to ground-truth the major marine habitats of the area, and;
- to document the diversity of coral and fish species at representative sites within selected habitats.

Secondary objectives:

- to establish the location of prominent terrestrial and marine landmarks in order to spatially rectify Landsat satellite images of the area, which will be used as a basis for the habitat map, and;
- to opportunistically collect photographic stills and digital video footage, which characterise key flora, fauna, habitat type, and human usage, for use in the public participation and marine reserve planning processes. These data will also be of use for ongoing management purposes.

Of the 85 preselected ground-truthing and spatial rectification sites, a total of 50 sites the proposed southern extension of Ningaloo Marine Park were ground-truthed. These sites mainly modelled two bays, Gnaraloo Bay and north of Cape Farquhar. This number of sites seems to have been sufficient to verify, model and improve in the preliminary habitat map (Figures 2 & 3).

The resulting broadscale benthic habitat map (Figures 4 & 5) and biological data will be used as a planning resource in the implementation process for the proposed southern extension of Ningaloo Marine Park (*see* Appendix C. CALM Data Report: MRI/MW/NSE-30/1999; Bancroft, 1999).

The species lists compiled for coral areas at Gnaraloo Bay were similar to other areas of similar habitats found elsewhere in the Ningaloo Reef region (*see* Appendix C. CALM Data Report: MRI/MW/NSE-30/1999; Bancroft, 1999).

Habitat maps will be the primary tool for future management planning. Habitat diversity will be used as a surrogate for species and community diversity. Spot verification to confirm species diversity differences or similarities will be performed in conjunction with habitat verification.

3. STATEMENT OF EXPENDITURE

Item	MPAP funding	MPAP Expenditure (\$)	CALM Expenditure (\$)	Total Expenditure (\$)
NHT funds received 1998	\$16,500			\$0
Expenditure to June 1999		\$700	\$800	\$1,500
Initial auto-classification		\$3,605	\$5,769	\$10,874
Field survey October 1999		\$10,672	\$12,692	\$34,238
Expenditure 1999/2000 (to December 1999)		\$7,023	\$24,850	\$66,111
Funds on final report 1999/2000	\$5,500			\$66,111
Totals	\$22,000	\$22,000	\$44,111	\$66,111

4. REFERENCES

- Bancroft, K.P. (1999). Broadscale habitat map and biological data of the major benthic habitats of the proposed southern extension to Ningaloo Marine Park. Data Report MRI/MW/NSE-30/1999. December 1999. Marine Conservation Branch, Department of Conservation and Land Management, Fremantle, Western Australia. (Unpublished report)
- Bancroft, K.P. & Lapwood, M. (1999). Biological verification of the major benthic habitats of the proposed southern extension to the Ningaloo Marine Park (Amherst Point to Red Bluff). 18-24 October 1999. Field Programme Report MRI/MW/NSE-24/1999. October 1999. Marine Conservation Branch, Department of Conservation and Land Management, Fremantle, Western Australia. (Unpublished report)
- CALM (1994). A representative marine reserve system for Western Australia. Report of the Marine Parks and Reserves Selection Working Group. July 1994. Department of Conservation and Land Management. June 1994.
- WA Government (undated). New Horizons, the way ahead in marine conservation and management. Prepared for the Western Australian Government by the Department of Conservation and Land Management, Perth, Western Australia.

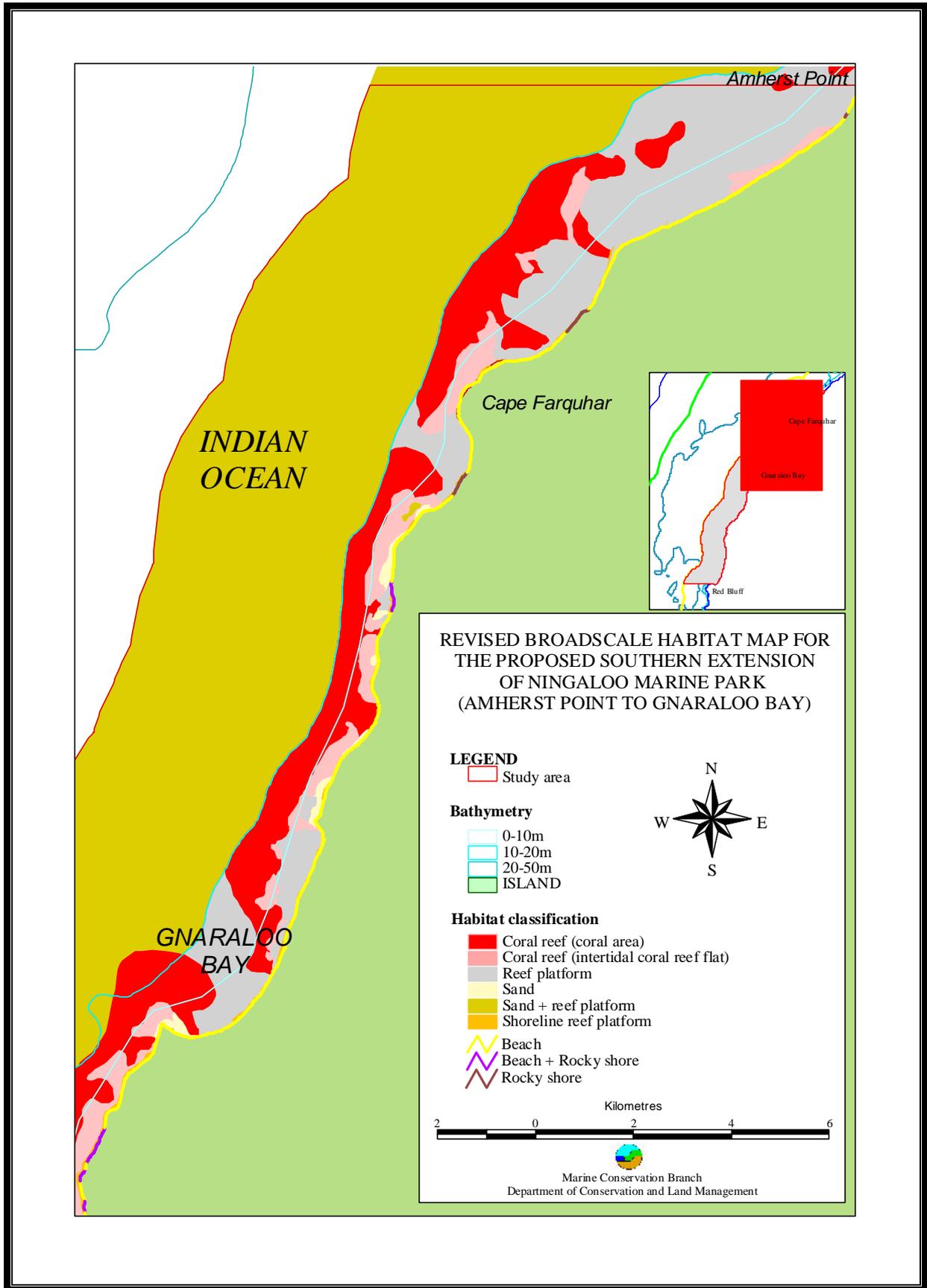


Figure 4. Revised habitat map of the proposed southern extension to Ningaloo Marine Park (Amherst Point to Gnaraloo Bay)

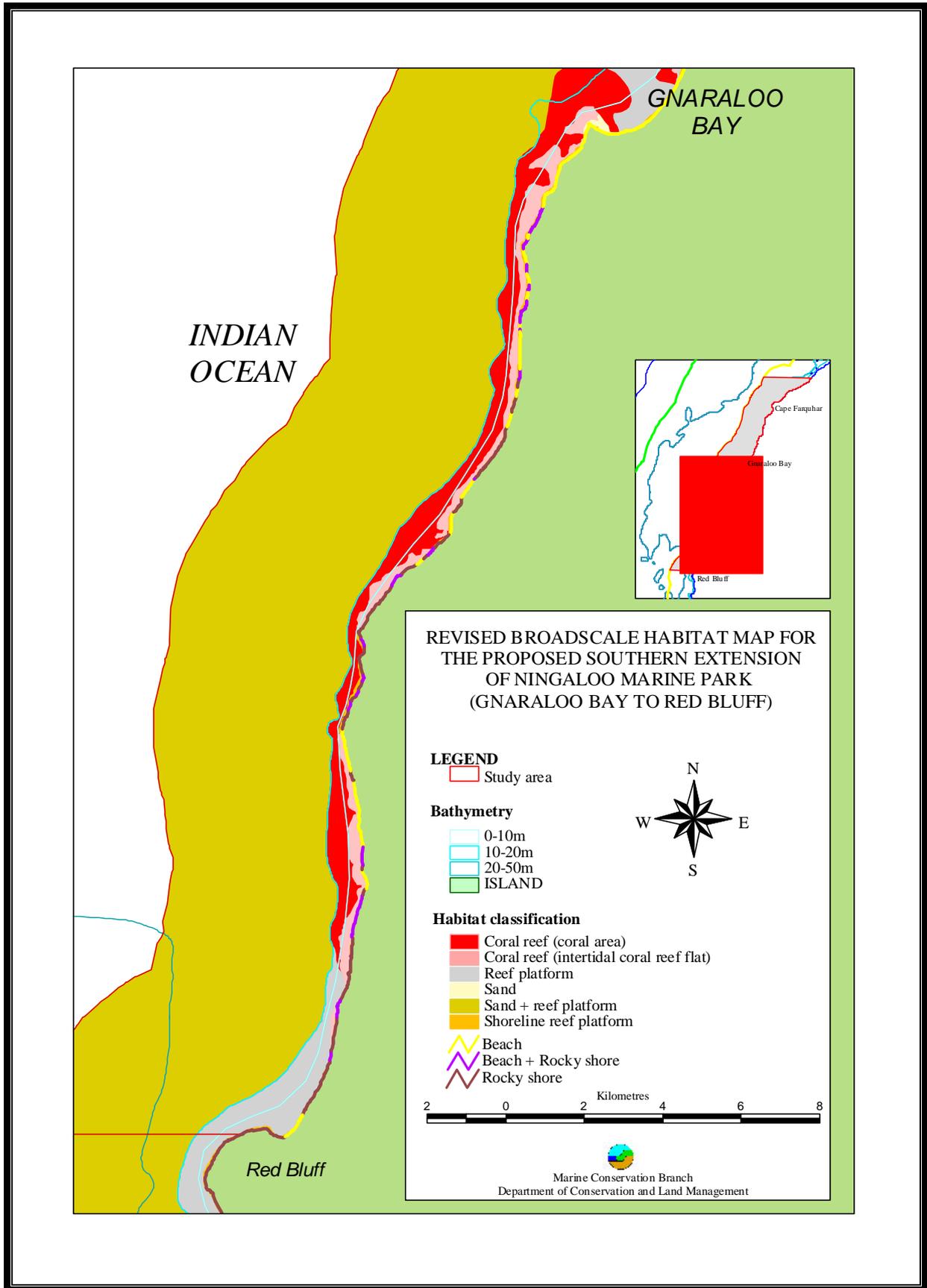


Figure 5. Revised habitat map of the proposed southern extension to Ningaloo Marine Park (Gnaraloo Bay to Red Bluff)

APPENDICES

APPENDIX A. PROJECT DETAILS AND WORK SCHEDULE**ENVIRONMENT AUSTRALIA****VARIATION TO CONTRACT FOR CONSULTANCY SERVICES**

Below are the revised scope items, reporting and payment schedule, and conditions for the project *Biological Survey of the Southern Portion of Ningaloo Reef (G024/97)*, funded under the Marine Protected Areas (MPA) Program (previously the Ocean Rescue 2000 Program) and subject to a Consultancy Agreement between the Great Barrier Reef Marine Park Authority and the Department of Conservation and Land Management, dated 27 June 1997 (copied attached).

Under current administrative arrangements for the MPA Program, all projects previously funded under the program will now be administered by Environment Australia.

Project Supervisor:**Dr Chris Simpson**

Agency:

CALM, Marine Conservation Branch

Contact Address:

47 Henry Street
FREMANTLE WA 6160

Telephone:

(08) 9432 5101

Facsimile:

(08) 9430 5408

Email:

chriss@calm.wa.gov.au

Environment Australia Liaison Officer:**Edward Kleverlaan**

Agency:

Environment Australia

Contact Address:

Marine Conservation Section
GPO Box 787
CANBERRA ACT 2601

Telephone:

(02) 6274 1750

Facsimile:

(02) 6274 1771

Email:

edward.kleverlaan@ea.gov.au

Scope**Specific Tasks**

1. Review and collate existing biological and physical data
2. Map and auto-classify major benthic habitats from satellite imagery
3. Undertake a survey of marine flora and fauna in the major habitat types identified in Action 2
4. Produce a summary report.

Work Timetable

Tasks	Feb 99	Mar 99	Apr 99	May 99	Jun 99	July 99	Aug 99	Sep 99	Oct 99	Nov 99
1. Review and collate existing biological and physical data.										
2. Map and auto-classify major benthic habitats from satellite imagery.										
3. Undertake a survey of marine flora and fauna in the major habitat types identified in Action 2										
4. Prepare draft Summary Report for comment and submit final Summary Report										

Financial Payments and Reporting Schedule

The total financial payment for the project is \$22,000 payable by the instalments specified in Table 1:

Table 1

Payment	Report	Date	Amount
Initial	Work Schedule	August 1997 (Paid)	\$16,500
	Progress	July 1999	\$0
Final	Final	November 1999	\$5,500
		Total	\$22,000

This variation is made on theday of1999

Signed on behalf of Environment Australia by:

Signed on behalf of the Department of Conservation and Land Management by:

.....(Full Name)

.....(Full Name)

.....(Signature)

.....(Signature)

and witnessed by:

.....(Full Name)

.....(Full Name)

.....(Signature)

.....(Signature)

APPENDIX B. BANCROFT, K.P. & LAPWOOD, M. (1999). CALM FIELD PROGRAMME REPORT MRI/MW/NSE-24/1999.

Bancroft, K.P. & Lapwood, M. (1999). Biological verification of the major benthic habitats of the proposed southern extension to the Ningaloo Marine Park (Amherst Point to Red Bluff). 18-24 October 1999. Field Programme Report MRI/MW/NSE-24/1999. October 1999. Marine Conservation Branch, Department of Conservation and Land Management, Fremantle, Western Australia. (Unpublished report)

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Bancroft, K.P. (1999). Broadscale habitat map and biological data of the major benthic habitats of the proposed southern extension to Ningaloo Marine Park. Data Report MRI/MW/NSE-30/1999. December 1999. Marine Conservation Branch, Department of Conservation and Land Management, Fremantle, Western Australia. (Unpublished report)

