MARINE RESERVE IMPLEMENTATION:
CENTRAL FOREST

BIOLOGICAL SURVEY OF THE MAJOR BENTHIC HABITATS OF THE GEOGRAPHE BAY-CAPES-HARDY INLET REGION (GEOGRAPHE BAY TO FLINDERS BAY): 28 JANUARY-8 FEBRUARY 1999

Post Field Programme Report

Prepared by K P Bancroft
Marine Conservation Branch

February 1999

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

CONTENTS

SUMMARY

This post field programme report reviews the biological survey conducted from 28th January to 8th February 1999, along the south west coast of Western Australia from Geographe Bay to Flinders Bay.

The primary objectives of this field survey were to collect data:

- to enable quantitative description of marine biota at representative sites of the major benthic habitats;
- to establish understanding of the diversity within the major benthic community types, and;
- for baseline information for long term monitoring.

Overall costs for the field survey were reconciled to be much higher than the predicted budget, as a result of the underestimation of CALM staff salaries and on-costs. A number of recommendations are made in relation to further biological surveys and improvements in field equipment.

OVERVIEW

OBJECTIVES

The primary objectives of the biological survey were achieved. A total of 20 survey sites were sampled during the ten days of the survey. These sites were:

- Canal Rocks (106, 107, 109);
- Cowaramup Bay (154, 155);
- Hamelin Bay (350, 400, 401);
- Foul Bay (246, 247);
- St Alouarn Islands (290, 303, 333), and;
- north and west Cape Naturaliste (43, 46, 51, 59, 61, 77, 79).

Overall, given the target of a minimum of 20 sites in ten days and the spatial extent of the area to be sampled, long days had to be worked and the Cape Mentelle region was totally dropped. It was hoped that the team would survey the west Cape Leeuwin region however strong southerlies and increasing swells prevented this when we were in the area (Wednesday 3rd and Thursday 4th February). It was fortunate that only two days were lost to bad weather, a couple of mornings had delayed starts due to waiting for easterlies to drop off and a couple of early finishes due to strong seabreezes, otherwise the minimum goal of 20 sites would not have been achieved.

Recommendations:

In order to achieve the minimum number of sampling sites within large areas, and to allow for disruptions to the fieldwork resulting from bad weather and equipment failure, further biological surveys should be planned with two field components. These components would utilize different vessel types:

(1) a live-aboard large vessel (as this survey was conducted) targeting the deeper sites that are inaccessible by land and;

(2) land-based smaller vessel targeting shallow, sheltered and exposed sites that are accessible by land.

PERSONNEL

The field survey team of four MCB staff and eight contract staff members interacted extremely well, particularly given the often-trying working conditions and punishing schedule. Each member of the team made a valuable and positive contribution to the overall success of the survey.

The skipper displayed considerable skill in handling and navigating his vessel under difficult conditions and commendable endurance during some very long night watches.

Any recommendations of the sampling team and methods will be review in the Data Report that will be following.

Recommendations:.
None

OPERATIONAL ISSUES

CHARTER VESSEL

The 15.4 m metre vessel, *MV Voyager* chartered from Moonlight Charters proved to be very suitable for this type of survey. No mechanical or other problems were encountered with the vessel, and in general it handled well under a variety of conditions.

However their air compressor was inoperable and we had to use the MCB compressor for air fills for the duration of the field trip (approximately 180 fills). It was stipulated in the tender notice that the vessel was to supply a functioning air compressor for the survey. It should have been their liability to ensure that diving cylinders were filled and not ours by default.

The menu was adequate however it was felt by some that there was too many meat meals (eg BBQ fry-ups) and too few vegetable side serves. Apples and oranges were supplied, however more choice would have been preferred. MCB also provided soft drinks for the trip. Closer scrutiny of the balance between price and services may be prudent in future field programmes of this type if the budget allows.

Recommendations:.
1. It is important to define the conditions of contract especially in the area of services to be supplied and highlight that in a mechanical failure such as the air compressor that it is the charters responsibility to ensure air fills. This would have been achieved by couriering an air compressor from Perth or making arrangements with local dive shop.
2. Review of menu prior field trip.

EQUIPMENT

The MCB provided the bulk of sampling, sorting and preserving equipment with some extra equipment supplied by contract staff (eg magnifying light, microscope and extra laptop computer). All of this equipment was satisfactory and was sufficiently backed up.

UWA provided an extra six scuba cylinders with MCB providing 14 cylinders, five regulator sets, six buoyancy compensators (BC's) and two wrist dive computers. The quantity of diving equipment was satisfactory but inevitable breakdowns occurred in some equipment. However, enough spare parts and back-up units were available to ensure continuity in the programme.

The use of the MCB zodiac along with the inflatable borrowed from Marine and Coastal District proved invaluable in transporting divers and equipment from the mother ship to the dive site. These boats were powered by 25hp Yamaha outboards which balanced sufficient horsepower with ease of handling.

The use of MCD's VHF handheld radio also proved invaluable and provided excellent communications between the zodiacs and the mother ship.

Iridum supplied a handheld satellite phone for trial on the survey. It was found that the technology still has room for improvement. Noticeable problems with satellite coverage, time delays in conversations and intermittent signals were experienced. Fortunately digital mobile net coverage for the region was reasonable.

Recommendations:.

1. MCB diving equipment should be upgraded as most are now over twelve years old. This includes BC's, regulators and dive computers.
2. MCB purchase another inflatable.
3. MCB purchase a VHF handheld radio.
4. MCB to revisit satellite phones when the technology has been improved.

PHOTOGRAPHIC EQUIPMENT

MCB photographic and video equipment was used throughout this survey by CALM staff. Some damage to equipment occurred:

- One Nikonos 102 strobe was flooded badly and damaged beyond repair. There was backup available.
- The battery case of one Stingray lamp that was adapted for use with the digital video was slightly flooded and was salvageable.
- The Amphibico underwater housing slightly leaked through the underwater microphone casing and has been sent off for repairs. Luckily ECU had the same housing which was utilized for the final sites.

Recommendations:.

1. Replace flooded Nikonos SB102 strobe.
2. MCB to investigate appropriate flood lamps for the digital video.
3. MCB purchase a backup digital video and underwater housing. Possibly investigate housings from other sources such as Wells in SA.

DIVING OPERATIONS

A total of 10,415 minutes (173.58 hours) were spent diving, over 9 days by 12 divers. This necessitated scuba cylinders being filled almost constantly especially on days when three dives occurred. All divers proved to be very capable and no incidents occurred.

It was necessary, on two occasions, to deviate from the dive plan and this was done after consultation with the field team, the skipper and the dive supervisor. The deviations occurred when it was found that the sites in question were deeper than the planned maximum depth of 18 metres.

The dive supervisor was stationed at all times either on the mother ship or as a boatman /standby diver except on two occasions when he dived with the team due to personnel restrictions.

All dives were logged and repetitive dive calculations were checked against computers.

Dives were planned in consultation with the field team leader, skipper and dive supervisor the previous evening with a deep dive done first, followed by progressively shallower dives. Residual nitrogen loading was calculated daily.

Recommendations:.

The dive supervisor should always be stationed on the surface (mother ship of on inflatable over dive site) and not a participating member of the survey dive team.

FIELD TECHNIQUES

The field techniques will be reviewed in the Data Report

Recommendations:.

None

RESOURCING

The estimated budget for the field survey was $65,658 (including a $4,500 contingency). Budget reconciliation incorporating actual costs ($111,963) is included as Appendix I of this report.

Overall costs for the field survey were significantly higher than the estimated budget ($46,305due to the underestimation of CALM staff salaries and on-costs.

Recommendations:.

Ensue that all MCB staff oncosts are incorporated as a budget item.

SAFETY

Diver safety practices were fully observed during the field trip, however for such extensive diving requirements a dedicated dive computer would ensure diver safety is being monitored.

Communication during the field trip was covered by Marine VHF, Marine 27MHz and HF radios, and mobile and satellite phones. Even though the satellite phone proved to be problematic (see EQUIPMENT above), in remote areas it would be invaluable.

For increased safety, the boatman maintained contact with mother boat using a handheld VHF radio.

Recommendations:.

1. All divers on MCB field programmes to have dedicated dive computers, which are, downloaded daily to monitor dive profiles.
2. MCB to revisit satellite phones when the technology has been improved
3. MCB purchase a VHF handheld radio.

PUBLIC RELATIONS

MEETINGS

No meetings were arranged during this survey as the team was living aboard the charter vessel.

Recommendations:.

MCB should investigate a possibility of an evening meeting with local conservation groups prior to field surveys.

NEWSPAPER ARTICLES

Ms Helen Allen, a reporter/photographer from the Busselton-Margaret Times was ferried aboard while anchored in Hamelin Bay. She interviewed Kevin Bancroft and photographed some of the survey team. A news article appeared in the Busselton-Margaret Times on Thusday 4th February 1999 (Appendix II).

Kevin Bancroft was interview over the telephone by Ms Elaine Lucus, a reporter from the Busselton-Dunsborough Mail that resulted in an article in the Busselton-Dunsborough Mail on Wednesday 10th February 1999 (Appendix III).

GWN interviewed Dr Chris Simpson in Perth regarding the survey and the marine reserve implementation process, which was aired on GWN News Thursday 11th February 1999.

No radio interviews were given.

Recommendations:.

1. Maintain contacts with local newspapers and regional TV.

2. Investigate ties with regional radio.

APPENDIX I: Budget reconciliation for the Geographe Bay-Capes-Hardy Inlet biological survey

Budget reconciliation for the Geographe Bay-Capes-Hardy Inlet biological survey

Budget Item		CALM ($ in kind)	MPA funds ($)	Total costs ($)
Travel				
Vehicles	MCB Triton - $0.45 @ km for 1000 km		450.00	450.00
	UWA - $0.33 @ km for 1200 km		396.00	396.00
	Sub-total		846.00	846.00
UWA contract				
Dr Gary Kendrick	Overall design and algae quantitative sampling		4382.00	4382.00
Dr John Huisman	Algae ID, field collection and herbarium accession		4000.00	4000.00
Cameron Simm	Algae quantitative sampling		2078.00	2078.00
Dr Laura Stocker	Ascidian ID and museum accession		1000.00	1000.00
Dr Anne Brearley	Mobile invertebrate ID and museum accession		2500.00	2500.00
Dr Euan Harvey	Fish ID, sampling design and quantitative sampling		4000.00	4000.00
Mark Westera	Fish quantitative sampling		2078.00	2078.00
Dr Jane Prince/Dr Anne Brearley	Intertidal assemblages sampling design and quantitative sampling (date to be announce).		4000.00	4000.00
Dr Gary Kendrick	Data analysis		4250.00	4250.00
	Sub-total		28288.00	28288.00
Staff				
Jeremy Colman	30 days @ $585	17550.00		17550.00
K.P. Bancroft	25 days @ $497	7650.00	4775.00	12425.00
Ray Lawrie	2 days @ $572	704.00	440.00	1144.00
Tim Daly	25 days @ $396 > why diff?	6100.00	3800.00	9900.00
Mike Lapwood	22 days @ $474	6424.00	4004.00	10428.00
Sue Elscott	11 days @ $297	2013.00	1254.00	3267.00
Hard living allowance	11 days x 4 staff @ $0.37		390.00	390.00
Diving allowances	10 days x ~3 dives x 4 staff @ $3.90 ← does not compute →		300.00	300.00
	Sub-total	40441.00	14963.00	55404.00
Vessel & other equipment				
17 m charter boat *MV Voyager*	Moonlight Charters		14600.00	14600.00
MCB inflatable & 25 hp o/b	11 days @ $100		1100.00	1100.00
MCB inflatable & 25 hp o/b	11 days @ $100		1100.00	1100.00
Fuel & oil			500.00	500.00
GPS unit	11 days @ $10		110.00	110.00
Dive compressor	11 days @ $100		1100.00	1100.00
Benthic dredge	11 days @ $15		165.00	165.00
Handheld VHF radio	11 days @ $15		165.00	165.00
Miscellaneous equipment			400.00	400.00
	Sub-total		20040.00	20040.00
Consumables				
Ethanol	40 l		154.00	154.00
Formaldehyde	50 l		636.00	636.00
Specimen containers	200 x 500 ml		175.00	175.00
Specimen containers	300 x 100 ml		68.00	68.00
Data sheets	500		350.00	350.00
Digital video tapes	15 x DVM-E60 @ $25		375.00	375.00
Digital video backup tapes	10 @ $35		350.00	350.00
Slide film	10 x Fuji Sensia 200 & processing		250.00	250.00
Other consumables	Gloves/pencils/chalk/erasers/batteries...etc		500.00	500.00
	Sub-total		2858.00	2858.00
Contingency				
Administration overruns	10% of funding		4500.00	4500.00
	Sub-total		4500.00	4500.00
	TOTAL	**$40,441.00**	**$71,495.00**	**$111,936.00**

APPENDIX II: Copy of article in the Busselton-Margaret Times

Dr John Huisman, left, Dr Gary Kendrick, Sue Elsot and Cameron Sim are part of the 12-member team collecting marine specimens between Busselton and Augusta. The survey is looking at the area as a possible marine park.

Survey may lead to big ocean park

By ROBERT TURNER

MARINE scientists have started their biological survey of the sea between Geographe Bay and Flinders Bay at Augusta as part of the proposal to create a new marine park in the area.

A crew of scientists from UWA and Edith Cowan and Murdoch Universities have joined the Department of Conservation and Land Management's marine conservation branch on board a chartered vessel for the two-week survey.

The 12-member team started the survey last week, sailing between Dunsborough and Augusta and stopping off at points along the way to dive and collect plants and animals to gather a snapshot of the marine environment.

Another land-based team had compiled surveys of intertidal zones to add to the data base.

CALM's marine conservation branch manager Dr Chris Simpson said the Cape to Cape coastline was unique with many varied habitats.

The scientists were gathering data from all the major formations around the coast, ranging from seagrass meadows, sand, intertidal zones and granite and limestone reefs, he said.

It was more likely that the area would be declared a marine park, which would not prohibit access to the public, he said.

Conservation Minister Cheryl Edwardes said the biological survey was one of the preliminary steps in the process to create a marine park.

A 1994 survey of WA's coastline included Geographe Bay-Flinders Bay as a priority location for the creation of marine reserves.

"This biological survey is one of several assessments that will be carried out in the lead up to the community consultation process and the preparation of a draft management plan before a marine conservation reserve is created," Mrs Edwardes said.

She said little was known about the conservation values of the marine environment along the Geographe Bay to Hardy Inlet coastline, although similar marine environments elsewhere in Australia were known to have high levels of biological diversity.

APPENDIX III: Copy of Article in the Busselton-Dunsborough Mail

Rare algae found off Cape

A TEN day biological survey from Flinders Bay off Augusta to Geographe Bay has brought to light a "rare red" off Cape Naturaliste.

Held as part of the state government's proposal to create a new marine conservation reserve in the Geographe Bay/Capes-Hardy Inlet region, the survey discovered a rare red algae off Cape Naturaliste and a species of seaweed off Hamelin Bay which had only been found once before.

But the survey, which ended on Sunday, may also record a number of species for the first time, Conservation and Land Management (CALM) marine conservation officer Kevin Bancroft said.

"We collected a lot of species on the survey," Mr Bancroft said.

"No one has really collected a great deal in the area before."

Among the collection were 140 sponges and about 120 sea squirts.

Mr Bancroft said many of these could be endemic to the region and the survey could be the first time they had been catalogued.

"But that is not as amazing as it sounds," Mr Bancroft said.

"In WA, the amount of marine research which has been done in the past is so minimal."

The biological survey—the first of its kind in the region—followed a habitat survey of the region which was undertaken by CALM in December and which identified broad categories of habitats for more than 360 sites.

Mr Bancroft said the biological survey team—which included scientists from CALM, the University of Western Australia, Murdoch and Edith Cowan Universities—targeted a variety of habitats from Cape Leeuwin to Cape Naturaliste to get an idea of number and diversity of marine species.

The team averaged about two dives a day to sample sites, while an on-land team targeted the fringing coastline and reefs.

Mr Bancroft said the information gathered during the survey would guide an advisory committee which would help guide the planning process for a marine park.