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**Great Barrier Reef Marine Park Authority
Annual Report
1983 – 84**

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FOR
LOAN**

The Great Barrier Reef Marine Park Authority

Annual Report 1983-84

Great Barrier Reef Marine Park Authority
Townsville 1984

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Great Barrier Reef
Marine Park Authority
P.O. Box 1379
TOWNSVILLE, QLD. 4810

Dear Minister,

In accordance with Section 60 of the **Great Barrier Reef Marine Park Act 1975**, I submit the Eighth Annual Report of the Great Barrier Reef Marine Park Authority on the operations of the Authority for the year that ended 30 June 1984.

Yours sincerely,

Graeme Kelleher
Chairman

The Hon. Barry Cohen, M.P.
Minister for Home Affairs and Environment
Parliament House
CANBERRA, A.C.T. 2600

THE PHOTOGRAPHS

During 1983-84 the Great Barrier Reef Marine Park Authority formally adopted a statement of its primary goal: *'To Provide for the wise use, appreciation and enjoyment of the Great Barrier Reef in perpetuity through the development and care of the Great Barrier Reef Marine Park.'* In striving to achieve this goal, the Authority takes special care to accommodate all reasonable use of the Reef. It does this through the development of zoning plans which specify what uses may occur within each zone and the conditions under which those uses may proceed.

The colour photographs which appear in this annual report have been selected to illustrate a range of activities and to emphasize that the Great Barrier Reef Marine Park is truly a multi-use Park. It is, of course, not possible to illustrate in one publication all the activities which may be undertaken within the Marine Park.

(PAGE VI) COMMERCIAL SHIPPING

Commercial shipping and trawling, both economically important uses of the Great Barrier Reef, are only two of the many activities provided for in areas zoned General Use 'A'. This is the least restrictive zone within the Marine Park.

(Photograph: GBRMPA)

(Page 14) AQUARIUM FISH COLLECTING

Unfamiliar to most people, aquarium fish collecting is one activity which, under permit, is allowed in areas zoned General Use 'B'. Such areas provide for other reasonable uses free from commercial shipping and trawling.

(Photograph: GBRMPA)

(Page 22) RECREATIONAL FISHING

Reef fishing is only one of the many ways that people use and enjoy the Reef. Areas zoned Marine National Park 'A' protect some reefs from most extractive activities while providing for all recreational activities and limited line fishing.

(Photograph by Malcolm Florence)

(Page 27) MACKEREL FISHING

The Marine National Park Buffer Zone protects many reefal areas from the effects of extractive activities while still allowing fishermen access to important trolling grounds to pursue such prized pelagic species as mackerel.

(Photograph courtesy of Don Battersby)

(Page 34) SNORKELLING AND REEF WALKING

Reef visitors can enjoy snorkelling and reef walking in areas zoned Marine National Park 'B'. These areas are free from all collecting and fishing and may be thought of as 'look but don't take' areas.

(Photograph courtesy of Telford South Molle Island Resort)

(PAGE 42) SCIENTIFIC RESEARCH

There is still much to learn and understand about the Great Barrier Reef. Areas zoned for Scientific Research allow research, such as the study of patterns of coral recruitment, to be undertaken free from all other activities.

(Photograph: GBRMPA)

(PAGE 46) PRESERVATION

Human activity is prohibited within some areas of the Marine Park to preserve those areas in their natural state undisturbed by people. Preservation Zones are the most restrictive areas within the Marine Park.

(Photograph: GBRMPA)

(PAGE 48) PERMITS

In addition to zoning provisions, human activity within the Marine Park is also regulated by the issue of permits. Permits help to separate conflicting activities, encourage responsible behaviour in Reef users, gather information about the Reef and activities which may be damaging to the Reef and, where necessary, impose limits on activities. During the past year an unusual permit was issued for the sinking and filming of an aircraft as part of the making of a feature film.

(Photograph courtesy of Ron and Valerie Taylor)

(Cover photograph by Nev Collins)

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FROM THE CHAIRMAN

During the year, the area of the Great Barrier Reef Marine Park increased from about 45 000 km² to almost 350 000 km² — a seven-fold increase. In the same period, the area which is subject to a zoning plan, and therefore to a formal management program, increased four-fold.

The Authority has a responsibility not only to achieve the objective of conservation of the Great Barrier Reef while allowing the continued reasonable use of its natural resources, but to do this in a way which does not place unacceptable burdens on the community. We must be frugal in the use of both financial and human resources.

We are very conscious of this obligation and have throughout the year worked to establish a framework which will allow us to meet these responsibilities.

One of the elements in this framework has been the development of a statement of a principal goal and sub-ordinate aims of the Authority. These have been derived directly from objectives and functions defined in the **Great Barrier Reef Marine Park Act 1975** (the Act). We have agreed that the principal goal of the Authority should be to provide for the protection, wise use, appreciation and enjoyment of the Great Barrier Reef in perpetuity through the development and care of the Great Barrier Reef Marine Park. We are sure that, in order to meet this goal, the Authority and its programs must earn the support of the general public. The specific aims which are set out later in this report describe the means by which we hope to retain and increase such support.

Another important element of the framework is the commitment to delegation to and liaison with other government agencies with responsibilities in the area of the Great Barrier Reef Marine Park. While the Queensland National Parks and Wildlife Service (Q.NPWS) will continue to be the principal organisation responsible for day-to-day management of the Marine Park, arrangements are being made for the licensing of officers of the Queensland Boating and Fisheries Patrol and of the Queensland Water Police as inspectors under the Act. Officers of the Australian Federal Police, which now has responsibility for coastal aerial surveillance around Australia, will also be licensed as inspectors. These actions will not only increase the effectiveness of management of the Marine Park, but will do so at an insignificant cost. They will ensure that all of the government officers whom members of the public may meet in the Marine Park will be part of a co-ordinated management team with common goals and aims.

We continue to see the provision to the public of helpful information and education programs as a central contribution to our primary goal. During the year, significant expansion was made in our education and information services and programs. They are described later in this report. We are not, however, under the illusion that such programs can, by themselves, ensure that everyone will voluntarily agree to abide by the provisions of zoning plans and regulations.

We know that the public has to be confident that serious or repeated infringements will be dealt with appropriately, in accordance with the law. The appointment of inspectors in the various agencies mentioned above will contribute to such enforcement.

Knowledge is the basis of all successful action. During the year, there were major developments in our research and monitoring programs. Fundamental to any understanding of the processes which occur in the area of the Great Barrier Reef is knowledge of the water movements of the Region. A major collaborative program involving the Authority, the Australian Institute of Marine Science (AIMS) and the James Cook University of North Queensland (JCU) was set up to investigate these water movements. The aim is to develop a model which will allow prediction of the movement of water masses and the living organisms which inhabit them. The discovery by scientists from JCU that many of the coral species of the Great Barrier Reef spawn simultaneously and predictably each year has major implications for management of the Marine Park. This work was partially funded by the Authority.

Large numbers of crown of thorns starfish have continued to be observed on individual reefs, particularly in the central part of the Region. The Authority re-established the Crown of Thorns Expert Advisory Committee under the Chairmanship of Professor Ken Back, Vice-Chancellor of JCU, to investigate this matter and to recommend appropriate research and management to the Authority. Other actions over the past few years have contributed to the design and funding of several research projects aimed at understanding the reason for the fluctuations in numbers of this animal. This work will continue and will be supplemented by research recommended by the Advisory Committee. We shall continue to keep the public and governments informed on this important issue.

The Great Barrier Reef Ministerial Council has endorsed a program of planning for the sections of the Marine Park which have not yet been zoned. It provides for zoning plans covering the entire Marine Park to be in place by 1988.

We have continued to receive great assistance from the public in the development of the Far Northern Section Zoning Plan. It is clear that the very great majority of Australians see the Marine Park as theirs and support the work of the Authority in ensuring the conservation of the Great Barrier Reef in perpetuity.

GREAT BARRIER REEF MARINE PARK AUTHORITY

ESTABLISHMENT BY THE GREAT BARRIER REEF MARINE PARK ACT 1975

The Great Barrier Reef Marine Park Authority, which was established under the **Great Barrier Reef Marine Park Act 1975**, is a Commonwealth statutory body consisting of a full-time chairman and two part-time members, one of whom is nominated by the Queensland Government.

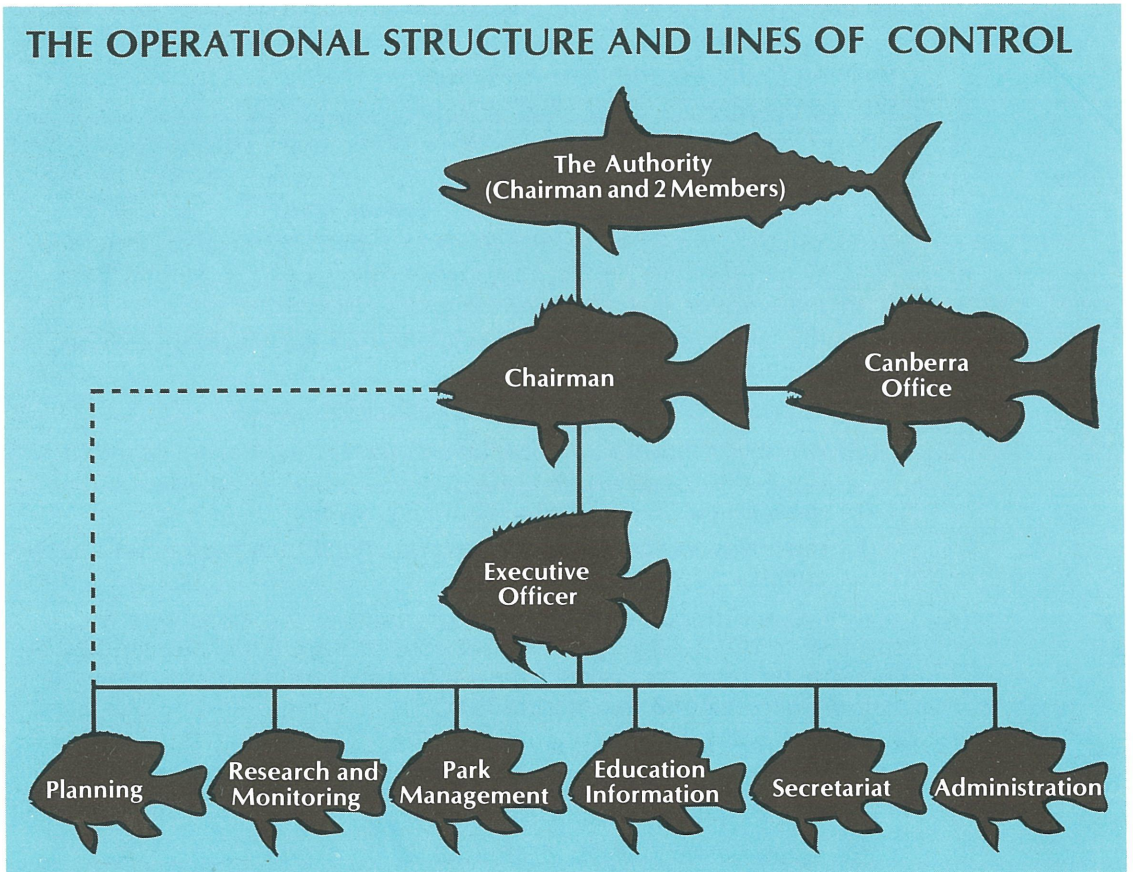
The functions of the Authority, defined in Section 7 of the Act as amended in November 1983, are as follows:

- (a) *to make recommendations to the Minister in relation to the care and development of the Marine Park including recommendations, from time to time, as to —*
 - (i) *the areas that should be declared to be parts of the Marine Park; and*
 - (ii) *the regulations that should be made under this Act;*
- (b) *to carry out, by itself or in co-operation with other institutions and persons, and to arrange for any other institutions or persons to carry out, research and investigations relevant to the Marine Park;*
- (c) *to prepare zoning plans for the Marine Park in accordance with Part V;*
- (ca) *to furnish information and advice to the Minister in respect of matters relating to the Marine Park, including —*
 - (i) *information and advice in relation to any agreement (including any proposed agreement) between the Commonwealth and Queensland on such matters;*
 - (ii) *information and advice on the following matters:*
 - (A) *whether the Commonwealth should grant financial assistance to Queensland in respect of a matter relating to the Marine Park;*
 - (B) *the amount and allocation of such assistance;*
 - (C) *the terms and conditions (if any) on which such assistance should be granted; and*
 - (iii) *information and advice on the following matters:*
 - (A) *whether it is desirable that Queensland should make payment to the Authority in respect of a matter relating to the Marine Park;*
 - (B) *the amount and allocation of such payment;*
 - (C) *the terms and conditions (if any) on which such payment should be given;*
- (cb) *to receive and disburse moneys appropriated by the Parliament for payment to the Authority for the purpose of payment of the moneys to Queensland by way of financial assistance to Queensland in respect of matters that relate to the Marine Park;*
- (cc) *to receive and disburse moneys paid to the Authority by Queensland under an agreement between —*
 - (i) *the Commonwealth and Queensland;*
 - (ii) *Queensland and the Authority; or*

- (iii) the Commonwealth, Queensland and the Authority;
- (d) such functions relating to the Marine Park as are provided for by the regulations; and
- (e) to do anything incidental or conducive to the performance of any of the foregoing functions.'

The Authority began operations in 1976. Following the agreement of 14 June 1979 between the then Prime Minister and the Premier of Queensland on constitutional and jurisdictional issues, the Great Barrier Reef Ministerial Council was formed to co-ordinate policy of the two Governments. This arrangement has enhanced the Authority's pursuit of its responsibilities and functions in co-operation with the Government of Queensland, local authorities and the public.

Fig. 1.



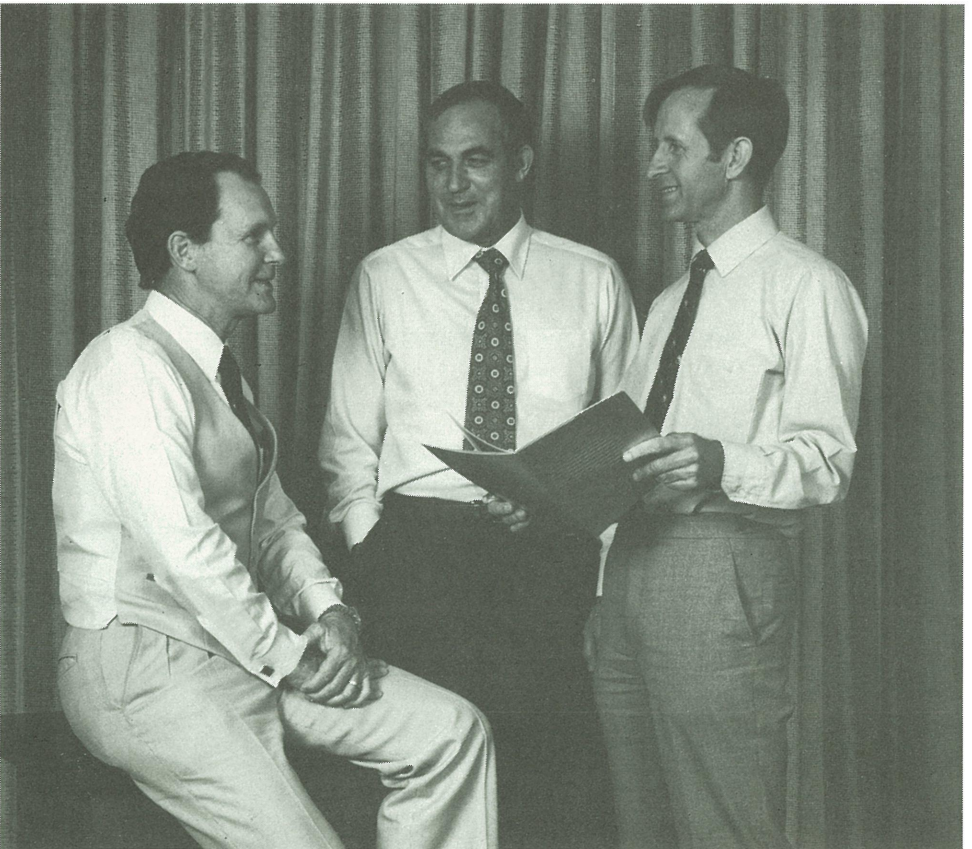
OFFICE OF THE AUTHORITY

The Authority has established an office in Townsville and a small office in Canberra. This arrangement arises from the need for the Authority to have its principal technical resources close to the Reef and also to maintain a presence in Canberra.

The Canberra office serves the Minister, consults with Commonwealth departments whose responsibilities are affected by or affect the Authority's programs, and provides the secretariat for the Great Barrier Reef Ministerial Council and the joint Commonwealth/Queensland Committee on Offshore Developments in the Great Barrier Reef Region.

MEMBERSHIP

The full-time Chairman of the Authority is Mr. Graeme Kelleher, who was appointed on 21 December 1979 for a period of five years. Mr. Kelleher has extensive experience in a wide array of activities concerned with the environment. He was one of the three commissioners on the Ranger



Dr. Joe Baker, O.B.E., Mr. Syd Schubert and Mr. Graeme Kelleher.
(Photograph: GBRMPA)

Uranium Environmental Inquiry, which was instrumental in shaping Australian Government policies concerning uranium, non-proliferation of nuclear weapons and land use in the Alligator Rivers Region of the Northern Territory. Mr. Kelleher has also served as First Assistant Secretary of the Water and Soils Resources Division in the Department of Environment, and as an examiner of New Zealand's environment policies for the international Organisation for Economic Co-operation and Development (OECD). He is chairman of the National Committee on Environmental Engineering of the Institution of Engineers, Australia.

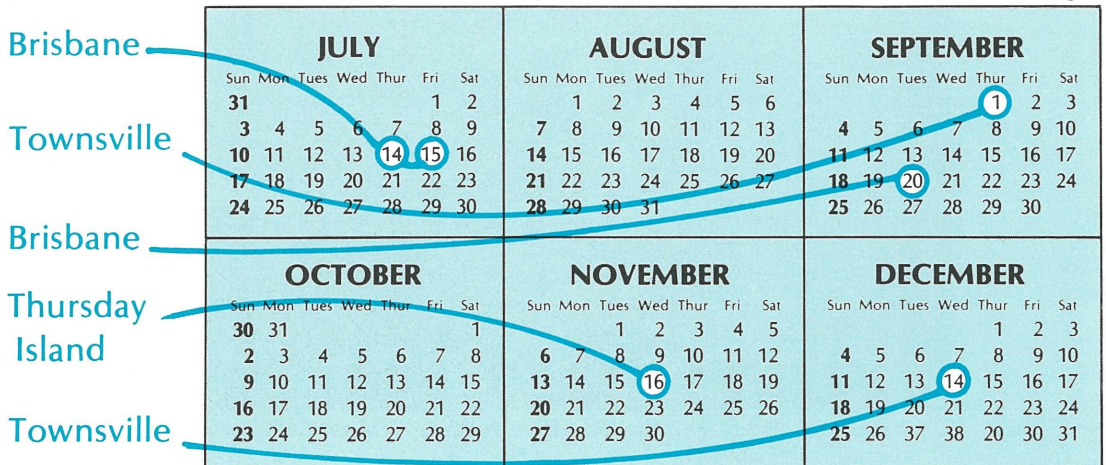
Mr. Syd Schubert, the Co-ordinator-General of Queensland, was nominated by the Queensland Government as one of the two part-time members. Mr. Schubert, as Co-ordinator-General, has for many years had primary responsibility for advising the Queensland Government on natural resources development and management, and for implementing that Government's policies in such areas. As part of that responsibility he discharges significant functions in relation to the administration of the Queensland Marine Parks Act 1982. Mr. Schubert's current five-year term expires on 30 June 1986.

Dr. Joe Baker, O.B.E., is the other part-time member. Dr. Baker is Director of the Sir George Fisher Centre for Tropical Marine Studies at James Cook University of North Queensland. Dr. Baker has had extensive experience in marine scientific research and administration and is a member of many of Australia's scientific advisory bodies. His current five-year term expires on 30 June 1987.

MEETINGS OF THE AUTHORITY

1983

Fig. 2.



1984

Brampton Island

Townsville

Brisbane

JANUARY							FEBRUARY							MARCH							
Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	
29	30	31							1	2	3	4						1	2	3	
1	2	3	4	5	6	7	5	6	7	8	9	10	11	4	5	6	7	8	9	10	
8	9	10	11	12	13	14	12	13	14	15	16	17	18	11	12	13	14	15	16	17	
15	16	17	18	19	20	21	19	20	21	22	23	24	25	18	19	20	21	22	23	24	
22	23	24	25	26	27	28	26	27	28	29				25	26	27	28	29	30	31	
APRIL							MAY							JUNE							
Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri	Sat	
29	30								1	2	3	4	5							1	2
1	2	3	4	5	6	7	6	7	8	9	10	11	12	3	4	5	6	7	8	9	
8	9	10	11	12	13	14	13	14	15	16	17	18	19	10	11	12	13	14	15	16	
15	16	17	18	19	20	21	20	21	22	23	24	25	26	17	18	19	20	21	22	23	
22	23	24	25	26	27	28	27	28	29	30	31			24	25	26	27	28	29	30	

GOAL AND AIMS

At its 70th meeting, the Authority adopted a statement of its goal and aims and directed staff to have regard to the statement in developing and implementing Authority programs and to make appropriate reference to the statement in proposals to the Authority. The statement was derived from and is consistent with the objects, functions and powers specified in the Act.

1. GOAL

To provide for the protection, wise use, appreciation and enjoyment of the Great Barrier Reef in perpetuity through the development and care of the Great Barrier Reef Marine Park.

2. AIMS

These aims are subordinate to the primary goal and must be read in conjunction with it and with each other.

2.1 Social

- To involve the community meaningfully in the establishment and management of the Marine Park.
- To minimise regulation of, and interference in, human activities, consistent with meeting the goal and other aims of the of the Authority.
- To achieve management of the Marine Park primarily through the community's understanding and acceptance of the provisions of zoning, regulations and management practices.
- To achieve competence and fairness in the development and care of the Marine Park through the deliberate acquisition and use of relevant scientific and non-scientific information and techniques in decision-making and other activities.

THE GREAT BARRIER REEF MINISTERIAL COUNCIL

The Great Barrier Reef Ministerial Council was established in June 1979 to co-ordinate policy on the Reef between the Commonwealth and Queensland Governments at a Ministerial level. The Council comprises two Ministers from each Government.

EIGHTH MEETING

The eighth meeting of the Council took place in Brisbane on 23 May 1984. Ministers who attended the meeting were:

- The Hon. Barry Cohen, M.P., Commonwealth Minister for Home Affairs and Environment (Convenor)
- The Hon. John Brown, M.P., Commonwealth Minister for Sport, Recreation and Tourism
- The Hon. Joh Bjelke-Petersen, M.L.A., Premier and Treasurer of Queensland
- The Hon. Peter McKechnie, M.L.A., Queensland Minister for Tourism, National Parks, Sport and the Arts

At the meeting Council:

- endorsed the Authority's five-year program for zoning and implementation of day-to-day management for the Marine Park
- noted the proposed zoning plan for the Far Northern Section
- agreed that the Whitsunday area should be in the next major area of the Marine park to be zoned
- noted a report on the Queensland **Marine Parks Act 1982** and associated regulations, and a progress report of a pilot study in relation to Heron Island on complementary management plans for the Capricornia Section
- considered a report from the Commonwealth/Queensland Committee on Offshore Developments in the Great Barrier Reef Region and agreed that the terms of reference of the Committee be modified so that the Committee:
 - provides a mechanism for the dissemination to members of information on proposals and developments provided to it by the Authority
 - facilitates procedural co-operation between the two Governments for the assessment and approval of offshore tourist, research and mariculture developments consistent with relevant legislation.
 - reports to Council as appropriate.

During the meeting a legally enforceable 'Assets Agreement' between the Authority and the Queensland Government was signed to allow the Authority to pay moneys to the Queensland Government for buildings on Heron Island intended for use in relation to the Great Barrier Reef Marine Park and Queensland marine and national parks, the use or management of which is likely to affect the Great Barrier Reef Marine Park. The Agreement specifies conditions governing control, ownership, use and disposal of the buildings.

The Authority congratulates the Hon. Sir Johannes Bjelke-Petersen K.C.M.G., M.L.A. on his appointment by Her Majesty the Queen, as Knight Commander of the Most Distinguished Order of St. Michael and St. George, in the Queen's Birthday Honours 1984.

THE GREAT BARRIER REEF CONSULTATIVE COMMITTEE

ESTABLISHMENT BY THE GREAT BARRIER REEF MARINE PARK ACT 1975.

The Great Barrier Reef Consultative Committee was established under the **Great Barrier Reef Marine Park Act 1975**. The functions of the Committee, defined in Section 21 of the Act are as follows:

- (a) to furnish advice to the Minister, either of its own motion or upon request made to it by the Minister, in respect of matters relating to the operation of this Act; and*
- (b) to furnish advice to the Authority in respect of matters relating to the Marine Park, including advice as to the areas that should be parts of the Marine Park, referred to it by the Authority.'*

The Consultative Committee represents a wide and varied cross-section of interests in the Great Barrier Reef, from both the public and private sectors and including tourism, fishing, science and conservation. The Committee currently consists of 15 members appointed by the Minister and a member of the Authority appointed by the Authority.

CURRENT MEMBERS

- Professor Kevin Stark, (Chairman)
James Cook University of North Queensland
- Dr. Robert Bain
Commonwealth Department of Primary Industry
- Mr. Dale Bryan
Queensland Commercial Fisherman's State Council
- Dr. John Bunt
Australian Institute of Marine Science
- Mr. Paul Eccles
Commonwealth Department of Transport
- Mr. Ernest Grant
Queensland Department of Harbours and Marine
- Mr. Edward Hegerl,
Australian Littoral Society and Queensland Conservation Council
- Mr. Tor Hundloe
Australian Conservation Foundation
- Mr. John Izatt
Queensland Game Fishing Association
- Mr. Graeme Kelleher
Great Barrier Reef Marine Park Authority
- Mr. Patrick King
Queensland Tourist and Travel Corporation
- Dr. Patricia Mather
Australian Coral Reef Society (incorporating the Great Barrier Reef Committee)

-
- Mr. Gordon McKauge
Far North Queensland Promotions Bureau Tourism Task Force
 - Mr. Keith Nielson
Commonwealth Department of Sport, Recreation and Tourism
 - Dr. Peter Saenger,
Australian Underwater Federation and Queensland Amateur Fishing Council
 - Dr. Graham Saunders
Queensland National Parks and Wildlife Service

Appointments for all members of the Consultative Committee except Mr. Kelleher and Dr. Bunt expire on 3 October 1985. Dr. Bunt's term concludes 23 September 1984. Mr. Kelleher who is the Authority's appointee has an indefinite term.

Administrative and secretariat support for the Consultative Committee is provided by staff of the Authority.

MEETINGS

The Consultative Committee met three times in 1983-84, twice in Brisbane and once on Heron Island. In conjunction with the meeting on Heron Island, members made an aerial inspection of the Swain Reefs within the Southern Section of the Marine Park.

During the year, the Consultative Committee responded to requests by the Authority for advice on:

- the zoning plan for the Far Northern Section of the Marine Park
- an inventory prepared for that Section and used in the development of the zoning plan
- guidelines for the development of artificial reefs within the Marine Park
- two of the Authority's publications — the **1982-83 Annual Report** and the newsletter **Reeflections**.

The Authority also received, through the Minister, particulars of advice on the crown of thorns starfish that was furnished to the Minister by the Committee.

YEAR IN REVIEW

Fig. 3.

JULY

AUGUST

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							29	30	31				

The Governor-General proclaimed the declaration of the Far Northern, Central and Southern Sections of the Great Barrier Reef Marine Park.

Start of the period for receipt of public representations on the preparation of a zoning plan for the Far Northern Section.

The Governor-General proclaimed the declaration of the Townsville and Inshore Southern Sections of the Great Barrier Reef Marine Park, completing the declaration of all major sections of the Marine Park.

SEPTEMBER

OCTOBER

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The Great Barrier Reef Marine Park (Prohibition of Drilling for Petroleum) Regulations, which prohibit oil drilling from those areas of the Great Barrier Reef Region not included in the Marine Park, came into operation.

The Great Barrier Reef Marine Park Regulations came into operation. The Great Barrier Reef Marine Park (Capricornia Section) and (Cormorant Pass Section) Regulations were repealed (Pages 31-34).

NOVEMBER

DECEMBER

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20	21	22	23	24									24
27	28	29	30				25	26	27	28	29	30	31

The Zoning Plans for the Cairns and Cormorant Pass Sections of the Marine Park came into operation.

The Great Barrier Reef Marine Park Amendment Act 1983 was assented to and came into operation (Pages 5-7).

JANUARY

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FEBRUARY

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The Minister for Home Affairs and Environment announced the call by the Authority for public comment on the proposed zoning plan for the Far Northern Section.

MARCH

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APRIL

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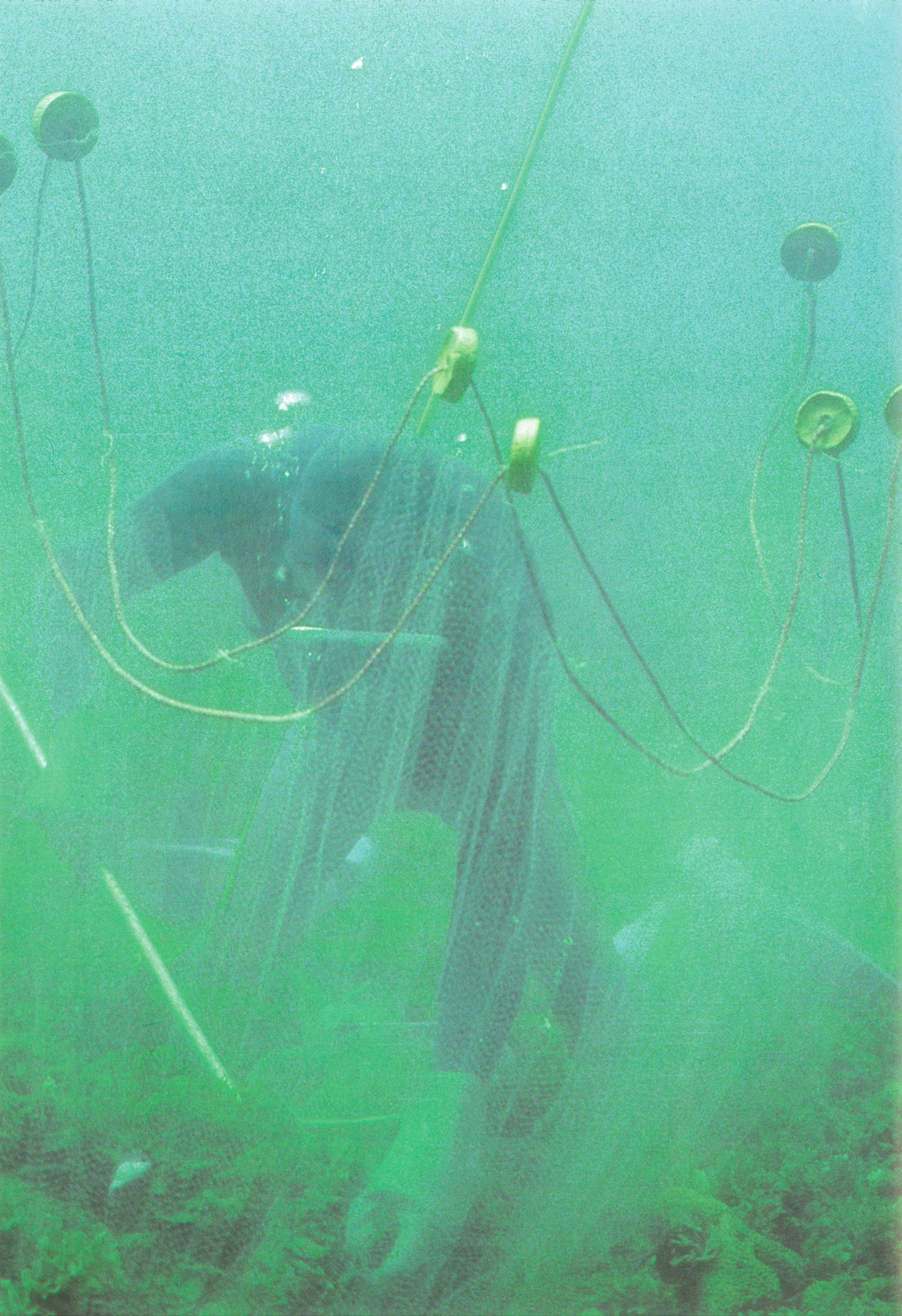
The 'Assets Agreement' between the Authority and the Queensland Government for Marine Park buildings on Heron Island, was signed by the Chairman of the Authority and the Premier of Queensland at the eighth meeting of the Great Barrier Reef Ministerial Council in Brisbane.

MAY

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JUNE

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PLANNING

INTRODUCTION

The Planning Section is responsible to the Chairman for preparing recommendations on the declaration of sections of the Marine Park, and for developing zoning plans and making recommendations for regulations that establish the basis for management of those sections.

Planning is based on the analysis and synthesis of information on the character, resources and use of the Great Barrier Reef Region. This information is obtained from technical literature, specialist reports prepared by consultants, staff and other public instrumentalities, and from representations made by the public.

DECLARATION OF THE REMAINING MARINE PARK SECTIONS

In August 1983, three new sections of the Marine Park were declared: the Far Northern, Central, and Southern Sections.

A major highlight of the year for the Authority was the declaration of the Townsville and Inshore Southern Sections — the final two sections to be included in the Marine Park. The addition of these Sections in October 1983 brought the area in the Marine Park to just over 344 000 square kilometres or to 98.5% of the Great Barrier Reef Region.

CAIRNS AND CORMORANT PASS SECTIONS ZONING PLANS

Zoning Plans for the Cairns and Cormorant Pass Sections were tabled in Parliament on 1 June 1983 and came into operation on 23 November 1983.

FAR NORTHERN SECTION ZONING PLAN

Zoning plans fulfil an essential environmental aim of the Authority: *‘to provide for the protection of the natural features of the Reef, while providing for multiple use of the Reef’s resources’*.

Preparation of the zoning plan for the Far Northern Section began in August 1983. The Planning Section formalized its planning methodology to improve the overall zoning process and the final product.

- A project team composed of a representative from each of the Research, Park Management, Education and Information, and Planning Sections was formed. This provided a more formal means of co-ordinating resource analysis, public participation, and publicity while taking advantage of expertise located in all sections of the Authority in development of the draft zoning plan. It is intended that the project team approach will facilitate the co-ordination between planning and management of the Section.
- In conjunction with the Queensland Premier’s Department, a working group was established comprised of staff from the Authority and officers of relevant Queensland Departments and instrumentalities. The group

functioned effectively to assist in preparation of an inventory of resource and usage information, in sorting out policy issues, and in development of the zoning plan. A similar working group was established with relevant Commonwealth departments and authorities.

In the first stage of planning the Far Northern Section, an inventory was made of the Section's resources and uses. As required by the Act, the public was encouraged to participate in the major stages of planning. Accordingly, the public was invited to provide information on the uses and characteristics of the Section, to express any related concerns and interests, and to make recommendations for zoning and management. To assist the public in making representations, a leaflet **Help Zone the Reef** was used to elicit responses. It contained a questionnaire which aided subsequent computer assisted analysis of the representations. Between September and December, 1983, one hundred and sixteen responses were received from individuals, organizations representing entire industries, and community interest groups with large membership numbers.

With the aid of the information and recommendations offered by the respondents, the inventory was revised and a draft zoning plan was prepared for the Section. The public, particularly users of the section was invited in April 1984 to review and comment on the draft zoning plan as the second phase of public participation. **Zoning the Reef**, a leaflet which was the basis of the second phase of public participation, used an open-ended questionnaire format to elicit feedback on what the public liked or disliked in the proposed plan, any recommended changes to the plan, and information that would support those recommendations. The use of the questionnaire format assisted in a more efficient and consistent processing of the public's comments through a computerized database system. To provide additional insight into the draft zoning plan, a companion booklet **Zoning the Far Northern Section** was prepared.

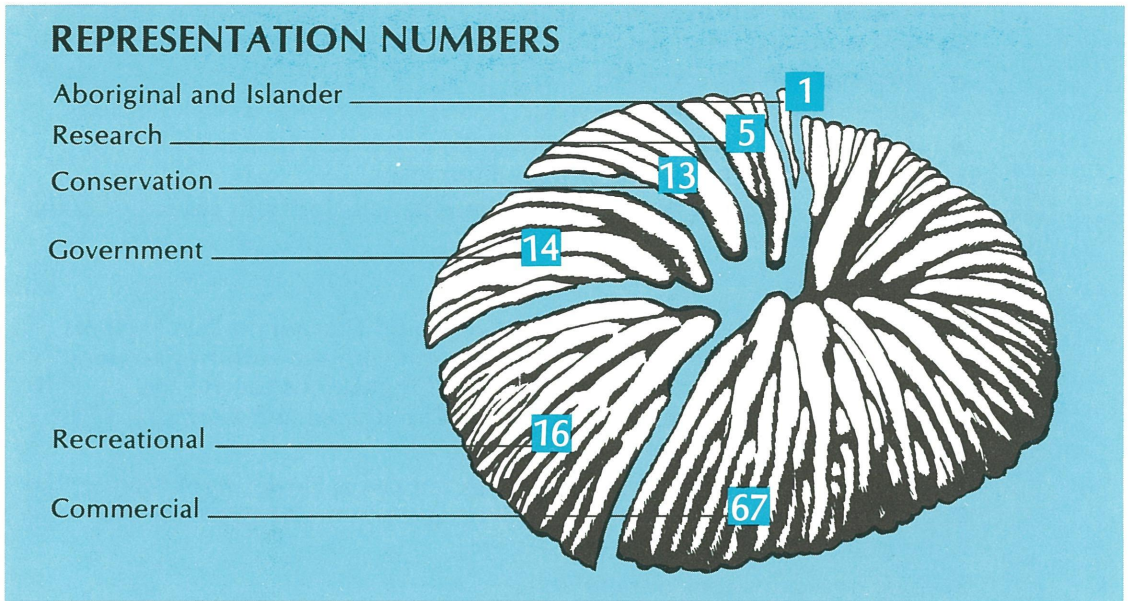
It explained:

- the results of the first phase of public participation
- the criteria used in developing the draft zoning plan
- the reasons for certain reefs or areas being proposed for inclusion in specific zones.

One of the features of the draft zoning plan is the incorporation of a coast-to-shelf edge transect of Marine National Park 'B' zone to provide for block conservation. This zoning was given a high priority in the Far Northern Section due to the Section's relatively pristine nature and low level of present use. The alternative approach used in other zoning plans has been 'matrix conservation' whereby relatively small areas of protective zoning are distributed throughout the area covered by a plan. Future monitoring will provide an opportunity to evaluate the merits of the two concepts.

The final date for receipt of representations on the proposed Far Northern Section zoning plan is 29 July 1984. By 30 June 1984, seventy-eight representations had been received.

After consideration of the public's comments, and possible revision of the



zoning plan, the plan will be submitted by the Authority to the Minister. The plan is required to be laid before both Houses for 15 sitting days. (The **Great Barrier Reef Marine Park Amendment Act 1983**, assented to in November 1983, altered the required number of sitting days from 20 to 15.) If no resolution of disallowance is passed by either House, it is anticipated that the Minister will specify that the Far Northern Zoning Plan is to come into operation in July 1985.

The zoning process and public participation are seen as two of the most important means of fulfilling the Authority's social aim: *'to achieve management of the Marine Park primarily through the community's understanding and acceptance of the provisions of zoning, regulations and management practices'*.

WHAT SECTION NEXT?

At its eighth meeting the Great Barrier Reef Ministerial Council recommended that the next section to be zoned should include the Whitsunday area. At the end of the year, the internal boundaries of the Marine Park were being reviewed with the aims of reducing the total number of sections, amalgamating priority areas such as Hydrographer's Passage and the Whitsunday and Townsville areas, and aligning the boundaries with Q.NPWS management areas. Decisions will be made soon by the Authority on whether to recommend changes to internal boundaries and on which sections will be zoned next.

Techniques which proved successful for zoning the Far Northern Section will be used in zoning other Sections of the Marine Park. These include:

- the project team approach
- Queensland and Commonwealth Inter-Departmental working groups
- a document to accompany the draft zoning plan which explains the rationale in development of the zoning plan
- computerisation of the public's representations for both phases of public participation.

REGULATIONS

As part of the implementation of the Cairns and Cormorant Pass Sections Zoning Plans, the Authority, after consultation with the Attorney-General's Department, recommended a set of general regulations for the Marine Park to replace the existing regulations for the Capricornia and Cormorant Pass Sections and providing for the Cairns Section.

These new general regulations, known as the **Great Barrier Reef Marine Park Regulations**, were made by the Governor-General on 3 November 1983, and came into operation on 7 November 1983.

Specific new provisions of note are:

- powers to require advertisement of applications for permits
- improved powers to seek information about applications
- limitations on taking or having groper or potato cod which are over 1200 millimetres in length
- powers to suspend or revoke permits
- ability to accept oral applications for permits in special circumstances.

In order to give more protection to the animals and plants in the Marine Park, regulations were proposed to prohibit drilling for petroleum in the small areas of the Region not included in the Marine Park. The Governor-General accepted the recommendation and accordingly made the **Great Barrier Reef Marine Park (Prohibition of Drilling for Petroleum) Regulations** which came into operation on 1 September 1983, following the proclamation of the Far Northern, Central and Southern Sections. Following proclamation of the Townsville and Inshore Southern Sections, an amendment reflecting these proclamations to the principal Regulations on 20 October 1984, was notified in the Gazette and came into operation.

DATA PROCESSING ACTIVITIES

Following the appointment of two Computer Systems Officers, several data processing tasks were initiated. These included the development of programs to analyse public responses to zoning plans and the preliminary design of a Great Barrier Reef resources database management system. An analysis, based on two consultancy reports of the computing needs of the organisation, was performed and resulted in a recommendation that the Authority significantly upgrade its in-house computing facilities. The recommendation was accepted by the Authority and, upon Ministerial endorsement of the Authority's ADP

Strategic Plan, tender documents for a computer system were prepared and conveyed to the Purchasing Division, Department of Administrative Services. It is expected that the proposed system will be installed early in 1985.

The resource database management system will provide a means for co-ordinating, correlating and assessing resource information from surveys, Reef users, consultancies and coastal surveillance. The system will have the capability for financial and project management tasks as well as for data analysis.

CROWN OF THORNS STARFISH

The crown of thorns starfish continued to receive considerable attention during the year. The Authority established a computerised database to collate information on the distribution of the starfish and to include information on the extent of its impact on the Reef. The database contains information provided by manta tow surveys (see page 73) and information acquired by a survey questionnaire which was widely distributed to scientists, dive clubs, dive shops, cruising charters and other interested persons.

During February 1984 the Chairman and Authority staff took part in a formal briefing of media representatives, organised by the Far North Queensland Promotions Bureau. Participants at the briefing were provided with detailed information kits and were given the opportunity to view coral predation and recovery on reefs out from Cairns.

The Authority re-established a Crown of Thorns Starfish Expert Advisory Committee under the Chairmanship of Professor Ken Back, the Vice-Chancellor of JCU.

The terms of reference for the Committee are:

- to review the results of research into crown of thorns starfish and relevant aspects of coral reef ecology, with particular reference to research published or conducted since 1980
- in light of reports of the current incidence of crown of thorns starfish, and Authority reports and surveys, to advise on future research and monitoring directions, with particular reference to cost and feasibility
- to advise on possible research programs or projects relevant to management and/or understanding of the relationship between crown of thorns starfish and coral reefs
- to advise on a program for keeping the public informed on the crown of thorns starfish phenomenon and research and management actions which are being undertaken in relation to it.

In June 1984, a research project was initiated to investigate possible control measures to protect coral from crown of thorns predation at specific sites of particular importance to tourist operators and scientific researchers, with a view to assisting private and government organisations with the provision of expert advice.

The Great Barrier Reef Marine Park Authority, in co-operation with Q.NPWS and the Queensland Fish Management Authority, undertook the research project to provide information on the feasibility of using injection techniques to control crown of thorns starfish populations in limited areas. Labour, costs and the fate of injected starfish were factors considered. The project was carried out in a small area popularly known as 'Cod Hole' in the Cormorant Pass Section of the Marine Park.

Reports by charter boat operators and subsequent follow up by staff of the Authority established that a discrete population of approximately 1000 crown of thorns starfish was present in 'Cod Hole', an ecologically important habitat for the resident colony of tame potato cod (*Epinephelus tukula*) which is a major natural attraction for divers and snorkellers.

Results to date indicate that the area has been successfully cleared of starfish. The Authority, Queensland National Parks and Wildlife Service and charter boat operators will continue to monitor the situation as part of the research project.

At the end of the financial year the Authority was organising a survey of crown of thorns starfish numbers, particularly juveniles, and coral condition on a number of reefs between Townsville and the Whitsunday coast. The survey will involve Royal Australian Navy personnel on special project training and will provide comparative data with the last survey of the same reefs ten years ago.

REMOTE SENSING APPLICATIONS

The Authority continued to play an active role in applying remote sensing data products to reef and coastal waters features survey and analysis.

The Barrier Reef Image ANalysis (BRIAN) program, carried out in collaboration with the CSIRO Division of Water and Land Resources, was essentially completed. The system and its applications to reef features analysis will be fully documented in two future CSIRO publications:

Jupp D. et al 1984(a) **The BRIAN Handbook. An Introduction to Landsat and the BRIAN System for Users.** This handbook will provide a comprehensive guide to large area surveys using satellite image data computer analysis. It will furnish users with the means to develop interpretations of reef cover, first order bathymetry and rectified map-like products for use in the development of zoning plans.

Jupp D. et al 1984(b) **Interpretation of Landsat Data by Computer Classification and Labelling.** This report will present a case study using the BRIAN methodology to interpret images of the Cairns Section in terms of reef cover and structure, and to extend those interpretations from well-known to little-known areas. The study demonstrated that the reconnaissance mapping methods developed are time and cost effective for very large area surveys such as basic reef inventories.

Both reports represent the successful completion of a collaborative research effort by the Division and the Authority. The results were used in zoning the Cairns, Cormorant Pass and Far Northern Sections.

The software and the techniques were successfully transferred to the Australian Survey Office (ASO), which is actively investigating further development of an improved image analysis system. The ASO has an active Remote Sensing Unit which has produced rectified imagery for a variety of purposes although 75% of the current output is for the Authority.

Further collaborative research in remote sensing applications to marine area planning and management is proceeding by agreement with the CSIRO Division of Water and Land Resources under the provisions of a Memorandum of Understanding. The following areas of research are under active review:

- improvements to computer based classifications of reef and water features
- initial investigations into the detection and mapping of seashore submerged aquatic vegetation (principally seagrass)
- acquisition and analysis of spectrographic data to determine reef and coastal waters spectral properties
- applicability of other remote sensing data sources (airborne multispectral scanners, climatic satellite and Coastal Zone Color Scanner data).

ENDANGERED SPECIES/TRADITIONAL FISHERIES

The Authority took an active role in an Interdepartmental Committee to Establish Guidelines for Taking of Protected Animals (Dugongs and Turtles) which was co-ordinated by the Queensland Fish Management Authority. The Committee investigated the possibility of sustained take of such animals in traditional fisheries by Aboriginal communities. A report is expected before the end of 1984.

UNESCO HANDBOOK

The Authority concluded a contract with the United Nations Educational, Scientific and Cultural Organisation (UNESCO) for editing a handbook on coral reef management. It was edited by the Assistant Executive Officer, Planning, Richard Kenchington and Ms. Brydget E.T Hudson of Townsville.

The Handbook is aimed particularly at planners and managers in developing countries of South-East Asia, Pacific and Indian Ocean coral reef areas. Publication is expected in late 1984.

THE FUTURE

The Planning Section is proceeding in accordance with the program accepted by the Great Barrier Reef Ministerial Council which provides for zoning of all sections of the Marine Park to be completed in 1987.



PARK MANAGEMENT

INTRODUCTION

Management of the Marine Park depends ultimately for its success on the management of people. Park management agencies seek to control, educate, inform and influence the behaviour of those people who use the Park to ensure the wise use, appreciation and enjoyment of the Reef's resources. These agencies also need to ensure that the people who are employed to manage the Park have a strong commitment to the ideals embodied in the Marine Park concept and a motivation to carry out management functions in ways that enhance visitor appreciation and use of the Reef while ensuring its conservation.

SHARED RESPONSIBILITIES

Broadly speaking, the job of Park management has been split into two elements — the planning of management systems, policies and programs remains primarily the responsibility of the Authority, while the job of implementing the management of the Marine Park on a day-to-day basis falls to Queensland Government agencies, in particular Q.NPWS. The split of these functions creates a special need for the definition of roles and responsibilities and for the establishment of special liaison networks to ensure the most efficient conduct of day-to-day management.

THE YEAR IN SUMMARY

1983-84 was a year of challenges and of a rapidly growing awareness of the complexity and difficulty of some of the Park management issues. Management of the Cairns Section in particular raised new problems and new issues not previously encountered in the Capricornia Section. Substantial delays were experienced in the establishment of the Cairns Section partially due to a major restructuring of Q.NPWS and also because forecasts of the time and resources required to put into practice day-to-day management have proved to be gross underestimates. Although the zoning program for remaining sections of the Marine Park will require that one section or group of sections come into operation on 1 July of the next three calendar years, the physical task of establishing management will make it impossible to have a level of management other than the bare minimum at the date of commencement.

GOAL AND AIMS

Park management operations are conducted within the functions set by the Act and Regulations and are aimed towards achievement of the Authority's goal (see page 11).

The aims of the Authority give an emphasis to the manner in which Authority staff and agencies of the Authority should undertake the particular responsibilities provided to them. The particular aims adopted by the Authority are met in many ways through the programs and guidelines already established for the day-to-day management of the Marine Park. In practice the achievement of these aims is yet to be fully realised. This is the result of energies in the early days being absorbed in establishing operational and

administrative systems, acquiring equipment and sorting out roles and responsibilities. Nevertheless a substantial start has been made in the Capricornia Section towards achieving the aims: *'involving the community meaningfully in the establishment and management of the Marine Park'* and *'achievement of management of the Marine Park primarily through the community's understanding and acceptance of the provisions of zoning plans, regulations and management practices'*. For example, staff of Q.NPWS based in Rockhampton spent approximately 15% of their time in the April-June quarter on interpretive and educational work.

Another aim, that of *'minimising regulation of and interference in human activities ...'* has been at least partially achieved by the permit system where a conscious effort is made to strike a balance between allowing reasonable use of the Marine Park and ensuring conservation of the Reef's resources. In some cases, restrictions have been placed on the numbers of a particular species which may be collected. As far as possible these restrictions are set in consultation with the particular users.

The aim of *'achieving competence and fairness in the development and care of the Marine Park through the deliberate acquisition and use of relevant scientific and non-scientific information and techniques in decision-making and other activities'* will need to be addressed more and more as the area of Park requiring management and therefore the size of the task expands. However, this aim was partially achieved in 1983-84 through the use of advice provided by expert consultants, through the adoption of a program management system, through the regionalisation of activities by Q.NPWS, and by the continuing use of technological innovations which might aid Park management. As regards the aim of *'minimising costs of developing and caring for the Marine Park'*, close scrutiny is given to estimates for day-to-day management operations consistent with the need to provide a satisfactory standard of service. In addition careful consideration is given in setting conditions for permits which might infringe on the conduct of legitimate economic activities in the Marine Park.

FRAMEWORK FOR MANAGEMENT

The policy framework within which the Park Management Section operates derives initially from the Act and Regulations, and from decisions of Government, such as the 1979 agreement between the then Prime Minister and the Premier of Queensland, which provides for shared responsibility between the Commonwealth and Queensland Governments for management of the Marine Park. Within this broad framework further policy decisions are embodied in zoning plans. In the implementation of zoning plans and regulations, which is the main function of the Park Management Section, guidelines are developed for Park management officers in the conduct of specific operations or for the management of specific locations within the Marine Park.

BASIS OF AGREEMENT ON DAY-TO-DAY MANAGEMENT

Since the commencement of management of the Capricornia Section, in 1981, operations have continued under the 'Basis of Agreement' which sets the broad parameters for the conduct of day-to-day management. Both Governments intend that this 'Basis of Agreement' should be replaced by a formal agreement which is expected to be signed during the latter half of 1984. The new agreement will contain the major policy framework for day-to-day management. Management Guidelines which were developed for application to the Capricornia Section in 1981 will need revision in the coming year. Both documents will need to cover the additional requirements for other sections of the Marine Park and take account of factors which have arisen through experience. Some examples of these are the provision of interim management arrangements prior to zoning plans coming into effect, the need for pre-management budgeting to ensure that management can be established by the date zoning plans come into effect and finally the need to define better the roles and responsibilities of the Authority and Queensland day-to-day management organisations.

POLICY DEVELOPMENT

The amount of work on the development of draft policy proposals for day-to-day management continues to grow, generated largely by specific cases which come to the attention of the Authority. When this occurs, the Park Management Section usually drafts a policy statement for consideration by the Authority.

Most of the proposals in 1983-84 derived from specific applications for permission to undertake activities within the Marine Park. For example:

- conduct of research within the Marine Park both on an individual and an institutional level
- the establishment of mariculture operations in the Cairns Section
- traditional hunting and fishing particularly of dugong and turtle.

In the coming year other issues specifically related to permits will require development and approval of policies by the Authority. These include shell collecting, coral collecting and aquarium fish collecting. Particular attention will need to be given to the control of offshore facilities.

TOURIST FACILITIES AND PROGRAMS

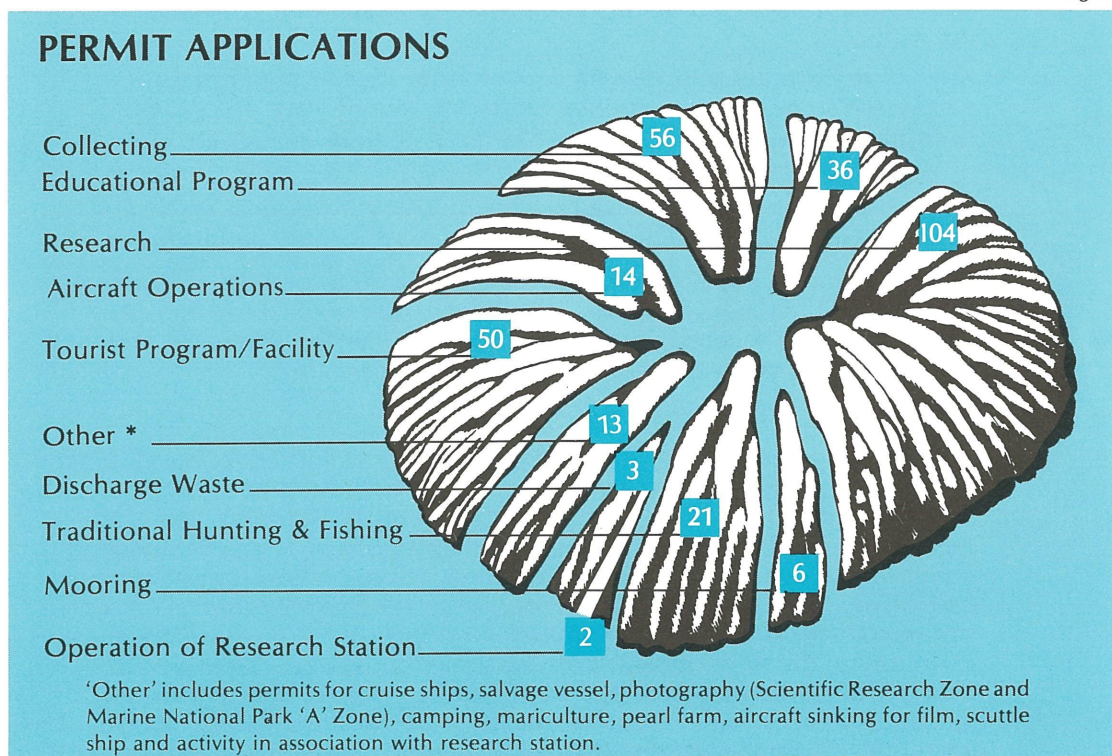
1983-84 saw an increase in the number of proposals for tourist developments of varying sizes on reefs off Cairns, Townsville and the Whitsunday coast. The proposals include single moorings for charter boats, pontoons and semi-submersible craft for coral viewing, and major hotel style accommodation either fixed to or floating on reefs offshore. These proposed developments, particularly beyond the Territorial Sea, raise new issues of control for which additional legislation may be required. Not only do the environmental issues surrounding the development of these structures need to be considered, but a variety of other important issues need to be covered such as taxation, health, control of illegal activities, building standards, gambling, liquor licensing and compensation. The Commonwealth Government is at present

developing legislation to control the construction and conduct of such structures beyond the Territorial Sea. Permits will be required for operation of such structures within the Marine Park. To ensure consistency of evaluation and issue of permits for these operations specific criteria of assessment are needed. The Authority commissioned a consultant in 1983-84 to consider the policy aspects of such offshore developments. During the coming year, the methodology and policy for assessment of permit applications will be refined.

The coming into operation of the Cairns Section Zoning Plan required an immediate issue of permits for a large number of tourist operators conducting programs within the Section. Most of these involved charter boats. This required consideration of the numbers of operators that may use a particular reef, the conditions that might be placed on the permits and the wide range of activities which could constitute a tourist program, e.g. regular ferry services from the mainland to offshore destinations and charter boats or float planes on reef-hopping tours.

Also during 1983-84 the Authority completed a Procedures Manual for the guidance of delegated officers in the assessment and issue of permits. Statistics for all Marine Park permits issued during 1983-84 are presented in Fig. 3.

Fig. 5.





JOINT IDENTITY

During 1983-84 substantial agreement was reached on the policy of joint identification of day-to-day management officers, buildings and equipment. The joint identity will reflect both the Authority and Q.NPWS. In 1984-85 the public should become aware of this visible expression of co-operative management. In addition, a consultant was commissioned to report on requirements for a sign system for the marine environment which would meet the requirements of the Authority and the Queensland Co-ordinator-General, who is responsible for the implementation of the Queensland **Marine Parks Act 1982**, and which would be compatible with the sign system used by Q.NPWS on island national parks.

CO-ORDINATION

The development of Authority policy proposals requires careful co-ordination with other agencies, particularly those of the Queensland Government, to promote the concept of complementary management. For example, conditions for traditional hunting and fishing permits were developed in consultation with the Queensland Fish Management Authority which is responsible for State legislation applying to the taking of dugong within Queensland coastal waters.

PROGRAMS

CAPRICORNIA

1983-84 was a year of consolidation of established elements of the program, e.g. surveillance, and development of some of the more important aspects of day-to-day management such as education and interpretation. Staff of Q.NPWS contacted many user groups and individuals to provide information about the Marine Park and to seek advice on problems users may be experiencing.

The Q.NPWS made significant progress in establishing a systematic programmed approach to day-to-day operations including the identification of specific projects, procedures for approval and an analysis of staff time spent on the various functions of day-to-day management. Training programs, particularly for enforcement practice, were designed during 1983-84 for conduct early in 1984-85.

Much of the Service's attention was focussed on a major restructuring of the whole organisation which had inevitable consequences in diverting energies away from the conduct of specific responsibilities. By the end of 1983 the restructuring had been concluded and the recruitment of additional staff had commenced. In 1984-85 it is expected that the consequence of the restructuring will be a more integrated and systematic approach to management of the maritime estate.

The building of staff accommodation and a workshop/store on Heron Island also was completed during the year by the Queensland Department of Works. This is a major facility which provides a base for management

operations within the Capricornia Section and should enhance the capacity of Q.NPWS officers to conduct education, monitoring, surveillance and resource management tasks.

One objective set in 1983-84, the declaration of Reef Appreciation Areas, was not achieved. The welcome decision by the Queensland Government to prepare zoning plans for Queensland Marine Parks within the outer boundaries of the Capricornia Section caused delays in the establishment of Reef Appreciation Areas because of the desirability of conducting the declaration of both Queensland and Commonwealth areas in parallel.

During 1983-84, in collaboration with Queensland agencies, further work was conducted on the establishment of management plans for specific sites in the Capricornia Section, e.g. Lady Elliott Island and Reef, Lady Musgrave Island and Reef, and Heron Island. It is expected that these plans will come into operation in 1984-85.

Reviews were undertaken of the vessel requirements for Capricornia, based on the experience with the power catamaran **Protector II**, and on staffing and surveillance levels for the Section.

Substantial administrative work was undertaken in 1983-84 towards the establishment of a reef education centre on Lady Elliott Island. Although this may not reach fruition for some years, it is expected that in the near future the Authority will acquire ownership of the lightstation buildings on the Island. These will be refurbished for the conduct of reef education activities mainly for school groups to complement those already provided at Heron Island by the Heron Island Research Station and by mainland educational institutions.

CAIRNS/CORMORANT PASS

The Zoning Plans for the Cairns and Cormorant Pass Sections came into operation on 23 November 1983. Despite efforts to have a management presence in place as soon as possible after that date, at the end of 1983-84 the only capability for day-to-day management was two existing Q.NPWS officers based in Cairns whose time is largely taken up with the conduct of programs on Green Island. However, a senior officer responsible for establishing management for the Cairns and Cormorant Pass Sections was transferred to Cairns in April and two overseers were recruited in June 1984. Some progress was made in the purchase of equipment for the Cairns office of the Service but the major thrust for establishment of management will be in 1984-85.

The Authority has been offered the lease of a large building, the Customs Bond Store in Abbott Street, Cairns for use for day-to-day management of the Section. It has been agreed with Q.NPWS that this building will be acquired, refurbished and used by day-to-day management staff. This will be completed in 1984-85.

A major development in the Cairns Section was the issue of the first permit for traditional hunting and fishing, to the Hope Vale Aboriginal community north of Cooktown. This required a careful approach in a sensitive area

where traditional hunting and fishing practices still remain but in a modified way. Further negotiations with the Hope Vale community were undertaken in the latter half of the year with a view to more effective communication and to ensure that both the objectives of the Authority and the aspirations of the people at Hope Vale are met. Two objectives are sought, first the conservation of an endangered species and second the continued opportunity for the practice of a traditional lifestyle by the people of Hope Vale.

FAR NORTHERN SECTION

Experience with the management of the Capricornia, Cairns and Cormorant Pass Sections indicates that it is important to have resources available in the year prior to a zoning plan coming into operation to prepare for management. A planning phase budget was therefore approved by Ministerial Council in May 1984 for the Far Northern Section which is expected to come into operation in July 1985.

UNZONED SECTIONS

Interim management is required for the implementation of general regulations which apply in all sections of the Marine Park whether zoned or not, e.g. in relation to the taking of certain species of fish, the discharge of waste and spearfishing with SCUBA or for commercial purposes. Arrangements have commenced with Q.NPWS to implement these particular general regulations.

During 1983-84 a sequence of zoning for the remaining sections of the Marine Park was decided by the Authority and the consequences for management were examined. With the expectation that zoning will be completed and management commenced for the entire Park by 1988, the approximate costs to each Government both in establishment and in ongoing running costs were estimated during the year.

The Authority decided that the difficulties in establishing management might be overcome by the formation of a special task force dedicated to identifying the resources needed and the steps involved, and to arrange for the establishment of management for the next three sections of Park. This task force, which will include officers from Q.NPWS and the Authority, is expected to begin work in 1984-85, dealing first with establishment of management for the Far Northern Section and then for subsequent sections of the Marine Park.

LIAISON

The division of responsibilities for Park management between the Authority and Q.NPWS places demands on both organisations to ensure that there is effective communication. The liaison required is mainly three-way between the Authority's Townsville office, the head office of Q.NPWS in Brisbane and the Far Northern, Northern and Central Regional offices of the Service. The nomination of specific officers in each organisation with responsibility for liaison has contributed much towards the free exchange of information and a

Fig. 6.

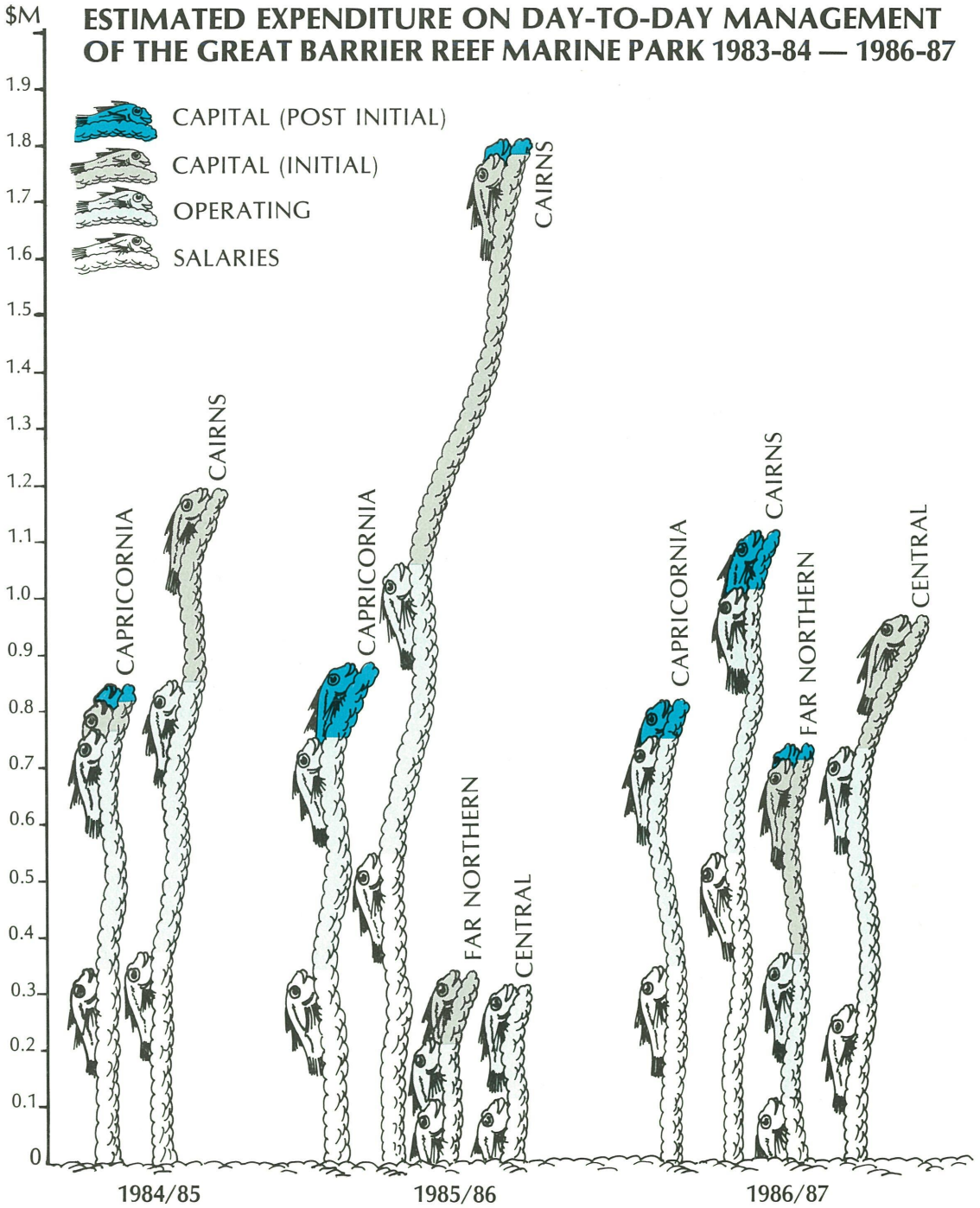
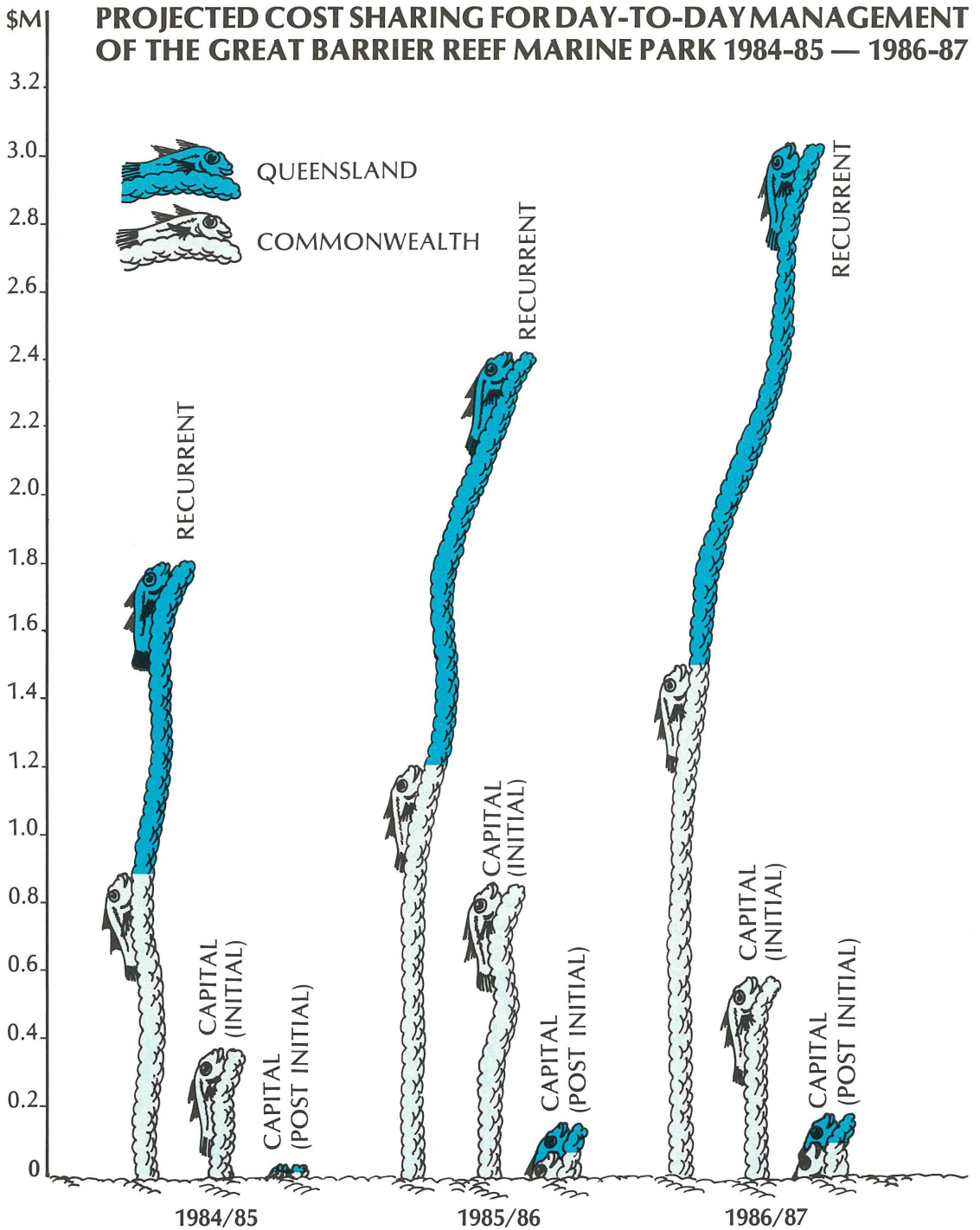


Fig. 7.



co-operative and collaborative approach to the solution of management problems. Much of the success of this liaison has depended on the establishment of effective personal relationships between officers.

Liaison in a more general sense is undertaken through the Management Co-ordinating Committee which is a forum for co-ordination of management responsibilities within the Great Barrier Reef Region. Membership includes representatives of the Authority, Q.NPWS, Premier's Department, Land Administration Commission, Department of Harbours and Marine, and the Queensland Fish Management Authority. Furthermore, with the increased interest in offshore developments a Commonwealth/State committee was established to facilitate the consideration of applications for offshore developments within the Region by relevant Federal and State Departments.

It is important for management staff to participate in the zoning process. This ensures that zoning plans are manageable and that management officers are familiar with the reasons for the provisions in zoning plans. During the year the Park Management Section participated in project teams working on the zoning of the Far Northern Section and on preliminary resource evaluation for the Townsville/Whitsunday area.

During 1983-84 the main Commonwealth aerial surveillance contractor for the Great Barrier Reef Region was changed from AIReSEARCH to the firm Skywest, which is equipped with different aircraft and radar systems. In 1984-85, the Authority will closely monitor the effectiveness of this surveillance system in terms of quality of sightings and reporting.

THE FUTURE

Major challenges still remain in establishing and refining management for both the Capricornia Section and the Cairns Section. However, management for the Far Northern Section of the Marine Park must also be established by 1985-86. Management of this Section is expected to create immense problems because of its distance from established centres of population and the transient nature of many of the users of the area. In addition it is expected that there will be large areas of reef which have restricted uses. The Authority and Q.NPWS are working towards establishing a cost-effective and efficient system of surveillance which will be the major tool for management of this Section of the Marine Park. In 1984-85 preliminary planning for the management of the Townsville/Whitsunday area of the Marine Park will also be considered. Estimated expenditure on day-to-day management and projected cost sharing for day-to-day management for the period 1984-85 to 1986-87 are presented in Figs 6 and 7 respectively.



EDUCATION AND INFORMATION

INTRODUCTION

Successful management of the Marine Park depends to a large extent on users and visitors voluntarily adopting a code of behaviour that is compatible with the zoning plans and regulations for the Park. To attempt to enforce legislation without seeking and encouraging the willing co-operation of the community would require an almost impossibly high level of surveillance and enforcement.

The aim of the Authority's Education and Information program is thus to achieve management of the Marine Park primarily through the community's understanding and acceptance of the Marine Park concept, regulations and management practices through the provision of education and information materials and services.

The thrust of the program is directed through three distinct channels: the formal education program which is designed to develop curriculum materials and services for teachers and students, the extension program which is aimed primarily at current Reef user groups and the community education program which is designed to promote understanding and support for the Marine Park concept by the community at large. The Education and Information Section also provides general services support by publishing statutory and research materials and maintaining a specialised library service available to the Authority, its staff and the general public.

FORMAL EDUCATION PROGRAM

The formal education program conducted during the 1983-84 year continued to reflect the importance the Authority places on educating young people in schools — the group of potential users of the Marine Park whose habits and attitudes may not yet have been determined.

Project Reef-Ed which was initiated in 1981 was the Authority's major curriculum project during the past year. The project aims to produce a **Teachers' Handbook for Great Barrier Reef Field Work** which is due to be published in 1985. The handbook will be aimed at teachers of years 10-12 and will focus on education in the field; however, it will also contain suggestions for work away from the Reef. Contents of the handbook will include information on reefs and islands, aims and objectives of reef education and reef field work, student activities, and logistics of reef field trips. The handbook will be supplemented by a series of companion guides which will provide information on suggested field work locations within the Marine Park. The handbook is not intended to specify a particular program or course of Reef study but rather to provide teachers with a diverse range of student activities from which they can select according to their own aims.

The 1983-84 program also included a series of in-service education courses for teachers in coastal centres adjacent to the Marine Park. The courses, conducted jointly with Q.NPWS, covered the geology and life forms of the Reef, its history, the human use of its resources, and management of this use in the Marine Park. Teachers were also advised on curriculum programs

and resources currently available to meet the particular needs of their students. The Authority plans to hold another series of in-service courses in the forthcoming year.

The Authority also collaborated with the Australian Conservation Foundation to produce a booklet titled **The Great Barrier Reef**. Published by the Gould League of Victoria as part of the League's Junior Survival Series, the booklet presents an overview of life on the Great Barrier Reef. Teachers, as well as upper primary and lower secondary school students, should find this work an invaluable introduction to tropical marine biology.

Three issues of the newsletter **Ebb & Flow** produced during the year catered for the special needs of students and teachers by providing information about the Reef, news and reviews of available resources, suggestions of things to do and places to visit and a vehicle for sharing Reef experiences, ideas and concerns. **Ebb & Flow** has been so well received that its format has undergone a 'facelift' and it is hoped that it will be produced more frequently in the future.

THE EXTENSION PROGRAM

Many people think only of a kaleidoscope of colourful corals and fishes when they think of the Great Barrier Reef. But the Reef Region is also important to the livelihood and recreation of many different community groups. To develop practical management strategies for the Marine Park it is vital that staff of the Authority seek information and recommendations from user groups who have a wealth of knowledge and experience to draw from. Direct contact with commercial and recreational fishermen, charter boat operators, resort managers, boaters, divers and scientists assists the Authority in developing and reviewing interpretive materials that explain the provisions of zoning plans and regulations in a manner easily understood by the people who use the Reef.

During 1983-84 officers from the Authority visited fishing and shell collecting clubs, boat and aircraft charter operators, boat and tackle shops and professional and recreational diving organisations in areas adjacent to the Cairns Section of the Marine Park. These groups recommended that interpretive material on the Zoning Plans for the Cairns and Cormorant Pass Sections should include a large scale map with accompanying table showing the activities allowed in each zone. Consequently the Authority produced a full colour zoning poster and a series of five regional activities guides which explain the Zoning Plans and Regulations as they effect areas of the Cairns Section around Lizard Island and offshore from Cooktown, Port Douglas, Cairns and Innisfail.

It has been encouraging to see the poster and brochures so widely accepted and a reprint of 30 000 copies is already in train. A similar package explaining the Zoning Plan for the Far Northern Section will be released when the Zoning Plan is approved.

A zoning poster and similar brochures produced earlier for the Capricornia

Section are also in great demand with some of the series going into their third reprint.

Both the Authority and Q.NPWS interact with a variety of community groups within the areas adjacent to the Capricornia, Cairns and Cormorant Pass Sections of the Marine Park. A computerised database developed during the past year will facilitate the recording of important contacts, dates, events and follow-up work conducted by officers from both agencies.

The Authority and Q.NPWS are jointly involved in the installation of a major permanent display at the new Gladstone airport. Incorporating four large murals covering about 26 square metres, this innovative display will introduce the islands and reefs of the Capricornia Section and some of the activities available to visitors to this Section of the Marine Park.

COMMUNITY EDUCATION PROGRAM

The Great Barrier Reef was inscribed on the World Heritage List in 1981. Most Australians, while perhaps realising the significance of this event, live far away from the Reef. The Authority believes that it is important that all Australians, including those who may never see the Reef, develop an increased awareness and understanding of this magnificent natural resource which in turn should lead to an appreciation of the need for management of the Reef through the care and development of the Great Barrier Reef Marine Park.

During the past year the Authority and Q.NPWS collaborated on a number of projects to enhance the community's understanding of some of the fascinating natural and man-made features of the Reef.

An important project initiated in 1983-84 was a new poster series titled **Reef Heritage**. The series has been designed to provide information on Reef animals which are endangered and on relics of cultural significance such as shipwrecks. The dugong or sea cow, a species of marine mammal which inhabits the northern waters of the Great Barrier Reef Region, is the subject of the first poster of the series. A complementary audio-visual program deals with the dugong's biology and management issues. The Aboriginal community of Hope Vale assisted in the production of the program.

The Authority and Q.NPWS also proposed a new series of information brochures titled **Reef Notes**. Authors from a variety of disciplines and organisations have contributed to the series, which will cover topics such as crown of thorns starfish, seabirds, turtles, hard and soft corals and the Reef Region fisheries. The first in the series is due for release around November 1984. Written in a non-academic style, **Reef Notes** should prove both interesting reading and a valuable resource to the general public, teachers and students.

The Authority's newsletter **Reflections** has continued to prove popular, covering a wide range of topics and serving as a forum for discussion of Reef related matters. The format of **Reflections** has also undergone some changes

and its circulation has been increased from 5 000 to 10 000 copies.

Early in 1984 the Authority provided a subsidy to the University of Queensland Press to assist in the production of a book titled **Plant Life of the Great Barrier Reef and Adjacent Shores** by Dr. Alan Cribb and Joan Cribb. This hardback, illustrated handbook with over 200 colour photographs will enhance the identification of over 180 species of flowering plants and over 80 species of seaweed found within and adjacent to the Great Barrier Reef Region.

The Authority has always recognised the value of television and radio in reaching target groups. During the last year a project was initiated to produce five trial programs for possible broadcast on radio throughout Australia. The pilot series, which will be initially broadcast in North Queensland, will provide information on the origin and history of the Reef, its inhabitants and management issues. The Authority is also investigating further opportunities to inform the community about the Reef and the Marine Park through television.

During 1983-84 staff of the Education and Information Section designed and constructed several displays to meet a wide range of needs including Marine Park declarations, public functions, conferences and exhibitions. The first two in a new series of posters were also released. Separate posters depicting a clownfish and anemone, and a turret coral carry the caption, *'The Great Barrier Reef Marine Park — Ours to Use Wisely'*. Both posters are proving very popular. Another poster depicting the six species of coral trout found in Reef waters has proved useful to fishermen and others in correctly identifying these popular table fish.

The Authority also contributed articles to a variety of magazines including tourist-targeted and conservation-orientated journals. A stamp series on the Marine Life of the Great Barrier Reef was launched jointly by the Authority and Australia Post. Reaction to the first set of stamps in the series was most favourable.

PUBLIC PARTICIPATION

The first phase of public participation for the zoning of the Far Northern Section of the Marine Park commenced in September 1983. Explanatory brochures, maps and posters were a major part of an extensive media campaign designed to reach all target groups interested in the zoning process. The brochure **Help Zone the Reef**, which was originally designed and used in the zoning of the Cairns and Cormorant Pass Sections, was redesigned for the Far Northern Section to help people in making representations. The fact that 61% of respondents used the mail-back facility of the brochure reflects the success of the design. The second phase of public participation began in April 1984 and incorporated a poster and two explanatory documents **Zoning the Far Northern Section** and **Zoning the Reef**.

GENERAL SERVICES PROGRAM

The Authority published two special reports during the year to give the



Majorie Wilke of St. John's Lutheran Primary School and Tony Hay a teacher at Bundaberg East State School discuss reef beach rock formation with Kirk Peterson of the Authority and Sue Osborne of Q.NPWS at the Great Barrier Reef Teachers' In-Service Course held in Bundaberg, 28 April 1984. (Photograph: J. J. Valks)

public access to important research data. The first, **Green Island Economic Study** presents an evaluation of the existing and alternative uses of Green Island and Reef as a tourist/recreational resource. The second, the **Great Barrier Reef Marine Park Authority Research Report 1976-82** is a detailed summary of all research consultancies arranged by the Authority between 1976 and 1982.

Statutory publications produced during the year were the **1982-83 Annual Report**, the **Zoning Plan for the Cairns and Cormorant Pass Sections**, and the **Far Northern Section Zoning Plan for Public Review**. The Authority's permit application brochure was also revised to assist both applicants in applying for permits, and Authority and Q.NPWS staff in processing permit applications.

BICENTENNIAL PROJECT

During the past year the Authority continued its involvement in the development of a proposed Bicentennial project, Great Barrier Reef Wonderland. The proposed complex, which has been recommended by the Queensland Government as part of the Commemorative Bicentennial Program, will display a coral reef microcosm. This aquarium will be based on a prototype developed by Dr. W. Adey of the Smithsonian Institution in Washington, D.C., USA, and will provide the Authority with an opportunity to broaden the community's awareness and understanding of the Great Barrier Reef and the Marine Park concept.

The Authority has established a committee, representing appropriate areas of expertise, to advise on the development of an aquarium and associated exhibits within the complex including research into the design and planning. The Chairman of the Authority is also a member of the Great Barrier Reef Wonderland Association, a regionally-based organisation formed to carry out preliminary administrative steps to prepare for the receipt of major Bicentennial funds and the commencement of the processes of design and construction.

FREEDOM OF INFORMATION

The Commonwealth Freedom of Information Act 1982 (FOI) became effective as of 1 December 1982.

To date no FOI requests have been received. This may reflect the fact that information has always been readily available to the public from the offices of the Authority.

The processing of enquiries made under provisions of FOI for access to documents is the responsibility of officers of the Education and Information Section. Internal procedures to be followed by Authority staff are set out in an FOI procedures manual, adapted from guidelines issued by the Attorney-General's Department. Responsibility for granting or denying access to documents rests with the Executive Officer for requests made to the Authority and with the Secretary, Great Barrier Reef Consultative Committee for requests made to the Committee. Responsibility for review of decisions rests with the Chairman of the Authority and Committee respectively.

The Chairman and six senior officers of the Authority staff have attended training seminars conducted by the Attorney-General's Department. Internal briefing sessions have been conducted for all members of staff.

LIBRARY

The function of the library is to aid the Authority and staff in the pursuit of their duties by providing rapid and efficient access to information in published material in the library's own collection or those of other libraries. The Authority's library collection is also used by students, visiting researchers and members of the public, and some library service is provided to other institutions with which the Authority has geographic or operational ties.

The library collection includes monographs, periodicals, photographs, slides, films, pamphlets, posters, maps and charts. Although its emphasis is on the Great Barrier Reef, subject coverage is wide and includes special collections on tourism, environmental management, national parks and government administration.

During the year under review, the REEF bibliographic database continued to develop. Both newly published and older material was indexed and the database now includes references to over 6 000 publications. In addition to the monthly **REEF: Current Awareness Bulletin**, and a 1983 annual cumulation, a further bibliography was published; **Maps of the Great Barrier Reef: an indexed list of maps and charts of the Great Barrier Reef Region**.

This is of value in accessing the Authority's own substantial collection of maps, as well as being of use to workers in a number of fields. There is a steady demand for publications listed in REEF from coral reef workers throughout Australia and overseas.

The demand for library services continues to grow. For this reason the appointment during the year of a full-time clerical assistant within the library was an important development. A more detailed account of the library is to be published in **Australian Special Libraries News**.

THE FUTURE

The work of the Education and Information Section continues to expand. The completion of the zoning of the Far Northern Section will necessitate the production of explanatory materials. The zoning of subsequent sections of the Marine Park will involve intensive public participation, again involving the publication and distribution of a variety of information materials targeted at a wide range of groups.

The Section will continue to investigate the most efficient and cost effective ways of satisfying the perceived needs of the community through well planned and well integrated Education and Information programs.



RESEARCH AND MONITORING

INTRODUCTION

Under Section 7.1.(b) of the Act, the Authority's function is *'to carry out, by itself, or in co-operation with other institutions and persons, and to arrange for any other institutions or persons to carry out, research and investigations relevant to the Marine Park'*. Research and investigations include basic and applied research, data gathering, contract studies on specific issues or localities, and monitoring studies.

The Authority is not primarily a research agency; most research is conducted for the Authority by external organisations including universities, private consultants, and government research bodies. Studies undertaken by the Research and Monitoring Section are usually oriented towards meeting a short-term planning or management need, or testing and developing methods and procedures which have a specific management application.

Because of the broad-ranging planning, management, education and information needs of the Authority, the research and monitoring program is both multi-faceted and multi-disciplinary. Ten categories including oceanography, marine biology, analysis of use and environmental design have been used as a basis for classifying the research activities of the Authority since 1976.

In 1983-84, eighty-five projects were in progress, including 22 projects supported by augmentative research grants. The projects covered most of the ten disciplinary categories. Appendix C lists each of the major projects funded by the Authority in 1983-84 including projects which were in progress, but not funded during the year.

Appendix D lists the augmentative research grants awarded to students for the 1983 and 1984 academic years. The augmentative research grants scheme is designed to assist recent graduates or post-graduate students conducting studies relevant to the Marine Park.

CO-ORDINATION AND LIAISON

During the year the Authority continued its established role of co-ordinating and reporting on research in the Great Barrier Reef Region. Liaison was maintained with institutions and individuals conducting, recommending or supporting reef related research. These included universities (particularly the JCU), the Australian Institute of Marine Science, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Queen's Fellowships and Marine Research Allocations Advisory Committee (QFMRAAC), State and Commonwealth Departments and visiting overseas researchers.

SIGNIFICANT PROJECTS

Several projects funded by the Authority in 1983-84 are of particular interest because of their scope, subject, locality or other factors. (Details for all projects are included in Appendixes C and D.)

GREAT BARRIER REEF CONFERENCE AND WORKSHOP

In late August 1983 the inaugural Great Barrier Reef Conference was held in Townsville. The conference was funded by the Authority and the Queen's Fellowships and Marine Research Allocations Advisory Committee with additional assistance provided by the Bureau of Mineral Resources, the Australian Institute of Marine Science, James Cook University, Q.NPWS, the Australian Museum and the University of Queensland. The conference objectives were to report on the present state of knowledge in various fields of Reef research, and to assist in the assessment of future directions for research on the Great Barrier Reef. Some 90 papers were presented, under the broad headings of geoscience, community structure, metabolism, evolution of islands, oceanography, and reef resource management. Copies of the **Proceedings of the Great Barrier Reef Conference** are available from the Sir George Fisher Centre for Tropical Marine Studies, James Cook University.

The conference was followed by a three-day workshop at the Australian Institute of Marine Science. The objective of the workshop was to analyse the work presented at the conference and to identify priority topics of research for the next five years. Copies of the **Report of the Great Barrier Reef Conference Workshop** are available from the Institute.

SURVEY OF CORALS AND CORAL TROUT IN THE FAR NORTHERN SECTION

In April and May, 1984 Dr. Tony Ayling of Sea Research, a private consulting firm, and a team of divers undertook a 42-day survey of reefs in the Far Northern Section of the Marine Park. The survey followed a seven-day training trip off Townsville, during which assistants were trained in the manta-tow coral survey technique. This involves an observer being towed at two knots behind a small boat over and around a reef for about 20 minutes at a time. The observer records a number of standard parameters concerning the coral cover, condition, growth forms and communities of the reef. The survey team undertook general reconnaissance of coral and crown of thorns starfish on each reef using the manta-tow technique and counted coral trout (*Plectropomus* spp.), crown of thorns starfish and various other organisms. Thirty-one reefs within the Section were surveyed despite 'hazards' including aggressive sharks, crocodiles and rough seas.

Relative density indexes of the common coral trout (*Plectropomus leopardus*) were generally less than 25 per hectare, but ranged up to 60 per hectare; comparable with other areas between Lizard Island and the Whitsundays, and fished reefs in the Capricornia Section which have been previously surveyed. The coral on most reefs was reported to appear healthy, and in many places was particularly attractive. Only 45 crown of thorns starfish were observed on the thirty-one reefs and no evidence was found of past coral damage from crown of thorns starfish infestations.

The data gathered during the survey will be used in zoning the Far Northern Section of the Marine Park, and will provide a valuable basis for monitoring the effects of human use and management of the Section.

TOURIST IMPACT ON CORAL REEFS

In March 1984, Dr. Mike Liddle and Dr. Alice Kay of Griffith University completed their project on the effects of tourists walking on coral reefs. Their final report was the culmination of three years of studies based on experiments at Heron Island Reef. The researchers found significant differences between the resilience/tolerance levels of the various coral species on reef crests and flats. It is expected that after comparison with at least one other reef area, it will be possible to produce guidelines for the location and operation of reef walking activities, such that the local environmental impact will be minimised.

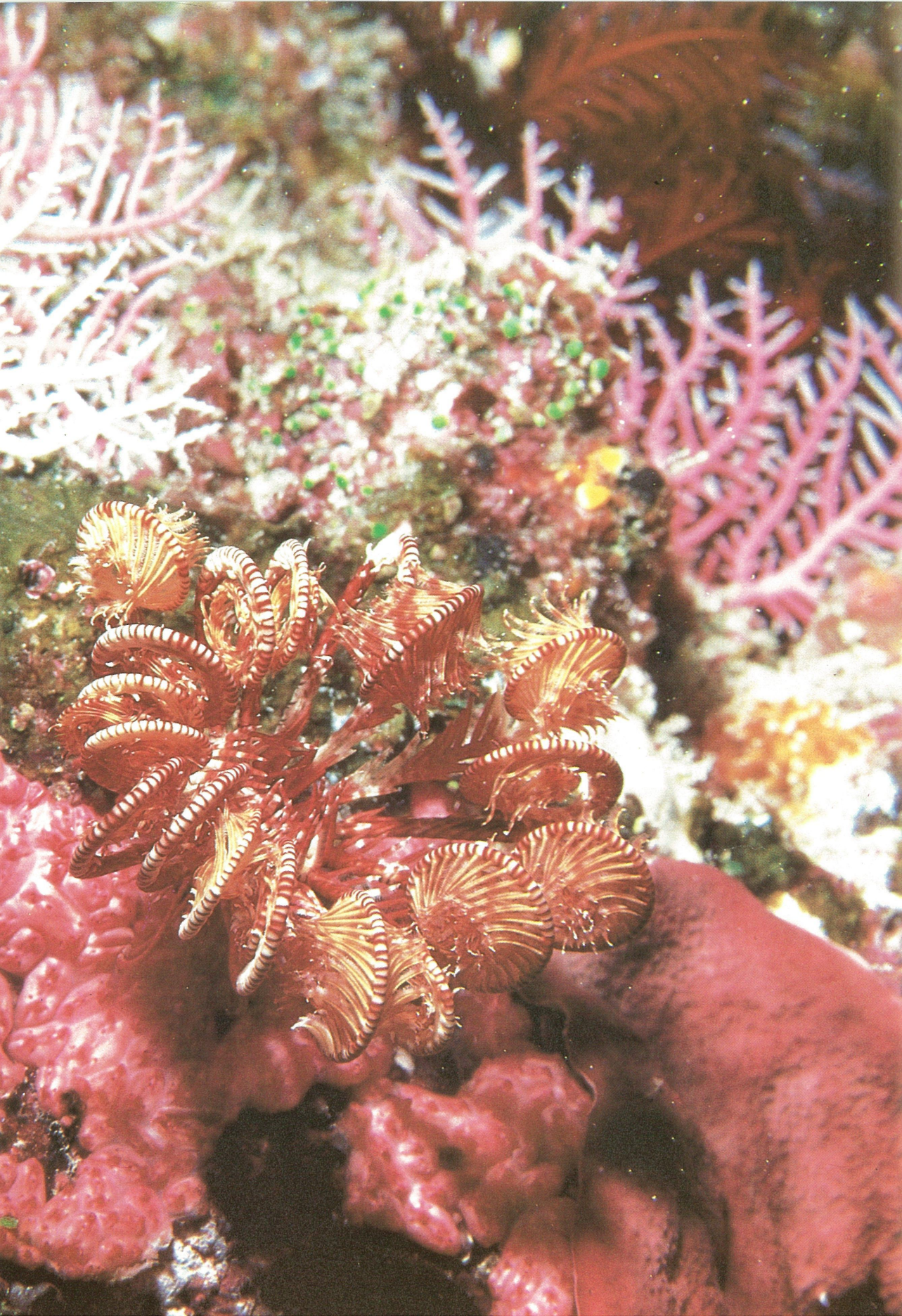
CONTAMINANTS IN WATERS OF THE GREAT BARRIER REEF

In early 1984, a number of press reports claimed that the Great Barrier Reef Region was far more polluted than previously thought. In order to review the current status of contaminant levels in the Great Barrier Reef Region, and to provide the Authority with some guidance on further research needs and priorities, a workshop was organised on Contaminants in Waters of the Great Barrier Reef. The workshop brought together 35 invited experts and focused on three main contaminant groups — heavy metals, polychlorinated biphenyls (PCBs) and other organochlorines, and hydrocarbons.

The group concluded that none of these contaminants had been detected at levels which were likely to prove injurious to human health or the reef system. However, participants noted that the levels of some contaminants in coastal areas (particularly harbours) were comparable with pollution levels recorded elsewhere in Australia and overseas. Participants also noted that further research is required into factors such as the sub-lethal and ecotoxicological effects of various compounds as well as the source and fate of pollutants. A report of the workshop proceedings including the workshop recommendations will be published in the Great Barrier Reef Marine Park Authority Workshop series.

COLLABORATIVE STUDY ON WATER FLOW MODELLING IN THE CENTRAL GREAT BARRIER REEF REGION

In late 1983, the Authority entered into an agreement with James Cook University and the Australian Institute of Marine Science to contribute to a major collaborative research project titled **Flow Modelling in the Central Great Barrier Reef Region**. The objective of the project is to develop numerical flow models which can be used to understand fluid dynamics, advection and dispersion, and ultimately to predict ocean response to environmental forcing and to predict the fate and distribution of advected biota and contaminants. The chief investigators are Dr. John Andrews (AIMS) and Dr. Lance Bode (JCU). The project which will last for three years, will initially focus on the central part of the Region and may extend to other areas of the Region.



TRADITIONAL USES OF MARINE RESOURCES BY ABORIGINAL COMMUNITIES

Knowledge of the marine environment held by residents of the Hope Vale Aboriginal community is being recorded in a study which commenced in December 1983. Researcher Andrew Smith will spend the best part of two years living in Hope Vale (north of Cooktown) and will report on past and present hunting and fishing particularly for dugong and turtle. It is intended that this intensive research will assist in the development of effective management guidelines, and provide much information on the biology and life history of local organisms.

RE-ESTABLISHMENT OF HARD CORALS IN DAMAGED REEFS

Coral reefs are subjected to both natural and man-induced forces that can cause major mortality in corals. Waiting for natural recovery may not be the best option in areas of commercial significance, or in heavily visited areas. A preliminary report prepared by Dr. Vicki Harriott and Mr. Peter Harrison of James Cook University, summarizes knowledge on coral damage and natural recolonization, and suggests methods which might accelerate coral recolonization following extensive mortality. In the next phase of the project, some of the recommended methods will be tested in the field.

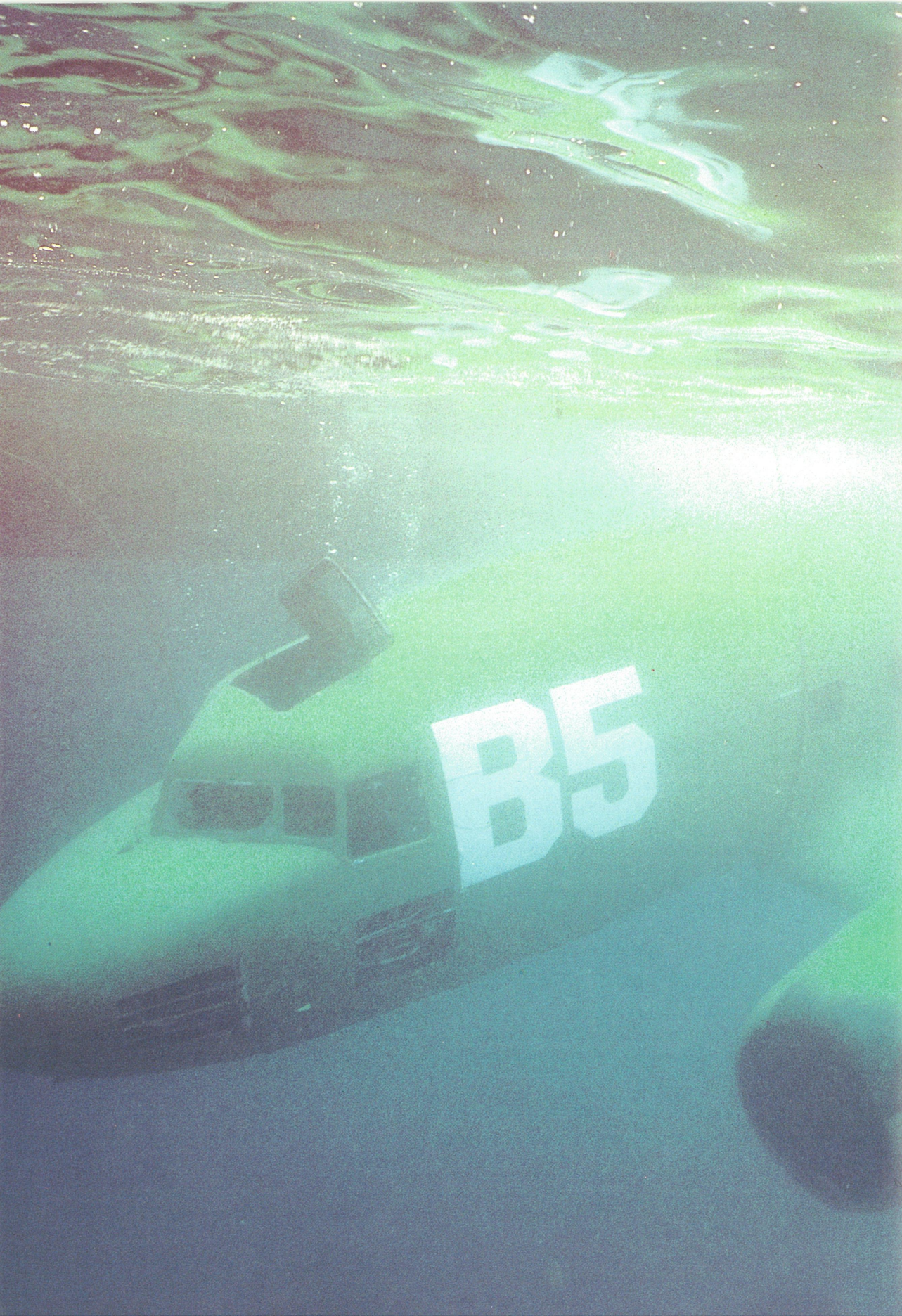
PUBLICATIONS

In 1983-84 three important publications of the Authority required the close involvement of the Research and Monitoring Section:

- **Research Report 1976-82.** This report is a compendium of the 118 research projects funded by the Authority between 1976 and 1982.
- **Annotated Checklist of Fishes in the Capricorn Bunker Group, Great Barrier Reef, Australia.** Following a review of existing checklists and Museum material from the Capricorn and Bunker groups of the Great Barrier Reef, Dr. Barry Russell compiled an annotated checklist. The checklist contains 859 species, including 82 new records for Australia.
- **Australian Marine Research in Progress.** In 1983, the second hard copy edition of **Australian Marine Research in Progress (AMRIP)** was published jointly by the Authority, the Victorian Institute of Marine Sciences and the Commonwealth Department of Science and Technology. This edition lists 816 projects; approximately one-third are focussed on the Great Barrier Reef.

THE FUTURE

The 1983-84 research and monitoring program represented a further important phase in the transition of the Authority's research and monitoring study needs. Greater emphasis is now being given to the design and implementation of projects which will enable the Authority to evaluate the effectiveness of its planning, management and educational activities. At the same time, the Research and Monitoring Section is stimulating cost-effective research and encouraging closer co-operation between the principal agencies engaged in Reef research. This trend is expected to continue, consistent with the goal and aims of the Authority and its functional charter.



ADMINISTRATION

INTRODUCTION

The Administration Section provides support to the Authority and staff of the Authority in the areas of financial estimating and accounting, human resource planning and organisational design, property, personnel, and general services such as communications, word processing, typing and registry.

The acquisition and effective management of adequate financial, staffing and other resources are vital to the achievement of the Authority's goal, aims and objectives. In this context, the Authority has been concerned to ensure that its administrative processes are of high quality and responsive to modern attitudes and techniques while at the same time achieving best value for expenditure.

The nature and level of administrative activities in the Authority are for the most part determined by the ongoing requirements for basic services common to all Government administration and the need to provide support for developments in relation to the Marine Park. Administrative programs in 1983-84 reflected the significant developments in relation to the declaration and zoning of sections of the Marine Park and established a planning framework for the provision of services in 1984-85.

Resources available to the Authority during the year in relation to Finance and Staff increased by 29% and 22% respectively. An outline of these and other administrative areas follows.

FINANCE

In the 1983-84 Budget, Parliament appropriated \$4 139 000 for the Authority's activities. Further funds totalling \$290 941, carried forward from 1982-83, were also available. Under the cost-sharing arrangements for day-to-day management of the Marine Park, receipts from the Queensland Government were \$301 137. Receipts from other sources, including the sale of information materials, amounted to \$18 740. Expenditure for the year was \$4 152 782, which was 87% of funds available. Full details are provided in Appendix E.

The shortfall in expenditure for the year resulted from the following:

DAY-TO-DAY MANAGEMENT OF THE MARINE PARK

Capricornia Section

- funds committed for the Heron Island Interpretive Centre were not spent pending settlement of sub-leasing arrangements
- under revised administrative arrangements some costs were not claimed by the Queensland Government
- down-time on the **Protector II** significantly reduced running costs
- maintenance costs were reduced because of delays in completion of buildings on Heron Island.

Cairns /Cormorant Pass Sections

- delays in recruitment of Q.NPWS staff significantly reduced operating costs

Computer

- revised ADP strategic plan deferred computer acquisitions until 1984-85

Administration

- salaries costs were reduced because of unavoidable delays in recruitment processes
- certain suppliers were unable to meet commitments within the financial year

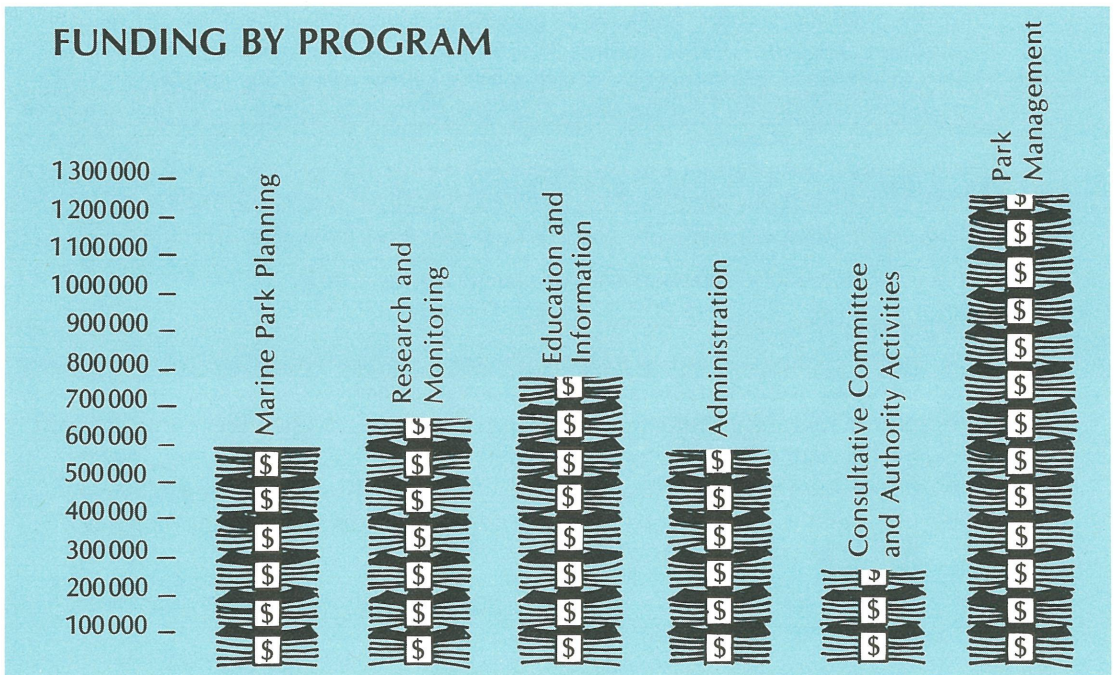
Education/Information

- staffing and operational delays meant that a number of programs could not be implemented

The expenditure of funds by function is shown in Fig. 8.

The Authority decided that financial management arrangements would be improved by a greater devolution of responsibility. Accordingly, it revised financial delegations during the year.

Fig. 8.



PROPERTY

The Authority's Townsville office now occupies the ground and three other floors of Melton Place, 67-71 Denham Street. This inner city location provides essential public accessibility and limited facilities for public information, display and reference library purposes.

A permanent location for the Authority in Townsville is included in the proposed Great Barrier Reef Wonderland Bicentennial project.

ORGANISATIONAL STRUCTURE

In December 1983 the Governor-General, on a recommendation from the Public Service Board, agreed to the creation of the following positions:

- Clerk, Class 9 (Senior Project Manager), Education/Information Section
- Clerk, Class 8 (Park Management Officer), Park Management Section
- Clerk, Class 4 (Permits Officer), Park Management Section
- Clerical Assistant, Grade 4, Canberra Office.

The Authority endorsed a proposal to strengthen the structures of the Planning, Research and Monitoring, Park Management, Education and Information, and Administration Sections through the creation of several new positions and the reclassification of others. Implementation of this decision was held in abeyance pending the introduction of new arrangements for the management of organisational structures as part of the Government's public service reforms. In the meantime the Authority's organisational needs were reviewed and refined in the light of projected requirements for 1984-85 in relation to developments in the Marine Park.

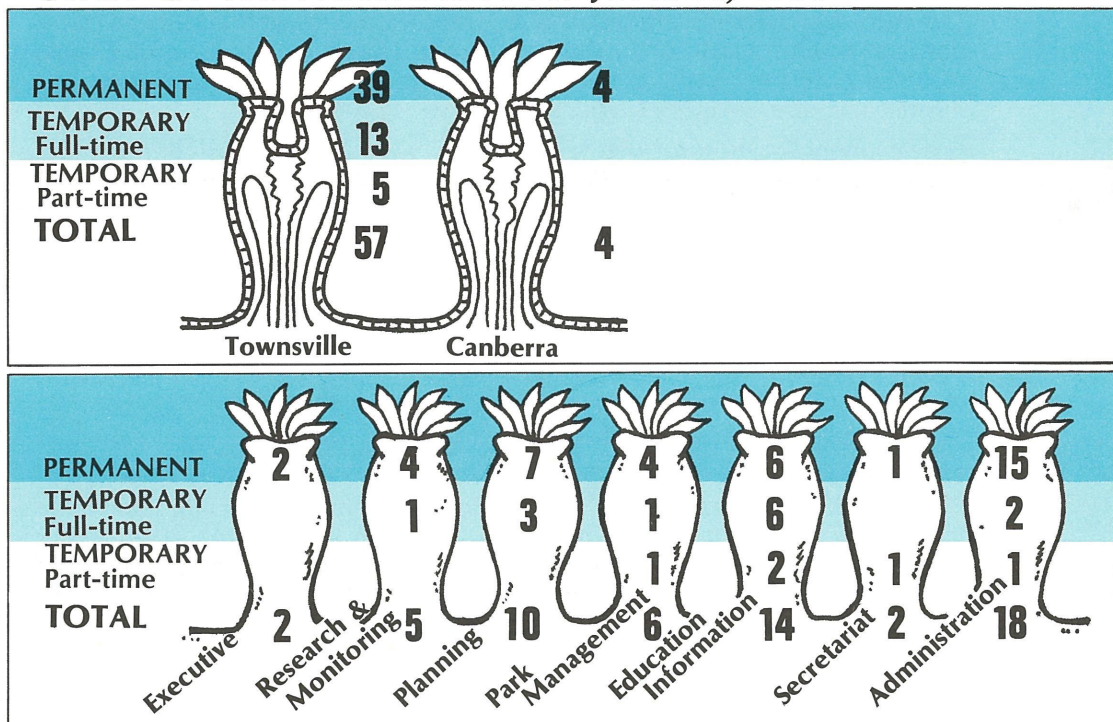
STAFF RESOURCES

The average operative staffing level approved for the Authority for 1983-84 was 52 full-time and 7 part-time compared with a staff ceiling of 44 and 6 respectively in 1982-83. This increase recognised the substantial additional workload associated with the accelerated program of declaration and zoning. The recruitment plan implemented by the Authority ensured maximum use of the increased staffing limits by filling several essential positions and achieving actual average staffing levels for the year of 52.2 full-time and 6.1 part-time.

However, several executive and other experienced staff left the Authority to work for other natural resource management organisations in Australia and overseas. While the appointment of Authority staff to such important positions reflects favourably on the Office of the Authority and the quality of its staff, the loss of expert resources adversely affects the development and implementation of Marine Park programs. 1983-84 was a particularly difficult year in this regard.

The Authority continued its participation in the Special Youth Employment Training Program, the National Employment Strategy for Aboriginals, the Britain/Australia Vocational Exchange Scheme and work assignments sought by educational institutions. Information on the distribution of staff as at 30 June 1984 is provided in Fig. 9.

STAFF OF THE AUTHORITY AT JUNE 30, 1984



GENERAL SERVICES

During the year the Authority's improved word processing system became fully operational. Its advanced features together with the relocation of some word processors to client areas has improved liaison and services. A particularly useful feature of the system is its ability to transfer text by telephone link between the word processors in Townsville and Canberra.

A stocktake of all the Authority's assets was undertaken and found to be satisfactory. The development of an improved system for the recording, control and maintenance of assets was commenced in 1983-84 and will be implemented during 1984-85.

THE FUTURE

The staffing level set for the Authority for 1984-85, now expressed in staff years, will allow additional recruitment totalling up to six staff years. The finalisation of the organisational changes mentioned previously and the introduction of improved recruitment procedures will enable the Administration Section to respond quickly to this decision.

The introduction of new computer facilities in 1984-85 will give the Administration Section access to quicker and more effective reporting and control systems in the areas of financial and staff resource management.

A comprehensive staff development and training program will be further developed and implemented in the next year with the objective of increasing the skills, job satisfaction and self-regard of staff of the Authority.

Together with improvements already achieved, these initiatives will assist the Authority in meeting the challenges of the coming year.

LIST OF APPENDIXES

- A. EXECUTIVE STAFF
- B. PUBLICATIONS AVAILABLE
- C. REPORTS ON RESEARCH UNDERWAY IN 1983-84
- D. AUGMENTATIVE RESEARCH PROJECTS 1983-84
- E. FINANCIAL STATEMENTS
- F. AUDITOR-GENERAL'S REPORT

APPENDIX A

EXECUTIVE STAFF

The Chairman has the powers of, or exercisable by, a Secretary of a Department under the Public Service Act.

Executive Officer Dr. A.J. Gilmour

Planning Mr. R.A. Kenchington

Research and Monitoring Dr. W. Craik

Park Management Mr. S.J. Woodley

Education and Information Mr. D.W. Chippendale (Acting)

Administration Mr. I. Burston (Acting)

Canberra Office Mr. B.T. Garton

ADDRESSES

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Telephone: (077) 71 2191

Canberra Office

2nd Floor, Gas Industry House
Corner Moore and Rudd Streets
Canberra. A.C.T. 2601

G.P.O. Box 791, Canberra. A.C.T. 2601

Telephone: (062) 47 0211

APPENDIX B

PUBLICATIONS AVAILABLE

BOOKS

Nomination of the Great Barrier Reef by the Commonwealth of Australia for Inclusion in the World Heritage List.
Townsville, GBRMPA, 1981. ISBN 0-642-52281-2.

Cook, Cays and Corals; a bibliography of publications about the Great Barrier Reef Marine Park Cairns Section.
Townsville, GBRMPA, 1982. ISBN 0-642-52297-9.

Research Report 1976-1982. Townsville, GBRMPA, 1983.
ISBN 0-642-52345-2.

Maps of the Great Barrier Reef: an indexed list of maps and charts of the Great Barrier Reef Region.
Townsville, GBRMPA, [1984]. ISBN 0-642-52361-4.

TECHNICAL MEMORANDUM SERIES

CRAIK, Wendy. **Research on Fishes of the Great Barrier Reef.**
Townsville, GBRMPA, 1978. (Technical memorandum GBRMPA-TM-1). 30p.

CRAIK, Wendy. **Fisheries Factors Affecting Marine Park Management.** Townsville, GBRMPA, 1978. (Technical Memorandum GBRMPA-TM-2). 30p.

GBRMPA-TM-3 not issued.

CRAIK, Wendy. **Amateur Fishing on the Great Barrier Reef.**
Townsville, GBRMPA, 1979. (Technical Memorandum GBRMPA-TM-4). 19p.

MIDDLETON, Jason H. **Report of Scientific Discussion Meeting on the Physical Oceanography of the Great Barrier Reef Region held at the University of New South Wales 5-6 July 1982.**
Townsville, GBRMPA, August 1983. (Technical Memorandum GBRMPA-TM-5). 42p.

WORKSHOP SERIES (ISSN 0156-5842)

Workshop on the Northern Sector of the Great Barrier Reef; Papers and Proceedings of a Workshop held in Townsville, 20-21 April, 1978. Townsville, GBRMPA, 1978. (GBRMPA Workshop Series No. 1), 462p. ISBN 0-642-91150-9 [Reprinted August 1983].

Workshop on Reef Fish Assessment and Monitoring held at Heron Island, 18-28 November, 1978. Townsville, GBRMPA, [1978]. (GBRMPA Workshop Series No. 2) 64p.

Workshop on Coral Trout Assessment Techniques held at Heron Island 21 April - 4 May, 1979. Townsville, GBRMPA, [1979]. (GBRMPA Workshop Series No. 3) 85p.

Papers and Proceeding of the Workshop 'Tourism and the Great Barrier Reef' held in Mackay 9-11 April, 1979.
Townsville, GBRMPA, 1981. (GBRMPA Workshop Series No. 4) 182p.
ISBN 0-642-52273-1.

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Number 4, August 1982.

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Companion map to Great Barrier Reef 1:2 200 000. (Strip map, coloured) November 1982 (BRA Q6)

Great Barrier Reef Marine Park Capricornia Section, Zoning Plan — Zoning Map 1:1 000 000. (A3 size, coloured) August 1980 (BRA Q17)

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Cairns Section, Great Barrier Reef Marine Park Zoning Plans — Zoning Map (3) 1:300 000. (A3 size, coloured) May 1983 (BRA Q52)

Cairns Section, Great Barrier Reef Marine Park Zoning Plans — Zoning Map (4) 1:300 000. (A3 size, coloured) May 1983 (BRA Q54)

Cairns Section, Great Barrier Reef Marine Park Zoning Plans — Zoning Map (5) 1:300 000. (A3 size, coloured) May 1983 (BRA Q55)

Cairns Section, Great Barrier Reef Marine Park Zoning Plans — Zoning Map (6) 1:300 000. (A3 size, coloured) May 1983 (BRA Q55)

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Reef Activities Manual: a guide to providing environmental activities for guests during a Great Barrier Reef visit. Great Barrier Reef Marine Park Authority and Queensland National Parks and Wildlife Service. 1 volume, looseleaf, 1983.

Junior Survival: The Great Barrier Reef. Published for the Great Barrier Reef Marine Park Authority by the Gould League of Victoria with the assistance of the Australian Conservation Foundation. Melbourne, 1984.

The Richest Reef. Young Australia Reader Series. Thomas Nelson, Australia and the Great Barrier Reef Marine Park Authority. Melbourne, 1983.

Australian Marine Research in Progress, 1983. Victorian Institute of Marine Science, the Department of Science and Technology and the Great Barrier Reef Marine Park Authority. Melbourne, 1983.

APPENDIX C

RESEARCH IN PROGRESS 1983-84

OCEANOGRAPHY

1. Sedimentation between the Herbert River Delta and Orpheus Island

PERIOD: January 1981 - August 1984
PROJECT LEADERS: Dr. D. Johnson
Dr. M. Risk (formerly with the Australian Institute of
Marine Science)
PROJECT OFFICER: Mr. R. Kenchington/Ms. E. Eager
FINANCIAL SUPPORT: GBRMPA — \$5150

OBJECTIVES

To detail the terrigenous-carbonate transition between the Herbert River Delta and fringing reefs at Orpheus Island. To quantify sediment inputs to the reef. To investigate the geochemical record in coral skeletons.

IMPLICATIONS/MANAGEMENT NEEDS

This study will indicate the extent of the effects of terrigenous impacts to the Great Barrier Reef lagoon and enable gradients of effects to be described. Such information is needed as background to monitoring activities and also to evaluate extreme inputs to the Great Barrier Reef lagoon from the land.

METHODOLOGY

Samples from fringing reefs were collected. Sediment traps were set on the reef. Bottom samples and push cores were taken between the delta and the reefs, and results integrated with earlier shallow seismic profiling studies.

STATUS

Field work has been completed. Awaiting final report.

LOCALITY: Herbert River Delta — Orpheus Island

2. Drift Card Study of Great Barrier Reef Surface Currents

PERIOD: January 1981 — August 1984
PROJECT LEADER: Dr. J.D. Collins (Marine Biology, James Cook University)
PROJECT OFFICERS: Mr. R. Kenchington/Ms. E. Eager
FINANCIAL SUPPORT: GBRMPA — \$67 040

OBJECTIVES

To produce an integrated picture of drift over the Great Barrier Reef lagoon. To establish correlations between drift and wind patterns.

IMPLICATIONS/MANAGEMENT NEEDS

This project will provide data which is important to understanding surface water movements in the Great Barrier Reef. It will enable production of predictive models for oil slick dispersal and dispersal of larvae. It will also provide a set of data upon which to base hypotheses for more refined studies of water movement in the Great Barrier Reef Region.

METHODOLOGY

80 000 drift cards were released regularly over an 18 month period (from December, 1981) by Coastwatch aircraft at 14 sites in the Great Barrier Reef Region. Computer analysis of data from returned drift cards was undertaken and related to wind data throughout the Region.

STATUS

Draft final report submitted. Two articles published in *Australian Fisheries*.

LOCALITY: Great Barrier Reef Region.

119. Circulation and Sediment Movement on and around North Queensland Bayhead Fringing Reefs

PERIOD: January 1983 — June 1985
PROJECT LEADERS: Prof. D. Hopley (Geography, James Cook University)
Mr. K. Parnell
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$15 440; Qld. Co-ordinator General — \$4 861

OBJECTIVES

To produce a model of bay dynamics, with applications to existing and possible resort sites, indicating the likely effects of development, with special emphasis on effluent disposal and changing water quality.

IMPLICATIONS/MANAGEMENT NEEDS

Further resort development in North Queensland is likely to take place in high island bayhead situations. Problems of effluent disposal will occur. The study will indicate effects of different strategies and suggest possible solutions, providing a means of decision-making with limited field investigation at a variety of present and future resort sites.

METHODOLOGY

Direct measurement of current velocity and direction, combined with tracer data and salinity measurements will be used in model development.

Sediments will be analysed using basic analytical techniques. Tracers and current meters will be deployed to examine water movement and changes in water quality.

STATUS

Final report to GBRMPA due June 1985.

LOCALITY: Orpheus Island
Other resort islands

149. Boundary Layer Flows Past Patch Reefs

PERIOD: August 1983 — November 1983

PROJECT LEADER: Prof. P. Wilson (Mathematics, University of Sydney)

PROJECT OFFICER: Dr. J. Kermond/Ms. S. Driml

FINANCIAL SUPPORT: GBRMPA — \$6080

OBJECTIVES

To undertake a preliminary, theoretical and observational study of the boundary layers associated with tidal flows past isolated reefs. In particular, to determine the effective thickness of these layers.

IMPLICATIONS/MANAGEMENT NEEDS

The model ultimately produced could be of use in the design of effluent disposal systems in reef areas.

METHODOLOGY

Theoretical models of flows associated with the reef at One Tree Island were developed on the basis of flows past cylindrical objects and previously collected data. Field testing of the models involved the release of Rhodamine dye into the water at One Tree Island Reef and tracing the dye by drogues and aerial photography.

STATUS

The project has been completed and further evaluation of the technique is proposed.

LOCALITY: Capricornia Section — One Tree Island Reef

150. Flow Modelling in the Central Great Barrier Reef Region — A Collaborative Research Project

PERIOD: January 1984 — December 1986

PROJECT LEADERS: Dr. J.C. Andrews (Australian Institute of Marine Science)
Dr. L. Bode (Systems Engineering, James Cook University)

PROJECT OFFICER: Dr. W. Craik/Dr. J. Kermond

FINANCIAL SUPPORT: GBRMPA — \$126 000

OBJECTIVES

To construct and validate numerical models of flows on the Queensland Continental shelf and slope in the Central Great Barrier Reef Region. To use the models to understand fluid dynamics, advection and dispersion. (Oil, nutrients, larvae, etc.). To use the models for prediction.

IMPLICATIONS/MANAGEMENT NEEDS

A 1982 expert review on knowledge of the physical oceanography of the Great Barrier Reef Region listed important questions remaining unanswered. This project should answer some of these questions concerning oceanographic events and provide a model to predict these events.

METHODOLOGY

Data on tides, winds, currents, etc. will be collected (by instruments in the field where necessary) and analysed to construct or modify barotropic and baroclinic models of flow in the Central Great Barrier Reef Region.

STATUS

Preliminary analysis of tidal data collected by Australian Institute of Marine Science has begun.

LOCALITY: Townsville and Central Sections

MARINE GEOSCIENCES

9. Sea-water Temperature Interpretation from Modern and Holocene Corals of the Central Great Barrier Reef: a Spatial and Temporal Perspective

PERIOD: May 1982 — December 1983

PROJECT LEADER: Mr. F. Muir (Geography, James Cook University)

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$2500; Augmentative Research Grant — \$200

OBJECTIVES

To predict from present-day and Holocene corals the annual and seasonal ambient sea-water temperatures at the time of coral growth. To provide a possible interpretation of Holocene sea-water temperatures as they relate to Holocene sea-level variations.

IMPLICATIONS/MANAGEMENT NEEDS

This study is designed to provide an indication of environmental factors influencing coral growth in the Holocene period. Temporal variations may be explained by changing climatic and oceanographic factors. Differences between nearshore fringing reef corals and offshore reef corals may be evident.

METHODOLOGY

Geochemical analysis and sclerochronology of the modern coral and fossil coral cores will be undertaken. Geochemical analysis involved interpretation of Sr/Ca ratio levels. These ratios will be related to the sclerochronology density bands and C¹⁴ dates.

STATUS

Final report received.

LOCALITY: Townsville and Central Sections

151. Biologic Reef Destruction — Products, Rates, and Causes

PERIOD: October 1983 — December 1985

PROJECT LEADER: Dr. P.A. Hutchings (Australian Museum)

Dr. P.J. Davies (Bureau of Mineral Resources)

Mr. W. Kiene (Geology, Australian National University)

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$45 149

OBJECTIVES

To determine the principal bioeroders and mechanisms of erosion on reef fronts, reef flats and in lagoons of juvenile, mature and senile reefs. To determine whether the products and processes of bioerosion are related to evolutionary stages of reef growth.

IMPLICATIONS/MANAGEMENT NEEDS

Bioerosion is a destructive force on reefs. Natural rates of bioerosion must be assessed before man's impact can be assessed.

METHODOLOGY

The experimental design consists of attaching regular sized blocks of unbored coral to the reef in various environments. The organisms responsible for bioerosion will be determined and the rates of erosion calculated. The experiments will be conducted in the Capricornia Section and results compared with those already obtained from Lizard Island.

The patterns and rates of bioerosion in reefs in various stages of development will be examined to assess the importance of bioerosion in the evolutionary stages of reef growth.

STATUS

Field work in progress; coral blocks established. Final report to GBRMPA due in June 1985.

LOCALITY: Capricornia Section

152. Coastal Processes Forming and Maintaining the Coral Cays of the Great Barrier Reef and their Implications for Marine Park Management

PERIOD: November 1983 — December 1984
PROJECT LEADER: Dr. M. Gourlay (Civil Engineering, University of Queensland)
PROJECT OFFICER: Dr. W. Craik/Dr. J. Kermond
FINANCIAL SUPPORT: GBRMPA — \$5000

OBJECTIVES

To collect and collate relevant available information on physical and geomorphological processes forming and maintaining cays.

IMPLICATIONS/MANAGEMENT NEEDS

This project is designed to provide information on the effects of dredged channels, groynes, seawalls etc.; guidelines on widths of buffer zones for buildings, maximum area of cay for development, locations of effluent discharges, etc.; and possibilities of catastrophic destruction of cays.

METHODOLOGY

Intensive library research. Selected cays of the Great Barrier Reef will be visited to check the relevance of conclusions drawn in the literature.

STATUS

The project is underway. Field work at Raine Island and Low Isles has been undertaken.

LOCALITY: Great Barrier Reef Region

153. Stratigraphy of Lagoon Sediments and Reef Margins — Lady Musgrave Island

PERIOD: May 1984 — June 1985
PROJECT LEADER: Assoc. Prof. C.V.G. Phipps (Geology and Geophysics, University of Sydney)
PROJECT OFFICER: Mr. I. Dutton
FINANCIAL SUPPORT: GBRMPA — \$3000

OBJECTIVES

To relate reef flat stratigraphy and development to lagoonal stratigraphy, to define sedimentation rates in the lagoon and to expand upon existing understanding of sedimentation patterns and processes. Supplementary analysis of fresh water wedge under Lady Musgrave Island.

IMPLICATIONS/MANAGEMENT NEEDS

This project should improve understanding of surface sediment pattern variations and thus whether patterns/processes of erosion/sedimentation at Lady Musgrave have been affected by human activities.

METHODOLOGY

Vibrocres to 6m will be used to study stratigraphy. Supplementary use of boomer lines and shallow drilling will determine sediment thickness and gain substrate information.

STATUS

Project underway.

LOCALITY: Capricornia Section — Lady Musgrave Island Reef

154. Stability of Coral Cays in the Capricornia Section of the Great Barrier Reef Marine Park

PERIOD: May 1984 — February 1985
PROJECT LEADER: Dr. P.G. Flood (Geology, University of New England)
PROJECT OFFICER: Mr. I. Dutton
FINANCIAL SUPPORT: GBRMPA — \$5000

OBJECTIVES

To install permanent survey marks on five islands within the Capricorn Group (Heron, Masthead, Wilson, Tryon and North) in order to monitor changes in shoreline configuration over time. To calibrate survey works with earlier studies by researcher between 1972 and 1982. To provide supplementary training of Q.NPWS staff in cay stability survey and monitoring.

IMPLICATIONS/MANAGEMENT NEEDS

This project will enable comprehensive, long term assessment of coral cay stability, and improve the understanding of patterns and processes such as erosion and human activities, cyclones etc.

METHODOLOGY

Survey marks will be placed during field visit and field training of Q.NPWS staff in cay stability.

STATUS

Project underway.

LOCALITY: Capricornia Section

155. Role of *Acanthaster* in Reef Degradational Processes — a Preliminary Study

PERIOD: May 1984 — August 1984

PROJECT LEADER: Dr. R. Henderson (Geology, James Cook University)

PROJECT OFFICER: Mr. I. Dutton

FINANCIAL SUPPORT: GBRMPA — \$3040

OBJECTIVES

To produce an atlas documenting the morphology of *A. planci* skeletal elements. To compile records of *A. planci* infestations in the Great Barrier Reef from skeletal elements in samples. To plan in detail a schedule and techniques for site investigations, monitoring and core sampling relevant to this sphere of investigation.

IMPLICATIONS/MANAGEMENT NEEDS

This project will provide information on the role of *Acanthaster* in reef degradation processes, and hence will contribute to understanding of *Acanthaster* in terms of long term dynamics, and the degree of threat which *Acanthaster* infestations may pose to reef stability.

METHODOLOGY

The skeleton of *A. planci* will be documented using a Scanning Electron Microscope. Records of *A. planci* infestations will be compiled.

STATUS

Project underway.

LOCALITY: Cairns Section — Green Island Reef
Central Section — John Brewer Reef

156. Modern Sediment Disposal at the Burdekin River Mouth

PERIOD: May 1984 — November 1984

PROJECT LEADER: Prof. R.M. Carter (Geology, James Cook University)

PROJECT OFFICER: Mr. I. Dutton

FINANCIAL SUPPORT: GBRMPA — \$3330

OBJECTIVES

To undertake a pilot study to investigate the pattern of sediment distribution and dispersal onto the river shelf at the Burdekin River mouth, with respect to: (i) locations of maximum sediment accumulation over the past 6500 years; (ii) volumetric estimate of the shelf sediment wedge; (iii) establishing the seawards extent of the wedge; particularly with respect to the 18-20m sediment 'fence'; and (iv) establishing a sedimentary baseline against which post-dam effects can be measured.

IMPLICATIONS/MANAGEMENT NEEDS

This project will provide a basis for determining effects of the Burdekin Dam on the Great Barrier Reef. This is important as the Burdekin is the largest single supplier of sediment in the Great Barrier Reef Region.

METHODOLOGY

Standard techniques of low frequency seismic profiling, grab sampling, coring and laboratory analyses will be employed.

STATUS

Project underway.

LOCALITY: Townsville Section — Burdekin River-Mouth

MARINE CHEMISTRY

159. Workshop on Contaminants in Waters of the Great Barrier Reef

PERIOD: May 1984
PROJECT LEADER: Dr. A. Gilmour (GBRMPA)
PROJECT OFFICER: Mr. I. Dutton
FINANCIAL SUPPORT: GBRMPA — \$10592

OBJECTIVES

1. To receive and discuss the findings of recent contaminant research studies in the Great Barrier Reef Region, considering in particular: (i) sampling design and methods; (ii) analytical techniques; (iii) comparative national and international levels and their significance; and (iv) the degree of threat which the measured levels are believed to pose to organisms and ecosystems of the Reef.
2. To determine what critical information deficiencies (if any) exist in relation to our understanding of the source, level and fate of marine contaminants in the Region, and to determine how these could be overcome.
3. On the basis of (1) and (2) above, to determine priorities for further research in this field and how further research effort could best be co-ordinated. This should include consideration of parameter selection; design, techniques and frequency of sampling; analytical methods and intercalibration; and how spatial and temporal variability may influence the design of cost-effective research.

IMPLICATIONS/MANAGEMENT NEEDS

This project will enable the Authority to determine the degree of threat posed to the Reef system by various contaminant groups, and thus should enable determination of future research needs/priorities. It will provide complementary, up to date input for consideration in the design of a monitoring network for the Reef.

STATUS

The workshop participants noted that measured levels of substances (within each of the contaminant groups considered) do not pose a threat to human health, individual organisms or the Great Barrier Reef system as a whole in the short term. Draft report of proceedings is currently under review. Proceedings to be published in late 1984.

LOCALITY: Great Barrier Reef Region

BATHYMETRY AND SURVEY

17. Assessment of Aerial Photographs and LANDSAT Imagery for Coral Reef Data Collection

PERIOD: 1979 — December 1983
PROJECT LEADER: Ms D. Kuchler (Geography, James Cook University)
PROJECT OFFICER: Mr. D. Claasen
FINANCIAL SUPPORT: GBRMPA — \$23 449; Augmentative Research Grants \$1 184

OBJECTIVES

To test the accuracy of LANDSAT Imagery and colour aerial photographs for recording inventory and monitoring data on coral reefs.

IMPLICATIONS/MANAGEMENT NEEDS

Collection of data by remote sensing on periodic overflights has been proposed as an alternative to ground data collection. This project is designed to provide basic facts about remotely sensed data (quality, quantity, cost).

METHODOLOGY

Use of the various inventory and resource-matrix analysis options in the Barrier Reef Image ANalysis Software Package (BRIAN) resulted in a cross-tabulation relationship between interpreted aerial photographs and interpreted LANDSAT Imagery and ground data.

An assessment was made of the capability of remote sensing techniques to identify and locate changes in the coral reef environment.

STATUS

Awaiting final report.

LOCALITY: Capricornia Section and Cairns Section

20. Reef and Island classification Map and Gazetteer

PERIOD: March 1982 — December 1983
PROJECT LEADERS: Prof. J. Oliver (Geography, James Cook University)
Assoc. Prof. D. Hopley
Dr. P.J. Isedale
PROJECT OFFICER: Dr. J. Dunn/Ms. S. Driml
FINANCIAL SUPPORT: GBRMPA — \$20454

OBJECTIVES

To provide a series of maps at a uniform scale of 1:250 000 showing location, the shape and morphology and other specified characteristics of reefs and islands within the Great Barrier Reef Region, and a gazetteer of reefs. (Stage 1:3 maps; Stage 2:2 maps and gazetteer)

IMPLICATIONS/MANAGEMENT NEEDS

These maps show greater resolution of reef shapes, location and orientation, and an up-to-date classification of reefs and islands that was not available on any existing series of maps or charts, and provide an aid for declaration, zoning, management, and information/education.

METHODOLOGY

Five maps covering the entire Great Barrier Reef Region have been produced from the most recent rectified satellite imagery, photographs, Commonwealth reconnaissance maps, Queensland cadastral maps (for fringing reefs), photography by the Beach Protection Authority, charts and field data. The maps give a cartographic presentation of reefs showing morphological zones, islands, reef names etc. A gazetteer accompanies the maps and lists and classifies the reefs, and gives latitude, longitude, area, reef island type and presence of lights, beacons, resorts etc.

STATUS

The maps and gazetteer have been submitted to and approved by GBRMPA
LOCALITY: Great Barrier Reef Region

161. Analysis of Spectrographic Data of Reef and Shallow Water Features: Remotely Sensed Data

PERIOD: January 1984 — June 1984
PROJECT LEADER: Dr. D. Jupp (CSIRO, Division of Water and Land Resources)
PROJECT OFFICER: Mr. D. Claasen
FINANCIAL SUPPORT: GBRMPA — \$7 500

OBJECTIVES

To relate ground conditions (particularly areas of seagrass) to spectral characteristics as part of the continuing work on satellite imagery of the Great Barrier Reef.

IMPLICATIONS/MANAGEMENT NEEDS

This project will assess the potential of remote sensing to map important (productive) areas of the nearshore sea bottom such as seagrass concentrations.

METHODOLOGY

Data from the Coastal Zone Color Scanner (CZCS) and LANDSAT images were classified and labelled. Results were verified by limited field work.

STATUS

Pilot study completed and a paper on it presented at the 10th International Symposium for Machine Processing of Remotely Sensed Data at Purdue University, Indiana, U.S.A. in June 1984.

LOCALITY: Great Barrier Reef Region

162. Resource Inventory, Far Southern Area, Great Barrier Reef

PERIOD: April 1984 — August 1984
PROJECT LEADERS: Mr. E. Hegerl (Australian Littoral Society Inc.)
Ms. D. Tarte
PROJECT OFFICER: Ms. S. Driml
FINANCIAL SUPPORT: GBRMPA — \$7 550

OBJECTIVES

To extend the existing Great Barrier Reef Inventory to the southern extent of the Region. To provide physical and biological descriptions of reefs and islands and information on human use.

IMPLICATIONS/MANAGEMENT NEEDS

The extension of the inventory will provide information for planning the Southern and Inshore Southern Sections and review of the Capricornia Section of the Marine Park.

METHODOLOGY

Information on physical characteristics, usage levels etc. from a review of literature and search of government records is indexed in a form consistent with the Great Barrier Reef Gazetteer. Information is provided separately for each reef and cay.

STATUS

A draft report has been prepared, the final report is due August 1984.

LOCALITY: Southern, Inshore Southern and Capricornia Sections.

MARINE BIOLOGY

52. Handbook: Algal Flora of Heron Island and Adjacent Reefs

PERIOD: January 1981 — December 1984

PROJECT LEADER: Dr. A.B. Cribb (Botany, University of Queensland)

PROJECT OFFICER: Mr. R. Kenchington/Ms. S. Driml

FINANCIAL SUPPORT: GBRMPA — \$1117

OBJECTIVES

To produce a handbook of the algal flora of Heron Island.

IMPLICATIONS/MANAGEMENT NEEDS

The handbook will provide a research and communication guide to the intertidal algae of Heron Island and adjacent reefs. Such information is valuable for (a) interpretive activities in the Marine Park and (b) monitoring.

METHODOLOGY

Specimens of over 200 species were collected. These included five species not previously collected from the area (one previously undescribed) and numerous specimens which furnished information on morphology or reproduction which had not previously been available.

STATUS

Part I (Rhodophyta) of the handbook of the algae of the Capricornia Section has been completed and submitted for publication to the Great Barrier Reef Committee.

LOCALITY: Capricornia Section

54. Systematics and Ecology of the Phytobenthos of the Swain Reefs

PERIOD: January 1981 — December 1984

PROJECT LEADER: Dr. P.G. Saenger (Private Consultant)

PROJECT OFFICER: Mr. R. Kenchington/Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$10570

OBJECTIVES

To document the phytobenthos of the Swain Reefs. To observe the functional role of phytobenthos in a southern reef ecosystem.

IMPLICATIONS/MANAGEMENT NEEDS

Identification of algal components of reef systems is important for interpretation and extension activities in the Marine Park. An algal flora which contains species of importance as indicators of pollutants or of the well being of reefal systems may be identified.

METHODOLOGY

Systematic collection at various depths, habitats, etc. is being made to complete taxonomic studies already undertaken. Marked study sites will be revisited at various intervals to undertake quantitative studies and determine seasonal and long term changes in species composition, standing crop, growth rates and reproductive development.

STATUS

Field work has been completed. Awaiting final report.

LOCALITY: Swain Reefs

64. Biology and Management of Trochus

PERIOD: June 1981 — September 1984
PROJECT LEADERS: Mr. R. Pearson (Fisheries Research Branch, Queensland
Mr. W. Nash Department of Primary Industries)
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$38 151; QLD. D.P.I. — \$35 000

OBJECTIVES

To determine the basic biology, reproduction, recruitment, growth, population structure and the sustainable, harvestable yield of trochus and management principles for a possible collection fishery within the Great Barrier Marine Park.

IMPLICATIONS/MANAGEMENT NEEDS

Considerable interest has been expressed by commercial fisherman in collecting trochus in the Great Barrier Reef Region. Present biological understanding is minimal and totally inadequate for determining the impact, sustainable harvest or reasonable extent of such a fishery.

METHODOLOGY

A survey of the trochus resource in the Cairns and Mackay areas has been made. Basic biological studies undertaken have included growth rate (size-frequency analysis and/or tagging), recruitment, reproduction (breeding season, size/age at sexual maturity, fecundity), and movement.

STATUS

The final report is being prepared — due for submission to GBRMPA September 1984.

LOCALITY: Cairns and Southern Sections

65. Coral Trout Monitoring at Heron Island Reef

PERIOD: June 1982 — June 1984
PROJECT LEADERS: Ms. M. Preker (Heron Island Research Station)
Dr. I. Lawn
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$1 200

OBJECTIVES

To collect and provide data on coral trout populations on a monthly basis to provide a numerical indication of the natural variability in such populations.

IMPLICATIONS/MANAGEMENT NEEDS

This study is designed to provide information on natural monthly variation in coral trout numbers at Heron Island Reef. It will be useful with respect to management programs. It is important to know population parameters of coral trout (as an indicator of other large predatory fish) in the southern area of the Great Barrier Reef Region.

METHODOLOGY

Twelve monthly surveys by intensive SCUBA search technique were made over a 150m transect at the unfished area of Heron Island Reef, previously surveyed in development of the technique.

STATUS

Surveys commenced July 1983 and were completed June 1984.

LOCALITY: Capricornia Section — Heron Island Reef

102. Tourist Impact on Reef Corals

PERIOD: February 1982 — March 1984
PROJECT LEADERS: Dr. M. Liddle (School of Australian Environmental Studies,
Dr. A. Kay Griffith University)
PROJECT OFFICER: Mr. R. Kenchington/Mr. I. Dutton
FINANCIAL SUPPORT: GBRMPA — \$59849

OBJECTIVES

To determine the effects of human trampling on reef flat coral communities typically visited by reef walkers.

IMPLICATIONS/MANAGEMENT NEEDS

This study is designed to provide basic data for: (a) assessment of reef top impacts (b) interpretive activities in the Marine Park.

METHODOLOGY

An experiment to look at the effects of trampling was undertaken over 18 months. The ability of four common reef flat corals to survive and recover after human trampling was assessed in another series of experiments which determined such things as the amount of force required to break the coral skeleton and the growth rate and survival rate of dislodged coral fragments and damaged colonies.

STATUS

Final report has been submitted to GBRMPA

LOCALITY: Capricornia Section — Heron Island Reef

121. An Illustrated Key to the Parrot fishes of the Great Barrier Reef

PERIOD: July 1982 — December 1984
PROJECT LEADER: Dr. H. Choat (University of Auckland, New Zealand)
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$9900; M.S.T.G.S. — \$6645

OBJECTIVES

To produce an illustrated key to the parrotfish (Scaridae) of the Great Barrier Reef.

IMPLICATIONS/MANAGEMENT NEEDS

This project will provide assistance to scientists, reef users, educational programs etc. on identifying and separating what is probably the most difficult group of fishes to identify in the Great Barrier Reef.

METHODOLOGY

The key will contain the following information for each of approximately 25 species of parrotfish: classification of taxonomic status, meristic and structural data details of sequence of sexual and colour identities expected during life cycle with appropriate illustrations, local (within reef) distribution data, information on geographical distribution. The key will be illustrated with photographs of parrotfishes at various life stages.

STATUS

Submission to Australian Museum Records is anticipated to occur in August 1984. Publication will follow editorial review.

LOCALITY: Great Barrier Reef Region

123. Survey of seabird colonies of the Capricornia Section of the Great Barrier Reef Marine Park

PERIOD: December 1982 — July 1984
PROJECT LEADER: Dr. K. Hulsman (School of Australian Environmental Studies,
Griffith University)
PROJECT OFFICER: Ms. S. Driml
FINANCIAL SUPPORT: GBRMPA — \$13940; Qld. Co-ordinator-General — \$10411

OBJECTIVES

To census seabird colonies for distribution and abundance of each seabird species. To measure reproductive output of colonies, to continue banding program, to determine the reliability of aerial photographs to estimate population size, to measure forage distance.

IMPLICATIONS/MANAGEMENT NEEDS

By identifying sources and numbers of recruits, habitats available, status of colonies, etc., this study will assist decisions now for management and in the future for revision of the Zoning Plan.

METHODOLOGY

Visits to all islands in the Capricornia Section were made over the breeding period 1982-83 and again in 1983-84 to census seabird colonies and measure the reproductive output of each species in each colony.

STATUS

An interim report on data gathered in the 1982-83 breeding season has been submitted. Final report to GBRMPA due July 1984.

LOCALITY: Capricornia Section

124. The effects of Fuel Oil, Oil Emulsifier, and Lower Salinity upon the common Indo-Pacific reef coral *Acropora formosa*

PERIOD: June 1983 — August 1984

PROJECT LEADERS: Mr. P. Harrison . (Sir George Fisher Centre for Tropical Marine Studies, and Department of Marine Biology, James Cook University)
Dr. C.G. Alexander
Dr. J.D. Collins

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$2784

OBJECTIVES

To determine the effects of oil emulsifier, oil plus emulsifier and lowered salinity on *Acropora formosa*.

IMPLICATIONS/MANAGEMENT NEEDS

Oil spills, use of oil emulsifier, and lowered salinity (increased runoff) may occur in the Great Barrier Reef Region. Laboratory information on reactions of *A. formosa* to such stresses will assist in predicting effects of oil spills, effects of cleanup and effects of increased runoff.

METHODOLOGY

The research will use coral *A. formosa* (widespread and well-studied), Bunker C fuel (widely used in Great Barrier Reef Region), emulsifier BPA-B (currently recommended by Department of Transport), lowered salinity (typical of increased urbanisation and industrialisation), in four treatments and control. Effects will be examined at morphological, histological, and ultra-structural levels.

STATUS

Final report to GBRMPA due August 1984.

128. Analysis of Visually Dominant Organisms Data from Manta Tow Coral Surveys.

PERIOD: March — November 1983

PROJECT LEADERS: Mr. G. Bull (Zoology, James Cook University)
Dr. R. Jones

PROJECT OFFICER: Ms. S. Driml

FINANCIAL SUPPORT: GBRMPA — \$13 200

OBJECTIVES

To analyse data on visually dominant organisms collected in coral surveys.

IMPLICATIONS/MANAGEMENT NEEDS

The project will provide reference data on major coral communities for later comparison of information on communities within and between reefs.

METHODOLOGY

The data gathered on the manta tow surveys were analysed using cluster analysis. Coral communities were identified.

STATUS

The project has been completed.

LOCALITY: Capricornia Section
Cairns Section

132. Annual Survey of Recruitment of Selected Reef Species on Capricornia Reefs

PERIOD: April 1983 — June 1984
PROJECT LEADERS: Dr. P. Sale (Sydney University)
Dr. P. Doherty (Griffith University)
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$8 887

OBJECTIVES

To continue and expand a program monitoring recruitment of selected reef species in specified habitats on seven Capricornia reefs.

IMPLICATION/MANAGEMENT NEEDS

This study will indicate the degree of variability in recruitment within and between reefs. It may assist in predicting adult population, distribution and abundance, and have relevance to management replenishment areas.

METHODOLOGY

Visual surveys were conducted at seven Capricornia Section reefs, namely: Wistari, Heron, Llewellyn, Fairfax, Lady Musgrave, One Tree and Fitzroy Reefs.

Replicate sites in two habitats at each reef (lagoonal patch reefs and leeward reef slopes) were surveyed to 20-25 feet. Results were calculated to give densities per 100m² for young (of year) of selected species seen.

STATUS

The survey has been undertaken. Final report submitted to Authority and *Oecologia* (in press).

LOCALITY: Capricornia Section

133. Monitoring Replenishment Areas: Coral Trout Survey Technique

PERIOD: April 1983 — August 1984.
PROJECT LEADERS: Dr. W. Craik (GBRMPA)
Dr. Z. Dinesen, (Queensland National Parks and Wildlife Service)
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$8 914; Q.NPWS

OBJECTIVES

To monitor coral trout communities in replenishment areas, Wistari, heron, Wreck and Llewellyn (restricted activities), North West, Fitzroy, and Lady Musgrave Reefs, Capricornia Section.

IMPLICATIONS/MANAGEMENT NEEDS

This project will assess the effectiveness of permanently closed, partially restricted and restricted reefs as replenishment areas.

METHODOLOGY

Surveys were made of nine reefs (17 transects) before closure using intensive SCUBA search technique of surveying coral trout. The surveys are being continued at around six monthly intervals by Q.NPWS officers, and results will be assessed at the end of each survey and written up on a comparative basis.

Reefs surveyed were Boulton, North, Wreck, Llewellyn, North West, Heron, Wistari, Lady Musgrave and Fitzroy Reefs.

STATUS

Initial survey took place in June 1983, just prior to closure of replenishment areas. Compared with surveys in 1979-80, prior to zoning plan coming into effect, the numbers of trout at Wreck and Llewellyn Reefs were higher. Final report in preparation.

LOCALITY: Capricornia Section

134. Year to Year Variation in Recruitment of Juvenile Hard Corals on a Reef Front

PERIOD: April — December 1983
PROJECT LEADER: Dr. C. Wallace (Marine Biology, James Cook University)
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$1 876

OBJECTIVES

To understand within and between year recruitment of corals to a reef. To test a simple method for monitoring coral recruitment on a continuing basis.

IMPLICATIONS/MANAGEMENT NEEDS

This study will provide information on natural variation in coral recruitment to enable assessment of human impact. It may provide a useful continuing method of measuring coral recruitment.

METHODOLOGY

Following studies in recruitment of juvenile hard corals onto plates in 1980-81 and 1981-82 which indicated that summer recruitment was significant, another set of recruitment plates was set down in 1982-83 so that the previous findings could be compared with those of a third year.

STATUS

Report submitted to GBRMPA and also submitted for publication in a scientific journal.

LOCALITY: Central Section — Big Broadhurst Reef

146. Evaluation of Biological and Economic Aspects of Coral Collecting in the Great Barrier Reef Region

PERIOD: June 1983 — June 1985

PROJECT LEADERS: Dr. J.T. Baker, O.B.E. (Sir George Fisher Centre for Tropical Marine Studies and Department of Marine Biology, James Cook University)
Assoc. Prof. M. Pichon
Mr. J. Oliver

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$82 230

OBJECTIVES

To investigate aspects of the biology of principal commercial coral species of the Great Barrier Reef from the view of management. To determine rates of production (supply) and collection to provide guidelines for harvesting and management.

IMPLICATIONS/MANAGEMENT NEEDS

Enforcement of the ban on Philippine exports is creating pressure on Australian corals. There is an urgent need for management guidelines e.g. best form of lease, quantities to be harvested, regrowth rates etc. to be determined.

METHODOLOGY

The project has two aspects to be undertaken over a two year period. Biological research will investigate distribution and abundance, size-frequency, growth studies, reproductive strategies and recruitment information, damage and mortality.

This aspect will be complemented by a proposed GBRMPA study on the economics of coral, shell, and aquarium fish collecting.

STATUS

Surveys of coral collectors completed. Experimental work continuing. Final report to GBRMPA due April 1985.

LOCALITY: Great Barrier Reef Region

163. Methods for the Re-establishment of Hard Corals in Denuded Reef Systems

PERIOD: August 1983 — December 1983

PROJECT LEADER: Dr. V. Harriott (Sir George Fisher Centre for Tropical Marine Studies, James Cook University)

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$10 091 (Phase 1)

OBJECTIVES

To compile, from available knowledge, a set of procedures for the re-establishment of hard corals on an area of reef where corals once flourished. To test these procedures and evaluate their effectiveness. To prepare a practical handbook.

IMPLICATIONS/MANAGEMENT NEEDS

This project should produce a handbook which will identify causes of reef deterioration likely to be encountered in recreationally and commercially important areas, and in particular which will outline methods for re-establishing coral communities in the different environments.

METHODOLOGY

In Phase I a draft report which outlines suggested methods for coral community re-establishment, was prepared after consultation with appropriate scientists and others e.g. tourist/resort operators, Marine Park field staff. A field trip has been undertaken to select suitable study sites to field test the methods proposed in the report (Phase II).

STATUS

Phase I has been completed. Phase II to commence early 1985.

LOCALITY: Cairns Section

164. Planktonic Dispersal of Larval Corals

PERIOD: October 1983 — July 1984

PROJECT LEADER: Mr. G. Bull (Marine Biology, James Cook University)

PROJECT OFFICER: Ms. S. Driml

FINANCIAL SUPPORT: GBRMPA — \$19232

OBJECTIVES

To track the paths of coral larvae resulting from a mass spawning from site of origin to final settlement place.

IMPLICATIONS/MANAGEMENT NEEDS

Information on interdependence of reefs is useful for zoning in investigating whether settlement and recruitment at one reef is dependent on spawning products of other reefs.

METHODOLOGY

Observations at the selected reef began around the previously predicted date for mass spawning. Current drogues were released among the spawning corals and subsequently followed by small boats, with position fixing by radar from a mother ship. At regular intervals the water around the drogues was sampled for the presence and abundance of coral eggs and larvae. Analysis of samples of seawater taken will reveal the abundance of larvae at sites around the reef and along the current track.

STATUS

Final report has been submitted to GBRMPA

LOCALITY: Central Section — Bowden Reef

165. Coral Reef Metabolism and Calcification

PERIOD: September 1983 — September 1984

PROJECT LEADERS: Assoc. Prof. M. Pichon (Marine Biology, James Cook University)
Dr. J. Morrissey

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$1800; JCU Special Grant 1983 — \$2000

OBJECTIVES

To obtain baseline data on coral reef metabolic and calcification rates to ascertain whether a coral reef contributes to the pool of organic matter in shallow water marine environments or whether it is a consumer of organic matter.

IMPLICATIONS/MANAGEMENT NEEDS

Organic production and rates of calcification are parameters which best provide accurate information on the state of health of a given reef and therefore are of direct relevance to the planning and management of the Marine Park.

METHODOLOGY

Reef metabolism will be assessed by rates of oxygen production over daily cycles. Changes in oxygen concentration in waters flowing over the reef (upstream/downstream technique) will be measured by an oxygen polarographic electrode.

Calcification will be derived directly from changes measured in seawater total alkalinity (Analyses by wet chemistry according to the method of Culbertson et al, 1979).

STATUS

Final report to GBRMPA due September 1984.

166. Provision of Demographic Data and Recommendations for Management Guidelines for the collection of Aquarium Fish in the Great Barrier Reef Marine Park

PERIOD: August 1983 — June 1986
PROJECT LEADER: Assoc. Prof. P. Sale (Biological Sciences, University of Sydney)
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$41 302

OBJECTIVES

To collect demographic data on six species (including families Chaetodontidae, Pomacentridae and Labridae) to permit the development of size-age relationships useful for monitoring populations and to permit the assessment of turnover rate in the One Tree Island Reef populations. To investigate temporal variation in standing stock and rate of recruitment. To study social organisation, habitat requirements and mobility of adults of each species.

IMPLICATIONS/MANAGEMENT NEEDS

This project will provide firm demographic data on six representative species of interest to the aquarium trade. The techniques developed for determining such data will be available for subsequent application to other species.

METHODOLOGY

Field studies and laboratory examination of otoliths and other structures will provide data on (i) abundance and size structure; (ii) age, size, reproductive state, fecundity, fecundity-size relationship; (iii) social organisation, adult movement and habitat use; and (iv) settlement and survivorship.

Small manipulative experiments to investigate the effects of removing recruits on subsequent recruitment will be set up for the summer of 1984-85.

STATUS

The field work has commenced at One Tree Island on representative species. Final report to GBRMPA due June 1986.

LOCALITY: Capricornia Section — One Tree Island Reef

167. Field Study to Monitor Dugongs killed by Members of the Hope Vale Aboriginal Community in the Starke River Scientific Research Zone in the Cairns Section of Great Barrier Reef Marine Park in January 1984

PERIOD: December 1983 — June 1984
PROJECT LEADER: Dr. H. Marsh (Marine Biology, James Cook University)
PROJECT OFFICERS: Ms. C. Baldwin, Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$2 169

OBJECTIVES

To assist in the development of biologically sound management programs for dugongs particularly in the Great Barrier Reef Marine Park by monitoring and analysing material from the seasonal catch of the people at Hope Vale Community in the Cairns Section.

IMPLICATIONS/MANAGEMENT NEEDS

The information collected in this study is basic for the development of an effective permit system and accompanying public education program to manage this dugong population.

METHODOLOGY

Samples were taken for analysis from dugong killed.

STATUS

Report on the 1983-84 summer hunting season received.

LOCALITY: Cairns Section — Starke River Scientific Research Zone

168. Reproductive Ecology of Eight Staghorn Coral (*Acropora*) Species

PERIOD: September 1983 — June 1984
PROJECT LEADER: Dr. C. Wallace (Marine Biology, James Cook University)
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$2741

OBJECTIVES

To study the reproductive biology of eight species of staghorn coral.

IMPLICATIONS/MANAGEMENT NEEDS

This study will contribute information relevant to management of coral collecting, re-stocking damaged reefs and natural reef re-establishment after destructive events (e.g. *Acanthaster* predation).

METHODOLOGY

Five hundred reproductive specimens were dissected (each dissection involved counting and measuring the eggs of five polyps). These specimens were collected from tagged colonies of the eight study species over two years and then decalcified.

STATUS

Awaiting final report.

LOCALITY: Townsville

169. Monitoring Crown of Thorns

PERIOD: 1981 —
PROJECT LEADER: Mr. P. McGinnity (GBRMPA)
PROJECT OFFICER: Mr. P. McGinnity
FINANCIAL SUPPORT: GBRMPA staff and facilities

OBJECTIVES

To monitor the situation with regard to (i) the spread of crown of thorns throughout the Great Barrier Reef Region; and (ii) the intensity of crown of thorns predation of reefs throughout the Great Barrier Reef Region. To provide an historical data base of (i) and (ii) above.

IMPLICATIONS/MANAGEMENT NEEDS

The reason for an apparent upsurge in crown of thorns populations since the early 1960s is still not understood i.e. man induced or natural. Therefore, the role of the Authority in monitoring the crown of thorns will continue until reasons for population increases are established or populations decline into insignificance.

METHODOLOGY

Reef users are provided with crown of thorns sighting forms which they complete for individual reefs visited.

STATUS

Replies have been entered onto a computerised data base which will be updated regularly.

LOCALITY: Great Barrier Reef Region

170. Stereo-photographic Coral Monitoring of Lizard Island Area Sites

PERIOD: January 1984 — May 1984
PROJECT LEADERS: Dr. A.M. Ayling (Sea Research)
Dr. A.L. Ayling
PROJECT OFFICER: Dr. J. Kermond
FINANCIAL SUPPORT: GBRMPA — \$3 345

OBJECTIVES

To assist in the collection of stereoscopic photographic data in the Lizard Island area and become conversant with the technique. To enable continued monitoring at sites on Yonge and Carter Reefs.

IMPLICATIONS/MANAGEMENT NEEDS

A feasible, practical method of detecting change(s) in a reef environment will be an important management tool. The technique provides a valuable basis for assessing natural changes in a reef system over the long term.

METHODOLOGY

Technology and site details will be transferred by the developer of the methodology (Dr.T. Done).

STATUS

The sites have been photographed and a final report received.

LOCALITY: Cairns Section — Lizard Island area

171. Coral Trout Survey in the Swain Reefs

PERIOD: January 1984

PROJECT LEADERS: Dr. A.M. Ayling (Sea Research)
Dr. A.L. Ayling

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$5 545

OBJECTIVES

To provide initial size-frequency distributions of coral trout populations at about ten reefs in the Swain Reefs.

IMPLICATIONS/MANAGEMENT NEEDS

This project will provide preliminary data on relative numbers and sizes of coral trout for reefs in an area yet to be zoned.

METHODOLOGY

Ten 50 x 20 metre transects were searched for coral trout on each reef using SCUBA search techniques.

STATUS

Final report has been submitted.

LOCALITY: Southern Section — Swain Reefs

172. Coral Trout and Coral Survey of the Far Northern Section

PERIOD: March 1984 — June 1984

PROJECT LEADER: Dr. A.M. Ayling (Sea Research)

PROJECT OFFICER: Mr. I. Dutton

FINANCIAL SUPPORT: GBRMPA — \$47 000

OBJECTIVES

To survey coral, coral trout and crown of thorns starfish in the Far Northern Section of the Marine Park.

IMPLICATIONS/MANAGEMENT NEEDS

This project will provide initial reference data on the Far Northern Section relevant to zoning and management. The survey will also provide comparative basis for future monitoring.

METHODOLOGY

Coral trout (*Plectropomus* species) and *A. planci* counts were made at each of 31 reefs using ten 50m x 20m transects per reef and coral was surveyed using manta tow technique.

STATUS

The project has been completed and a final report submitted.

LOCALITY: Far Northern Section

173. Analysis of Current Measurement in Lizard Island Area in Conjunction with Larval Fish Study

PERIOD: February 1984 — December 1984

PROJECT LEADERS: Dr. J. Leis (Australian Museum)
Dr. C. Frith (Geography, University of Sydney)

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$2750

OBJECTIVES

To relate data on currents to larval fish distribution.

IMPLICATIONS/MANAGEMENT NEEDS

This study will provide useful information on distribution and dispersal of fish larvae, and maintenance of fish larvae distributions. A detailed study of small scale oceanography within the Great Barrier Reef Lagoon will eventually result.

METHODOLOGY

Two years data collected by current meters in the Lizard Island area will be analysed and the results integrated with data on larval fish distribution.

STATUS

The project has commenced. Final report to GBRMPA due December 1984.

LOCALITY: Cairns Section — Lizard Island area

174. Juvenile Fish Nursery Areas: Pilot Study on By-catch of Trawlers

PERIOD: April 1984 — August 1984

PROJECT: Dr. G. Goeden (Fisheries Research Branch, Qld.
Department of Primary Industries)

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$10 000

OBJECTIVES

To compare catch per unit effort of alleged juvenile fish nursery areas with catch per unit effort of similar non-nursery areas.

IMPLICATIONS/MANAGEMENT NEEDS

Public representations indicate a conflict of interest between commercial and amateur fishermen in this area. This study is designed to investigate the situation.

METHODOLOGY

Trawled samples will be collected from alleged 'nursery' and 'non-nursery' areas; samples sorted into 'reef fish' and 'non-reef fish'; catch per unit effort figures calculated and compared between areas.

STATUS

Non-nursery area trawled. Bad weather interrupted remaining field work.

LOCALITY: Cairns Section

175. The Impact of Reef Walking at Hardy Reef

PERIOD: May 1984 — July 1984

PROJECT LEADERS: Dr. M. Liddle and Dr. A. Kay, (School of Australian Environmental Studies, Griffith University)

PROJECT OFFICER: Mr. I. Dutton

FINANCIAL SUPPORT: GBRMPA — \$5 000

OBJECTIVES

To quantify, map and describe existing and future levels and patterns of reef walking at Hardy Reef.

To assess the nature and degree of physical and biological impact associated with present and anticipated future reef walking use levels at Hardy Reef.

To compare the type, nature and levels of reef walking damage recorded at Hardy Reef with those previously recorded at Heron Island Reef and determine whether there are any major differences or features not previously observed.

To evaluate techniques for reef walking impact/damage assessment which were used in the Heron Island study, and determine their adequacy and applicability in the context of Hardy Reef.

IMPLICATIONS/MANAGEMENT NEEDS

This project will enable verification of reef walking impact assessment techniques developed during Heron Island study. It will enhance management capacity and ability to regulate future activities at Hardy Reef.

METHODOLOGY

Project involves field reconnaissance and survey of Hardy Reef followed by desk-top study.

STATUS

Project underway.

LOCALITY: Southern Section — Hardy Reef

176. Review of Beche-de-mer (Holothurian) Surveys

PERIOD: June 1984
PROJECT LEADER: Dr. V. Harriott (Sir George Fisher Centre for Tropical Marine Studies, James Cook University)
PROJECT OFFICER: Ms. E. Eager
FINANCIAL SUPPORT: GBRMPA — \$1675

OBJECTIVES

To analyse data and review surveys on beche-de-mer (holothurians).

IMPLICATIONS/MANAGEMENT NEEDS

There is some pressure for revival of the traditional beche-de-mer fishery in the Great Barrier Reef Marine Park. Pressure for revival of the fishery will require consideration of the impact and sustainability of this use of the Great Barrier Reef resources. This project will review available knowledge on distribution, abundance and biology.

METHODOLOGY

The analysis of survey data collected by the then Qld. Fisheries Service will be completed. A report will be written outlining distribution and abundance, and reviewing census techniques and other relevant information.

STATUS

The final report has been submitted to GBRMPA

LOCALITY: Central and Cairns Sections

177. Analysis of Fish Tagging Data

PERIOD: June 1984
PROJECT LEADER: Mr. R. Giddins
PROJECT OFFICER: Ms. E. Eager
FINANCIAL SUPPORT: GBRMPA — \$712

OBJECTIVES

To analyse length-frequency data on reef fishes, information on breeding areas, and effects of fishing conditions on catch.

IMPLICATIONS/MANAGEMENT NEEDS

More information on reef fish movements will be useful for management particularly for interpreting the results of surveys investigating the effects of Replenishment Areas.

METHODOLOGY

Existing data records will be checked and converted for cross-tabulation analyses using the Statistical Package for Social Sciences (SPSS).

STATUS

Data preparation completed. Analysis started.

LOCALITY: Capricornia Section

178. Experimental Crown of Thorns Eradication

PERIOD: June 1984
PROJECT LEADER: Mr. P. McGinnity (GBRMPA)
PROJECT OFFICER: Ms. S. Driml
FINANCIAL SUPPORT: GBRMPA — \$1320

OBJECTIVES

To undertake the eradication of crown of thorns starfish (*Acanthaster planci*) from a defined area, testing the copper sulphate injection method of killing the starfish and assessing the costs of the exercise in terms of time, manpower and other costs.

IMPLICATIONS/MANAGEMENT NEEDS

This exercise was designed to evaluate the eradication of *A. planci* from areas of commercial importance for tourism, and to provide information for management.

METHODOLOGY

Locate *A. planci* within the defined site and kill using copper sulphate injection. Report on time, cost and success of killing.

STATUS

Field work completed, report being prepared.

LOCALITY: Cormorant Pass Section

179. Coral Trout Workshop

PERIOD: February 1984

PROJECT LEADER: Dr. W. Craik (GBRMPA)
Dr. Z. Dinesen
Queensland National Parks and Wildlife Service
Dr. A. Ayling (Sea Research)

PROJECT OFFICER: Dr. W. Craig

FINANCIAL SUPPORT: GBRMPA — \$3 990

OBJECTIVES

To investigate in the field alternative coral trout survey techniques and train Q.NPWS staff.

IMPLICATIONS/MANAGEMENT NEEDS

Coral Trout surveys are significant monitoring techniques. It is essential that techniques be tailored to conditions prevailing in the Great Barrier Reef Region.

METHODOLOGY

Counts from intensive search, six different transect sizes, and random groups of straight line transects were compared. Effect of observer was also investigated.

STATUS

Workshop completed. Report submitted to GBRMPA.

LOCALITY: Central Section — John Brewer Reef

ANALYSIS OF USE

95. Man-Made Noise in the Ocean

PERIOD: January 1981 — December 1984

PROJECT LEADERS: Dr. G.H. Allen (Electrical and Electronic Engineering,
James Cook University)

PROJECT OFFICER: Mr. R. Kenchington/Ms. S. Driml

FINANCIAL SUPPORT: GBRMPA — \$3 000

OBJECTIVES

To measure the noise spectra of vessels and relate ship noise to ambient levels in the sea at various frequencies. This is a pilot project.

IMPLICATIONS/MANAGEMENT NEEDS

This study may enable the specification of a passive surveillance network to: (a) record use of areas of the marine park; (b) test the effectiveness of zoning plans; and (c) direct officers of management agencies to areas of high level use.

METHODOLOGY

Pressure sensitive detectors are fitted to a portable spectral analyser system carried in a small craft. This will measure ambient sea noise and boat noises between the mainland and the Great Barrer Reef.

STATUS

Awaiting final report.

99. Socio-Economic Research Program for the Great Barrier Reef Marine Park Authority

PERIOD: March 1981 — June 1984
PROJECT LEADER: Dr. G. McColl (Unisearch Ltd., University of New South Wales)
PROJECT OFFICER: Dr. J. Dunn/Ms. S. Driml
FINANCIAL SUPPORT: GBRMPA — \$31 500

OBJECTIVES

To review and assess in the light of recent socio-economic research and the Authority's objectives, the future socio-economic research program needs of GBRMPA.

IMPLICATIONS/MANAGEMENT NEEDS

This project will provide the Authority with advice on a range of research topics and methods and assist in the Authority's socio-economic program.

METHODOLOGY

A draft report was prepared covering fisheries, tourism/recreation and other matters. The draft was discussed at a 2-day workshop in Brisbane in November 1981 attended by academics, State and Federal Government Departmental officers, individuals from private enterprise, the consultants and GBRMPA staff. As a result of these discussions a final report has been prepared outlining a possible socio-economic research program for the GBRMPA.

STATUS

A final report has been submitted.

LOCALITY: Great Barrier Reef Region

103. History of Crown of Thorns Incidence on the Great Barrier Reef

PERIOD: June 1982 — December 1983
PROJECT LEADERS: Prof. B. Dalton (History, James Cook University)
Mr. H. Reynolds
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$26 400

OBJECTIVES

To collect material related to historical use and frequency of events in the Great Barrier Reef Region, with particular reference to the incidence of crown of thorns starfish.

IMPLICATIONS/MANAGEMENT NEEDS

This study has relevance to recent outbreaks of crown of thorns and the frequency and extent thereof. It will also meet an overdue need to collect and collate historical information (often unwritten) on the Great Barrier Reef.

METHODOLOGY

Information was collected by (i) conducting interviews using a standard format with long-time residents of areas adjacent to the Great Barrier Reef Region; (ii) a literature search to extend contacts and collect written information; and (iii) cross checking oral information on events with timing of other events and the written record.

STATUS

The final report has been submitted to GBRMPA.

LOCALITY: Great Barrier Reef Region

147. Compilation of Fisheries Economics of the Great Barrier Reef

PERIOD: April 1983 — December 1983
PROJECT: Mr. T. Hundloe (Institute of Applied Social Research
Griffith University)
PROJECT OFFICER: Ms. S. Driml
FINANCIAL SUPPORT: GBRMPA — \$4 800

OBJECTIVES

To compile information on fisheries economics collected by the Institute of Applied Social Research into a single volume for publication.

IMPLICATIONS/MANAGEMENT NEEDS

Information on fisheries economics is required to aid zoning decisions and monitor the economic impact of zoning and management of Marine Parks.

METHODOLOGY

Information on the economics of commercial, recreational and charter boat fishing has been gathered by the consultant by interview and mail questionnaire. The data have been analysed and the results have been presented in a number of reports to the Great Barrier Reef Marine Park Authority. This project involves editing and interpreting the data and preparing a single volume on the entire Great Barrier Reef Region for publication.

STATUS

The final report was approved by the GBRMPA and publication of the report as a book in the Special Publications Series recommended.

186. Traditional uses of Marine Resources by Aboriginal Communities on the East Coast of Cape York Peninsula: Stage 1

PERIOD: December 1983 — June 1985
PROJECT LEADERS: Mr. A. Smith (Sir George Fisher Centre for Tropical Marine Studies, Department of Marine Biology and Dr. J.T. Baker Department of Behavioural Sciences, James Cook University)
Dr. H. Marsh
Dr. J. Taylor
PROJECT OFFICERS: Ms. C. Baldwin, Ms. S. Driml
FINANCIAL SUPPORT: GBRMPA — \$47 600

OBJECTIVES

To document the current and traditional hunting and fishing practices of the Hope Vale Aboriginal Community. To acquire indigenous knowledge of the biology and behaviour of tropical marine food resources. To utilise this information in the development of a management program for Aboriginal use of marine resources within the Great Barrier Reef Marine Park.

IMPLICATIONS/MANAGEMENT NEEDS

The presence of a sizable population of dugongs north of Cape Flattery was the reason for the 'Scientific Research' zoning of an area traditionally hunted by Hope Vale residents. The co-operation of these people in the management of the dugong population is essential. Knowledge of other marine resources could contribute to Marine Park planning and management.

METHODOLOGY

Field work for 15 months in the Hope Vale Community will include personal observation, participation, and interview.

STATUS

Project underway.

LOCALITY: Cairns Section — Hope Vale

187. Application of Recreational Opportunity Spectrum Concepts to Marine Park Planning

PERIOD: January 1984 — July 1984
PROJECT LEADER: Dr. D. Pitts (Environmental Science and Services)
PROJECT OFFICER: Mr. I. Dutton
FINANCIAL SUPPORT: GBRMPA — \$2 590

OBJECTIVES

To evaluate the utility of the Recreational Opportunity Spectrum (ROS) in the general context of Marine Park planning. To identify any specific areas of application where ROS techniques can be adopted to improve planning procedures and practices within the Great Barrier Reef Marine Park Authority.

IMPLICATIONS/MANAGEMENT NEEDS

This project will provide the Authority with a basis for determining the utility of the ROS technique in Marine Park planning.

METHODOLOGY

The study will be undertaken by literature review assessment of relevant examples (including Great Barrier Reef Marine Park Sections), technique evaluation/appraisal and report production.

STATUS

Final report awaited.

LOCALITY: Great Barrier Reef Region

188. User Survey, Capricornia Section: Stage 1

PERIOD: June 1984 — September 1984

PROJECT LEADER: Dr. D. Pitts (Environmental, Science and Services)

PROJECT OFFICER: Ms. S. Driml

FINANCIAL SUPPORT: GBRMPA — \$15 000

OBJECTIVES

To design and conduct a survey of users of the Capricornia Section of the Great Barrier Reef Marine Park to ascertain perceptions and impacts of Marine Park planning and management.

IMPLICATIONS/MANAGEMENT NEEDS

To evaluate planning and management for input into the review of the Capricornia Section Zoning Plan.

METHODOLOGY

Design survey and select sample frame for all user groups, undertake pilot survey, review, and conduct survey.

STATUS

Project underway.

LOCALITY: Capricornia Section

189. Survey of Charter Boats, Great Barrier Reef Region: Stage 1

PERIOD: June 1984 — October 1984

PROJECT LEADER: Mr. T. Hundloe (Institute of Applied Social Research, Griffith University)

PROJECT OFFICER: Ms. S. Driml

FINANCIAL SUPPORT: GBRMPA — \$2 590

OBJECTIVES

To design and conduct a survey of charter boats operating in the Great Barrier Reef Region to investigate activity patterns, fish catch and economic characteristics. (Stage 1 is limited to the Central Section).

IMPLICATIONS/MANAGEMENT NEEDS

An updating of information on charter boats in the Great Barrier Reef Region is necessary for monitoring use trends. The specific information to be gathered will be used in zoning and in operating the permit system.

METHODOLOGY

A questionnaire will be developed in conjunction with GBRMPA staff and surveys by personal interview of charter boat operators will be conducted.

STATUS

Project commenced June 1984.

LOCALITY: Central Section

GREAT BARRIER REEF DATA BASES

191. Collaborative Reef Geographic Information System (CORGIS) based upon Extensions of the Relational Database Model

PERIOD: December 1983 — June 1986
PROJECT LEADER: Dr. D. Abel (CSIRO, Division of Computing Research)
PROJECT OFFICERS: Mr. W. Wallace, Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$29 000; CSIRO; MSTGS \$21 000

OBJECTIVES

To provide a Geographic Information System (GIS) design and associated display system to tie data and graphics to form an effective computer-assisted design tool.

IMPLICATIONS/MANAGEMENT NEEDS

The system will provide a base for storing and retrieving data for planning and management uses.

METHODOLOGY

Development of the Geographic Information System (GIS) will include: (i) definition of cellular and polygonal representations; (ii) definition of GIS interfaces to a formatted relational database management system and graphic devices; (iii) implementation of basic operations on entities held in cellular representations; (iv) implementation of a GIS with treatment of spatial and attribute items separated.

STATUS

Delay in starting project — commenced June 1984.

LOCALITY: Great Barrier Reef Region

MECHANICS OF INFORMATION TRANSFER

117. Australian Marine Research in Progress

PERIOD: July 1982 — December 1983
PROJECT LEADERS: Department of Science and Technology
Victorian Institute of Marine Sciences
Central Information Library Editing Service (CSIRO)
Great Barrier Reef Marine Park Authority
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA — \$12 000

OBJECTIVES

To produce a second hard copy of AMRIP (Australian Marine Research In Progress), a book form of computer stored information on marine research projects in Australia.

IMPLICATIONS/MANAGEMENT NEEDS

This project is designed to produce a current summary of on-going research in the Great Barrier Reef Region (and elsewhere), which is readily accessible and readily updated.

METHODOLOGY

Nationally distributed questionnaires on Research in Progress are used in gathering information for editing and classification, data entry, printing. Development of an interactive system is proposed.

STATUS

The second hard copy of AMRIP has been published.

118. Aquatic Science Research Electronic Bulletin

PERIOD: May 1982 — June 1984
PROJECT LEADER: Dr. D. Abel (CSIRO, Division of Computing Research)
PROJECT OFFICER: Ms. S. Driml
FINANCIAL SUPPORT: GBRMPA — \$7 900

OBJECTIVES

To produce an on-line, interactive bulletin of research-related information. This is a pilot study.

IMPLICATIONS/MANAGEMENT NEEDS

This project should eventually result in a readily accessible up-to-date source of information being available on all research activities relating to the Great Barrier Reef Region and other areas of Australia.

METHODOLOGY

The development of specifications for the bulletin was undertaken and software to produce the bulletin is being prepared. Potential users are being surveyed to evaluate potential use before implementation.

STATUS

Pilot testing of the system has been completed. Development of the system is being evaluated.

192. Great Barrier Reef Conference

PERIOD: September 1983

PROJECT LEADER: Dr. J.T. Baker (Sir George Fisher Centre for Tropical Marine Studies, James Cook University)

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA — \$7500

OBJECTIVES

To assist in funding this major conference on research in the Great Barrier Reef Region.

IMPLICATIONS/MANAGEMENT NEEDS

This conference was designed to analyse research progress on the Great Barrier Reef in the past 5 to 10 years and to allow evaluation of the possible research emphasis in the five years to 1988 (including research most important to satisfying the management needs of GBRMPA)

METHODOLOGY

Ninety-eight papers were presented and both formal and informal discussion groups were scheduled throughout the Conference.

STATUS

The project has been completed. Proceedings have been published.

LOCALITY: Great Barrier Reef Region

APPENDIX D

AUGMENTATIVE RESEARCH PROJECTS 1983-84

MARINE GEOSCIENCES

120. Geomorphological Information on the Continental Shelf Coral Reefs and Coastline from Fitzroy to Gould Islands

PERIOD: 1983
PROJECT LEADER: Mr. T. Graham (Geography, James Cook University)
SUPERVISOR: Assoc. Prof. D. Hopley
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$900

OBJECTIVES

To investigate terrestrial influence on shelf and reef morphology in an area where reefs are close to the coast.

IMPLICATIONS/MANAGEMENT NEEDS

Information on the influence of European settlement on reef growth and bottom sedimentation will be gained.

METHODOLOGY

Methods will include aerial photograph interpretation and ground survey, coring on fringing, mid-shelf and outer shelf reefs. A Ewing corer will be used to examine sediments in inter-reefal locations and on submerged outer reefs. The growth histories of corals and reefs will be investigated using X-radiographic techniques and C¹⁴ dating.

STATUS

Project continuing.

LOCALITY: Cairns Section — Fitzroy Island, Gould Island

157. Comparative Structure and Growth of Windward and Leeward Fringing Reefs on Orpheus Island, North Queensland

PERIOD: 1984
PROJECT LEADER: Mr. R. Barnes (Geography, James Cook University)
SUPERVISOR: Assoc. Prof. D. Hopley
PROJECT OFFICER: Ms. E. Eager
FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$700

OBJECTIVES

To examine the structure of a windward fringing reef (Iris Point, Orpheus Island) and compare it with previously drilled leeward reefs on Orpheus and Fantome Islands.

IMPLICATIONS/MANAGEMENT NEEDS

No windward fringing reef has yet been drilled on the Great Barrier Reef although these are generally the most luxuriant and diverse of the fringing reefs. Knowledge on the nature of these reefs will help in future management as they are likely to receive much tourist pressure and are vulnerable to mainland influence.

METHODOLOGY

Cores will be drilled from Iris Point Reef for radiocarbon dating and laboratory work which will include: (i) careful logging, including evidence of bioerosion; (ii) aragonite and calcite analysis; (iii) Sr:Ca ratios; and (iv) determination of non carbonate content as an indicator of terrigenous influence. Surface mapping of the reef will be carried out.

STATUS

Project underway.

LOCALITY: Townsville Section — Orpheus Island

158. Geomorphology and Sediments of Sanctuary Reef, Swain Reefs Area, Southern Great Barrier Reef

PERIOD: 1984
PROJECT LEADER: Mr. S. Reed (Geology and Geophysics, University New England)
SUPERVISOR: Dr. P. Flood
PROJECT OFFICER: Ms. E. Eager
FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$800

OBJECTIVES

To produce a map of the geomorphology of Sanctuary Reef. To describe the morphological zonation across several transects. To determine factors influencing sedimentation.

IMPLICATIONS/MANAGEMENT NEEDS

This project will enable geoscientists to determine if the Swain Reefs are similar to other reefs of the Great Barrier Reef. If they are, the findings of more than 10 years research in the southern, central and northern Great Barrier Reef can be applied to the reefs of the Swains — thereby enabling informed decisions to be made when management of this vast area is to be incorporated into a zoning plan.

METHODOLOGY

Methods will include aerial photograph interpretation and ground survey to prepare a base map, collection and analysis of sediment samples, comparison of zonation of sediment parameters with the morphological zonation.

STATUS

Project underway.

LOCALITY: Southern Section — Sanctuary Reef

160. Analysis of Soils from Coral Islands in the Capricornia Section of the Great Barrier Reef Marine Park

PERIOD: 1984
PROJECT LEADERS: 2 Students (Chemistry, Capricornia Institute of Advanced Education)
SUPERVISORS: Dr. G. Pegg & Dr. J. Hughes
PROJECT OFFICER: Ms. E. Eager
FINANCIAL SUPPORT: Qld. Co-ordinator General — \$900

OBJECTIVES

To determine important physical and chemical properties of soils and to relate these findings to parameters such as location, depth, human usage, flora and fauna populations and possibly effluent disposal.

IMPLICATIONS/MANAGEMENT NEEDS

Management implications for planning island use.

METHODOLOGY

Soil samples will be analysed for pH, conductivity and concentrations of: chloride, sodium, potassium, magnesium, calcium, iron, copper, nitrate, nitrite, phosphate and total organic material.

STATUS

Project underway.

LOCALITY: Capricornia Section — Heron Island

MARINE BIOLOGY

135. An Investigation into the Biology of Parrot Fish (Scaridae) with particular Reference to Factors Influencing their Distribution

PERIOD: 1983
PROJECT LEADER: Mr. D. Bellwood (Zoology, James Cook University)
SUPERVISOR: Dr. N. Milward
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$559

OBJECTIVES

To study the post settlement development of juvenile scarids. To examine the biology of adult scarids particularly their feeding biology.

IMPLICATIONS/MANAGEMENT NEEDS

Parrot fishes are one of the most important families of reef fish numerically and in biomass. Knowledge of their biology is useful for management.

METHODOLOGY

The studies of the post settlement development of juvenile scarids, the spatial and temporal variation in juvenile scarid recruitment, and the biology of adult scarids were continued.

STATUS

Report received.

LOCALITY: Cairns Section — Lizard Island Reef

136. Aspects of Community Dynamics and Biology of Scleractinian Corals on the Heron Reef Crest

PERIOD: 1983 and 1984
PROJECT LEADER: Ms. A. Bothwell (Zoology, University of Queensland)
SUPERVISOR: Dr. R. Endean, Dr. J. Kikkawa
PROJECT OFFICER: Dr. W. Craik/Ms. E. Eager
FINANCIAL SUPPORT: GBRMPA Augmentative Research Grants — \$1800

OBJECTIVES

To monitor and catalogue parts of a coral community in a long term study to provide information on temporal changes in recruitment, frequency and abundance of species etc.

IMPLICATIONS/MANAGEMENT NEEDS

This study is one of the few long term studies on coral reef community organisation on back reef and reef crest areas.

METHODOLOGY

Over 40 x 1m² quadrats have been established on the Heron Reef crest. The quadrats are in three groups, two in back reef locations and one to windward. A basic census is taken around August each year and involves making photographic records, additional higher resolution maps and observations of interactions. The records are made at the level of species and individual colonies in order to characterise the demography of the community generally as well as of species populations.

STATUS

Project continuing.

LOCALITY: Capricornia Section — Heron Island Reef

137. Microbial Ecology of the Staghorn Coral (*Acropora*)

PERIOD: 1983 and 1984
PROJECT LEADER: Ms. A. Duncan (Microbiology, La Trobe University)
SUPERVISOR: Prof. J. Waid
PROJECT OFFICER: Dr. W. Craik
FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$1540

OBJECTIVES

To identify and characterise activities of microorganisms associated with coral. To evaluate the effect of perturbation on microorganisms e.g. nutrients, pollutants. To assess the viability of using *Desulfovibrio* as an indicator of coral stress.

IMPLICATIONS/MANAGEMENT NEEDS

This study is designed to provide a greater understanding of the possible effects of pollution (oil, pesticides etc.) and eutrophication from both catastrophic events and low level inputs.

METHODOLOGY

Bacteria, fungi, and protozoa will be isolated from samples of *Acropora*, enumerated and purified. Dead corals will be compared to determine if microorganisms cause or are the result of death. Subsequently in vitro perturbations will be examined. Samples of coral will be collected from apparently stressed and unstressed sites to study *Desulfovibrio* occurrence and further experiments will be carried out to establish the effect of a wide range of stresses on *Desulfovibrio* numbers.

STATUS

Project continuing.

LOCALITY: Townsville Section — Magnetic Island

138. Abundance, Schooling Behaviour, and Population Dynamics of Silversides (Atherinidae) and Sprats (Dussumieriidae)

PERIOD: 1983 and 1984

PROJECT LEADER: Ms. P. Dupee (Zoology, University of Queensland)

SUPERVISOR: Dr. K. Warburton

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$1660
Postgraduate Fulbright Award

OBJECTIVES

To quantify abundance and biomass of atherinids and dussumieriids. To evaluate the importance of atherinids and dussumieriids in the diet of predators and to calculate predation mortality. To assess the population dynamics of atherinids and dussumieriids.

IMPLICATIONS/MANAGEMENT NEEDS

Silversides and sprats are primary prey species for many predatory species of fish and seabirds. Understanding of this role in greater detail is relevant to management.

METHODOLOGY

Silversides and sprats will be collected and data analysed. Photographic and visual observations of these species will be undertaken.

STATUS

Project continuing.

LOCALITY: Capicornia Section — One Tree Island Lagoon

139. Sex Patterns and Competitive Interactions in Three Species of *Thalassoma*

PERIOD: 1983

PROJECT LEADER: Ms. G. Eckert (Biological Sciences, University of Sydney)

SUPERVISOR: Dr. P. Sale

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$900

OBJECTIVES

To investigate the ecology and life history of three species of labrids at One Tree Island Reef.

IMPLICATIONS/MANAGEMENT NEEDS

Labrids are sex reversing fishes about which little is known. Some are vulnerable to fishing. Life histories in different habitats are important for management.

METHODOLOGY

Settlement in different habitats was monitored through observation and experiment. Juvenile mortality, adult populations, and social structure were also monitored. The sex of juveniles was determined by experiment.

STATUS

Report received.

LOCALITY: Capricornia Section — One Tree Island Reef

140. Genetic Variability among Geographically Isolated Nesting Populations of the Loggerhead Turtle (*Caretta caretta*)

PERIOD: 1983

PROJECT LEADER: Ms. E. Gyuris (Zoology, Monash University)

SUPERVISORS: Dr. J. Baldwin, Mr. C. Limpus (Q.NPWS)

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$593

OBJECTIVES

To determine the genetic distinction between the Mon Repos (Bundaberg) and Capricorn-Bunker loggerhead turtle populations.

IMPLICATIONS/MANAGEMENT NEEDS

Management strategies may differ if there is only one population rather than two separate populations.

METHODOLOGY

Polymorphic proteins were examined electrophoretically.

STATUS

Report received.

LOCALITY: Mon Repos, Bundaberg;
Capricornia Section

141. The Productivity and Bioaccumulation of Trace Elements by Blue-green Algae of the Great Barrier Reef

PERIOD: 1983

PROJECT LEADER: Mr. G. Jones (Chemistry, University of Melbourne)

SUPERVISOR: Dr. J.D. Smith

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$900

OBJECTIVES

To determine the productivity of blue-green algal mats and the importance of this productivity to the Reef ecosystem. To determine the elemental composition of the blue-green algae and organisms higher in the food chain to determine if trace elements are accumulated.

IMPLICATIONS/MANAGEMENT NEEDS

Blue-green algae may accumulate trace elements and are grazed by *Holothuria atra*. The project will give base line analysis of algal productivity and trace element accumulation in the food chain.

METHODOLOGY

Productivity will be determined by C¹⁴ uptake and biomass estimates. Elemental analysis will be undertaken by energy dispersive XRF spectrometry.

STATUS

Report received.

LOCALITY: Cairns Section — Lizard Island Reef

142. The Algal Bearing Ascidians of the Great Barrier Reef

PERIOD: 1983 and 1984

PROJECT LEADER: Mr. D. Parry (Chemistry, University of Queensland)

SUPERVISORS: Prof. C. Hawkins, Dr. P. Mather

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grants — \$1690

OBJECTIVES

To investigate the symbiotic relationship between algal cells and ascidian host. To establish a catalogue of algal bearing ascidians at Heron Island Reef. To provide a chemotaxonomic method to assist identification. To investigate the ability of ascidians to concentrate heavy metals and thereby act as indicators of pollution.

IMPLICATIONS/MANAGEMENT NEEDS

This project will provide information on oxygen levels on reef flats and on the ability of ascidians to concentrate heavy metals and therefore act as indicators of pollution.

METHODOLOGY

The research plan involves (i) observations; (ii) isolation and identification of pigments from algae, together with the isolation and identification of compounds from the ascidian host; (iii) a study of photosynthesis and respiration of these animals in the field; and (iv) determination of the concentration of trace and heavy metals in these ascidians.

STATUS

Project continuing.

LOCALITY: Capricornia Section — Heron Island Reef

143. An Investigation into the Relationship between Breeding and Feeding of Seabirds around Reef Environments

PERIOD: 1983

PROJECT LEADER: Mr. G.C. Smith (Australian Environmental Studies,
Griffith University)

SUPERVISORS: Dr. C. Catterall, Dr. K. Hulsman

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$900

OBJECTIVES

To test if food is a limiting resource to reproductive output and chick growth of tropical seabirds. To test if weather, tides, inter-specific competition and prey availability affect consumption.

IMPLICATIONS/MANAGEMENT NEEDS

The viability of seabirds may be affected by food supplies (overfishing), and/or pollution effects. This study should provide information for fish management decisions on boundaries for management of bird populations.

METHODOLOGY

Rapid surveys were carried out to determine numbers and distributions of seabirds, and location, size and reproductive output of breeding colonies in the Lizard Island region.

STATUS

Preliminary report received.

LOCALITY: Cairns Section — Lizard Island area

145. Investigation of Environmental and Biological Factors causing Morphological Variation in Reef Corals, *Pavona cactus* and *Turbinaria mesenterina*

PERIOD: 1983

PROJECT LEADER: Ms. B. Willis (Marine Biology, James Cook University)

SUPERVISOR: Assoc. Prof. M. Pichon

PROJECT OFFICER: Dr. W. Craik

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$353

OBJECTIVES

To elucidate growth and reproductive strategies of *Pavona cactus* and *Turbinaria mesenterina*.

IMPLICATIONS/MANAGEMENT NEEDS

Information on spawning periods and growth requirements will enable the prediction of periods of vulnerability for these two coral species. Both are inshore reef species which may occur near tourist or heavily populated areas. The project is of relevance to recolonization of dead reefs.

METHODOLOGY

Growth and reproductive data for *T. mesenterina* were collected to complete a 2-year study of two growth forms of this species in Nelly Bay, Magnetic Island.

The growth of two forms of *P. cactus* at Lizard Island Reef were compared to test the hypothesis that fish grazing pressure is the selective agent responsible for the maintenance of polymorphism in this species.

STATUS

Report received.

LOCALITY: Townsville Section — Magnetic Island Reef
Cairns Section — Lizard Island Reef

180. Hereditary Structure and Genetic Exchange in Coral Populations

PERIOD: 1984
PROJECT LEADERS: Mr. A. Heyward (Marine Biology, James Cook University)
Mr. R. Babcock
SUPERVISOR: Assoc. Prof. M. Pichon, Dr. J. Collins
PROJECT OFFICER: Ms. E. Eager
FINANCIAL SUPPORT: GBRMPA Augmentative Research Grants — 2 x \$900

OBJECTIVES

To determine the degree of larval dispersal between reefs by documenting genetic variation within populations and genotypic frequency variation between separate populations.

IMPLICATIONS/MANAGEMENT NEEDS

The use of electrophoresis to determine the genotypic frequency variation between coral populations can provide information on the degree of larval exchange between reefs. Comparison of genetic variation within a population should allow comparison of the relative significance of larval recruitment and recruitment by fragmentation. This information would allow evaluation of the effects of such influences as cyclones, trampling or *Acanthaster*, and the responses of populations to these events.

METHODOLOGY

This study will investigate the genetic structure of populations of three species of coral, *Montipora ramosa*, *Goniastrea aspera* and *G. favulus* using a ten locus electrophoretic system. Preliminary studies have determined ten enzyme loci which show electrophoretic activity in corals. Sampling sites for the corals will be at Magnetic and Palm Islands.

STATUS

Project underway.

LOCALITY: Townsville Section — Magnetic Island and Palm Islands

181. Detrital Fluxes of Carbon and Nitrogen on a Coral Reef

PERIOD: 1984
PROJECT LEADER: Mr. R. Johnstone (Biological Sciences, University of Sydney)
SUPERVISOR: Assoc. Prof. A. Larkum
PROJECT OFFICER: Ms. E. Eager
FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$800

OBJECTIVES

To investigate factors determining bacterial distribution and examine aspects of bacterial metabolism related to carbon and nitrogen flow through coral sediments. Comparisons to be made between healthy and stressed reefs.

IMPLICATIONS/MANAGEMENT NEEDS

This study will increase understanding of the role of microbes in regenerating nutrients in coral reef systems with implications for management of human pollutants and wastes which often contain high levels of carbon and nitrogen and often collect as sediment.

METHODOLOGY

The study will involve sediment sampling and analysis for grain size and carbon content, estimation of bacterial numbers, and analysis of sediment flux and interstitial water samples for nitrogen and carbon compounds, dissolved oxygen and pH.

STATUS

Project underway.

LOCALITY: Capricornia Section — One Tree Island Reef

182. Functional Morphology and Nutrition of the Dugong in relation to its Seagrass Diet

PERIOD: 1984

PROJECT LEADER: Ms. J. Lanyon (Zoology, Monash University)

SUPERVISORS: Dr. G.D. Sanson, Dr. H. Marsh (James Cook University)

PROJECT OFFICER: Ms. E. Eager

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$750

OBJECTIVES

To investigate seagrasses at the community, morphological and ultra-structural levels in relation to the functional morphology of the dentition and digestive tract of the dugong.

IMPLICATIONS/MANAGEMENT NEEDS

A possible relationship between seagrass nutrient levels and availability and the timing of breeding and migratory movements may have implications for planning to protect areas of seagrass for dugong conservation.

METHODOLOGY

Laboratory investigation into the physical and chemical nature of seagrasses with respect to digestibility will be combined with studies of the mechanics of mastication by dugong and samples of ingested material from dugong.

STATUS

Project underway.

LOCALITY: Townsville Section

183. Bibliographic Database of Coral Reef Molluscs

PERIOD: 1984

PROJECT LEADER: Mr. B. Long (Zoology, University of Queensland)

SUPERVISOR: Dr. T. Hailstone

PROJECT OFFICER: Ms. E. Eager

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$950

OBJECTIVES

To prepare a database of published material on Queensland coral reef molluscs suitable for transfer to the REEF database.

IMPLICATIONS/MANAGEMENT NEEDS

The planning of the Great Barrier Reef Marine Park requires information on the biological resources within or close to the Sections. A comprehensive data set on the Queensland coral reef molluscs will contribute towards this information requirement.

METHODOLOGY

The data set will be developed from existing coded references on cards. GBRMPA staff will be consulted to determine the data structure and system of indexing to allow selective searching of the references and ultimate transfer of the data set to REEF.

STATUS

Project underway.

184. Production of Planulae in *Pocillopora*, *Stylophora* or *Seriatopora*

PERIOD: 1984

PROJECT LEADER: Mr. P. Muir (Marine Biology, James Cook University)

SUPERVISOR: Dr. C.G. Alexander

PROJECT OFFICER: Ms. E. Eager

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$600

OBJECTIVES

To clarify the origin(s) of planulae of these scleractinian corals (relative importance of sexual versus asexual reproduction).

IMPLICATIONS/MANAGEMENT NEEDS

This study should increase knowledge of the interdependence of populations of widespread scleractinian coral species and hence assist in the planning and management of the Marine Park.

METHODOLOGY

Samples of planulae will be collected regularly to compare seasonal release around Magnetic Island with results obtained elsewhere and for histological analyses to determine the origin of planulae released in the peak season. Electrophoretic work will be conducted to determine whether meiosis has occurred during development.

STATUS

Project underway.

LOCALITY: Townsville Section — Magnetic Island

185. Metabolic Studies of the Crown of Thorns Starfish

PERIOD: 1984

PROJECT LEADER: Mr. K Peckham (Zoology, James Cook University)

SUPERVISOR: Dr. J.S. Lucas

PROJECT OFFICER: Ms. E. Eager

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$800

OBJECTIVES

To determine the relationship between specific metabolic rate (SMR) and size in *Acanthaster planci* and the effects of nutritional status on SMR.

IMPLICATIONS/MANAGEMENT NEEDS

It should be possible to predict rates of coral damage versus starfish density and size, and add to general explanation of *A. planci* biology.

METHODOLOGY

Oxygen consumption will be used to measure metabolic rate. Wet and ash-free dry weights of pyloric caeca and gonads relative to total body weight will be used to measure nutritional status.

STATUS

Project underway. Report due December 1984.

LOCALITY: Townsville Section
Cairns Section — Lizard Island area

ANALYSIS OF USE

106. Evaluation of the Travel Cost Method for Estimating Recreation Use Values of Public Amenity Resources such as Sites on the Great Barrier Reef

PERIOD: 1982 - 1984

PROJECT LEADER: Mr. R.K. Sloan (Economics, University of New South Wales)

SUPERVISOR: Dr. D. Gallagher

PROJECT OFFICER: Dr. J. Dunn/Ms. S. Driml

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$712

OBJECTIVES

To assess the empirical relevance of theoretical work on the travel cost method (TCM) which indicates it may be inappropriate for establishing a site value when it is used in different ways by various visitors.

IMPLICATIONS/MANAGEMENT NEEDS

The TCM is the most widely used method for evaluating recreation sites. This study will add to the understanding of recreation site valuation procedures.

METHODOLOGY

Data on the TCM were collected using an appropriate questionnaire distributed at Heron Island. Data collected also provided socio-economic profiles, delineation of use categories, and identification of the most valued attributes of the site.

STATUS

Preliminary report received.

LOCALITY: Capricornia Section — Heron Island

148. A Study of the Decision-Making Behaviour of Day Visitors to the Great Barrier Reef Marine Park

PERIOD: 1983

PROJECT LEADER: Mr. N. Whittem (Geography, University of New England)

SUPERVISOR: Dr. J.J. Pigram

PROJECT OFFICER: Ms. S. Driml

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$720

OBJECTIVES

To compare two distinct day-visitor groups to Beaver Cay with respect to (i) visitor profiles; (ii) experience, expectations, images, motive and decision-making behaviour; and (iii) satisfaction and opinion on future Great Barrier Reef planning.

IMPLICATIONS/MANAGEMENT NEEDS

Understanding of user's perceptions and behaviour is important for predicting future use demands.

METHODOLOGY

Questionnaires were distributed during the cruise to and from Beaver Cay to samples of visitors from two groups; (a) those departing from mainland; and (b) those from the Dunk Island Holiday resort.

STATUS

Report received.

LOCALITY: Cairns Section — Beaver Cay

190. Application of Recreational Opportunity Spectrum to a Marine Park

PERIOD: 1984

PROJECT LEADER: Ms. K. Means (Australian Environmental Studies, Griffith University)

SUPERVISORS: Mr. T. Hundloe, Dr. R. Rickson

PROJECT OFFICER: Ms. E. Eager

FINANCIAL SUPPORT: GBRMPA Augmentative Research Grant — \$800

OBJECTIVES

To establish whether a marine park composed of heterogeneous units can be treated as one recreational resource amenable to Recreational Opportunity Spectrum classification.

IMPLICATIONS/MANAGEMENT NEEDS

Investigation of the demands for a range of recreational opportunities and available suitable sites is useful input into planning.

METHODOLOGY

Personal interview of campers on islands in the Capricornia Section are being undertaken to determine visitors' behaviour, demands and perceptions.

STATUS

Project underway.

LOCALITY: Capricornia Section

APPENDIX E

FINANCIAL STATEMENTS

GREAT BARRIER REEF MARINE PARK AUTHORITY

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE PERIOD 1 JULY 1983 TO 30 JUNE 1984

	Notes	1983-84	1982-83
Cash at bank and on hand 1 July		\$ 290 941	\$ 222 361
RECEIPTS			
Appropriation from the Commonwealth Government	(2)	4 139 000	3 253 800
Day-to-day Management — Queensland Government contribution	(2)	301 137	191 387
Sale of promotional material		3 705	3 949
Other receipts		15 035	7 675
		4749818	3679172
PAYMENTS			
<i>Operational</i>			
Expenses of Chairman and Members	(4)	112 787	106 880
Expenses of Great Barrier Reef Consultative Committee	(5)	24 508	24 033
Salaries and allowances		1 408 646	1 119 784
Administrative expenses			
— Travel and subsistence		163 825	144 044
— Office requisites		31 358	24 837
— Postage and telephones		136 459	98 289
— Office services		159 845	109 237
— Computer services		49 155	62 260
— Library services		24 679	18 247
— Advertising		28 449	22 026
— Recruitment expenses		91 364	15 883
— Operating costs — equipment		37 820	29 170
— Incidentals		35 471	33 178
Research and monitoring		416 437	276 854
Planning	(6)	100 761	27 396
Education/Information		168 435	221 142
Park Management	(7)	9 574	477 250
Day-to-day management			
— Capricornia Section	(2),(9)	472 026	382 775
— Cairns/Cormorant Pass Sections	(2),(9)	99 000	—
		3570599	3193285
<i>Capital</i>			
Automatic data processing		—	25 928
Furniture, fittings and display equipment		77 064	30 925
Office machines		41 968	81 555
Audio-visual and photographic equipment		7 259	10 108
Marine and diving equipment		10 918	1 968
Vehicles and other equipment		22 448	5 779
Day-to-day management			
— Capricornia Section	(2),(3),(9)	328 526	38 683
— Cairns/Cormorant Pass Sections	(2),(9)	94 000	—
		582 183	194 946
Cash at bank and on hand 30 June		597 036	290 941
		4749818	3679172

STATEMENT OF CAPITAL ASSETS (AT COST) AS AT 30 JUNE 1984

	Notes	1983-84	1982-83
		\$	\$
Automatic data processing		68 878	77 620
Furniture, fittings and display equipment		246 509	189 950
Office machines		186 662	174 763
Audio-visual and photographic equipment		47 728	43 682
Marine and diving equipment		41 491	40 830
Vehicles and other equipment		44 372	27 874
Capital items — Capricornia Section	(3),(9)	165 502	125 938
— Cairns/Cormorant Pass Sections	(2),(9)	31 659	—
	(8)	832 801	680 657

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 1984

NOTE (1) Accounts are kept on a cash basis. Expenditure was in accordance with estimates approved by the Minister. The Authority's financial statements for 1984-85 are to be modified to comply with the Form and Standard of Financial Statements of Commonwealth Undertakings.

NOTE (2) Day-to-day Management
The forgoing Statement of Receipts and Payments and Statements of Capital Assets were prepared subject to agreement between the Commonwealth and Queensland Governments for day-to-day management and control and ownership of assets.

Zoning Plans for the Cairns and Cormorant Pass Sections of the Great Barrier Reef Marine Park came into effect on 7 November 1983.

Principles agreed between the Commonwealth and Queensland Governments relating to the day-to-day management of the Great Barrier Reef Marine Park provide for:

- the Queensland National Parks and Wildlife Service to carry out the day-to-day management of the Great Barrier Reef Marine Park, subject to the Authority;
- the Commonwealth to fund 100% of an initial capital works program (in the first three years or so) required to establish management of the Great Barrier Reef Marine Park on a sound basis, with other capital costs of management of the Great Barrier Reef Marine Park being shared equally between the two Governments.
- the Commonwealth and Queensland to meet in equal shares, the recurrent costs for management of Queensland national and marine parks within the outer boundaries of the Great Barrier Reef Marine Park;
- the Authority to administer funds provided by the Commonwealth and Queensland for these purposes; and
- The Commonwealth contribution included \$557 013 for recurrent costs as follows:

— Capricornia	\$357 013
— Cairns/Cormorant Pass	\$200 000

\$285 513 was expended with the balance of \$271 500 carried forward as cash towards 1984-85 commitments, as follows:

— Capricornia	\$121 000
— Cairns/Cormorant Pass	\$150 500

- The Commonwealth contribution included \$486893 for the initial capital works program, as follows:

— Capricornia	\$392893
— Cairns/Cormorant Pass	\$ 94000

\$391277 was expended with the balance of \$95616 carried forward as cash, as follows:

— Capricornia	\$ 95616
— Cairns/Cormorant Pass	\$ —

- The cash carried forward figure for the Capricornia initial capital works program is the amount committed for buildings on Heron Island (\$95616). Expenditure is dependent on the finalisation of inter-governmental agreements for the control and ownership of these assets.
- The Commonwealth contribution included \$15625 for post-initial capital works in the Capricornia Section.
- Expenditure on Rates, Services and Rental amounting to \$9508 in excess of the approved item level of \$30 000 but within the overall total of the Capricornia Section of the program was subsequently ratified by the Authority.

NOTE (3) An agreement was entered into on 23 May 1984 in which the ownership of buildings on Heron Island wholly funded by the Authority was transferred to the Queensland Government. The value of these buildings being \$224653 is included under capital payments, day-to-day Management — Capricornia Section, but has been excluded from the Statement of Capital Assets. Other capital items funded by the Queensland Government have also been excluded from the Statement of Capital Assets (\$14508).

	1983-84	1982-83
	\$	\$
NOTE (4) This item comprises		
Remuneration and Allowances		
• Chairman	55 161	50 613
• Part-time Members	11 346	10 900
Travel and Subsistence	38 500	38 143
Other Expenses	7 780	7 224
	<u>112 787</u>	<u>106 880</u>
NOTE (5) This item comprises	1983-84	1982-83
	\$	\$
Fees	5 287	6 148
Other expenses	19 221	17 885
	<u>24 508</u>	<u>24 033</u>

NOTE (6) This item includes \$56179 for the Public Participation Program which was previously included under Education/Information.

NOTE (7) In 1982-83 the Authority contributed \$467 393 under Commonwealth contracts for aerial surveillance in the Great Barrier Reef Region. The Authority continued to benefit from this operation in 1983-84 but the costs were met from the Department of Home Affairs and Environment.

NOTE (8) The Authority in 1983-84 changed its accounting policy with regard to the taking up of items as assets. Items with a value of less than \$200 and a useful operational life of less than 3 years were expended. As a result of this change in policy, items totalling \$423 399 were written off.

NOTE (9) NATIONAL PARKS AND WILDLIFE SERVICE
GREAT BARRIER REEF MARINE PARK —
CAPRICORNIA AND CAIRNS/CORMORANT PASS SECTIONS
STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 30TH JUNE 1984

	1983-84	1982-83
	\$	\$
The balance at 1st July comprised —		
Recurrent Costs	55 974	47 935
Capital Works and Services	13 745	5 717
	<u>69 719</u>	<u>53 652</u>
Receipts for the year were —		
For Recurrent Costs	571 026	382 775
For Capital Works and Services	422 526	38 683
Total Receipts (Note (B) (a))	<u>993 552</u>	<u>421 458</u>
From which the following payments were made —		
Salaries and On-costs	297 569	170 974
Operating Costs (Note (B) (b))	270 474	203 762
Capital Works and Services (Notes (B) (c) and (d))	310 384	30 655
Total Payments	<u>878 427</u>	<u>405 391</u>
Resulting in an excess of receipts over payments of	115 125	16 067
Leaving a balance at 30th June comprising —		
Recurrent Costs	58 957	55 974
Capital Works and Services	125 887	13 745
	<u>184 844</u>	<u>69 719</u>

NOTES TO AND FORMING PART OF THE ACCOUNTS

(A) Statement of Accounting Policies

NOTE (a) Basis of Accounts

The Accounts have been prepared on a cash basis, consistent with the basis applied in the previous financial year. The accounts for 1983-84 include the initial financial transactions in relation to the Cairns and Cormorant Pass Sections of the Great Barrier Reef Marine Park.

NOTE (b)	Current Assets/Liabilities Current assets and liabilities stood at a normal level at the beginning and end of the year.		
NOTE (c)	Contingent Assets/Liabilities There were no known contingent assets or liabilities of a significant nature at 30th June 1984.		
		1983-84 \$	1982-83 \$
(B)	Explanatory Notes		
NOTE (a)	Receipts during the year were provided from the following sources:		
	Commonwealth Government:		
	Recurrent Costs 50%	285 513	191 387
	Capital Works and Services:		
	Initial Program 100%	391 277	38 683
	Post-Initial Program 50%	15 625	—
		692 415	230 070
	Queensland Government:		
	Recurrent Costs 50%	285 513	191 388
	Capital Works and Services:		
	Post-Initial Program 50%	15 624	—
		301 137	191 388
		993 552	421 458
		1983-84	1982-83
NOTE (b)	Operating Costs	\$	\$
	Air Travel	21 982	15 397
	Travel allowance	26 897	18 620
	Vessel charter	15 216	1 500
	Aerial surveillance	50 163	41 295
	Vessel running expenses	11 275	18 391
	Motor vehicle running expenses	9 759	4 971
	Office supplies	4 298	3 774
	Appointment expenses	1 087	6 846
	Rates, services and rental	40 461	23 725
	Photocopy and printing	7 111	2 629
	Library	2 229	1 804
	Conferences and training	513	552
	General operating expenses	44 162	34 777
	Monitoring	9 787	6 616
	Photographic materials and processing	7 741	3 605
	Temporary accommodation:		
	Rental — Heron Island	3 893	5 000
	Furniture and fittings	494	6 500

	Professional fees (Day Labour)	11 162	7 760
	Uniforms	2 044	—
	Building maintenance	200	—
		270 474	203 762
NOTE (c)	Capital Works and Services		
	— Initial Program		
	as		
	Vessels and associated equipment	5 569	2 200
	Vehicles	17 017	8 539
	Diving equipment	7 296	9 566
	Audio-visual and interpretation equipment	20 832	5 418
	Air compressor	—	3 496
	Plant and equipment	4 969	841
	Moorings	—	595
	Monitoring facilities	1 033	—
	Accommodation — Heron Island	224 653	—
		281 369	30 655
	— Postal Initial Program		
	as		
	Vessels and associated equipment	7 249	—
	Vehicles	17 126	—
	Plant and equipment	4 640	—
		29 015	—
		310 384	30 655

NOTE (d) Statement of Capital Assets (At Cost) as at 30th June 1984

	Funded by Commonwealth (cumulative from 1st July 1981)		Funded by Queensland (cumulative from 1st July 1981)	
	1983-84 \$	1982-83 \$	1983-84 \$	1982-83 \$
Vessels and associates equipment	59 402	50 209	3 625	—
Vehicles	49 170	23 590	8 563	—
Diving equipment	18 919	11 623	—	—
Audio-visual and interpretation equipment	32 020	11 188	—	—
Air compressor	3 496	3 496	—	—
Plant and equipment	10 507	3 218	2 320	—
Moorings	2 083	2 083	—	—
Building lease	13 000	13 000	—	—
Monitoring facilities	8 564	7 531	—	—
Accommodation — Heron Island	224 653	—	—	—
	421 814	125 938	14 508	—

Stocktakes were carried out by officers of the Queensland National Parks and Wildlife Service and equipment on hand balanced with official equipment cards.

We certify that, in our opinion, the foregoing Statement of Receipts and Payments and appended notes are correct and fairly set out the financial transactions of the Great Barrier Reef Marine Park — Capricornia and Cairns/Cormorant Park Sections for the period 1st July 1983 to 30th June 1984 and show a true and fair view of the state of affairs at 30th June 1984 on a basis consistent with that applied in respect of the financial year last preceding. The receipt and expenditure of moneys were in accordance with the approved programs and in accordance with draft agreements and agreements executed between the Commonwealth and Queensland Governments with regard to day-to-day management and control and ownership of assets.

R. V. KELLY
Acting Accountant
Queensland National Parks and
Wildlife Service

G. W. SAUNDERS
Director
Queensland Parks and
Wildlife Service

I have examined the accounts of the Queensland National Parks and Wildlife Service in relation to the Great Barrier Reef Marine Park — Capricornia and Cairns/Cormorant Pass Sections and I have obtained all the information and explanations that I have required. The foregoing Statement of Receipts and Payments and appended notes are in agreement with the accounts and have, in my opinion, been properly drawn up so as to present a true and fair view of the transactions for the period 1st July 1983 to 30th June 1984 and the financial position at 30th June 1984 on a basis consistent with that applied in respect of the financial year last preceding.

P. N. CRAVEN
Auditor-General of Queensland

In our opinion, the above Statement of Receipts and Payments and Statement of Capital Assets (At Cost) have been properly drawn up so as to show fairly the financial transactions of the Great Barrier Reef Marine Park Authority for the year ended 30 June 1984.

ALISTAIR J. GILMOUR
Executive Officer

GRAEME KELLEHER
Chairman

APPENDIX F

Auditor-General's Report

27 November 1984

The Honourable the Minister for
Home Affairs and Environment
Parliament House
CANBERRA ACT 2600

Dear Sir

GREAT BARRIER REEF MARINE PARK AUTHORITY REPORT ON FINANCIAL STATEMENTS

Pursuant to sub-section 60(2) of the Great Barrier Reef Marine Park Act 1975, the Great Barrier Reef Marine Park Authority has submitted for my report financial statements for the year ended 30 June 1984 comprising a statement of receipts and payments, a statement of capital assets (at cost) and accompanying notes.

The statements are in the form approved by the Minister for Finance under sub-section 60(1) of the Act. A copy of the statements is enclosed for your information.

I now report that the statements are in agreement with the accounts and records of the Authority and in my opinion —

- the statements are based on proper accounts and records, and
- subject to Note 2 and finalisation of agreement between the Commonwealth and Queensland Governments for day-to-day management of the Great Barrier Reef Marine Park and control and ownership of assets, the receipts and expenditure of moneys, and the acquisition and disposal of assets, by the Authority during the year have been in accordance with the Act.

Yours faithfully



P. L. Lidbetter
First Assistant
Auditor-General

